THE BATTLE OVER BISPHENOL-A: UNITED STATES CHEMICAL POLICY AND THE NEW NETWORKED ENVIRONMENTAL POLITICS

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by

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ABSTRACT OF DISSERTATION

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ABSTRACT

The chemical Bisphenol-A (BPA) has been linked to a range of negative health outcomes including reproductive and developmental disorders, diabetes, obesity, and cancer. These scientific findings have resulted in an ongoing public debate over the safety of the chemical. Throughout the course of these debates, the chemical industry and environmental health activists have been visible contenders in the battle over the chemical’s safety and the need for regulation.

The central purpose of this study is to examine how environmental policy-making arenas in the United States are influenced and shaped by both corporate elites and by social movement actors. In particular, this research aims to clarify how differences in power and resources influence BPA regulatory decisions at the state-level. The analysis relies on multiple sources of data including 1) interviews with 20 individuals associated with BPA social movement work; 2) publicly available documents that provide an understanding and overview of the actions of the BPA industry; and 3) media coverage that demonstrates the salience of social movement frames regarding BPA. This research is informed primarily by power structure research, the social movements literature and is also shaped by network theory and recent work on the manufacturing of scientific doubt.

This research revealed that chemical industry elites were able to access decision-making structures through financial contributions and the manipulation of scientific data. In contrast BPA activists, organizers, and scientists achieved political influence through the strategic development of networked organizational structures and through the deployment of unique and emotive frames that were highly resonant with both the public and the media. The recent passage of numerous state-level regulations controlling BPA suggests that the innovative organizational structures and tactical repertoires employed by BPA actors were relatively successful in influencing policy makers.
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LIST OF ABBREVIATIONS

ACC: American Chemistry Council
API: American Petroleum Institute
BPA: Bisphenol-A
CBI: Confidential Business Information
CDC: Centers for Disease Control
CERCLA: Comprehensive Environmental Response, Compensation and Liability Act
CHEJ: Center for Health, Environmental and Justice
CPSC: Consumer Product Safety Commission
CWA: Clean Water Action
EDF: Environmental Defense Fund
EPA: Environmental Protection Agency
EWG: Environmental Working Group
GMA: Grocery Manufacturers Association
ICT: Information and communication technologies
OIRA: Office of Information and Regulatory Affairs
OMB: Office of Management and Budget
PIRG: Public Interest Research Group
POPs: Persistent Organic Pollutants
SCHF: Safer Chemicals, Healthy Families
SMO: Social movement organization
TSCA: Toxic Substances Control Act
CHAPTER ONE
INTRODUCTION

“Risks such as those produced in later modernity… induce systematic and often irreversible harm, generally remain invisible, are based on causal interpretations, and thus initially only exist in terms of the scientific or anti-scientific knowledge about them. They can thus be changed… and are open to social definition and construction. Hence the mass media and the scientific and legal professions in charge of defining risks become key social and political actors.”

-Ulrich Beck, The Risk Society

The Global Chemical Industry

Global chemical production is at an all-time high, with more unique chemicals being produced in higher quantities than ever before. Chemicals have become a ubiquitous part of life worldwide, being used in the production of everything from high tech electronics to food, clothing and children’s toys. 500 million tons of chemicals are produced globally each year and there are more than 80,000 chemicals on the American market with approximately 1,000 new chemicals introduced each year (Wilson, 2006). The American Chemistry Council estimates that the global chemical industry generates revenues of $1.3 trillion annually. Although a global industry, the U.S. alone makes up 18.6 percent or $698 billion of these earnings (ACC, 2010). Other top producers include China, Japan, Germany, France, the UK, Korea and Brazil. Among these countries, a handful of multinational chemical companies contribute to the majority of sales: BASF, Dow, Formosa Plastics, DuPont, Saudi Basic Industries Corporation, Bayer and Mitsubishi.

The global proliferation of chemical production has led to ongoing discussions of the health and environmental impacts of the ever-increasing use of chemicals. The Stockholm Convention on Persistent Organic Pollutants (POPs) was one of the first global treaties attempting to regulate some of the most toxic chemicals that remain intact in the environment or
human bodies for long time periods. Administered by the United Nations Environment
Programme, the treaty entered into force in 2004 with 170 parties having ratified the agreement.
Although the U.S. has not ratified the treaty, other major chemical producers including China
and Japan have. This treaty requires Parties to take measures to eliminate or reduce the release of
persistent organic pollutants into the environment.

Along with the Stockholm Convention, the European Union passed the REACH policy,
which entered into force in 2007. Under REACH, chemical manufacturers and chemical
importers are required to collect data on the safety of the chemicals they are using or producing
and must register this information in a central database run by the European Chemicals Agency.
In addition to the registration of chemical substances, REACH mandates that the most toxic
substances should be substituted by safer alternatives where they exist. The EU has afforded
eleven years for the phasing in of REACH.

These two examples illustrate two of the most significant attempts to assess and control
chemical risks to health and the environment. While these policies have been critiqued elsewhere
and a full analysis of their effectiveness are the not within the realm of this dissertation, they are
indicative of a global trend in recognizing the impacts of chemical substances and directing
political efforts toward controlling them.¹ REACH and the Stockholm Convention are also
illustrative of the policy developments that are informed by the collaborative negotiations of
environmental health advocates, scientists, policy makers and industry. The decisions made
regarding these laws are based upon the ever-expanding scientific data demonstrating health and

¹ For example, see Ken Geiser’s “Limits of Risk Management and the New Chemicals Policies” in Transforming
Sustainability Strategy into Action edited by Beth Beloff, Marianne Lines, and Dicksen Tanzil. New York: John
Wiley and Sons, 2005 or Ken Geiser and Joel Tickner’s “Reforming State-Level Chemicals Policy Reform in the
United States: Status, Opportunities and Challenges” in Options for State Chemicals Policy Reform: A Resource
environmental effects related to chemical manufacturing, use, and disposal and were heavily supported by a range of health, environmental and political organizations. The passage and subsequent implementation of these two policies demonstrate the continued and evolving global discourse on environmental health that is based upon the development and dissemination of scientific knowledge, broad and inclusive activist networks, and a challenge to conceptions of capitalism that prioritize economic growth over health and environmental safety.

In contrast to these policies, in the U.S. fewer than 250 of the 80,000 plus chemicals on the market have undergone health and safety tests that the Toxic Substances Control Act of 1976 (TSCA) has the authority to demand. And while the U.S. bans only five chemical substances or groups of chemicals, the EU bans 35 chemicals or groups of chemicals. Despite the increased use of chemical substances worldwide, TSCA has not been updated in more than 35 years although other industrialized countries have taken action as chemicals have become increasingly ubiquitous in human bodies, wildlife, and the broader environment.

**Chemical Proliferation: Human Health and Ecosystem Effects**

The Centers for Disease Control (CDC) now routinely conducts biomonitoring studies that test the blood and urine of Americans for the presence of chemical substances. Their most recent iteration in 2009 found that nearly all of the 2500 participants had detectable levels of substances such as perchlorate, mercury, BPA, multiple perfluorinated chemicals, and flame retardants. Based on these findings, it is estimated that the average American carries more than 150 different chemicals in their bodies at any point in time. While the CDC only tests adults, a 2005 study tested the cord blood of ten infants and found that each of the blood samples contained more than 200 synthetic chemicals, demonstrating that exposure to a myriad of chemical substances begins even before birth.
Breast Cancer Action (2010) suggests that as much as 70 percent of breast cancer cases may be attributable to environmental causes, while the 20 fold increase in autism rates in the U.S. has been linked in some scientific research to exposure to heavy metals in the external environment (Windham et al., 2006; Palmer, Blanchard and Wood, 2009). A 2007 statement from the International Conference on Fetal Programming and Developmental Toxicity reported that chemical exposures during prenatal and early postnatal life were capable of influencing human health throughout the life course and that “certain environmental chemicals can alter gene expression by DNA methylation and chromatin remodeling. These epigenetic changes can cause lasting functional changes in specific organs and tissues and increased susceptibility to disease” (Grandjean et al., 2008).

Wildlife are suspected to be similarly affected by chemical exposures and extensive biomonitoring has demonstrated the presence of chemical substances in the bodies of both aquatic and land species. Health effects from these exposures are widely observed and include effects on reproduction, development and life expectancy for numerous species (McAloose and Newton, 2009; Guilette and Gunderson, 2001; Harrison, Holmes and Humfrey, 1997; Colburn, Dumanoski and Meyers, 1996).

**KEY ISSUES AND PURPOSE**

The expansion of the global chemical industry and the increasingly alarming implications of scientific research has generated numerous debates over regulatory action both globally and domestically. A great deal of social science research has undertaken the task of critiquing proposed or implemented policies and offering prescriptives to address problems or flaws, however, less research has examined policy debates as they play out in real time. Questions of
how certain policies or chemical regulations come into force are not well understood. We know little about how or why particular policies are adopted over others and have little information on the processes by which opponents and supporters of regulatory action are active in policy realms. This dissertation seeks to examine how key stakeholders in one chemical policy debate in the U.S. access and influence decision-making structures in order to advocate for their preferred outcomes. Of particular importance are corporate entities that seek to avoid regulations that would impose financial losses and environmental health activists that seek to reduce environmental health risks via increased regulation. Also important in chemical policy debates are scientists, whose research often forms the basis for action, but whose findings may also draw criticism and create controversy.

In uncovering the interactions and activities of these actors, this dissertation analyzes the current effort to promote chemical regulatory policies at the state-level that would control or ban the use of one chemical, Bisphenol-A (BPA), in consumer products. Although regulations exist at the federal level that aim to control the use of chemical substances such as BPA, the oversight by the Environmental Protection agency (under TSCA), the Consumer Product Safety Commission and the Food and Drug Administration have made little headway in assessing and controlling the hazards posed by the presence of chemical substances in a variety of applications. These shortcomings are further exacerbated in an era when neoliberal policy recommendations abound, limiting the pathways that social movement actors can utilize to agitate for regulatory change.  

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2 Neoliberal policy recommendations are recognized as free market policy initiatives which include deregulation, the scaling back of environmental protections, the downsizing of regulatory budgets and staff, the introduction of voluntary compliance mechanisms, the privatization of the public sector and the installation of corporate officials in offices or positions who have a vested interest in avoiding regulation.
The lack of action on the part of regulatory agencies has therefore served as a catalyst for state-based environmental and health organizations to agitate for policy changes that regulate chemical substances and challenge the notion that economic gains take precedence over public health and environmental safety. This perceived lack of action, in combination with the development of scientific research demonstrating health effects from BPA exposure has generated a policy debate that sets powerful chemical elite interests in opposition to environmental health activists. The BPA industry is a $6 billion a year industry that is interested in protecting its image and profitability and competes with an active group of environmental health activists that have elected to pursue increased regulations that ban or limit the use of BPA in consumer goods. These opposing entities have adopted different strategies in pursuit of their goals.

Given these two oppositional forces, I pose a number of key questions in exploring the policy debate over BPA, including: How do the dominant participants in the debate (industry actors and social movement activists) access decision-makers, primarily legislators or regulatory agencies that will make decisions regarding BPA? How are the tactics used to achieve influence similar or different? And in pursuit of dominating the debate over BPA, how do these opposing groups frame the issue? Which frames are the most dominant and which might be considered successful? Similarly, insofar as the scientific evidence behind a chemical’s effects on health or the environment are a critical component of regulatory decisions, in what ways do activists or industry officials make use of science or scientific expertise?

**Implications**

The battle over BPA is a complex, contested policy debate with numerous stakeholders. From social movement activists, chemical industry officials, government agencies and scientists
who are working to uncover the mysteries behind BPA, numerous organizations and individuals work to acquire the most influence over public opinion, legislators, the media, and regulatory agencies. A powerful chemical industry elite has come to dominate much of the scientific and legislative debate over chemical regulation; as they have significant financial resources and a vast network of relationships with legislators, they are a formidable force in opposing the effort to pass more stringent regulations. In contrast, the environmental health movement is not well funded and has far fewer elite connections. In working to achieve influence they have had to develop unique strategies, frames and organizational forms in order to compete with dominant industry forces, strategies that have often yielded promising results.

Where industry officials have developed elaborate practices to establish influence and control in regulatory decision-making arenas, environmentalists have elected to pursue a strategy that would generate influence starting from the local state level. Developing a connected, geographically dispersed and networked organizational structure, activists seeking to regulate BPA chose to scale back regulatory goals, pushing for the regulation of BPA at the state level where opportunities to access legislators were more readily available.

I therefore suggest that although the BPA industry has clearly established channels by which to access and influence policy makers, BPA activists have in many cases adopted more appropriate strategies that have allowed them to create unique pathways to decision-making structures. The successful passage of BPA legislation in seven different states suggests that the battle over BPA is being won not by the dominant forces of corporate industry, but by activists who, in creating new organizational forms, have excelled at disseminating appropriate and resonant messages and frames.
While this dissertation explains the routes by which competing interests develop and influence power structures, this is also a story about a battle for democratic power and social justice. For many activists, the ability to demand environmental regulations is a public right, one that many believe is being compromised by uncontrolled corporate influence and the dominance of neoliberal policies that prioritize economic benefits over public health. Telling the story of BPA is therefore a political project important to our understanding of the relative openness of decision-making structures. In an era of heightened environmentalism, this research can yield insights as to whether public demands for increased regulation can overcome patterns of elite influence and control.

This study will contribute to both activist and academic research on social movement activity. Environmental activists may use the information provided within to develop a greater understanding of how their collaborative efforts can best be used to influence regulatory change. In particular, the unique framing strategies and networked organizational form adopted in BPA campaign efforts should demonstrate the range of creative options movements can use to overcome barriers to participation in legislative debates. Findings on the corporate chemical elite can be used to inform legislators and the public about how power financial interests continue to play a major role in environmental policy debates, repeating many of the injustices we have seen in relation to climate change debates (e.g. the manipulation of scientific data and the infiltration of environmental agencies that make decisions).

This dissertation is also specifically designed to contribute to the broader body of scholarly work on social movements. I synthesize a number of perspectives on social movements through a focus on framing, political opportunities, media strategies and networked organizational structures. This melding of theoretical traditions contributes to the recent literature
on environmental social movements and expands our sociological understanding of movement efforts in relation to policy structures. Finally, this work also expands upon the tradition of power structure research by building a new analysis of how elite structures engage in processes of manipulating and distorting scientific research in order to shape policy discussions.

RESEARCH METHODS

This dissertation is an exploration of the interactions between key stakeholders (chemical corporations and social movement actors) as they engage in efforts to influence chemical policy outcomes. In order to assess the influence that each group has on policy debates, a multiple method approach was utilized.

Studying Up: Acquiring Data on Corporate Elites

As the “studying-up” required to clarify how corporate entities gain access and entrée into policy realms is a somewhat elusive project (in that corporate actors may be less visible or less willing to speak about their relationships with policy makers or politicians), I collected a range of data that I used to construct a picture of how corporate actors used their power and influence to access regulatory structures (Nader, 1972). When viewed together, these sources demonstrate the interlocking and overlapping connections that tie elite business and governmental officials to one another. In gathering data I did my best to adopt a systematic process of collection whereby I reviewed the transcripts from chemical policy hearings within the federal government from 2007 onward. Where possible I also attended these public hearings and took field notes of the interactions and testimonies. From these data, I compiled a list of “key players” (both trade groups and individual spokespersons) within the chemical industry that routinely participated or testified in legislative hearings. I then examined each group or
individual’s records in a publicly available lobbying database to clarify the financial relationships between corporate actors and politicians. In addition to lobbying records, I conducted internet-based biographical research (e.g. resumes, CVs, news stories, employer/organization websites) on the individuals and organizations that represent the chemical industry to further elucidate the types of relationships and interests that overlap between corporate leaders and political officials.

**Studying Social Movement Networks, Strategies and Frames**

In examining the social movement activity that surrounded chemical policy changes in the U.S., I adopted a qualitative approach to data collection that included semi-structured interviews and participant observation as well as supplementary assessments that included content analysis.

Although I examine the political and economic actions of chemical industry actors in the second and third chapter of this dissertation, I chose to develop in chapters four and five a social movement analysis to examine the efforts of movement actors seeking to pass state-based legislation that would regulate BPA. Although a subset of the broader environmental health movement and an example of a short-lived social movement campaign, this narrower focus allowed me to access a large proportion of the active BPA campaign participants. BPA campaigners (professional activists and scientists who are engaged with the activist community) are a loosely connected, geographically disparate group that emerged from within a broader coalition of environmental health organizations. BPA campaign efforts arose in 2007 in a number of states across the country with the goal of passing state-level legislation to regulate the use of BPA in consumer products. This campaign, as a subset of a larger movement, has a fluctuating number of individual participants backed by different organizations. I elected to
interview 20 such participants, which is a fairly large percentage of the campaigners active at any given point in time. The participants ranged from younger activists just beginning their careers in the environmental health movement to more seasoned activists who had been part of the movement for decades. I interviewed 15 activists who were working to, in some capacity, regulate BPA at the state level. I also interviewed two men who, while part of the broader environmental health movement, did not focus the majority of their efforts on BPA. They did however speak or blog publicly on the issue and were considered both active and reliable contributors to strategizing efforts. I also interviewed one legislator who had introduced a state-level BPA bill and I conducted two interviews with BPA scientists. This sample, while made up predominantly of white middle class Americans, reflected the diverse range of participants in BPA campaign efforts. Throughout this dissertation I refer to these interviewees as “campaigners”. Where possible I distinguish between the different groups or individuals I spoke with. I gained the consent from the majority of interviewees (two people declined) to use their real name and occupational title in this research. However, respondents were allowed to ask that certain comments be disassociated with their names. Therefore in the text, either real names are used or I have concealed the identity of the respondent as per their wishes.

I employed a non-probability method of snowball sampling methodology that expanded the participant list as interviews are conducted with participants recommending colleagues and peers. Snowball sampling works particularly well with deviant populations, sensitive topics or with difficult to reach populations (Berg, 2004; Munhall & Chenail, 2008). I consider the population at hand to be relatively small and difficult to reach, however, as I had previously worked and volunteered within an overlapping movement circle, some of the participants were familiar with my name, granting me access to this movement sector. I conducted 20 semi-
structured interviews that lasted between 40 minutes and one and half hours. I then coded each interview using the Nvivo program. I employed a coding process that allowed me to organize the data into distinct categories and themes based upon the interview data. I began the coding process by reading each interview and noting common themes or threads that were present in the interviews. I then developed specific thematic categories in the Nvivo program to organize and clarify the most common concepts and coded each interview according to those categories. I engaged in a reflexive process whereby I continually coded and re-coded data as new themes arose or came to light. The themes that resulted from this process included information about strategic framing processes, networked structures and scientific discourses as they related to BPA.

The rapport that helped me to gain access to interview participants also allowed me to gain entrée into the communication infrastructure that supported BPA campaign work. Particularly important was my participation on the BPA listserve, an online communication tool that allowed BPA campaigners to interact by sharing information and engaging in strategic discussions via email. The listserve functioned as an organizing platform that allowed campaigners to rally support for their own state’s efforts, helped activists acquire advice or suggestions from other campaigners, and allowed participants to continually check-in about campaign goals- often increasing a sense of solidarity or connection. In following the efforts of the BPA campaign, I joined this listserve and tracked the process of communication and decision-making that occurred on the listserve. Additionally, I joined the Twitter and Facebook feeds from different participating organizations in order to follow their communications. Following these processes for 15 months allowed me to gain a sense of the connections between
organizations and individuals while also demonstrating the importance of online communications in such a diffuse movement effort.

Additionally, I was able to attend the one in-person meeting that the BPA campaign held in Washington D.C. in 2008. There I interacted with BPA campaigners, observed their strategic planning process and spoke with scientists who studied the chemical. This meeting provided an instructive overview of the campaign’s major participants and allowed me to observe planning, framing and communication processes in-person, a rare occurrence in a movement campaign that primarily connected virtually.

Finally, I engaged in a process of content analysis in order to understand how movement-generated frames and messages were adopted and disseminated by media outlets. Content analysis allows one to make inferences from the text of relevant documents or messages (Neuendorf, 2002). I engaged in a process of textual analysis to clarify what messages or themes were present in the media coverage of BPA. I conducted two searches using LexisNexis to look for news articles published between 2007 and 2010 that discussed BPA. In the first, I conducted a search to examine national print media coverage of BPA. I also narrowed the search criteria to look for examples of legislators speaking or being interviewed about BPA, a decision that led me to broaden the search to local or regional media outlets. With national print coverage, I examined the most popular reprinted coverage for my analyses while, in the case of data related to legislators, the coverage which was likely to receive the widest audience was selected (i.e. regional newspapers were selected over town or county newspapers). Although I did not review the vast amount of television or video coverage of BPA, there were a number of these stories that could be assessed in future research projects.


CHAPTER OVERVIEW

Chapter Two: Chemical Regulation in the U.S.

The U.S. is currently facing a crisis in relation to chemical regulatory policies because it continues to maintain policy mechanisms that are ineffective at controlling risks. In chapter two I demonstrate the inadequacies and failures in the existing policy structures that regulate toxic chemicals. By clarifying such shortcomings, I develop and provide context for the subsequent social movement mobilization to regulate toxic chemicals. Although the BPA movement work that I describe occurs at the individual state level, chapter two provides information on the national setting in which these policy debates play out.

I begin the chapter by focusing on the primary mechanisms of environmental regulation in the U.S. that seek to control risks. In doing so, I offer an historical overview that describes and explains how and why particular environmental policies were adopted during the 1960s and 1970s. Historically, environmental movement efforts have played an influential role in the passage and implementation of environmental laws and regulations. Before discussing a contemporary policy struggle, it is important to see how previously established chemical control mechanisms were instituted. In particular I argue that the Toxic Substances Control Act, the primary means of chemical regulation in the U.S., exemplifies a regime of environmental regulatory processes that is inadequate to the task of controlling the chemical risks we are currently facing.

I conclude the chapter by describing how the structural inadequacies of current chemical regulations are exacerbated by the dominance of corporate chemical industry influence. I contend that an interrelated set of processes allow the chemical industry to influence decision-making structures and manipulate information and knowledge regarding chemical risks. These
processes are enacted as a means of securing neo-liberal policy adjustments that would further weaken pre-existing chemical regulations.

**Chapter Three: BPA: A Case Study of Regulatory Failures and Industry Co-optation**

In chapter three I build upon the work in chapter two using a similar approach and outline to address the policy mechanisms that have constrained efforts to regulate BPA. In this chapter I use BPA as an example of how structural deficiencies in chemical regulations limit innovation and policy reform, even when new scientific evidence suggests there is cause for concern. I also clarify how the industry efforts to weaken or limit regulatory action are pervasive in the case of BPA, a chemical that generates billions of dollars in revenue each year.

I begin the chapter with an overview of BPA’s use and the health concerns related to the chemical’s presence in consumer products. I then describe the current regulations or regulatory agencies that have the authority and capacity to regulate BPA. In assessing the ability for currently existing regulations to control BPA, I argue that current approaches to chemical regulation are inadequate to the task of controlling BPA as it is a chemical that does not fit within the dominant paradigm of toxicological science that informs regulatory action.

I then assess how the BPA industry engages in the same processes of manipulation and policy influence that the broader chemical industry does. I describe the key players and organizations invested in preventing BPA regulations and explain the routes through which they have attempted to influence public and legislative opinion and infiltrate decision-making structures. As the science behind BPA has become a site of contestation and debate, I also explain how the BPA corporate elite has engaged in a series of attempts to invalidate the peer-reviewed research on BPA and how they have continually manufactured doubt over the
legitimacy of the scientific research on BPA. Chapters two and three, taken together, create an understanding of the opposition to chemical regulation and construct an understanding of the corporate entities in the battle over BPA. Chapters four and five describe the social movement efforts to regulate BPA that oppose industry efforts to forgo regulation.

**Chapter Four: BPA Campaigns, Activism and Network Structures**

In building upon the findings in chapters two and three that suggest that the chemical industry is a well-oiled and influential machine, chapter four demonstrates how social movement forces arose in response to chemical industry claims that increased regulations were unnecessary. I begin by describing the activities of what I term a *BPA campaign*, a subset of the broader environmental health movement that is working to achieve the narrowly-defined, short-term goal of state level BPA regulations.

I then explain how existing political opportunities that existed shaped not only the goals and strategies of BPA campaign efforts, but also how such opportunities influenced the organizational form utilized by campaign activists. I contend that limited political opportunities at the national level encouraged social movement actors to seek alternative strategic goals that sought policy change at the state level. The confluence of limited opportunities and the ease of connectivity provided by technological infrastructures enabled the BPA campaign to adopt a networked organizational structure where numerous activists connected across large spatial divides in meaningful and important ways.

**Chapter Five: Strategic Framing and Movement Success**
Marco Giguni (1998; 1999) warns that measuring a social movement’s success is a difficult, if not impossible project as competing and overlapping messages directed at power-holders limit the ability to measure a cause and effect relationship between movements and social structures. In the policy realm, this notion is likely exacerbated by the scale and number of competing messages related to the thousands of legislative bills introduced each legislative session. Given these limitations, I cannot explain how BPA campaign efforts have succeeded in winning BPA policy battles. Instead I describe and explain how BPA campaigners have influenced both the public and legislators through the use of strategic framing processes.

I begin by explaining the frames adopted by BPA campaigns and describe how interview participants understood and made use of frames. I explore the use of both a children’s health frame as well as a scientific frame and clarify how scientists themselves contributed to the development of scientific messaging points that were useful to campaigners. I then examine how BPA campaign frames have been adopted and replicated in various public forums including the mainstream media, and within legislative discussions. Important here is my concept of scientific rendering or the process whereby BPA campaigners have worked with scientists to create readily understood and easily transmitted language regarding scientific research.

I conclude by arguing that the strategic use of frames that challenged hegemonic notions of chemical policy combined with frames that presented easy to understand scientific research contributed to the widespread adoption of BPA campaign frames in public venues. Tarrow (1998) suggests that movements are able to create new opportunities for themselves and I suggest in this chapter that BPA campaigns, in successfully framing the issue, were afforded greater influence and access to legislative realms. Although the social movement approach to achieving influence over policy structures was markedly different than the direct paths that
chemical industry elites chose to take, I offer that the circuitous path taken by BPA campaigners created greater public support and visibility, increasingly legitimacy and reshaping the public debate over BPA in terms of environmental health risks.

Chapter Six: Conclusion

In analyzing the battle over BPA, I conclude that both the corporate industry elite and BPA campaigners have unique strategies that allow them to influence and manipulate regulatory or legislative decisions. While the corporate elite use their financial prowess to purchase influence and dominate policy debates, BPA campaigns used framing processes and media strategies to generate support for their point of view. The passage of nearly a dozen state or city-wide legislative bills controlling BPA is indicative of the advantages of passing state-level legislation rather than national level policy changes.

The battle over BPA is demonstrative of the difficulties in passing legislation that regulates toxic chemicals. The chemical industry is well financed and very experienced in developing messaging points that contradict or challenge environmental claims. However, the case of BPA demonstrates that environmental movement efforts can contribute to regulatory successes when activists gain legitimacy through the use of scientific information or expertise and when they construct narrow frames that are emotionally compelling. Although efforts to curb environmental degradation have in many cases adopted similar strategies, it is perhaps the unique organizational structure and the downsizing of policy goals that allowed BPA campaign efforts to succeed where other environmental movement efforts have failed. The interactive network structure used by BPA activists allowed for heightened responsiveness to industry opposition and
also allowed frames and messages to be repeated in numerous locations and regions simultaneously.

This research is instructive of the numerous ways in which social movement activists can confront and overcome powerful industry opposition. The connectivity and commitment shared within the BPA network contributed to the expansion of media coverage and public support for BPA regulation, support that in turn encouraged many legislators to take action against the chemical. These findings suggest not only that the American public remains concerned and interested in environmental issues, but also that environmental movement efforts when strategic, thoughtful, and well-organized can play a significant role in public policy debates.
CHAPTER TWO
A CRISIS IN CHEMICAL REGULATION IN THE UNITED STATES

“The real problem is that the U.S. regulatory system for toxic industrial chemicals is not effective and is a threat to human health.”

-Donald Kennedy, former Commissioner of the Food and Drug Administration and Editor of Science

A Crisis in American Chemical Policy

The widespread acknowledgement on the part of numerous governments around the world that chemical substances pose significant risks to humans, animals and ecosystems is taken for granted in the U.S. Having never ratified any global treaty related to environmental issues, the U.S. has long been in the practice of prioritizing business interests over environmental or public health risks. Despite the actions of the U.S. government during the 1970s when a wide array of legislation was passed to control environmental degradation and reduce public exposures to contaminants in the air and water, recent decades have seen the U.S. slipping behind many other nation’s attempts to combat environmental ills related to chemical substances.

Today, the U.S. is facing a crisis in relation to chemical regulatory policies. As other nations begin to take action, modernizing their approaches to chemical regulation and recognizing health and environmental risks, the U.S. maintains an outdated policy that has been demonstrated to be ineffective in controlling risks. The U.S. bears not only the environmental or public health consequences of failing to take action, but also the effects of failing to keep pace with a global chemical market that may be increasingly unwilling to import substances that have not been assessed for safety.

The U.S. federal government has not updated its primary mechanism to control chemical risks, the Toxic Substances Control Act (TSCA) since it was implemented in 1976. In the three
and a half decades since its implementation, the chemical industry has continued to grow and has added at least 20,000 new chemicals to the marketplace. Of the more than 80,000 chemicals registered for use in the U.S. the Environmental Protection Agency has gathered safety information for approximately 250 of these chemicals and banned only five (Tickner and Torrie, 2008).³ In contrast, the European Union has banned more than 30 different chemicals from commerce. The current approach to chemical regulation in the U.S. was adopted in the 1970s, when the scientific study of the interaction between chemical substances and human health or environmental outcomes was in its infancy. More than 30 years of research and scientific advancements now suggest that there is reason to be concerned about the worldwide reliance on chemical substances. The proliferation of chemicals at the national and global level has coincided with increases in a variety of diseases that are associated with environmental exposure to certain chemicals. Although genetics and individual risk factors play a role in the incidence of many diseases, epidemiologists studying environmental health suggest that environmental pollutants play a large role in numerous diseases.

Despite the advancement of scientific investigations and the increasingly global consensus that certain chemicals post substantial risks to humans and the environment, TSCA remains untouched. Although scientific evidence suggests that action should be taken to control and assess chemical risks, the U.S. government has largely failed to gather even the most basic safety data on the majority of the chemicals on the market today. This failure is due in part to a chemical regulatory crisis wherein outdated policies fail to provide the federal government with the authority or capacity to tackle such a task. Such a lack of policy oversight may also be linked to the expansive influence of the chemical industry within the federal government and the

³ The bans include PCBs, or chlorofluorocarbons, dioxin, asbestos, and hexavalent chromium.
industry’s desire to maintain regulations that require minimal financial inputs in the form of chemical testing or data collection.

As other countries outpace the U.S. in terms of environmental regulations, it is imperative that we begin to assess the shortcomings of our current system of chemical control. A self-reflexive analysis is vital to the project of improving health and environmental outcomes and reducing the risks inherent in contemporary society. Exploring the routes by which policies do, or do not, come into force is also important to the task of reducing environmental injustices and unequal exposures to toxic chemicals.

This chapter intends to convey how federal failures to update TSCA and the overwhelming influence of corporate entities in policy realms have contributed to the current chemical policy crisis. Therefore, the goals of this chapter are threefold: 1) Characterize the dominant mechanisms or of environmental regulation in the U.S. in order to clarify the limitations of current regulatory approaches to the environment; 2) Examine how the Toxic Substances Control Act, the primary means of chemical regulation in the U.S. exemplifies a regime of environmental regulatory processes that are inadequate to the task of controlling the chemical risks we are currently facing; and 3) Describe how the chemical industry within the U.S. is readily working to secure neo-liberal policy adjustments that would further weaken pre-existing chemical regulations.

**A BRIEF HISTORY OF ENVIRONMENTAL POLICY & REGULATION IN THE UNITED STATES**

A discussion of the current state of environmental regulation requires a basic understanding of the circumstances that gave rise to contemporary environmental regulatory
schemes. In what follows, I briefly describe the particular political circumstances that led to the development of environmental policy frameworks.

The decade from 1960 to 1970 was a time of significant social change. The Civil Rights and Women’s movements were challenging social, legal and institutional practices throughout the country. This period of heightened social movement activity also featured the rise of the contemporary environmental movement (Shabecoff, 1993). Membership among traditional environmental groups increased throughout the 1960s through groups like the Sierra Club and The National Audubon Society (Bosso, 2005). Throughout the 1960s and 1970s, new legislation relating to air and water quality as well as wildlife protection and land preservation received bipartisan support (Flippen, 2000).

In April 1970, the first Earth Day demonstrated the growing strength of the environmental movement and the increasing sense of environmentalism among the American public, a value that was reflected by the passage of a number of environmental policy measures during the 1970s. Richard Nixon sought to balance the political pressures from a public increasingly concerned with the environment with financial and business demands that tended to be against regulation. The Nixon administration’s desire to promote an image of an environmentally conscious Republican party resulted in the passage of the National Environmental Policy Act and legislation on clean air, national parks, endangered species, pesticides, coastal protection, and ocean dumping restrictions. The Nixon administration, although marred by conflict and scandal in other realms, succeeded in building the basic framework of environmental policy in the U.S. through the reorganization and redistribution of several federal offices. This regulatory shuffling resulted in the establishment of the Environmental Protection Agency (EPA), the Office of Management and Budget (OMB) and the
Office of Information and Regulatory Affairs (OIRA), all of which are foundational to environmental policy and regulation in the U.S.

The Birth of the EPA and the Reorganization of Administrative Powers

One of Nixon’s primary goals as president was to reorganize and redistribute both administrative powers and resources within certain federal offices. Using the power of executive orders, Nixon used his position as president to pass policy measures and establish federal offices that have varying degrees of environmental oversight (Dodds, 2006). Most notable is the development of EPA under Reorganization Order number three. The order consolidated many of the federal offices including the Federal Water Quality Administration, the National Air Pollution Control Administration, and Bureau of Solid Waste Management under EPA and advanced the goal of cohesive decision-making related to the environment. EPA now oversees the implementation of environmental standards, conducts research on environmental issues, and enforces environmental standards established by the federal government.

Headed by an administrator selected by the President, EPA is structured both by program (i.e. the Office of Air and Radiation oversees air pollution measures) and by scale (national matters are handled in D.C. while state matters are dealt with by ten regional offices across the country) (Eisner, 2007). Within the federal government today, EPA has extensive regulatory duties, reflected in its multi-billion dollar budget and 18,000 full time employees. Eisner (2007) notes however, that despite the expansion of EPA duties since its inception, real growth in the budget has been insubstantial when controlled for inflation. Along with the development

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4 Nixon passed 346 executive orders during his five years as president (Dodds, 2006:54).
5 The 2010 budget is approximately $10.5 billion, which is higher than in previous years, although the American Association for the Advancement of Science (AAAS) has noted that the Obama administration has continued the past trend of decreasing R&D funds for environmental research (http://www.aaas.org/spp/rd/epa09p.htm)
6 The EPA budget remains between .5 and 1 percent of total federal outlays (Dodds, 33-9). Nearly 40 percent of the EPA budget goes to the goal of ensuring clean water, followed by land preservation and restoration (23 percent) and
of EPA, the creation of two new offices also impacted environmental regulatory efforts. In 1970, the Nixon administration undertook an effort to centralize financial oversight of policy implementation through the establishment of the Office of Management and Budget and, within OMB, established the Office of Information and Regulatory Affairs (OIRA) which required policy proposals to be evaluated for their economic outcomes.

OMB resides in the executive office of the president and is the largest cabinet-level office. In 1970, Congress approved a proposal from Nixon to reorganize the bureau of the budget into OMB. Nixon followed this approval with Executive Order 11, 541 which directed OMB to monitor federal agency budgets and programs, effectively transforming a “low profile budget office into a controversial policy-making arm of the presidency” (as quoted in Dodds, 2007: 55). The establishment of OMB effectively allows the president to support or reject certain policy practices through the use of budgetary proposals.

Building upon the expanded duties of OMB, the Office of Information and Regulatory Affairs (OIRA) was established as part of OMB in 1980. OIRA directs federal agencies to analyze the economic impacts of proposed policies, codifying the practice of cost-benefit analysis within regulatory processes. Prior to 1980, OMB had been utilized to impose regulatory review requirements, the development of OIRA under the Reagan administration was capable of “stopping the regulatory process through administrative means…[and] remains one of the more effective instruments of presidential influence over regulation” (Eisner, 2007: 41). The development of OMB and OIRA increased presidential control over regulatory practices and also served to legitimate and centralize the practice of economic analyses of environmental (and other) regulations within the federal government.

climate change and clean air standards (13 percent). An additional 15 percent is passed on to state, local or tribal governments.
The creation of EPA, OMB and OIRA has had long lasting effects on federal environmental policies. All three of these offices and their staff contribute to environmental policy outcomes and have played a role in the development and implementation of environmental regulations.

**Food and Drug Administration and Consumer Product Safety Commission**

Although EPA oversees the majority of the environmental policies supported by the federal government, other federal agencies also oversee policies that pertain to the environment. Both the FDA and the CPSC have regulatory obligations that pertain to environmental conditions or practices and, most important to this dissertation, have the power to regulate toxic chemicals in certain ways.

*The Food and Drug Administration (FDA)*

The FDA, which has been a government office since the passage of the Food and Drug Act in 1906, assures that food and drugs are produced in sanitary environments. Although this necessarily implies that FDA will oversee a range of practices from food and drug production to food preparation, there are numerous environmental implications of the FDA’s work. FDA oversees food safety concerns, the development of drugs, vaccines and medical devices. The practice of regulating these consumer goods involves controlling the environments in which food is produced as well as the packaging and labeling of such products, meaning that FDA is tasked with ensuring that food and drugs in the U.S. are free from substances that pose a risk to human health. From an environmental perspective, FDA regulates chemical substances in food packaging and food products in much the same way that EPA does so for air, water and chemicals more generally. Despite the fact that FDA and EPA are separate federal agencies, they may often be tasked with regulating the same toxic substances in different applications.
The Consumer Product Safety Commission (CPSC)

In 1972, the FDA’s Bureau of Product Safety became the independently operating CPSC. Currently regulating more than 15,000 consumer products, CPSC establishes safety standards, collects and maintains a national database of product-related injuries and deaths, and has the power to recall or ban hazardous products. Recently, CPSC has begun to issue recalls based upon the chemical substances present in consumer products. Like FDA and EPA, CPSC has the power and the obligation to evaluate and assess chemical risks to human health albeit in a more limited capacity. Although CPSC provides an important and necessary function and keeps an expansive website of product recalls and safety information, the efforts of CPSC often replicate the work of FDA and EPA, although each regulatory office tests products in different applications, much of the data collected to assess environmental health and safety remains similar. There is currently no mechanism in place to ensure that studies and reviews on particular chemical substances are shared with other agencies and there is no centralized database where information on substances can be shared across offices.

Acts to Protect the Environment

Although the U.S. federal government has a long history of passing policies and laws to protect the environment, preserve land, and protect animals, many of the more comprehensive laws to protect environmental goods were passed in the 1970s. Highlights include the Clean Air Act of 1970, which established national air quality standards, followed by the Federal Water Pollution Control Act in 1972, which set standards for pollutant in water, the Endangered Species Act of 1973, which expanded the earlier Endangered Species Conservation Act of 1969, the Resource Conservation and Recovery Act (RCRA), which amended the Solid Waste Disposal Act of 1965 and set goals for protecting health and the environment, conserving energy...
and reducing and controlling solid wastes, and the Toxic Substances Control Act (TSCA) of 1976 which gives EPA the authority to regulate chemical substances that pose risks to health or the environment.

The passage of these acts not only signified widespread support for a range of environmental initiatives during a period of heightened environmentalism, but also built a foundation for environmental decision-making that has endured for more than four decades. However, concerted efforts by politicians and business interests to scale back environmental regulations, reduce the power of EPA and increase the requirements for regulatory action has left many of these acts unchanged, despite decades of new scientific study and a dramatic increase in environmental pollution worldwide. Along with political assaults upon regulatory structures, the policies established in the 1970s, in prioritizing economic imperatives over social or environmental benefits, had little hope of dramatically altering environmental hazards.

**THE LIBERAL REGIME OF ENVIRONMENTAL REGULATION**

Environmental regulatory measures passed in the 1970s laid a foundation that, while often opposed by more conservative members of congress, achieved some measure of bipartisan support due to the nature of the policies themselves. While heralded at the time as some of the most stringent environmental laws in the world, the fundamental mechanisms of these regulations allowed for a great deal of leeway in their implementation and tended to privilege business priorities over environmental protection. This *liberal regime of environmental regulation* (Faber, 2008: 119-20) is characterized by a number of elements that seek to manage and control risks, rather than reduce or eliminate them. Liberal environmental policies received political support precisely because they did not fundamentally transform how business
functioned; environmental measures had to be undertaken, but only when they did not create an insurmountable hurdle to profitability. Much of the burden of environmental protection and regulatory oversight was to be borne by the federal government, which has allowed for most of the industries targeted by environmental policies to adopt only minimal environmental protections and pay nominal fines for failing to meet legal standards.

Clarifying the characteristics of a liberal approach to environmental regulations is vital in understanding how and why American environmental policies have fallen short of expectations. Despite an undeniable improvement in environmental quality since the 1970s, the policies implemented decades ago have failed to adequately protect human health and the environment in hoped for ways, due in part to the structural flaws inherent in the policies themselves.  

**Characteristics of Liberal Environmentalism**

The liberal environmental approach to regulation that serves as the foundation for many current environmental laws and policies contains a number of key features that, although innovative many decades ago, have been critically assessed and recognized to have many limitations when applied to contemporary environmental concerns. The chart below summarizes some of the major characteristics. Although there are four characteristics noted below, not all characteristics are featured in all environmental policies. While a command and control model and the use of risk assessment tend to be widely visible across many types of environmental regulations, cost-benefit analyses and technology based standards may be applied in varied ways, often not in tandem, in environmental legislation.

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7 EPA reported in 2010 that in the past 40 years, environmental legislation has resulted in a 60 percent reduction in air pollutants, while the number of Americans receiving water that met health standards went from 79 percent (in 1993) to 92 percent (in 2008). For more, see EPA: *40 Years of Achievements 1970-2010*. Retrieved April 20, 2011: [http://www.epa.gov/40th/achieve.html](http://www.epa.gov/40th/achieve.html).
<table>
<thead>
<tr>
<th>Description</th>
<th>Critique</th>
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<tr>
<td><strong>Command and Control Mechanisms</strong></td>
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<tr>
<td>Limits on environmental pollution/exposure levels are set and sanctions aim to achieve compliance</td>
<td>Limited by enforcement capacity; accepts pollution as inevitable</td>
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<tr>
<td><strong>Risk Assessment Reliant</strong></td>
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<tr>
<td>Scientific evaluations consider how much exposure/pollution is “safe”</td>
<td>Assumes some exposure is necessary; slow to incorporate advancements in science in analysis; limits public involvement in assessment processes</td>
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<td><strong>Cost-Benefit Analysis</strong></td>
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<td>Mathematical models determine the appropriate course of regulatory action by weighing the economic costs of regulation with the potential outcomes</td>
<td>Require time and financial resources; do not factor environmental justice concerns into analysis; cannot assess all costs or benefits as many are unknown or not measurable</td>
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<tr>
<td><strong>Technology Based Standards</strong></td>
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<tr>
<td>Technological solutions or interventions are used to limit or reduce environmental destruction</td>
<td>Administrative costs of revising technology are high; “one size fits all” proposed solutions many not work in all contexts; end of pipe solutions rather than preventive measures</td>
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1. **Command and Control model**: A command and control model is a primary regulatory mechanism when handling environmental policy matters. With this model, government mandates businesses or other institutions to adhere to and adopt specific standards, controlling their compliance through negative sanctions such as fines. Command and control models develop solutions that attempt to solve an environmental problem via the control of the processes that create the concern (i.e. installing slurries that reduce smokestack emissions to “acceptable” levels) or through the amelioration of the problem after it occurs (i.e. air filters that are used to curb emissions). A command and control model sets standards that would reduce environmental degradation to a scientifically-acceptable level and compels polluting industries to meet these
standards through the adoption of various technologies that will reduce environmental ills. This model stands in contrast to a market-based approach that incentivizes the reduction of environmentally harmful activities, as is the case with proposed cap and trade system.

Command and control instruments tend to be favored by regulatory agencies because they provide what Eisner (2007) refers to as “a certainty of results” in that regulatory bodies can develop standards, oversee their enforcement and measure outcomes in a predictable and manageable way. However, this regulatory certainty is limited by the capacity of enforcement agencies to levy fines and is reliant upon clear information that allows for the development of standards and the mechanisms by which to assess failed compliance.

Holling and Meffe (1996) argue that command and control approaches are problematic insofar as they assume that the problem at hand is “clearly defined, relatively simple, and generally linear with respect to cause and effect” and that when such methods of control are applied to more complex or less predictable phenomena they are not only ineffective, but may actually contribute to the degradation of the natural world (329). The authors argue that command and control mechanisms fail to recognize variability, prioritize heterogeneity and that “when unanticipated environmental problems then arise, the a priori expectation of certainty is not met and results in surprise and crisis…an inevitable consequence of a command and control approach” (330). Command and control models in the pursuit of predictability, sacrifice the flexibility that is required when dealing with the natural world.

Furthermore, Faber (2008) notes that controlling environmental risks allows exposure to certain pollutants and chemicals at “tolerable” levels rather than prohibiting production in the first place. As the field of environmental toxicology evolves, scientists are often recognizing that there is no safe level of exposure for certain chemicals (Michaels and Monforton, 2008; Dietrich
et al, 2001), yet command and control models still seek to determine exposure levels for pollutants and chemicals. In determining exposure levels, risk assessments are conducted by federal agencies.

2. Risk Assessment and Environmental Hazards: In general, risk assessments seek to characterize and quantify the relative harm or safety related to a known or perceived hazard. In the context of public health, risk assessment is the process of determining the type and extent of harm that individuals or populations might be likely to endure as a result of human activities. From pesticide usage and the building of power plants, to the siting of waste facilities and the mining of coal, risk assessment is commonly employed to determine how to manage technologies, industries and chemicals that are bound to have some type of impact on human or ecological life (O’Brien, 2000; Cranor 1993).

At the core of this debate is the consideration of two concepts, hazard and exposure (O’Brien, 2000). Hazard is commonly understood to be the “capability [of a substance or activity] to cause particular kinds of action” (Ibid. 17). The evaluation of hazard tends to be based on laboratory animal experiments or observations from human experience (Cranor, 1993). Exposure, on the other hand, refers to the amount of a dangerous substance or chemical that comes into contact with the person where hazard is being assessed (O’Brien, 2000).

Within the EPA, the National Academy of Sciences (NAS) Risk Assessment Paradigm forms the basis of the risk assessments related to waste and cleanup programs. The NAS model is composed of four steps that are often found in other risk assessment models. The steps in this process of assessment include hazard identification, dose-response assessment, exposure assessment and risk characterization.
(A) Hazard Identification: This portion of the NAS risk assessment process aims to determine the nature of the potential adverse consequences of the contaminant and the strength of the evidence that it can have that effect. The types of health outcomes related to each activity or substance are determined as part of the hazard identification. Hazards are usually understood as physically adverse effects such as disease or death. Factors such as route of exposure, the type and severity of health effects, the biological plausibility of findings, and the consistency of findings across studies all contribute to the hazard identification process (National Research Council, 1994). Hazards may be estimated through the outcomes of laboratory experiments, but may also be identified in instances of real life scenarios; the pesticide DBCP or Nemagon became publicly recognized as a hazard when more than 30,000 farm workers in Nicaragua became sterile after exposure (BP, 2007).

(B) Dose-Response Assessment: A dose-response relationship indicates the toxicity of a particular chemical or substance when it is exposed to humans. This assessment is based upon the amount of a contaminant that a person is exposed to and the incidence of observable adverse health effects (EPA, 2008). Toxicity values are derived from these relationships and can be used to estimate the potential for adverse effects in an exposed population. In many situations, animal data and testing are employed to develop an understanding of human-chemical interactions, but toxicity may also be estimated from accidental exposures as well (Cranor, 1993; O’Brien, 2000).

(C) Exposure Assessment: This step in the risk assessment process refers to the estimation of likelihood that a person/community will be exposed to a hazard. The degree, frequency, extent, and route of exposure are evaluated to determine the amount or dose of a contaminant that a population or individual will likely receive. This step attempts, in some ways, to take into
account variations in location/environment, individual lifestyles and other characteristics of an exposed population.

(D) Risk Characterization: The final step in the risk assessment process summarizes and integrates the initial three steps into quantitative and qualitative expressions or estimates of risk. Thus, the risk assessment process is:

…the estimate of an ability of an activity or substance to cause a particular kind of damage… the estimate of the degree to which a certain organism will be exposed to that hazard… and the likelihood of an organism experiencing that damage (O’Brien, 2000: 20).

Social Justice Implications: While risk assessment is a widely accepted tool within both federal agencies and the U.S. judicial system, the risk assessment model has been characterized as highly flawed. One common criticism is that the science behind risk assessment is inherently imperfect. Within the scientific community, risk assessment models are often criticized for their failure to accurately evaluate the substances/chemicals in question (Cranor, 1993). Risk assessment models may yield results that do not accurately represent the nature of a chemical substance. Risk assessment models often determine a threshold for expected harm within a healthy white male and then extrapolate that threshold to other groups (such as women or children) that might have a varied response (O’Brien, 2000). In these cases, scientific risk assessment is unable to thoughtfully consider the human variation in affected populations (O’Brien, 2000; Cranor, 1993; Draper, 1991; Davis, 2002).

Similarly, the science of risk assessment has been targeted for critique because of its failure to account for multiple chemical exposures. The U.S. Centers for Disease Control (CDC) has conducted three different biomonitoring studies that detail the types of chemicals that are present in the bodies of the average American. These studies have all found that most Americans
carry a wide array and variety of chemicals in their bodies at all times (CDC, 2005). Despite the widespread acceptance that most, if not all, humans have some chemical body burden, risk assessment experiments are often conducted in highly controlled settings where results are not considered in relation to other chemicals or substances (Cranor, 1993; O’Brien, 2000). This means that complex interactions between the chemical being evaluated and all other environmental toxins are not even considered.

Peter Montague (1993) warns that the scientific methods used in risk assessments are ineffective in examining the breadth of chemical exposures humans are likely to encounter and are often a pliable device that can be used by risk assessors to create desirable results. Variation in results, where they might indicate poor research in other venues, is seen as a clear indication of unknown risks and a call for further research (Draper, 1991; Cranor, 1993). As former EPA chief William Ruckelshaus once said, "A risk assessment is like a captured spy. Torture it enough and it will tell you anything." Risk assessment then, is a science that can be manipulated to produce certain conclusions or outcomes if managed in the right ways. Michaels (2008) reflected upon the malleability of risk assessment when describing a case in which eleven teams of European scientists and engineers estimated the risk of accident at an ammonia storage plant. Working independently, the eleven teams came up with risk estimates for an accident as ranging from 1 in 400 to 1 in 10 million (for full discussion, see Michaels, 2008 page 69). This example demonstrates how risk assessment is susceptible to subtle biases and individual assumptions or choices, if not outright political interference, revealing that risk assessment is a far less objective science than it is purported to be.

Unfortunately, the individuals and organizations most likely to have the time and financial resources to “torture” data are often those corporate-friendly entities who have a vested
interest in the outcomes of such analyses (O’Brien, 2000; Bohme et al., 2005). Highly polluting industries spend large sums of money to conduct assessments that will yield the desirable scientific outcomes that allow for business as usual. A report by Public Citizen (2001) notes the strong links between the chemical and tobacco industries and the regulatory apparatuses in the U.S. Government who review the risks associated with environmental tobacco smoke. Bohme et al. (2005) also note that many corporations, when faced with legal battles over pollution, will hire public relations firms to “manage” the risk assessment aspects of a case. These PR firms will then contract out assessments that can prove the “safety” of corporate activities or, at a minimum, can manufacture doubt in the courtroom, complicating the evaluation of corporate activities or products. Risk assessments have the capacity to be manipulated and utilized in ways that not only fail to accurately determine risks to human health, but can also be used to maintain and support the activities of major corporate actors.

Although it has some tangible and promising benefits in terms of ease of regulation and the attractiveness of tangible “thresholds” or exposure levels, risk assessment has a limited capacity to promote or assure social justice and public safety. Brown (2007) points to the public/private divide as one of the downfalls or risk assessment. He offers that the dominant paradigm of private risk assessment can often completely obscure public debate over risk. For many average citizens, the evaluation of hazards and health risks has become loaded with scientific language and insight, all but removing affected populations from participating in decision-making. Draper (1991) notes a similar phenomenon in the evaluation of workplace hazards where health and safety data are controlled by employers, limiting worker knowledge of on-the-job hazards (99). The process of risk assessment is clouded in a dialogue of expertise and
prevents affected populations from accessing information and demanding action to protect health and the environment.

Risk assessment also complicates demands for social justice because of the cost-intensive and lengthy process of evaluation. For many individuals or communities, the cost of conducting a scientific risk assessment prevents public participation in data collection and ultimately limits public demands for justice within the legal system. Koenig and Rustad (2004) note “few public prosecutors can afford to hire the necessary research scientists to assist them in evaluating the physiology… toxicology and biology of an emergent environmental peril” (194). Thus, complex scientific language as well as financial imperatives often sideline public participation in risk assessment and evaluation.

The most inherently problematic aspect of risk assessment for many sociologists, however, is the fact that risk assessment demarcates some portion of the public as pollutable (O’Brien, 2000; Draper, 1991). The nature of risk assessment is such that it develops “acceptable” levels of contamination, cancer, disease and death within the larger population (O’Brien, 2000: 8-9). The development of such thresholds, while useful in terms of regulation, make invisible the realities of the individuals or communities that fall within that threshold and are knowingly exposed to hazardous substances and activities. For many environmental sociologists, this willingness to see the pollution of human bodies as inevitable is an environmental injustice in modern society. This problem is exacerbated by the risk assessment paradigm, which is uniquely situated to control and dominate the public debate on human health and safety (Davis, 2002; Steingraber, 1997; O’Brien, 2000; Montague, 1993).
3. Cost-Benefit Analysis

Where risk assessment seeks to determine “safe” levels of exposure, cost-benefit analysis use mathematical models to determine the appropriate course of regulatory action by prioritizing economic efficiency. The goal of such efforts is to balance the costs of a particular policy with the benefits it creates for the American public. In an effort to conserve resources, financial and otherwise, proponents of cost-benefit analysis suggest that decisions should be guided by a comparison of the benefits that regulations will have on a population, and what the subsequent costs of such efforts demands. Freeman (2006) states “we should undertake environmental protection and pollution control only if the results are worth more, in terms of individuals’ values, than what is given up by diverting resources from other uses” (194-5).

Such analyses are used to help decide between competing policy suggestions, with the thinking that it is advisable to choose the most cost effective policy mechanisms that will produce the most observable benefit. Cost-benefit analyses also come into play in the implementation of environmental policies when determinations must be made in regards to what route of action should be taken, as is the case with TSCA, the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA) as well as the 1996 amendments to the Safe Drinking Water Act (Freeman, 2006). The use of cost-benefit analyses has been prominent within EPA since the 1970s and, due to the passage of Executive Order 12866, is often a required element of regulatory impact statements within regulatory agencies (Croote, 1999).

Although it is undoubtedly important to consider the economic implications of environmental regulations in order to conserve resources and maximize the public benefits of

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8 Cost-benefit analyses are not used to set standards under the Clean Air and Water Acts (Freeman, 2006: 196), but were used to evaluate the costs and benefits of the program after it was implemented (Croote, 1999).
regulation, cost-benefit analyses have often been the site of critique. The reliance on such mechanisms of evaluation and decision-making can, like risk assessment, obscure critical issues of environmental justice, create debate over notions of “what counts” in the calculation of costs, and can contribute to the inability of environmental regulations to quickly respond to environmental problems.

Ironically, one concern with the widespread use of cost-benefit analyses within environmental regulatory decision-making is that they require the input of resources. In order to develop such economic analyses, experts must spend time collecting information about the costs and benefits and completing evaluations of the aggregate costs and benefits. Conducting analyses takes both time and money. Croote (1999), in bringing together a number of government studies assessing the costs of conducting cost-benefit analyses found a range of reported costs from $375,000 (1995$) to over $2 million per study. While the costs of implementing policies to control environmental risks is exponentially higher than the cost of the evaluating the economic implications (and when money is saved through the implementation of a more cost effective policy), the high cost of such studies and the compulsion to conduct them limits the range of policy proposals that can be evaluated. These evaluations also take time in order to be developed and analyzed, further increasing the overall resource strain from the use of cost-benefit models.

Cost-benefit analyses are developed through the evaluation of aggregated costs and benefits of a particular policy. Mathematical models are used to assess and evaluation policy models and offer what Eisner (2007) refers to as a “false sense of objectivity and certitude” (79). Cost-benefit analyses require the expertise of professionals and experts, elevating the weight of their findings and obscuring the uncertainties inherent in the calculations. The reliance on expert-developed models not only produces an aura of certainty, but also limits community access to
decision-making when community members lack the skills to understand the economic evaluation process and when they are unable to produce their own cost-benefit analyses due to a lack of expertise or resources to conduct the evaluations (Heinzerling and Ackerman, 2002).

Such constraints limit community participation in policy discussions when communities lack the resources or expertise to engage in data collection or analyses. The reliance on evaluations of costs and benefits does not allow for the nuances of environmental problems to be assessed and limits the input of community members who are not deemed legitimate participants in assessment processes. The experiences of environmental justice communities have contributed to the widespread understanding that many environmental risks are not distributed equally (Bullard, 1990; 1993; Bullard, Mohai, Saha and Wright, 2007). From air and water quality to the siting of hazardous facilities and dumping grounds, communities of low-income residents or people of color are much more likely to be exposed to a larger proportion of the negative environmental risks than they are to have access to environmental “goods” such as public recreation facilities or green spaces.

In developing cost-benefit analyses, calculations of who benefits tend to consider benefits as being widely shared. Such calculations assume that improvements in environmental regulations will produce widespread benefit across communities, but rarely are the benefits of environmental regulations shared equally. For example, although low income or minority communities are more likely to house hazardous waste sites than are white or middle class neighborhoods (Smith, 2009, Bullard et al., 2007; Faber and Krieg, 2002) the clean-up of Superfund sites is inequitable; environmental justice communities remain least likely to benefit from environmental policies designed to repair environmental damages as most Superfund sites
that are cleaned up are located in middle class and/or white neighborhoods (Faber, 2008; O’Neil, 2007; Lee, 2002).

Cost-benefit analysis are limited in their capacity to address environmental justice concerns because they do not allow for the weighting of benefits received by certain communities or populations. If the goal of environmental policy is to improve environmental quality for all Americans and cost-benefit analyses continue to be a primary means of selecting appropriate regulatory mechanisms, the process of analysis must be adapted to recognize the added benefits of reducing environmental hazards in already overburdened environmental justice communities.

The uncertainty inherent in the cost-benefit analysis process is perhaps one of the more problematic aspects of its use. While the immediate burdens to industry that come in the form of environmental safety measures may be fairly obvious, the notion of benefits is less clear. Benefits in terms of improved public health outcomes or a reduction in environmental pollutants have uncertain costs; estimates can be made, but improving environmental quality can have an untold number of benefits that are not accounted for.

Unfortunately, the immediacy of the costs associated with environmental protection may overshadow the variety of unknown benefits that are long-term benefits and which are shared diffusely by the public, rather than corporate actors who must bear the brunt of the up-front costs themselves. As such, the costs to business may be a more compelling case to regulators than the future costs of improved environmental quality. Freeman (2006), in a review of cost-benefit analyses conducted by the federal government, found that environmental policies that involve clear threats to human health and widespread exposures were the most likely to be found to have
that benefits of regulatory action outweigh the costs. In contrast, environmental action tended to be deemed economically disadvantageous “many of the regulations, standards and cleanup decisions taken under the Federal Insecticide, Fungicide and Rodenticide Act, the Toxic Substances Control Act, the Safe Drinking Water Act and Superfund” (ibid: 142).

Additionally, even when cost-benefit analyses demonstrate that the benefits of environmental regulation outweigh the costs to industry, the reliance on mechanisms that prioritize economics over the environment often provide lengthy windows of time in which industry can conduct business as usual before transitioning to more environmentally friendly practices.

The inability for cost-benefit analyses to truly account for future or long-term benefits of environmental regulation is further problematic in that the calculation of benefits has an anthropocentric bias; benefits to wildlife or other natural entities, while taken into consideration are not valued as highly as benefits to humans are. While many environmentalists would argue that the preservation of a certain species of plant or animals is invaluable, a cost-benefit analysis is unable to bring the environment onto the balance sheet in measures that are equitable to those benefits received by humans.

4. Technology Based Standards

In keeping with a command and control model, certain regulatory agencies require the use of technological solutions in order to meet environmental standards. The goal of such standards is to ensure that environmental control measures evolve as newer methods of control become technologically feasible. However, within federal regulatory agencies, the parameters for the use of appropriate technology varies broadly. In some instances business or corporations are

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9 For example, the reduction of lead and other particulates in air and water.
expected to use the “best practicable” technology, which allows businesses to balance economic
costs with environmental benefits, while at other times language such as “best available”
technology is used to reflect an insistence upon certain technological standards, regardless of
cost. When adopted in the 1970s such standards sought to control environmental hazards in a
relatively short period of time, with minimal financial burdens on industry.

However, as critics have noted, such standards assumes a “one size fits all” approach that
requires the adoption of similar environmentally protective technologies across the board,
regardless of variations in industrial facilities. This means that a very large chemical
manufacturing facility may be required to install the same technologies to reduce the
contamination of ground water that a small facility might, despite the fact that more efficient or
different technology might be required to control pollutants on a larger scale (Farber, 1994;
Ackerman and Stewart, 1985). Technology-based solutions to environmental hazards tend to
promote the use of end-of pipe solutions to control risks rather than promoting the “development
of new, environmentally superior strategies, and[they] may actually discourage their
development” (Ackerman and Stewart, 1985: 1336).

In addition to the limitations of mandated adoption of technological controls, the
administrative costs of such standards are quite high. A reliance on technology based standards
requires EPA to develop such standards, which means that between the various laws EPA is
tasked with overseeing, they are also required to collect information and draw conclusions on the
best technological control mechanisms for any number of polluting industries. Such evaluations
take both time and financial and administrative resources and as Karkkainen (2008) writes, for
some industries, “by the time a new technology-based regulatory standard is promulgated, it
may be technologically obsolete, because industry has moved on to new product lines and new
production technologies” (1414) (Stewart, 1992; O’Leary et al., 1999). Although technology based standards are lauded for their capacity to mitigate risks when used appropriately and when such standards evolve with the state of the art advances in technological innovation, the primacy of such standards within environmental regulations contributes to the increasingly large burden regulatory agencies face in collecting information and assessing compliance (Karkkainen, 2008).

Liberal environmental policies are limited in their capacity to mitigate environmental risks. Such policies are characterized by features that emphasize quantifiable results, prioritize economic benefits, lack the flexibility needed to adapt to new technologies and risks, and also employ a notion of objectivity that assumes little variability in risks across communities or industries. Recognizable in legislation such as the clean air and water acts, Superfund laws and pesticide control policies, the liberal environmental approach to regulation is readily observable in the Toxic Substances Control Act of 1976.

THE TOXIC SUBSTANCES CONTROL ACT: LIBERAL ENVIRONMENTALISM IN PRACTICE

The primary mechanism of chemical regulation in the U.S. is the Toxic Substances Control Act (TSCA). Passed in 1976, it provides the authority to the Environmental Protection Agency (EPA) to require the reporting and testing or labeling of certain chemical substances, and also gives EPA the authority to restrict chemicals of high concern. Notably, the bill excludes the chemicals in food, drugs, cosmetics, pesticides and consumer products. TSCA directs EPA to collect information on new and existing chemicals and to impose testing requirements. The statute also gives EPA the authority to impose regulations on production, processing, importation, distribution, use and disposal. In practice, EPA reviews the available on new
chemicals before they are placed on the market and controls or assesses risks for the chemicals already in commerce.

**Command and Control Regulation under TSCA**

At its most basic, TSCA is a command and control model; EPA using its regulatory authority is tasked with controlling or keeping new, potentially risky, chemicals out of commerce, while assessing and managing the risks posed by those chemicals already on the market (Auer and Alter, 2007). EPA has the authority to compel manufacturers to provide available safety data on their chemical products and ideally, EPA should use that information to set standards or limit the production, importation, or distribution of a particular chemical, reflecting the command and control functions of a liberal model of regulation. However, a lack of consistent and complete information from chemical manufacturers, along with the very real scientific uncertainty surrounding many new chemicals, creates scenarios in which it is exorbitantly expensive and difficult for regulatory authorities to draw conclusions firm enough in order to take action on a chemical substance (Karkkainen, 2008).

When TSCA was passed in the 1970s it “grandfathered” in 62,000 chemicals (approximately 99 percent by volume of what is on the market today) despite the fact that little or no data was available about the majority of those chemicals. This grandfathering provided a major loophole through which chemicals were presumed safe for their intended use. The 62,000 chemicals that were initially registered even where little data existed and in spite of the fact that there were likely numerous highly toxic and persistent chemicals among that group. This means that, for the majority of the chemicals used in commerce today, EPA has little information about their toxicity as only the most minimal data was required when the grandfathering process occurred.
With the information that was available or has since been provided, EPA has completed a basic safety assessment on about 2 percent of the 1976 existing chemicals and fewer than 250 of these chemicals have undergone more expansive mandatory testing (GAO, 2006; Wilson, 2006; Tickner and Torrie, 2008). To date only five chemicals or chemical groups have been subjected to rigorous testing and a resultant phase out: PCBs, CFCs, dioxins, asbestos and hexavalent chromium (Wilson, 2006; GAO, 2007, 2009). The limitations of a command and control model are particularly evident under TSCA due to the lack of information required to draw conclusions on the appropriate course of action to take regarding toxic chemical substances.

Logical Paralysis: The Centrality of Cost-Benefit Analysis in Chemical Regulation

In order for EPA to take action or require testing from a manufacturer, the agency must demonstrate that a) there is a dearth of data such that the effect of the chemical on health or the environment is unknown and testing is necessary, and b) the chemical is produced in substantial quantities that present an “unreasonable risk” to health or the environment (TSCA, Section 4). TSCA also requires that the benefits of any actions by EPA will outweigh the costs to the national economy, small business, and technological innovation (TSCA Section 6c). The consequences of such requirements are what Denison (2009) refers to as a “classic Catch-22” whereby EPA must “already have the information sufficient to document potential risk or extensive exposure in order to require a company to test its chemical to determine if there is actual risk.” TSCA has saddled EPA with such a heavy regulatory burden that it has been largely unable to gather and assess the quality and breadth of data that would be required to take significant action on toxic chemical substances.
A variety of critiques of TSCA have noted the “data gap” that is created when EPA is tasked with overseeing all facets of regulation (Wilson, 2006; Denison, 2009; GAO 2006, 2009). In 2005, the GAO reported that “TSCA’s authorities for collecting data on existing chemicals do not facilitate EPA’s review process because they generally place the costly and time consuming burden of obtaining data on EPA” (GAO, 2006). TSCA does not require manufacturers to collect or submit to EPA anything but the most basic data about a chemical (such as production volume, and the basic chemical structure of the substance). EPA must therefore do all of the legwork to carry out their policies including the burdensome task of illustrating that a chemical may be harmful and requires further testing or investigation.

The compulsion to conduct cost-benefit analyses of chemical regulation stifles EPA’s capacity to collect a wide array of data on chemical substances. The concept of “unreasonable risk” is a highly subjective concept; a corporation may see an unreasonable risk to health or the environment in very different ways than community members might. Balancing financial concerns with health or safety issues is a complex task that, ideally, would require a variety of stakeholder opinions to develop democratically informed conclusions about the cost-benefit ratio. However, as Cranor (1993) points out when regulatory processes are seen “merely as a scientific enterprise, public input is irrelevant, for the public is not an expert on scientific issues” (134).

Importantly, TSCA has separate provisions for “new” and “existing” chemicals. Each year approximately 700 new chemicals are introduced into commerce, with more than 21,000 new chemicals added to the TSCA database since implementation (GAO, 2009). TSCA requires industry to notify EPA 90 days before importing or manufacturing a chemical. During this 90-day period, manufacturers must complete a pre-manufacturing notice (PMN). These notices
require basic data such as the chemical’s molecular structure, but do not require manufacturers to test new chemicals for their effects on humans or animals.

PMNs require only that all toxicity data that has been collected be submitted to EPA when registering a chemical. This results in a disincentive for manufacturers to collect any safety data on their products, lest they discover negative health or environmental effects (Wilson, 2006). Goldman suggests that PMNs are also unnecessarily burdensome for EPA, as anywhere from 1500 to 3000 PMNs are filed each year with the associated chemical structure and function data on the chemical, yet only 10 percent of those chemicals actually make it into commerce, wasting EPA time and resources on numerous chemicals that are not even marketed.

In addition to this, even when TSCA does collect provisional data from manufacturers, confidential business information (CBI) clauses allow manufacturers to claim that their data must remain private. As a result there is currently no publicly available data for 43 percent of the 3,000 High Production Volume (HPV) chemicals and more than 65 percent of all filings with EPA fall under the CBI category (Goldman, 2002; TSCA Section 14a). In August of 2010, EPA did take action to reduce the effect of CBI clauses on the public’s right to know. In a statement from May of 2010, EPA declared that TSCA’s confidentiality clauses did not apply to findings related to health and safety, noting that data submitted by manufacturers that contained evidence of health or safety concerns could be shared with the public if its manufacturing processes were not disclosed. This statement reported that EPA would begin reviewing new and previously submitted CBI claims to assess whether or not the information was indeed eligible for confidential treatment. However, the thousands of CBI claims will invariably require a significant expenditure of EPA time and resources.

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10 HPV chemicals are those chemicals produced or imported in the United States in quantities of 1 million pounds or more per year.
The HPV Challenge Program was also initiated in 1998 through a collaboration between EPA, Environmental Defense, the American Chemistry Council and the American Petroleum Institute, in hopes of controlling some of the most widely used chemicals. HPV chemicals, which make up a substantial portion of the global chemical industry’s output were recognized as largely lacking a publicly available, internationally agreed upon set of hazard data. As such, the voluntary initiative was established to gather data on the health and environmental impacts HPV chemicals (Auer and Alter, 2007). After the creation of this program, companies with data on HPV chemicals submitted them to a website, at which point in time the public can comment on the data summaries. As of 2008, of the 2782 HPV chemicals targeted by the initiative, 429 chemicals had been exempted and 1079 had been “sponsored”, meaning that an organization or manufacturer volunteered to compile the relevant and existing data on the chemical so that it could be reviewed and assessed for safety (Environmental Defense, 2008). Of those chemicals sponsored, final data had been collected for 43 percent and test plans for another 13 percent existed. A report from Environmental Defense noted that, despite a high overall sponsorship rate, in 2004, 274 chemicals remained unsponsored (where no efforts are being made to compile data) by chemical manufacturers while an additional 13 percent lacked a test plan to gather information or data summaries (Environmental Defense, 2004). Despite clear successes in gathering information on these chemicals, the Lowell Center (2003) suggests that voluntary initiatives provide little insight in to how to use such data for risk management decisions. Thus, initiatives such as the HPV challenge are “voluntary by necessity” as EPA lacks the capacity to collect data without industry input. Although essential to the task of filling the data gap on numerous chemicals, voluntary participation demonstrates a key problem in the liberal approach
to chemical regulation where regulating agencies are themselves tasked with gathering scientific
data.

The complexities of the U.S.’s primary chemical regulatory mechanism result in the
paralysis of EPA: requiring EPA to provide scientific data on risks to health and the environment
in order to take action on a chemical, when such data is unavailable. Along with this, TSCA’s
cost-benefit requirements institute yet another level of complicated scientific and economic
considerations, further limiting the public’s capacity to participate in policy making forums.

**Bureaucratic Rigidity: Reliance on Risk Assessment**

In recent years, a variety of scientific research has disrupted common assumptions about
chemical exposures and human or environmental health. Traditional measures of chemical
exposures have assumed that the “dose makes the poison” and that for nearly all substances a
level existed whereby exposure would be safe. Such measures have also routinely failed to assess
cumulative chemical exposures despite the fact that chemical exposure does not happen in a
vacuum and all humans, animals and ecosystems are constantly exposed to numerous chemicals
in the environment.

Contemporary scientists have begun to challenge the notion that the dose makes the
poison, suggesting that for many chemicals including PCBs, lead, and endocrine disrupting
chemicals, there may be no safe level of exposure. Rather, any exposure, even very low levels,
has the potential to negatively impact human health. TSCA, because it is makes use of risk
assessment models for regulatory purposes is not situated to respond quickly to new
developments in scientific research. EPA’s requirements for scientific evidence of harm are not
only very complex, requiring the delicate balance of risk and financial imperatives, but are also
difficult to change or adapt as scientific processes evolve. This bureaucratic rigidity, where regulating agencies rely upon models of assessment or review because they are in force and difficult to alter limits the capacity for regulatory mechanisms to remain relevant and reflective of advancements in scientific research.

TSCA adopts a standard risk assessment model that consists of separately conducted hazard and exposure assessments which in combination results in a risk assessment. In both exposure and hazard assessments, the data available to EPA is used to confirm if there is widespread exposure to the chemical and whether or not such exposures pose a threat to health or the environment. As previously noted, there are numerous flaws to risk assessment as it is currently practiced within regulatory agencies including the possibility that there are no safe exposure levels for certain substances, the reality that such standards normalize chemical exposures and risks, and the failure of the approach to consider unequal exposures in developing hazard or exposure assessments. In relation to chemicals in particular, recent scientific data on endocrine disrupting chemicals highlights the limitations to risk assessment models, which routinely rely on traditional dose-response curves, which assume that the “dose makes the poison.” However, a large and growing body of environmental health literature shows that endocrine disrupting substances have complicated dose-response curves that do not easily fit with traditional toxicological practices of high-dose experiments. While low-dose experiments may be well established in medical endocrinology, such responses have been less well understood in the field of traditional toxicology that dominates risk assessment practices under TSCA.

Current approaches to risk assessment are unable to adapt to the changing nature of scientific discovery. In fact, the National Research Council published a report in 2008 titled
Science and Decisions: Advancing Risk Assessment. Also known as the “Silver Book” the report noted that risk assessment involves a lengthy and time consuming evaluation that can take as long as ten years for a single chemical assessment and also noted that the lack of comprehensive scientific data contributed to the inability for decision-makers to draw conclusions on many chemical substances (NRC, 2008).

Although the NRC concluded that risk assessment should be retained by EPA in making decisions, the committee noted that risk assessments, rather than developing conclusions simply on the toxicity of a particular substance should instead use risk assessment as a “method for evaluating the relative merits of various options for managing risk.” The NRC suggested that altering the approach to risk assessment in such a way would require “greater up-front planning” and would make the assessments more relevant and more directly associated with risk management activities.

In keeping with this recommendation the NRC report also suggested that the amount and type of data being reviewed for an assessment should be relevant to the requirements of what is needed to manage the risks; therefore, the data analyzed should be streamlined so as to include only the data that is necessary to draw conclusions about that type of chemical, rather than collecting numerous types of data that may have little importance to a final conclusion (e.g. including high-dose experimental data for known endocrine disruptors would, in this light, be unnecessary as it would not likely be relevant to an evaluation of the chemical).

As a fundamental component of EPA’s approach to regulating chemical substances, risk assessment has been limited in its capacity to generate timely and relevant conclusions on many substances and has largely failed to generate the type of risk management strategies that could mitigate certain health and environmental risks. This element of a liberal approach to
environmental regulation is flawed for its inability to keep up with changes in scientific research and is also hindered by the time and expense incurred by regulating agencies during the risk assessment process. The complex nature of bureaucratic structures and a commitment to risk assessment weakens the ability for regulations to adapt quickly to innovations in scientific study. For example, although emerging scientific evidence in the early part of the 20th century clearly demonstrated the link between environmental lead exposure and negative health outcomes, it took more than thirty years before regulations to control lead were passed in Congress (Davis, 2002).

In addition to the limitations imposed by a command and control model that requires the use of cost-benefit analyses and risk assessments TSCA also faces limitations due to the weaknesses within EPA organizational structures.

**Failures of EPA Oversight: Regulatory Chaos, Redundancies and Disincentives**

TSCA is but one of many policies intended to control the production, use, and disposal of potentially toxic substances. While EPA regulates chemicals in a general manner, electing to register chemicals and related safety or toxicity data, the FDA regulates chemicals in food packaging and containers and the Consumer Product Safety Commission regulates consumer products. Therefore, even if a chemical is known to be toxic to human health and/or the environment in one federal agency, it must be reviewed by other regulatory agencies before it can be fully controlled or regulated in each different application or scenario. The effect of this is that different agencies, from the state to the federal level, may come to differing conclusions about chemical substances. While this may promote a more rigorous scientific result (if three
agencies all conclude a chemical is hazardous, it may be safe to draw clear conclusions), it may also delay regulatory action when any disagreement is present.

Section 8 of TSCA authorizes EPA to create an inventory of existing chemical substances. However, this database often contains only basic data on the majority of chemicals listed and does not include data from other federal agencies despite the fact that other federal agencies may collect data or review the potential risks related on the same chemical substances. The lack of a central chemical database and the absence of a dialogue between regulatory agencies creates redundancies in data collection and wastes both financial and personnel resources. Along with this, TSCA generally requires that substances be reviewed on a chemical-by-chemical basis, with risks explained on an individual chemical basis rather than as groups or categories. This results in the repetitive production and requires a further expenditure of EPA time, staff and funds, ultimately limiting their capacity.

The structural flaws of TSCA are further exacerbated by the lack of regular enforcement as directed by the language in the bill. In a 2010 report from the U.S. Government Accountability Office testified before Congress that between 2002 and 2008 EPA had routinely failed to set or improve chemical standards relating to children’s heath and EPA has a storied history of delaying action on clearly toxic chemicals, as has been the case with lead (Davis, 2002) and mercury in air (EPA, 2005). Along with failures to act in a timely fashion, EPA has often failed to collect fines levied for violations of TSCA and other environmental policies. A 2010 auditing report by the Office of the Inspector General noted that “for the 5 fiscal years ending September 30, 2008, the Office of Enforcement and Compliance assurance reported civil fines and penalties assessed of $724 million. As of April 14, 2009, EPA had not collected $279,644,975 of these penalties, a significant portion of the assessed amount”. The report also
noted that EPA had routinely failed to report many fines through the appropriate mechanisms and that a number of accounting errors led to penalty information that lacked accuracy and transparency.\footnote{Despite these past failures, the Obama administration has succeeded in remedying these deficiencies. According to a report from OMB Watch in December 2010, EPA is moving “more quickly to address violations of environmental laws” as compared to the Bush administration and, under Obama, is collecting fines in 95% of all Clean Water Act cases and closing them within 9 days as compared to 87% collection of fines and closure in 26 days under President Bush. Retrieved April 26, 2011 (http://www.ombwatch.org/obamamidtermenforcementreport).}

Terry Davies, a former staff member at the Office of Environmental Quality, the precursor to EPA, notes that TSCA’s lack of teeth serves both industry and government interests, “It’s what I call the Faustian bargain: Industry likes TSCA because they don’t have to do anything and the EPA likes it because they don’t have the resources to do anything else” (as quoted in Baker, 2008: 200). A lack of clear and timely regulations along with poorly enforced fines due, in part, to a staff and budget inadequate to the task limit the capacity for TSCA to function as it is written and, as Davies points out, there is little will power to rock the boat, as doing so would require an increase in resources and staff.

In the same vein, Richard Denison (2010) argues that there is a general lack of political will within the federal government to truly regulate toxic substances. The centrality of voluntary programs to assess chemical safety has become the dominant mechanism of controlling risks, a dangerous status quo that limits innovation and discourages manufacturers to move beyond their current practices. He offers:

One of the most egregious failings of TSCA has been its failure to incentivize innovation toward safer chemicals and products. Instead, it has perpetuated a chemicals industry that has little incentive \textit{either} to replace existing chemicals – because they skate along without any scrutiny at all – or to ensure that new chemicals it does introduce are safe (or at least safer than the existing chemicals with which they will compete) – because the review they get is so cursory (data- and time-constrained) that only the most dangerous substances can be expected to be caught and stopped.
From this perspective, the limitations of TSCA are not only limited to the structural flaws and loopholes, but also the broader issue of limited EPA authority to enforce the law and a lack of political interest in revising the law.

TSCA’s reliance on mechanisms of command and control, risk assessment and cost-benefit analyses exemplify the limitations of liberal environmental approaches to regulation. Such an approach imposes a nearly insurmountable burden on EPA to prove harm without adequate data while negotiating financial imperatives and costs to industry while presumably overseeing other laws and policies.

THE POLLUTER INDUSTRIAL COMPLEX AND THE CHEMICAL INDUSTRY

The procedural and policy-based deficiencies of the current approach to regulation are exacerbated when viewed within a larger political context. Liberal environmental regulations, that are in practice inadequate to the task of protecting ecosystems and human health are further weakened when regulatory agencies and policies are susceptible to manipulation from corporate actors and industries with a vested interested in watering down regulations and regulatory powers. Faber (2008) argues that corporate interests that stand to profit from the weakening of environmental laws (even those that are highly flawed such as TSCA) have engaged in a range of activities that have restructured the state in ways that promote “cooperation” between government and business. In pursuit of profit, the polluter industrial complex (PIC) attempts to “colonize and restructure the state in its favor” though the use of political and economic maneuvers that allow corporate polluters to wield power over state apparatuses. The PIC attempts to roll back environmental regulations and control the expansion of environmental movement efforts by 1) selecting and financially supporting business-friendly candidates; 2)
working to have officials aligned with industry appointed to administer key government agencies, including environmental agencies; 3) installing and funding the presence of powerful corporate lobbyists who are beholden to the PIC in the halls of government; 4) rolling back environmental protections by maintaining a policy infrastructure that is favorable to environmentally destructive entities and which is utilized by both major political parties; and 5) corrupting the independent scientific investigation of environmental problems.

Although the term polluter industrial complex implies corporate interests that revolve around “dirty” industries that create pollution, the concept can be extended to include other corporate actors as well. The chemical industry in the U.S. is no exception- with revenues nearing $700 billion each year, the chemical industry has a significant stake in the regulation of their products and has consistently engaged in the tactics Faber (2008) attributes to the PIC. The combination of out-dated environmental policies and the efforts of neoliberal politicians and business interests to influence policy, delay regulatory decisions and manipulate scientific findings has resulted in the continued use of chemical policy mechanisms that only minimally protect health and the environment. Faber’s characterization of the polluter industrial complex can be mapped onto the activities of the chemical industry in the U.S. Both financially and politically, the chemical industry has manipulated policy structures and worked to decrease the effectiveness of chemical regulations.

The Candidate Selection Process: Purchasing Political Consent

One of the primary means by which the chemical industry PIC leverages and builds power is through campaign contributions that develop loyalty and allegiance from political candidates. As campaigns in the U.S. are increasingly expensive, corporate entities have the capacity to strongly
influence the policy positions of the candidates they fund. In 2010, a report by Common Cause, using California as a case study, found that the candidate who raises the most money wins 97 percent of general elections, and that 86 percent of winners raise more than five times what their opponent raises. Donations on the part of the chemical industry contribute to successful political campaigns and financial stability is often a determining factor in whether or not an individual can run for public office (Faber, 2008). As a result, many political candidates find themselves in a position where in order to win they must accept campaign donations from industries or trade groups that later expect reciprocity in the form of policy influence.

Faber (2008) writes that “political candidates are largely responsive to the blocs of ‘investors’ that support their campaigns… once elected these politicians know ‘not to bite the hand that feeds them’”(98). As with the polluting industries that Faber writes of, the chemical industry is similarly likely to partake in this effort to colonize state structures in their favor through the selective support it provides to anti-regulatory candidates.

From local officials to Congressional delegates, the chemical industry spends millions of dollars funding individual political campaigns. Kaplan (2010) reports that the chemical industry contributed more than $10 million in campaign contributions during the first nine months of 2010. In particular, the American Chemistry Council (ACC), the main chemical industry trade group, donated more than $305,000 to federal candidates, plus another $50,000 to the Democratic Governors Association, while Koch Industries, a multi-billion dollar company with interests in petroleum processing, chemicals, fertilizers and ranching, had donated more than $1.5 million to federal candidates (86 percent of which went to Republican candidates) before the close of 2010. Proctor and Gamble, a long time player in the chemical industry, donated nearly $400,000 to political causes (with a more equitable 56 percent of funds going to
Republican candidates) while BASF, one of the top U.S. manufacturers of Bisphenol-A, donated more than $250,000 in 2010.

Along with the donations made to political campaigns on behalf of chemical corporations, many companies have also been found to indirectly fund conservative political agendas that aim to limit environmental regulatory efforts. In October 2010, The New York Times released evidence that Dow Chemical, one of the largest chemical companies in the world had, in 2009, donated $1.7 million to the U.S. Chamber of Commerce a private group that has widely opposed a range of Democratic legislative initiatives by supporting and funding Republican candidates. The Chamber of Commerce engaged in lobbying and political campaigns that support the interests of their donors. Importantly, although the Chamber reports having more than 300,000 members, almost half of its $149 million in contributions in 2008 came from a small group of 45 donors, suggesting that large multi-national corporations use outlets such as the Chamber to further political interests in private and less direct ways (Lipton, McIntre, and Van Natta, 2010).

The extensive funding of politicians and politically influential organizations such as the Chamber of Commerce allow chemical corporations to have a stake in and to convey expectations about political decision-making processes. Funds can be withheld or removed when key decisions or votes are not in accordance with the political objectives of the chemical industry. David Koch for example, told a reporter for a libertarian magazine that, “If we’re going to give a lot of money, we’ll make darn sure they spend it in a way that goes along with our intent,” and that “To bring about social change [requires] a strategy [that is] vertically and horizontally integrated…from idea creation to policy development to education to grassroots organizations to lobbying to litigation to political action” (as quoted in Mayer, 2010). Koch’s admission suggests that financial interests are often inseparable from political outcomes. The
chemical industry elite is able to leverage campaign donations in ways that afford them influence and power in decision-making realms.

Lobbyists and the Special Interest Process

Lobbying is perhaps one of the most common and most powerful methods of influence that is possessed by the chemical industry’s power elite. Dow Chemical, Monsanto, Bayer, Proctor and Gamble and Koch Industries spent nearly $20 million lobbying the federal government on political issues from part way through 2009 to the middle of 2010. The American Chemical Council (ACC), the leading chemical industry association, spent $11.3 million lobbying for its member companies (among them Dow Chemical, Bayer, Monsanto, Chemtura, DuPont, and SABIC, among others. The Center for Responsive Politics reports that, in 2009, the chemical industry spent over $100 million lobbying members of Congress and had already spent over $40 million during the first half of 2010. The chemical industry’s capacity to lobby to this degree is unparalleled in the environmental health movement, made up largely of non-profit organizations that are funded by foundations. Corporate lobbyists are estimated to outnumber environmental, health and energy lobbyists by 8 to 1, an imbalance that leads provides the chemical industry more face time, the ability to build rapport with members of Congress and which allows the messaging points of industry groups to have more air time than those of environmental groups that have significantly less capacity.

The Industry’s Revolving door

The revolving door has been recognized as a dominant mechanism by which corporate elites are able to sway political decision-making in their favor. Observed in a variety of policy realms, corporate elites and their top-level employees can routinely be found to be political appointees to
various governmental offices, advisory boards or oversight committees. The opposite is also true in instances where members of political teams take upper level positions within corporations, creating a revolving door by which political and corporate actors fill key positions in a rotating fashion.

When it comes to the chemical industry, the revolving door is readily observable. Working under Republican Senator James Inhofe of Oklahoma, who has routinely worked to limit EPA authority and impede environmental regulatory action by casting doubt on scientific evidence (Inhofe famously referred to global warming as a “hoax” in a Senate speech in 2003), Rebeckah Adcock served as counsel for his work on the Senate Committee for the Environment and Public Works. Prior to her time on the Senator’s council, Adcock worked for the American Farm Bureau Federation as the director of congressional relations. Although a self-proclaimed grassroots organization, AFBF is a right-wing lobbying organization that has opposed environmental regulations such as the Endangered Species Act, the Clean Air and Safe Drinking Water Acts and other legislation intended to protect the environment and wildlife. According to *Amber Waves of Grain*, a report published by the Defenders of Wildlife, the AFBF has financial stake in oil, automotive and pesticide industries. Adcock’s work for both AFBF and Inhofe have led most recently to a position as Director of Government Affairs with CropLife America, a trade association dedicated to preserving the interests of pesticide manufacturers. According to the CropLife America website, Adcock will be working on reforms to TSCA and the Clean Water Act. Adcock’s tenure as a Congressional staffer and a lobbyist for powerful chemical and agribusiness trade groups make her uniquely adept at maneuvering within the halls of Congress and highly familiar with the political goals of anti-environmental corporations.

Both the ACC and the American Petroleum Institute contract with Ogilvy Government
Relations, a powerful lobbying group in D.C., to advocate for more business friendly chemical regulations. Among the staff at Ogilvy are numerous lobbyists with ties to key government offices or officials. Wayne Berman, Chairman of the firm, has long standing political and financial ties to the Republican party, including being appointed as Assistant Secretary of Commerce for Policy under George H.W. Bush, the senior advisor to the Bush/Cheney transition in 2001, and deputy director to the Republican National Convention in 1996. Berman claims to have “played a substantive political role in just about every Republican presidential campaign of the last generation… and has been a prominent fundraiser in “every Republican presidential race since 1992” (Ogilvy, 2011). Berman’s ties to Republican politicians and federal officials provide him access and entrée into the halls of Congress.

Moses Mercado is another Ogilvy lobbyist who exemplifies the revolving door. Named by The Hill as a best “hired gun” in 2008, Mercado’s intimate ties to a variety of Democratic politicians including serving as Chief of Staff to House Democratic leader Dick Gephardt, advising John Kerry’s presidential campaign, and acting as the Democratic National Convention’s Deputy Executive Director of Inter-Governmental Affairs. Greenpeace reported that Mercado was said to have been hired to help “Ogilvy put its all-Republican past behind it” (2009: 5).

Among other lobbying groups that are retained by the ACC is Holland and Knight, LLP. In 2009, the ACC spent $320,000 for the lobbying services of Holland and Knight in relation to chemicals.\(^\text{12}\) A top lobbyist with Holland and Knight who has advocated on behalf of the ACC on a number of issues, Gerry Sikorski was a Representative for Minnesota for ten years beginning in

1983 during which time he served on the Energy and Commerce Committee and also served as Vice Chairman on the Health and Environment Subcommittee. Along with Sikorski is Kathryn Lehman, a partner in the lobbying firm, who has served a variety of republican politicians including Newt Gingrich, James Sensenbrenner, Jr, (R-WI), Henry J. Hyde (R-IL), Tom DeLay (R-TX), and J. Dennis Hastert (R-IL).

Advisory Boards and Review Panels

The chemical industry PIC has also been successful at embedding industry officials within government advisory boards, the likes of which often make vital decisions regarding chemical control and regulation. Although the make up of advisory boards may often reflect the variety of stakeholders who would be influenced by regulations, it is generally presumed to be a group of non-partisan decision-makers tasked with evaluating the recommendations of federal agencies. One notable case is the presence of David Koch on the National Cancer Institute’s National Cancer Advisory Board, who was appointed there by George W. Bush in 2004. Despite the fact that the NCI advisory board was recently tasked with assessing the state of the evidence on formaldehyde, a chemical that Koch Industries has been a large producer of since 2005, Koch remained on the board. Although research conducted by the NCI demonstrated that formaldehyde was linked to cancer, Koch’s presence on the board as a member with vested interests in the outcome of NCI conclusions has been widely criticized (Schor, 2010).\(^\text{13}\)

In 2008 Deborah Rice, a former EPA scientist serving on a review panel for flame retardants was dismissed following a request from Sharon Kneiss of the American Chemistry Council. In the request, Kneiss claimed that because Rice had recently testified at a legislative hearing on

\(^{13}\) Negative press coverage and the publication of the Mayer article in *The New Yorker* ultimately led to Koch’s resignation from the board in September 2010.
one of the chemicals being reviewed, there was a conflict of interest if Rice continued to serve. Although Rice had no financial conflicts of interest and reported that she testified on the nature of the chemical and not her opinions, she was still removed from the panel and her comments struck from the final report. Following this, Environmental Working Group (EWG) released a report that found 17 direct or potential conflicts of interest among seven other EPA advisory panels. In some cases, the scientists serving received direct payment from industry, routinely acted to reduce chemical safety standards, or made public statements about the chemical(s) under review. Although Rice presented a potential conflict of interest in remaining on the panel, the continued presence of reviewers sympathetic to industry and the ability for the ACC to request Rice’s removal and see results suggest the embeddedness of the chemical industry within EPA’s decision-making structures.

*Industry Supported candidates fill top environmental posts*

In addition to chemical industry members filling top positions on regulatory advisory boards, there are also instances where the politicians who receive campaign donations from the chemical industry serve on environmental committees within Congress. In instances where this occurs, PIC funded politicians may request or encourage regulatory inaction, delays or outright opposition. For example Michigan representative Fred Upton, who has been elected the next chairman of the House Energy and Commerce Committee, has made statements regarding his intentions to limit the capacities through the use of oversight hearings related to recent EPA decisions (Broder and Stolberg, 2010). In his editorial in the Washington Times, entitled “Declaring War on the Regulatory State” Upton noted that if upcoming elections shifted power in the House, that there would be a concerted effort to curtail EPA’s “job-killing regulations.”
James Inhofe of the Environment and Public Works committee has similarly vowed to forestall or “stop EPA in its tracks” when it comes to passing legislation related to the environment.

**The Opinion Shaping Process and Public Relations**

*Industry Astroturf*

Numerous scholars have noted the penchant for corporate actors to pay public relations firms to develop “Astroturf” groups, which imitate the grassroots feeling of many environmental organizations through the development of public interest groups that at first glance appear to be environmentally friendly, but in practice advocate for the weakening of environmental policies and regulations and which often challenge the claims of legitimate grassroots organizations (Stauber, 1995; Faber, 2008; Beder, 1997). Building off the appeal of grassroots and local-feeling organizations, corporations interested in illustrating widespread public or local support for their activities hire companies to manufacture grassroots citizen movements utilizing high-tech data and communications systems (Stauber, 1995). Beder (1997) offers, “technology makes building volunteer organizations as simple as writing a check” (32).

These interest groups are created to give an aura of widespread support for anti-environmental policies. In December 2009, in the wake of the passage of a number of state bills to regulate BPA and increasing media coverage of toxic chemical exposures, the chemical industry developed a high profile front group called the Coalition for Chemical Safety. Though the group and its website has since been taken down due to intense scrutiny from the public, environmental groups and media-outlets such as *The Huffington Post*, when it was online it imitated many of the familiar elements of the SCHF with images of children and families despite being group made up entirely of businesses and corporations including Dow Chemical and
upwards of 150 regional chemical industry organizations. Managed by DDC Advocacy, a recognized PR firm that specializes in Astroturf campaigns and has ties to major corporations and the U.S. Chamber of Commerce, the Coalition for Chemical Safety released numerous statements calling for a halt on BPA bans and limited action on altering TSCA.

Aside from the reality that such practices are largely synthetic, Beder (1997) notes that Astroturf groups are dangerous to the legislative process when mobilized to behave as a true grassroots movement because legislators are highly responsive to grassroots efforts. In fact, Lord (1995) finds that visible grassroots efforts (sending postcards, calling legislators, demonstrating) have a greater influence on legislator’s opinions of a particular issue than lobbyists. When corporations are able to pay for the kind of grassroots visibility that environmental activists with slimmer budgets have to cultivate over time, corporate influence becomes even more expansive.

*Bait and Switch: The Chemical Industry “Comes to the Table”*

Most recently the chemical industry PIC has succeeded in influencing policy struggles related to chemical regulation by acquiescing to demands for greater regulatory oversight and agreeing to the need for chemical regulatory reform. Despite the positive connotations that come with industry coming to the table, much of the regulatory reforms that are supported by the chemical industry preserve the status quo and limit meaningful changes to chemicals policy.

One of the more prominent advocates for chemical policy reform in the U.S. has been the environmental health coalition Safer Chemicals Healthy Families (SCHF). In 2009 SCHF brought together a range of environmental, health care and parent groups to increase the visibility of demands for reform. SCHF claims to have 11 million individual members who
support a nine-part “Platform for the reform of TSCA”\textsuperscript{14}. This platform includes a range of steps to take immediate regulatory action on the worst toxic chemicals affecting the most vulnerable populations and reflects a desire to transform older liberal models of regulation. SCHF advocates for an expansion of policies that shift away from traditional risk assessment models and incorporate a health-based, rather than economic-based approach to chemical control that prioritizes business outcomes over health. In direct response, the ACC released their “Ten Principles for Modernizing TSCA”\textsuperscript{15}.

Although in some ways the two prescriptives are remarkably similar, both SCHF and the ACC call for the prioritization of the worst chemical risks as a starting point for regulation, both recognize that children may be of particular concern when evaluating chemical safety, both note that the onus to collect chemical safety data should be on manufacturers producing chemical substances and not on the federal government itself, and both suggest that transparency of federal decision-making should be improved by making chemical safety data publicly available, there are significant differences. First, SCHF suggests that the risk assessment model used to evaluate chemical substances should be revised according to recommendations made by the National Academy of Science and that new assessments should consider the increasing importance of biomonitoring in assessing human exposures to chemicals. In contrast, the ACC suggests that “EPA should rely on scientifically valid data and information, regardless of its source”, a notion which raises some questions about the capacity for the chemical industry to accurately evaluate their own products for safety. The ACC similarly suggests that existing data should be used in chemical evaluations to reduce costs despite the fact that pre-existing data may be out of date.


In developing this list of priorities, the ACC and its roster of chemical industry clients appears to have accepted the necessity of altering chemical regulations. However, in recent legislative hearings, the willingness of the chemical industry to accept more stringent regulations has come under question. Although seemingly supportive of increased transparency in reporting and aware of a need for industry to play more of a role in collecting safety data, the ACC and its clients have railed against stronger regulations during legislative discussions related to advancing chemical reforms. Richard Denison (2010a) of the Environmental Defense Fund (EDF), when writing about his experiences testifying and participating in these hearings reports that the industry has objected to numerous provisions under discussion, often claiming that increased regulations will harm U.S. jobs and global competitiveness. Daniel Rosenberg of the National Resources Defense Council (NRDC), in discussing the chemical industry’s performance at the July hearing noted that the industry “still use[s] the rhetoric of reform, but there doesn't seem to be anything real behind it. Thus far they have said 'no' to just about everything proposed in the legislation or by EPA” (as quoted in Kaplan, 2010).

During a legislative hearing in the House Energy and commerce committee on July 29, 2010 Cal Dooley, President of the ACC, referred to the proposed TSCA reform bill as unworkable, with an “impossibly high hurdle” set by the safety standards in the proposed bill. Despite the ACC’s “Principles of Modernization” which called for the prioritization of assessing the most harmful chemicals, Dooley stated in the hearing that such an approach would stigmatize the industry, concluding that the current iteration of the bill was unacceptable to industry members. In keeping with this reversal of earlier claims to support legislative modernization, the Society of Chemical Manufacturers and Affiliates (SOCMA), another industry trade group who shares many of the ACC’s member list, released a statement immediately prior to the July
hearing that suggested that TSCA reforms would limit innovation, would increase competition from China and would result in job loss.

Despite recognizing current regulations as inadequate to the task of assessing chemical risks, both SOCMA and the ACC have failed to suggest options for moving forward and have succeeded in stymieing regulatory action by insisting that regulations will negatively impact the American economy. Along with these statements Charles Auer, the former director of EPA’s Office of Pollution Prevention and Toxics (he retired in January 2009), submitted a 16 page critique of the revised TSCA legislation the day after the hearing. In the statement Auer, now a lobbyist and consultant affiliated with Bergeson and Campbell, a legal and advising firm for the chemical and agricultural industries, referred to proposed revisions TSCA as cumbersome and he stated that TSCA would “overly and unnecessarily burden U.S. competitiveness”.

Auer’s claims, while relevant and important given his experience as a former overseer of TSCA implementation, raise doubts as yet another instance of industry revolving door practices. The chemical industry’s initial willingness to discuss reforms to TSCA appears to have been more theoretical than practical as the initial attempts to come to an agreement about the needed changes has been limited.

The Science Shaping Process: The Production of Knowledge and the Manufacture of Doubt

In addition to the development of PR campaigns that challenge the efforts of environmental and health coalitions to promote chemical policy reforms, the chemical industry has succeeded in casting doubt over the scientific observations that have been made about

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numerous chemical substances. Faber suggests that the production of scientific information and knowledge contributes to the capacity of environmental polluters to exert control over policymakers and the public (by using such information to bolster corporate PR campaigns) (2008:103). In the case of the chemical industry this process of ideological control is achieved not only through the production of scientific data that serves corporate interests, but is also advanced through a *science shaping process* in which the chemical industry questions the validity of scientific research that is critical of toxic chemicals and raises questions about the safety of chemical exposures.

In *Doubt is Their Product* Michaels (2008) reviews decades of corporate efforts to hire lobbying firms, scientists and policy experts to cast doubt on the scientific evidence that certain chemicals or products were linked to health risks. From tobacco to asbestos and PVC, corporate efforts to acquire scientific findings in their favor routinely adopted practices that the chemical industry has also adopted at certain points in time including hiring well paid and well connected lobbyists to expand their influence; hiring PR firms to both improve the industry’s image or to develop rhetoric that encourages distrust of regulatory efforts (“if they take away your cigarettes, what will they take away next?”); installing industry-funded scientists on government advisory boards; and casting doubt on scientific findings by demanding the retesting and reevaluation of data in pursuit of absolute scientific certainty, a practice which delays regulatory action.

Michaels writes that the tobacco industry was one of the first to master the art of scientific deception by, in the words of an industry employee, “creating doubt about the health charge without actually denying it… [and by] encouraging objective scientific research as the only way to resolve the question of health hazard” (11). The chemical industry has managed to achieve both of these aims; questioning the relevance of scientific evidence of harm and calling
for more extensive or definitively conclusive research before agreeing to take action on chemical substances.

In June of 2009, the chemical industry was dealt a serious blow when The Endocrine Society, a professional society of 14,000 members who research on hormones and endocrinology, issued a statement that exposure to harmful, endocrine disrupting chemicals was not merely an issue of the amount of a chemical one was exposed to (the previous assumption was that the “dose makes the poison”), but was also about the timing of exposure and that a person’s age at exposure was also an issue relevant to understanding the health effects of a chemical. Although numerous scientists studying hormones had already recognized this paradigm shift and suggested that the dose and the timing are critical in understanding health effects of chemical exposures, the Endocrine Society’s statement heightened concerns over children’s health in relation to chemical proliferation. Despite the publication of this statement and the plethora of scientific research papers that made similar arguments, the ACC responded "that a group called the International Union of Pure and Applied Chemistry found there have been no 'conclusive' studies proving that the chemicals cause disease" (Szabo, 2009). However the IUPAC paper used to support the ACC’s claim was written by a scientist working for Syngenta (established in 2000 via a merger of Zeneca and Novartis), a multi-billion dollar agribusiness and key player in the global chemical industry (Ashby, 2003). The outright dismissal of the Endocrine Society’s claims is demonstrative of the chemical industry’s desire to question scientific consensus when it challenges their public image and the success of their products.

This science shaping process clarifies the extensive efforts of the chemical industry to challenge established findings on chemical safety. When this process is viewed along with the
other processes by which the chemical industry PIC colonizes state structures, a clearer image emerges as to how opposition to chemical policy reforms is evident in numerous decision-making structures.

**Conclusion**

A crisis in chemical policy in the U.S. currently exists and impinges on the ability of the U.S. government to control chemical threats to health and the environment. This crisis is manifest not only in the structural deficiencies of a liberal model of environmental policy that is inadequate to the task of controlling chemical risks, but is also apparent within a political system that is open to penetration by an anti-regulatory industrial chemical elite.

Structural limitations exist where a liberal regime of environmental regulation continues to utilize mechanisms of chemical assessment that prioritize financial imperatives and advance a sense of scientific certitude. A regulatory scheme that is founded upon these notions functions best in the face of small, linear and unchanging risks. However, the acceleration of chemical production and the scale at which chemical substances are produced is too expansive to mesh easily with this regulatory model. This liberal regime of regulation has consistently failed to both understand and incorporate the varied and nuanced ways that chemical risks function in different communities or varied contexts. In seeking to reduce chemical exposures across all environments, environmental policies must be adapted to be more cognizant of the different ways in which chemical risks are unequally distributed.

These structural limitations are further problematic as the regulatory oversight has been routinely compromised by a corporate chemical elite that has a vested interest in rolling back chemical regulations that would limit industry profitability. A series of interrelated processes contribute to the weakening of this regulatory system. These processes include 1) the candidate
selection process whereby the chemical industry elite aids sympathetic political candidates in their election fundraising efforts in order to secure political support for anti-regulatory efforts; 2) the opinion shaping process in which public relations campaigns and astroturf programs are used to sway support for regulatory action; and 3) the science shaping process through which industry both generates new scientific information to challenge previously establishing scientific findings while also manufacturing doubt by criticizing and challenging the validity of the peer-reviewed research on chemical substances as well as the scientists who conduct the research. While this chapter has demonstrated how these three processes are employed by the chemical industry elite to slow or weaken federal chemical regulations, the next chapter expands upon and explores these forms of political interventions as they appear in the regulatory battle over the chemical BPA.
“We should be worried about what amounts to a huge, uncontrolled human testing experiment. Without agreeing to it, without understanding it, without even knowing it, we have become the chemical industry’s guinea pigs.”

-Dominique Browning, *Toxic Ignorance is Not Bliss*

**Introduction**

The chemical BPA and the subsequent industry and social movement organizing around the implications of the chemical’s safety and use make for an excellent site of sociological inquiry. The limitations inherent in the broader system of chemical regulation in the U.S. can be further illuminated with the case of BPA. The structural limitations of the liberal regime of environmental regulation- including the problems associated with technical and scientific models of assessment and control and the political constraints imposed by the chemical industry elite are readily visible when examining the regulatory efforts surrounding BPA.

The power and influence afforded the BPA industry is achieved through the development of channels of overlapping corporate interests, shared governing boards and the success of high-powered lobbying and interest groups. As was the case with the tobacco industry and the asbestos industry, the corporate insistence on delaying or preventing regulations and challenging scientific evidence about hazards, BPA also demonstrated how corporate interference in chemical regulatory realms slows environmental protection. This case is somewhat unique in that despite intense chemical industry opposition to regulation, BPA bans have passed in numerous states across the U.S. While chapters four and five will explore the social movement dynamics that have contributed to the increasing oversight of BPA, this chapter intends to clarify how the chemical industry elite has engaged in the same series of maneuvers to colonize state structures.
and stall regulatory reform. In explicating the specific ways in which this occurs, this chapter 1) Provides background on the chemical BPA, its uses and relevance in the American marketplace; 2) Describes existing regulations that could potentially control or regulate BPA; and 3) Describes the notion of the polluter industrial complex as it applies to the BPA industry. The candidate selection process and the opinion shaping process are described, while much attention is paid to the notion of the science shaping process whereby political influence has interfered with scientific research in hopes of delegitimizing efforts to regulate BPA.

**WHAT IS BISPHENOL-A (BPA)?**

First synthesized in the late 1800s as a synthetic estrogen, BPA became commonly used in the 1950s in the manufacture of polycarbonate plastics and epoxy resins (Vogel, 2009). Used as a building block in polycarbonate plastics, BPA is highly valued for its capacity to produce shatterproof plastics and is “strong enough to replace steel and clear enough to replace glass” (ibid.: 559). It has also been integral to the development of the can linings that are able to withstand exposure to acidic foods and the epoxy resins of which BPA is a key component “now serve virtually every major U.S. industry, either directly or indirectly” (as quoted in Vogel: 559). Because of its distinct properties BPA is used widely in canned food liners, plastic water and baby bottles, disposable eating utensils, dental sealants, computer casings, paper currency, numerous medical and optical devices, DVDs and CDs, credit and debit cards, soda cans, and was most recently found in sales receipt paper, which likely contributes to the chemical’s presence in recycled toilet paper (EWG, 2010; Gehring et al., 2004).

The primary producers of BPA are Mitsubishi, Sunoco, Dow Chemical, Bayer and GE Plastics, while BASF also produces the chemical in significant quantities. Outside of the U.S.
Mitsubishi and Teijin chemicals are the top producers of BPA. Considered a high production volume (HPV) chemical, BPA generates revenues that exceed $6 billion dollars annually (Rust and Kissinger, 2008). Dow Chemical reports that global production of BPA was at 11.5 billion pounds in 2008 (Dow Chemical, 2010). About 65 percent of the BPA manufactured worldwide is used for polycarbonate plastics, 30 percent is used to produce epoxy resins with the remaining 15 percent used for other types of resins, flame retardants and other applications (Senjen and Azoulay, 2008).

Despite the widespread use of the chemical in consumer products since the mid-twentieth century, a variety of peer-reviewed scientific research on BPA (some studies done as early as the 1930s) have illustrated that the chemical may not be as inert as once presumed and that exposure to small doses of the chemical may pose serious health risks.

In the late 1980s a surprising discovery revealed that low doses of estrogenic-compounds like BPA could wreak havoc on cells causing them, in some cases, to multiply rapidly (Colburn, Dumanoski and Meyers, 1997). Subsequent research discovered that not only were doses of chemical substances leaching from plastic equipment in lab settings, but that these relatively miniscule doses routinely affected the cells in negative ways. In these early studies BPA exposure levels of two to five parts per billion were enough to produce estrogenic responses in the lab cells being studied. In the years following these preliminary experiments, the study of what is now called endocrine disruptors has evolved significantly. Today, the study of endocrine disrupting chemicals (EDCs) is increasingly common.

The endocrine system is the network of glands, hormones and receptors that regulate our metabolism, behavior, growth and reproduction. The hormones of the endocrine system and their
receptors work in a unique way; the hormones and their receptors send off chemical signals that cause the body to emit a response. This endocrine signaling between hormones and receptors is a highly sensitive system with unique chemical messages that turn on or turn off particular response systems.

The study of EDCs has revealed that estrogenic compounds, such as BPA, have the capacity to mimic hormones, tricking the body into responding to what is essentially a false chemical message. When these chemicals are introduced into the body, they are capable of sending signals that disrupt the proper functioning of glands and hormones within the body. Vom Saal (2009) reports that BPA, at very low doses is estrogenic and acts as an endocrine disruptor. These responses are all the more worrisome because of the ubiquity of these types of chemicals, particularly BPA, in consumer products and the environment.

Exposure to BPA has become a cause for concern because of the endocrine disrupting properties of the chemical and the widespread exposure among humans. A study by the Centers for Disease Control and Prevention (CDC) found that, among a representative sample of Americans, 93 percent aged six and older had detectable levels of BPA in their urine (Calafat et al., 2008). Children had the highest levels of exposure, followed by teenagers, then adult women and men. Although BPA is metabolized by the body within six hours, the high percentage of exposure reveals that BPA exposure is ubiquitous in the course of daily American life (Vandenberg et al. 2007). Furthermore, Ginsberg and Rice (2009) argue that, despite rapid metabolism of BPA by the body, biological processes that occur during pregnancy and fetal development prevent BPA from being metabolized and result in fetal exposure to the chemical. As a result, millions of American children are being exposed to the chemical before they’re even born.
Along with in vitro exposures, recent studies have found that men who had high levels of BPA in their urine also had a high risk of low sperm concentration, vitality, and motility than did men with lesser concentrations of BPA in their bodies (Li et al., 2009; 2011). More than 200 peer-reviewed scientific studies published in academic journals have found adverse effects from low-dose exposure to BPA. These studies demonstrate a range of effects from low-dose exposures to BPA including infertility, premature puberty, diabetes, obesity, malformed genitalia, cancers of the reproductive organs and neurological and behavioral abnormalities.17

The majority of these exposures occur in the course of food and beverage consumption. Polycarbonate water and baby bottles are a primary source of exposure as are the linings of tin cans and plastic, metal and cardboard food containers. Scientific evidence suggests that the majority of BPA exposures are a result of consumer product use, although some evidence exists to suggest that BPA may leach from PVC house and water tanks, contaminating drinking water (Fernandez et al., 2007). A study by Health Canada (2008) found that BPA was present in the broader outdoor environment. However, it was not a significant source of exposure because it did not persist in the environment despite indications that it bioaccumulates. Therefore, exposure to BPA is intimately connected to consumer activities and products. Evidence of negative health effects that may be caused by the use of certain products containing BPA has essentially become a “call to arms” for chemical companies and plastic manufacturers to challenge scientific findings and dissuade consumers from demanding changes in regulatory practices.

There are increasingly viable alternatives to the use of BPA in many consumer products. For example, BPA alternatives were utilized by many companies following growing consumer

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17 For a complete summary of the 200 plus studies on BPA, see Frederick vom Saal’s 2009 summary, Bisphenol-A, available online at (http://endocrinedisruptors.missouri.edu/vomsaal/vomsaal.html).
concern over the hazards of the chemical. These chemical alternatives include Tritan Copolyester used by Nalgene and Camelback water bottles, High Density Polyethylene which is used in milk, juice and other non-reusable containers, and Polypropylene Homopolymer which replaced BPA in baby bottles and sippy cups produced by Medela, Nuby Whittelstone and Dr. Brown.\textsuperscript{18} Activists have routinely noted that non-chemical alternatives such as glass or stainless steel could be utilized to reduce chemical exposures via food and beverage intake.

However, there remains an impetus for most chemical manufacturers to continue with business as usual. Relying on traditional manufacturing and production practices reduces the need for spending on the research and development of alternatives. It could be quite difficult for many companies to find alternatives for some applications of BPA, as is the case with canned tomatoes. Due to the acidity of tomatoes and the expectation of a long shelf life as a canned good, food cans are lined with a resin containing BPA that is sufficiently able to withstand direct contact with acids. The acidity of tomatoes causes BPA to leach into foods and manufacturers have found it cumbersome to find alternatives that are viable. However, as of 2009 Muir Glen, a subsidiary of General Mills had found an alternative that would withstand tomato acids (though alternatives in this particular instance are not widespread and suggest a reluctance on the part of manufacturers to invest in costly changes in production practices). Costs in terms of health or environmental effects continue to be externalized, or in the case of Eden foods, passed on to consumers in the form of higher purchasing prices. Transitioning away from BPA in some of their canned products, Eden foods notes that their BPA-free cans cost 14 percent more than the industry standard cans that do contain BPA, suggesting that BPA alternatives are more expensive.

\textsuperscript{18} For a more complete listing of chemical alternatives, see the Breast Cancer Fund’s report on alternatives. Retrieved online April 26, 2011 (www.breastcancerfund.org/assets/pdfs/tips-fact-sheets/bpa-alternatives.pdf).
not only in terms of research and development costs, but perhaps in terms of raw materials as well (Eden Foods, 2011).

Along with increased costs associated with transitioning away from BPA usage, there may be some reluctance on the part of manufacturers to transition away from BPA as doing so might indicate that their products or substances are faulty and subject to litigation. In early January 2011, a lawsuit against Philips Electronics, who was responsible for selling Avent baby bottles and sippy cups that contained BPA, found the company liable for breach of warranty, violation of a deceptive trade practices statute, and unjust enrichment when they failed to disclose to consumers that the baby bottles and sippy cups contained BPA. They also failed to warn consumers of potential health effects associated with BPA. Following the resolution of the lawsuit, Phillips agreed not to use BPA in products without warning of the dangers and the company also instituted a program to allow purchasers to receive a refund if they had purchased a bottle with BPA. Phillips, as one of the first manufacturers to remove BPA from their products and in taking a lead in compensating consumers has opened up the potential for other liability cases. This precedent may create an impetus for manufacturers and chemical producers to continually maintain and defend their use of BPA despite scientific evidence and consumer demand. The success of litigious efforts to hold manufacturers accountable may create a disincentive for manufacturers to discontinue the use of BPA in other applications as it may open them up to liability claims. Although Phillips was the first manufacturer of baby bottles to face legal battles, other baby bottle manufacturers are currently facing similar lawsuits.
CURRENT BPA REGULATORY MECHANISMS

The Toxic Substances Control Act (TSCA)

Since its implementation in 1976, TSCA has failed to collect accurate and complete data on the majority of the thousands of chemicals in commerce. Although EPA can choose to take action on a chemical if there is enough data to suggest a cause for concern, TSCA limits EPA’s oversight to concerns related to the manufacturing, processing and distribution of chemical substances, rather than monitoring the use of the chemical in consumer applications. This means that EPA’s ability to control risks associated with BPA are limited to those instances in which the production or use of a chemical may create environmental harm or create unnecessary health risks. On March 29, 2010 EPA released a BPA “chemical action plan” in which it assessed the extent to which EPA would be the appropriate agency to regulate the chemical and its associated risks. In this plan, EPA concluded that the risks from the chemical that fell under TSCA jurisdiction were minimal as compared to the health risks associated with chemical exposures related to consumer product and food applications.¹⁹ The EPA report stated that:

Given that human exposures from TSCA uses of BPA are minor compared with human exposures from uses under FDA jurisdiction, EPA considers that FDA has the lead in making human health judgments on BPA. EPA does not consider that action under TSCA would be warranted at this time on the basis of potential human health concerns from exposures through TSCA uses of BPA (EPA, 2010).

Despite the fact that EPA concluded that it would not initiate regulatory action under TSCA on the basic of risk to human health, the agency has decided that further steps to assess the chemical should be considered. According to the chemical action plan, EPA “intends to consider initiating immediate actions addressing BPA in the environment based on concerns for potential effects in aquatic species” while also taking cues from the efforts of the FDA and NIEHS to consider

whether there is reason to continue assessing the effects of the chemical exposures related to manufacturing and processing. The action plan also notes EPA will use its authority under TSCA to gather information on the concentrations of BPA in surface, ground, and drinking water and will also require manufacturers to provide data on the reproductive and developmental effects of BPA in aquatic organisms and wildlife.

The chemical action plan lays out a firm foundation for how EPA might advance federal oversight of BPA, but the limitations of TSCA and EPA authority are visible within the plan of action laid out. To begin, information and data gathered about the hazards associated with the chemical are limited in scope, and require the efforts of multiple federal agencies in order to create a broader understanding of how the chemical impacts health and the environment. This process of chemical-by-chemical assessment on an agency-by-agency basis creates a burdensome process for regulatory agencies, whereby action on the chemical cannot occur across agencies, but is applied only in certain applications or uses, requiring the repetitive assessment of chemical substances. Additionally, although the plan intends to solicit data from manufacturers on developmental and reproductive effects (a positive notion in that it alleviates pressure from the government to conduct research and gather data), there are implications in collecting data from manufacturers who may have a vested interest in the outcome of their own research. Requiring scientific data from manufacturers does reduce regulatory burdens, but may introduce new concerns over the validity and reliability of research studies that are developed by manufacturers producing a chemical that is under regulatory scrutiny.

The Food and Drug Administration (FDA)

While EPA has some jurisdiction over BPA regulatory efforts, the FDA also maintains
some authority over the process of controlling the chemical. In the past, the FDA has continually claimed that, although BPA was known to leach from food packaging, the chemical was safe for use, even for young children and pregnant women. As recently as 2008 an FDA draft report assessing the safety of food contact exposures to BPA concluded that “an adequate margin of safety exists for BPA at current levels of exposure from food contact uses” (FDA, 2008). After a review of the conclusions of that report, the FDA came under intense scrutiny for its ties to industry and the likelihood that a conflict of interest with BPA industry officials may have impacted the assessment. Following another federal agency, the National Toxicology Program’s (NTP) 2008 report that there was “some concern” related to BPA exposures, the FDA reversed their safety claims about the chemical in January 2010, reporting that it now considers BPA to be of “some concern” for effects on the brain, behavior, and prostate glands of fetuses and the very young (NTP, 2008; FDA, 2010).

The FDA’s authority to regulate the chemical remains limited because, despite having the authority to control food additives and packaging, FDA’s classification of BPA as a food contact substance currently limits the capacity for the agency to control the chemical. The original approval on the part of FDA to label BPA as an indirect additive dates back to 1963 and exempts the chemical from the type of scrutiny that may be afforded to chemicals listed in another class because it was classified as a “generally regarded as safe” substance (Raloff, 2010). Manufacturers producing chemicals classified as such do not have to report the use of these chemicals in food-contact applications. FDA Commissioner Margaret Hamburg reported in a 2010 statement that the FDA would not ban or restrict BPA or recommend that consumers stop buying products that contain it. As the FDA has not been able to control the chemical as it is currently classified, the agency has called for further testing and alternatives assessment (Cone,
The recent consensus between federal agencies that BPA poses real and measurable health effects has been met with some level of federal support. In 2009 the National Institute of Environmental Health Sciences (NIEHS) pledged $30 million in federal stimulus funds over two years to study the low-dose effects of the chemical. This federal support is echoed by the Ban Poisonous Additives Act that was introduced in Congress by Senators Feinstein and Schumer and Representative Markey in 2008, 2009 and 2011. Proposing a ban on the sale or manufacture of food or beverage containers that contain BPA, the law would provide the FDA with the authority to regulate the chemicals, requiring the agency to seek manufacturer compliance and provide waivers to manufacturers who have not yet found alternatives. Those manufacturers not able to comply with the ban would be required to submit reports on their efforts at compliance as would also require the labeling of products that contain BPA. Although the act has failed to pass through Congress, the multiple introductions of the bill indicate that there is some Congressional support for controlling the chemical in consumer products.

The Role of Risk Assessment in BPA Regulatory Decisions

EPA and FDA have been significantly limited in their capacity to control the risks associated with BPA, in part due to the limitations placed on agency authority. The narrowly defined manner in which regulations are employed creates piecemeal regulations that examine the chemical on a case by case basis in the multitude of applications in which the chemical is produced and processed. Although there are very real differences in each different use of BPA, the repetitive review, assessment and subsequent attempts to control the chemical are a costly and time consuming endeavor. With each different agency conducting and assessing scientific
research, collecting and assessing manufacturing data and appointing advisory boards and review panels, millions of dollars have been spent on assessing the safety of one individual chemical. Although this practice is a cautious approach to ensuring that a substance is harmful before instituting regulations, it raises very real questions about the ability of the federal government to routinely and consistently assess the risks posed by chemical substances and take action against the worst offenders in a timely fashion.

The current attempts to develop a consensus around BPA suggest that it can be years before one chemical is comprehensively assessed. If we use the case of BPA as a reference point, considering that the NTP was tasked with reviewing the health risks associated with BPA in 2003 and the FDA and NTP did not reach a consensus about the concern surrounding the chemical until 2010, it would take 560,000 years for these agencies to assess the risks of the 80,000 chemicals in commerce today. Admittedly, not all chemicals would pose as daunting a task to assess as BPA—an endocrine disrupting compound that contradicts traditional toxicology models. However, the nature of the chemical demonstrates the limitations in formalizing risk assessment models as part of regulatory mechanisms.

As an endocrine disrupting chemical, the hazards associated with BPA challenge common notions of dose-response models that are a mainstay within risk assessment procedures. BPA has been found to cause negative health outcomes at very low doses of exposure, sometimes as low as one part per trillion (Wetherill et al., 2002; Takeuchi et al., 2004; Wozniak et al., 2005). Scientists Frederick vomSaal and Claude Hughes (2005) suggest that the basis of risk assessment is challenged by evidence of BPA causing significant health effects at dosages far below the currently accepted lowest observed adverse effect level that was calculated in the 1980s as the threshold for safety. Developments in scientific research in the 1990s revealed that, for certain
chemicals related to hormone functioning, low dose exposures to chemicals with hormone-like qualities triggered effects within the endocrine system where higher doses did not.

The traditional toxicological approach to risk assessment involves dose selection based on the maximum tolerated dose, which vomSaal describes as a “top-down dose selection,” where the higher a level of exposure, the more likely there will be a physical response. In contrast, endocrine disrupting compounds can be described as “bottom-up dose selection” (Welshons et al., 2003). Low dose and high dose approaches lead to very different conclusions of safety with regard to reference doses for BPA and “findings based on low-dose studies thus present a strong challenge to the assumptions that form the basis for chemical risk assessments” (vomSaal and Hughes, 2005).

The evidence provided by the low-dose effects of BPA suggest that traditional models for risk assessment lack the ability to adapt to new research and new criteria for assessment. The current model of risk assessment in place cannot readily adapt to a new body of research that challenges long-held assumptions and is likely a factor in the prolonged process of regulatory agencies making recommendations to control chemical risks.

**BPA INDUSTRY EFFORTS TO CURTAIL CHEMICAL REGULATIONS**

The limitations of federal laws are visible in regards to BPA as the chemical is widely observed to cause harm to the endocrine system at the levels which are found in consumer products, yet it has remained in a policy debate purgatory, undergoing repeated assessments, evaluations and tests. The deficiencies in policy mechanisms such as TSCA and the lack of authority on the part of the FDA to assess the risks associated with the chemical are further exacerbated in the case of BPA as the routes that would facilitate regulatory action are routinely
infiltrated by members of the BPA corporate elite. BPA demonstrates how corporate interventions into policy realms limit or delay regulatory decision-making despite widespread scientific consensus on the chemical harms associated with low dose exposure to BPA. The chemical industry elite has repeatedly engaged in a series of processes by which they have sought to influence, constrain or divert regulatory efforts.

As a multi-billion dollar commodity, BPA production and distribution is overseen by some of the most powerful chemical corporations in the world. These companies have the resources to launch extensive public relations campaigns to preserve the chemical’s image. As many of the same lobbying firms and agencies used to resist TSCA reforms overlap with those used to protect BPA, the strategies used to influence public opinion, interfere with political decision-making and shape scientific outcomes are relatively similar. These processes, as was previously demonstrated with the chemical industry more broadly, include the candidate selection process, the opinion shaping process and the science shaping process.

The case of BPA can be used to explore how these dynamics work on a smaller scale in relation to one chemical substance, allowing for the patterns of political influence to be traced more fully within a narrowly defined context. There are a number of trade associations and groups that work to influence public and legislative opinions on the safety of BPA, discourage legislative action, and challenge scientific research findings related to the chemical. The primary groups of interest in this effort, along with the chemical manufacturers themselves are the American Chemistry Council (ACC), the American Petroleum Institute (API), the Grocery Manufacturers Association (GMA), and the Society for Chemical Manufactures and the North American Metal Packaging Association (NAMPA).
**The American Chemistry Council:** The ACC is an industry group representing nearly 150 companies including top chemical producers Albemarle, Chemtura, Chevron Phillips Chemical, DuPont, ExxonMobil, 3M, Monsanto, and Occidental among many others. The ACC also represents primary BPA producers Bayer, Dow Chemical, Mitsubishi, SABIC (formerly GE Plastics), and Sunoco. In addition to spending heavily on lobbying and individual candidate donations, the ACC invests substantial time and money into their efforts to protect BPA from regulatory action.

**The American Petroleum Institute:** API, like the ACC, is an industry trade group representing the interests of major chemical companies. API represents the producers, transporters, suppliers, refiners and servicers of petroleum products. API’s members include some of the largest names in the oil and plastics business including Bayer, Dow, and Sunoco, three of the largest producers of BPA in the U.S. API employs a variety of strategies to protect the interests of their members including the use of lobbyists and the manipulation or generation of scientific research to challenge conclusions that would threaten their clients.

**The Grocery Manufacturers Association:** The GMA, which merged with the Food Products Association in 2007, is the world’s largest trade association for food and beverage companies. Representing major corporations such as Kraft Foods and Pepsi, as well as BPA manufacturers Bayer and Dow AgroChemical, the GMA channels political contributions, lobbies and engages in public relations on behalf of its member corporations. As food packaging has been found to contain levels of BPA that are known to cause harm in laboratory studies, the GMA has been an
active participant in the effort to control legislative efforts targeting BPA. A recent letter sent by
the GMA to members of Congress urged members to oppose regulatory action on BPA.20

The Society of Chemical Manufacturers and Affiliates: SOCMA is a U.S. trade association that
lobbies on U.S. laws and regulations related to chemical substances and advocates on behalf of
the small and mid-sized chemical producers. SOCMA has more than 300 member companies
including BASF, and a subsidiary of Dow Chemical. SOCMA’s vice president of government
relations has declared that SOCMA’s 2010 priorities were to “forcefully communicate how
overreaching [chemical policy] legislation will negatively impact specialty chemical
manufacturers, particularly small and mid-sized producers”.21 In pursuit of this goal, SOCMA
lobbies on issues related to chemical regulations and chemical security.

North American Metal Packaging Association: NAMPA is a trade group that represents the
interests of the food and beverage packaging industry. NAMPA represents a range of food and
beverage companies and chemical corporations including Coca Cola, H.J. Heinz, Hexion, and
Dow Chemical, lobbying on chemical regulatory issues in Washington D.C. and in various state
legislatures.

These trade associations and their constituents engage in practices that aim to permit the
unencumbered use of chemicals in consumer products and food and beverage containers and
packaging. The corporate interests supported by these associations benefit from maintaining
regulations that require minimal safety testing and data collection. The case of BPA provides a
clear example of the processes by which these trade groups and their members actively work to

20 This can be viewed online: Recent Legislation Action.” Bisphenol-A information. Retrieved February 23, 2011:
21 See their 2010 Legislative Goals online. Retrieved March 13, 2011:
deter regulatory action on BPA. As with TSCA reform processes, the BPA industry engages in practices designed to “colonize the state” in its favor (Faber, 2008), relying on direct and indirect lobbying within state and federal legislatures, attempting to influence public opinion on the issue and seeking to influence or distort the scientific understanding of BPA safety.

**The Opinion Shaping Process and BPA: Lobbying, Think Tanks and Public Relations**

The ability to influence and shape public perceptions of particular social problems or threats is a political tool that cannot be underestimated. In relation to the national level of politics, C. Wright Mills (1956) has written of the “power elite” who dominate decision-making arenas due to the overlapping and intertwined nature of major power-holders in the U.S. Intersecting interests, social backgrounds and experiences allow the power elite to control political outcomes and direct them in ways that support or benefit members of the power elite. Domhoff (1970; 1999; 2002; 2007), in building upon this work articulated a series of processes that could be used to explain how the power elite control decision-making channels.

In contrast to Mills however, Domhoff (1979; 1999) suggests that the corporate rich remain at the heart of the power elite. As such, Domhoff’s work sets out to develop an understanding of the routes by which corporate powers are able to set and control the public agenda. Although the BPA industry on its own cannot be recognized as a cohesive power elite that controls national-level decisions, the routes by which the industry accesses and influences policy-making structures are remarkably similar in nature to the those processes adopted by the power elite to influence and control power structures. Tracing the paths of influence used by this segment of the chemical industry is vital to the goal of clarifying how environmental policies are debated, challenged and distorted by a corporate elite who seek minimal environmental and health safeguards.
The opinion shaping process is the process by which the corporate elite uses public relations firms, thinks tanks, and other opinion shaping institutions in an attempt to influence public opinion or keep certain issues off the legislative agenda (Domhoff, 2002; 2007). Often focusing on the mass media as its target, Domhoff suggests (2007: 104) that although elite attempts to influence public opinion are not always successful in entirely swaying or altering public opinion, the process is important in that it “muddies the water on specific issues and creates a degree of momentary political cover before everyone moves on to the next crisis or issue”. As a means of derailing policy efforts or influencing public dialogue, the opinion shaping process succeeds via public relations campaigns aimed at promoting media coverage on a particular issue as well as achieving influence through financial contributions made to key stakeholders.

_BPA Industry Lobbying_

Elite dominance over political realms is advanced, in part, by extensive lobbying campaigns that work to secure political support for elite goals. The chemical industry, broadly speaking, spends millions of dollars annually on lobbying key politicians, both Democrat and Republican. In 2010 the Chemical and Related manufacturing industry spent $51 million on lobbying, with 536 lobbyists working in the halls of Congress. As a key source of influence within the halls of both federal and state-level legislative bodies, lobbyists not only supply information and evidence to support their client’s view, but-where restrictions are absent- may also offer meals, entertainment or other incentives for politicians who are amenable to the lobbyist’s suggestions. As Faber (2008) notes, the financial clout of an anti-environmental corporate elite allows these organizations “disproportionate access to government

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officials…[where] industry lobbyists are integrated so extensively into the environmental agency rule-making and legislative process that their recommendations are frequently adopted with little modification” (98). The BPA industry, as part of the larger chemical and food packaging industries, is no exception.

In 2010 the primary trade group advocating for BPA was the ACC and, although the organization lobbies on behalf of numerous member organizations, the more than $8.1 million spent on lobbying on the issue of chemical manufacturing demonstrates the degree of influence afforded the organization. With 48 lobbyists employed on their behalf, in addition to the ten ACC staff members who were also registered lobbyists in 2010, the ACC has extensive influence within legislative debates. The API spent $6.75 million on lobbying in 2010 with 55 lobbyists in addition to the 19 API staff members registered as lobbyists. The GMA also topped the list of food packaging trade groups in lobbying spending with nearly 40 lobbyists advocating on their behalf and spending $3.95 million on lobbying in 2010. Along with these top trade groups, individual BPA manufacturers also spent heavily on lobbying at the federal level. In 2010, Dow Chemical spent $8.2 million, Sunoco spent $1.1 million, and BASF spent $1.25 million on lobbying. These numbers represent industry spending at the federal level alone, clarifying the amount of funds spent on local or state-level legislation would increase these figures dramatically.

In each of the above instances, the funds spent invariably support lobbyists who advocate for a range of issues, not just BPA. While public records do not indicate how industry groups earmark their spending, it is possible to know which bills lobbyists advocate for and one of the

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most recent examples of corporate elite success in lobbying against proposed BPA regulations occurred in relation to the Food Safety Modernization Act. In 2010, Senator Dianne Feinstein proposed an amendment to the act that would ban BPA from infant formula packaging and baby bottles. Despite the seeming bipartisan support for the bill and the amendment and the fact that a compromise over the amendment’s language has been achieved—allowing a phase out period as well as maintaining individual state’s rights to control the chemical—Feinstein pulled the amendment after claiming that the ACC had interfered to such a degree that a bi-partisan compromise was no longer possible (Feinstein, 2010). Lobbying records indicate that the both GMA and the ACC, along with countless other food, packaging and chemical groups, lobbied against the bills, while the ACC, the API, the GMA and the chemical company BASF lobbied against the related House Bill—the Food Safety Enhancement Act of 2009, which requires federal action on BPA.

The efforts of the ACC and their associated lobbyists were highlighted as key elements in the failure of the act to pass with the BPA amendment included. *The New York Times* and *The Los Angeles Times* both reported that ACC lobbyists played a direct role in having the amendment excluded (Schor, 2010). Industry efforts to persuade politicians to avoid legislative action is clearly evident in leaked meeting minutes from a meeting entitled “BPA Joint Trade Association Meeting on Communications Strategy” in which key BPA industry members Coca-Cola, NAMPA, GMA, ACC, Alcoa, Crown, and Del Monte gathered to discuss strategies to prevent regulations and repair the image of BPA in the media. In the minutes, the ACC, the GMA and other industry officials noted:

Committee members are meeting with as many representatives on the Health Committee as possible. The members are focusing on more legislative battles and befriending people that are able to manipulate the legislative process. They believe a grassroots and
legislative approach is favorable because the legislators worry about how the moms will react.

The above illustrates not only the attempts of the chemical industry to influence and shape opinions related to BPA, but also indicates the degree to which such efforts can successfully limit action political action.

*Industry Think Tanks*

Think tanks have been noted as a key mechanism by which corporate elites attempt to influence opinions on certain political or regulatory issues (Faber, 2008; Beder, 1997). Jacques, Dunlap and Freeman (2008) note that conservative opposition to environmentalism heightened in response to the growing global environmental movement that was evident at the 1992 UN Conference on Environment and Development in Rio. Conservative think tanks thereafter became a key organizational component of an anti or counter environmental movement and, as Jacques et al. (2008) argue, rely prominently on the use of such think tanks to dispute the seriousness of the issue at hand and to undermine environmentally relevant science by promoting skepticism. The BPA industry is no exception.

In April of 2009, the ACC established the Center for Advancing Risk Assessment Science and Policy (ARASP). This center is designed to “promote adoption of risk assessment policies and practices, both within and outside government, that incorporate advances that have been made in understanding how chemicals act at the molecular, cellular, and organ levels” (ACC, 2009). Though a seemingly benign mission, the ARASP is invigorating the ACC’s commitment to maintaining a risk assessment model that may limit the development of a more accurate model of health and safety assessment, particularly when it comes to BPA, a chemical that does not fit neatly into the risk assessment models that are supported by the ACC.
Along with the broader effort of BPA industry groups to maintain current models of risk assessment, think tanks have also taken direct action to promote skepticism in relation to BPA. The Competitive Enterprise Institute stated, in 2007, that it served "as both a think tank—creating intellectual ammunition to support free markets—and an advocacy organization—putting that ammunition to use in persuasive ways.” With a long history of attacking environmental research on climate change and environmental health, CEI has released reports that aim to promote scientific skepticism (see for example, Rachel’s Folly which claims that regulating endocrine disrupting compounds—because they can be found in nature—may actually be harmful to humans and likens the concerns over the chemical to a witch hunt). CEI is connected to other conservative groups, including the Heritage Foundation, Alliance for America, and the Anti-Endangered Species Act organization. Although much of the funding base of CEI comes from unspecified sources, the institute’s multi-million dollar yearly revenues have been linked to numerous corporations and plastics industry groups including, Coca-Cola, the American Petroleum Institute, the American Plastics Council, Dow Chemical and ExxonMobil.

In 2010 CEI’s Director of Risk and Environment policy, Angela Logmasini appeared on Fox News to dispel concerns regarding BPA. In that interview, she claimed that “bad science” was behind the concern over BPA, stating that cancer incidence and mortality were decreasing and that chemical proliferation contributed to longer, healthier lives. Logmasini claimed that there was “no proof” that BPA caused harm, and likened the scientific evidence of harm to a “fishing expedition” in which scientists were searching for negative health effects. In relation to regulatory bans on the chemical, the CEI director suggested that there would be many negative effects resulting from such a ban and that actions already taken in certain places was a response.

to “media hype” and political pressure from mothers, as well as an anti-big business stance on
the part of environmental health advocates. This example conveys the efforts undertaken by CEI,
known to have connections with producers and manufacturers whose products contain BPA, to
contradict the science regarding the chemical and minimize the risks associated with the
chemical.

Similar efforts to dispel scientific research and to label public concern over BPA invalid
are associated with the Statistical Assessment Service (STATS) think tank, whose goals are to
“correct scientific misinformation in the media resulting from bad science, politics, or a simple
lack of information or knowledge”. Although STATS does not publicly disclose their funding
sources, it has been linked to the Center for Media and Public Affairs, a think tank heavily
funded by the tobacco industry. Trevor Butterworth (2009), a lead author on issues of chemical
safety has routinely authored reports and news stories that challenge the scientific findings on
BPA and blame the media and parents for being inappropriately concerned over the chemical. In
his report, “Science Suppressed: How American Became Obsessed with BPA” Butterworth’s
primary goal is to spotlight media outlets guilty of biased reporting on the issue of BPA and he
repeats the same cautionary tales used by CEI director Logomasini, concluding:

What if removing BPA on the thinnest scientific grounds actually results in greater harm
to the public? What if the protective value it confers in can linings is diminished or its
replacement turns out to be measurably more toxic. What if some of the parents who
turned to glass bottles for fear of polycarbonate “leaching” BPA drop and break them,
causing injury to their babies?

The power of industry think tanks to promote the type of skepticism that has been so successful
in preventing the passage of climate change legislation is particularly salient when it comes to
the issue of BPA. Industry affiliated interest groups have routinely articulated a counter-
argument to environmental health activists, claiming that the science behind the chemical is
unfounded and that being concerned about BPA in food applications and consumer products is irrational, if not outright negligent.

**Media Campaigns to Influence Public Opinions**

Although lobbyists and think tanks are a formidable means of achieving influence among both legislators and the public, the capacity for elite entities to influence the media must also be recognized. Although media coverage on the issue of BPA has overwhelmingly supported the regulation and control of BPA in consumer products, the BPA industry elite have attempted to control the public dialogue over the chemical. The most telling evidence of the industry’s efforts to control BPA’s public image come from the aforementioned leaked minutes from the “BPA Joint Trade Association Meeting on Communications Strategy”. During the course of the meeting, the industry officials noted that they believed that “a balance of legislative and grassroots outreach (to young mothers ages 21-35 and students) is imperative to the stability of their industry” and described their intentions to spend $500,000 to develop a survey of consumer perceptions of BPA that would contribute to a outreach campaign. The leaked minutes also describe the industry’s desire to use “fear tactics (e.g. “Do you want to have access to baby food anymore?”) as well as giving control back to consumers (e.g. you have a choice between the more expensive product that is frozen or fresh or foods packaged in cans) as ways to dissuade people from choosing BPA-free packaging.” Attendees noted, that despite spending “hundreds of thousands of dollars” on traditional media outreach, their attempts to control public debates were failing and there was a desire to:

…focus on quality instead of quantity in disseminating messages…The committee doubts obtaining a scientific spokesperson is attainable. Their “holy grail” spokesperson would be a “pregnant young mother who would be willing to speak around the country about the benefits of BPA”.

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Efforts to influence the media and shape public opinion are evidenced in the degree to which these industry groups were willing to expend financial resources in outreach and media campaigns, and the dogged pursuit of messaging points that would regain public trust and support. To date, these groups have had little success in attracting positive media attention outside of their own think tanks. Yet as Domhoff notes, it is not necessarily the success of these attempts that are important, but rather their ability to derail or contradict public opinion in ways that slow or complicate the debate. In this manner, elite attempts at shaping opinion can be considered successful as industry has succeeded in gaining media coverage that promotes skepticism.

The Candidate Selection Process

The candidate selection process is defined by Domhoff as the process by which political campaigns in the U.S., already stifled by a two party political system that circumscribes citizen input, are controlled by a corporate elite that provides extensive campaign funding to secure the favor of elected officials. This process entails not only the use of direct campaign contributions, but also refers to select negotiations—“lucrative speaking engagements, consulting contracts, and jobs that members of the power elites can offer to politicians during and after their careers” (Domhoff, 2002: 134). Faber (2008) likewise notes that the skyrocketing costs of political campaigns “magnify the political power of corporate capital… and the platforms of candidates and parties themselves are skewed in favor of those corporate executives and wealthy elites that fund campaigns” (71-2). This is likely to be further exacerbated by the 2010 Supreme Court ruling in Citizens United v. Federal Election Committee that the government may not ban political spending by corporations in candidate elections. As a result of these practices, the chemical industry elite is likely to have access to political candidates and influence over their
decision-making once they are elected. The funding of political candidates is widely practiced by the chemical industry writ large, as well as within the BPA industry among BPA manufacturers and distributors.

At the federal level, Dow Chemical donated more than $400,000 in the 2009-10 year, the ACC donated $363,857, and BASF contributed $343,331 in funding to candidates and political action committees (PACs).\textsuperscript{25} The majority of these contributions went to Republican members of Congress and their related PACs, although the ACC contributed more funding to Democratic candidates than Republicans in 2009-2010. These contributions pale in comparison to what any environmental health organization might have to wield influence or aid a like-minded politician in being elected to office and contribute to high levels of influence afforded the BPA industry in the halls of Congress.

At the state level, Dow Chemical, the ACC, the GMA, the API, BASF and Sunoco all made campaign contributions or paid to have lobbyists advocating on their behalf in states across the country. In a query from the National Institute on Money in State Politics, these six organizations spent $1.5 million on state-level lobbyists and contributions between 2008 and 2010.\textsuperscript{26} Although public records do not clarify the specific issues these funds went to support, the volume of funds channeled into both state and federal decision-making by members of the BPA


\textsuperscript{26} The National Institute on Money in State Politics. 2011. Industry Influence Statistics. Query conducted online February 23, 2011 (http://www.followthemoney.org/index.phtml). The NIMSP receives its data from the state disclosure agencies with which candidates must file their campaign finance reports. The institute collects the information for all state-level candidates in the primary and general elections. On February 21, 2011 I conducted a query of the main BPA industry groups or manufacturers that made contributions at the state level from 2008-2010, the primary years during which BPA was a state-based legislative issue. Not all the funds went directly to BPA-related efforts, but this number provides information on the extent to which the industry had state-level influence.
industry elite ensures that the industry has politicians who are not only familiar with the industry, but who may likely be indebted to the industry as well.

Revolving Door Politics

In addition to donations that facilitate the election of business-friendly politicians, revolving door practices whereby industry officials come and go from elected office to high-level industry positions is highly common among key members of the BPA industry. McGuire (2000) in writing of revolving doors within the legal system refers to the process as “pressure politics” where personal contacts and a specialized knowledge of legislative processes serve these individuals in easily “assuming the guise of lobbyists” (113). Butler and Sovey (2009) have found that successful lobbying firms routinely hire former members of Congress who, with their experience and connections, are able to exert influence over politicians. The authors suggest that lobbyists use their knowledge of the legislative process to evaluate and target key members to maximize their success in influencing policy outcomes. According to OpenSecrets.org, between 1995 and 2007, 43 percent of former Congress members turned to careers in lobbying after retiring from Congress. This reality is reflected in the revolving door practices of members of the BPA industry where many industry officials have filled government posts and circulate through the key positions in top industry groups.

Lobbyists working for the ACC are part of a rotation of political and industry elites. Cal Dooley, the current president and CEO of the ACC served as a California representative in the House for 14 years, leaving Congress in 2005. Prior to assuming leaderships of the ACC, Dooley chaired for industry trade groups, the Food Products Association (FPA) and the Grocery Manufacturers Association (GMA). Dooley’s duties as president and CEO often take him to the halls of Congress where he continues to lobby his former colleagues on behalf of the chemical
industry. Martin Durbin, formerly a head lobbyist with the ACC and now the Executive Vice President of Governmental Affairs with the API, has served as a legislative assistant to members of the Senate and the House, working for Representative Rick Boucher of Virginia who serves on the House Energy and Commerce Committee and is a member of the Energy and Environment committee. These committees are engaged in key chemical policy debates including TSCA reform and the federal level BPA bills introduced in 2008, 2009 and 2011. Federal records illustrate that Boucher accepted $15,000 from the chemical industry during the 2010 election cycle.27

Along with these widely circulating members of the ACC, Thomas Gibson left his post as the ACC’s senior vice president of advocacy to become the head of the American Iron and Steel Institute in 2009. Prior to his work with the ACC, Gibson was the chief of staff and served as an associate administrator for policy, economics, and innovation with EPA from 1991-1993. He was also the deputy staff director and majority counsel on the Senate Environment and Public Works Committee from 1995-2001. Gibson’s intimate knowledge and experience within the federal government makes him a powerful ally for industry; he has the social connections, experience, and skills to access and influence members of Congress. The revolving door practices of industry lobbying agencies contribute to the political influence that industry groups maintain.

The ACC is not the only BPA industry group with government connections. Jack Gerard is the current president of the American Petroleum Institute. Prior to his role at API Gerard served as the CEO of both the American Chemistry Council and the National Mining

Association. Gerard also served on the legislative teams of Senator James McClure (R-Idaho), and Representative George Hansen (R-Idaho). Timmons and Co., one of the main lobbying firms used by the API, is headed by Daniel Shapiro who formerly served as the deputy chief of staff to Senator Bill Nelson (D-Florida). API also retained the services of Martin Paone, the former secretary of the U.S. Senate, who served from 1982-2008.

While campaign funding and candidate selection are not the only element in determining the influence that chemical industry elites will have in a particular political setting, it remains an important aspect of the process of controlling the public policy agenda. The increasing need for political officials to raise money to develop election campaigns creates the space wherein industry groups can interfere in policy matters. As Domhoff (1979) points out, the need for a large pool of funds to manage political campaigns “gives members of the power elite a very direct role in the process … permitting them direct access to politicians of both parties. Even if they do not tie specific strings to their money, as they often do not, the fundraising process gives members of the power elite a chance to ensure that only people whom they consider sensible and approachable will emerge from party primaries” (152).

Although there are invariably members of the political electorate who are able to remain impervious to outside influence, the fundraising required to win an election (the average cost of winning a federal-level House race in 2008 was nearly $1.1 million and $6.5 million for a Senate seat) means that all but a few independently wealthy politicians are in the position to have to accept funds from interest groups and open their doors to lobbyists. While a campaign donation

may not be tied directly to a specific outcome in a policy debate, the capacity for influence is much higher for those industry groups that spend the most money.

The Science Shaping Process

The processes by which the BPA chemical elite have advanced their influence is amplified by a fourth process that can be recognized as a science shaping process. Although heretofore unrecognized as a distinct concept within the realm of sociological research, this concept builds upon the work of both Michaels (2008) and Rosner and Markowitz (2002) who have written of the corporate elite practice of promoting skepticism and challenging scientific research in attempts to derail legislation. In this process, industry groups promote skepticism and doubt regarding scientific research by: a) developing and disseminating their own funded research that contradicts the findings of non-industry funded research; b) limiting scientific consensus by promoting the use of outdated models or methods of study and subsequently calling for more research; and c) attacking the reputations and legitimacy of non-industry funded BPA experts in pursuit of destroying their credibility as scientists.

Promoting Skepticism Through Industry-Sponsored Research

Corporations and businesses have long been in the practice of developing research studies and expertise that will serve their interests. Developing research that suggests that products or exposure levels are safe, while training a coterie of “experts” willing to support and disseminate this research has been a common industry tactic in regulatory battles for years. According to a 1993 memo from public relations firm Burson Marsteller’s Tom Humber regarding strategies to challenge EPA assessments of environmental tobacco smoke that warned of health effects of exposure to tobacco smoke, ”the recruitment, education and training of a variety of experts must
be an integral part of any effort that hopes to advance credibility—or, conversely, successfully diminish that of the other side” (as quoted in McGarity, 2004: 907). The cultivation of industry-friendly experts and the development of contradictory research studies is one aspect of the science shaping process whereby the BPA industry is able to raise doubts about the scientific consensus regarding BPA.

After originally setting a safety standard for BPA in 1988 that was based upon high-dose exposure studies, BPA has routinely undergone assessment and oversight by federal agencies. In 1996 EPA estimated the exposure levels of BPA in Americans and deemed those levels safe (11 micrograms of BPA/day for adults and 7 micrograms/day for infants) as they had previously developed a safety standard of 50 micrograms of exposure/day. However, as new evidence of low-dose effects of the chemical began to come to light, federal agencies moved to collect more information.

In 2003 The National Institute of Health (NIH) nominated BPA for evaluation as a reproductive and developmental toxin. The Center for the Evaluation of Risk to Human Reproduction (CERHR) at the National Toxicology Program (NTP) was tasked with completing the assessment with the aid of Sciences International, a scientific consulting firm. Sciences International then conducted a literature review on BPA, summarizing research studies and stating which studies were acceptable for drawing conclusions on health risks. Sciences International and CERHR then convened an advisory panel of 15 scientists to assess the recommended literature and make recommendations on BPA. This panel notably excluded all scientists who have significant expertise or had published a paper on BPA, because of governmental concerns that expertise may inject bias into the evaluation process. The ACC, in defending this practice noted, “Scientists who have conducted significant amounts of research or
have otherwise taken a position on the chemical of interest, either favorable or unfavorable, are generally excluded from participation on the panel to avoid conflicts of interest or bias” (Pflaum, 2008). vomSaal, purported by many to be a leading expert on BPA, calls this position "absolutely based on complete ignorance of the way science works. What we love about what we do is it's absolutely self-correcting. Unlike practically any other field, if you publish something important and it's wrong ... it's critical that other scientists point that out” (ibid).

The CERHR panel concluded in 2006 that the chemical was safe after it disregarded studies by vom Saal and many others due to methodological differences. In the public commentary on this report, vom Saal and others disagreed with the panel’s conclusions and defended the low-dose research on the chemical. 29 Shortly after comments on the report were publicized, Marla Cone of the Los Angeles Times reported that Sciences International, while being contracted by NIH to complete the BPA review, was also funded by numerous chemical companies including Dow Chemical and BASF. This potential conflict of interest resulted in Sciences International being fired, although the original draft assessment of the chemical remained in use. The Environmental Working Group, in reviewing the draft assessment found that 70 percent of industry-funded studies and 30 percent of non-industry funded studies were deemed adequate in assessing BPA toxicity; the panel rejects independent studies at three times the rate of industry funded studies, while public comments from non-industry affiliated scientists found 297 errors of fact and interpretation within the assessment (Houlihan and Jacobs, 2008).

29 The CERHR report claimed that because BPA exposure occurs primarily through water and food consumption, oral introduction of the chemical in mice was the only method accepted. Scientists whose research had been excluded responded that, as BPA is most dangerous to fetuses which absorb the chemical while in the womb, digestion isn't the only means by which are exposed, and injecting the chemical during research studies is important in understanding the chemical.
In response to the continued concern over the chemical and the disagreement with the CERHR report, the NIH convened a panel of 38 non-industry affiliated scientists who conduct BPA research to conduct another review of the BPA literature. Known as the Chapel Hill panel, these scientists concluded that BPA presents a clear risk to human health, and disseminated their conclusions in the peer reviewed journal *Reproductive Toxicology* (see vom Saal et al., 2007). Despite the Chapel Hill Consensus outcomes, the final CERHR report concludes that there was only “some concern” about the chemical, and maintained that many of the previously rejected studies were irrelevant.

Following the growing public concern over the chemical in 2008, the House of Representatives Committee on Energy and Commerce demanded that FDA clarify its position on the safety of BPA and to provide evidence to support the FDA claim that there are no safety concerns related to BPA at the currently observed exposure levels. In February of that year, the FDA responded to Congress and revealed that agency conclusions about the chemical are based on two industry-funded studies sponsored by the American Plastics Council. In a review of these two studies published in *Environmental Health Perspectives*, John Myers and other scientists concluded that the research has “serious conceptual and methodologic flaws” and that “the FDA rationale for favoring these studies over hundreds of publically funded studies ignores the central factor in determining the reliability and validity of scientific findings, namely, independent replication, and use of the most appropriate and sensitive state-of-the-art assays, neither of which is an expectation of industry-funded good laboratory practices research” (Myers, vom Saal and Akingbemi et al., 2009).

In the continuing saga of federal assessments on BPA, the NTP released another assessment of the chemical in 2008, concluding that there was “some concern” about the
chemical after a review of the Chapel Hill Consensus, the CERHR report and other scientific literature. Following this NTP statement, the FDA released a contradictory statement concluding that current BPA exposures for adults were safe. An FDA Science Board was created to review the FDA’s report and it concluded that the report contained flaws that made it insufficient to draw conclusions about the safety of BPA. The FDA subcommittee recommended a revision of the study to correct the review’s errors. In response, the ACC claimed that the subcommittee’s assessment “states certain conclusions…that do not appear to be based on a sound and thorough scientific analysis” and are not supported by the “limited and inconclusive evidence” provided (ACC, 2008).

In January of 2010 the FDA reversed their statement on BPA and noted that there was “some concern” over BPA safety. However, industry efforts to derail or limit regulation throughout this process are clear. Science shaping is visible in BPA industry efforts to develop research that finds no harm from BPA exposures. A 2008 review of the BPA literature found that 98 percent of government-funded studies found adverse low-dose effects of BPA, but not a single industry-funded study found any effect (vom Saal, 2008).

Industry funded research delays the process of scientific consensus. Although the majority of the two hundred BPA studies that have been completed without industry funding have consistently found BPA to be associated with real health risks, the industry-sponsored research that maintains that BPA is safe complicates policy debates. When BPA industry elite are able to point to their own research studies to argue that there is no scientific consensus, regulatory action is stifled. The capacity for industry to influence decision-making processes is further problematic when industry officials compromise scientific advisory boards and advocate for their own interests. BPA industry elite are able to advance their goals through the
manipulation of the scientific process, raising doubts about the legitimacy of the broad body of endocrine disruptor research. This practice is all the more significant when industry members attack not only the scientific research on BPA, but the scientists who study the chemical as well.

Along with the conflicts of interest that have plagued regulatory assessments and tinge much of the research written by industry sponsored researchers, industry efforts to maintain laboratory standards and settings that are outdated and incompatible with general consensus on endocrine disrupting chemicals has been an oft-used means of shaping the science surrounding BPA. In particular, the reliance on outdated means of assessment has routinely produced scientific research that challenges the work of non-industry funded scientists.

One example of this practice is the use of a particular breed of rat, the Sprague Dawley rat, which was bred for lab research and has often been used in scientific research. However, despite the qualities of the rat that make it ideal for research (particularly its’ high rates of fecundity), the Sprague Dawley has also been noted to be less responsive to endocrine disrupting compounds and therefore inadequate to the task of assessing the health effects of endocrine disruptors such as BPA (Snell, 2009). The reliance on this type of test animal has raised extreme doubts as “No study using the CD-SD rat has reported finding any effect that would be detected in a standard toxicological study conducted for risk assessment purposes” (vom Saal, 2008). Despite the recognition by many endocrinologists that the Sprague Dawley rat is not appropriate in the effort to assess the risks of BPA, EPA proposed a chemical testing program-the Endocrine Disruptor Screening Program (EDSP) - that advocated the use of the Sprague Dawley rat in screening procedures (EPA, 2010). According to the EPA website, the EDSP grew out of:

The 1996 Food Quality Protection Act, which amended the Federal Food, Drug, and Cosmetic Act… and directed EPA to develop a screening program… to determine
whether certain substances may have hormonal effects in humans. The 1996 amendments to the Safe Drinking Water Act authorize EPA to screen substances that may be found in sources of drinking water for endocrine disruption potential.

Thus, a scientific advisory committee was developed in 1996 to advise EPA on how to best establish a program to carry out the Act’s requirements. In 2003 this advisory board released a white paper advocating the use of the Sprague Dawley rat. Despite the paper’s peer review by Jimmy Spearow, a geneticist, who described the paper as “disturbing” and “misleading” (as quoted in Snell, 2009: 48) the co-author of the report, Rochelle Tyl, defended the recommendations of the paper. However, Tyl’s credibility remains questionable as she is the author of the non-peer reviewed article that was deemed acceptable by the Sciences International report used by CERHR to claim that BPA was safe. Tyl had previously worked in the chemical industry and received financial support for research from The Society of the Plastics Industry, Inc. for studies that exonerate the health hazards of BPA (CSPI, 2007). In 2007 EPA noted that “while [the agency] recognizes that there are reasons to believe that [the Sprague Dawley] might be less sensitive, the data currently available appear to show that it is no worse or better than other strains for screening for endocrine activity” (Snell, 2009: 48).

Despite the fact that the use of this rat in studies of BPA consistently finds no effect where other studies draw different conclusions, EPA continues to rely on laboratory practices which are inadequate to the task of assessing the risks of BPA. Industry ties to federal advisory boards and decision-making processes limit the ability for scientific research to evolve in ways that reflect new technology and advances in scientific discourse. Maintaining a regulatory status-quo that privileges outdated models is a primary means of raising doubt regarding scientific consensus.
Along with potential disruptions in federal-level research studies due to the use of a lab animal that may be less than ideal for research on endocrine disruptors, the continued pressure of industry officials to rely on outdated or impractical laboratory settings is problematic as well. The decision-making that led federal agencies to reject the findings from numerous peer-reviewed articles that found BPA to be harmful is based upon the use of criteria termed “good laboratory practices” (GLP). First issued by the FDA in 1978, GLP established federal guidelines for private research companies submitting research on health effects and were developed in response to widespread misconduct by private research companies that do not go through the peer-review process (US HHS, 1981; Myers et al., 2009). GLP lays out basic guidelines for conducting research including the care and feeding of laboratory animals, standards for facility maintenance, calibration and care of equipment, personnel requirements, inspections, study protocols, and collection and storage of raw data (Myers et al., 2009; Markowitz and Rosner, 2002).

The decisions on the part of the federal government to reject peer-reviewed studies and instead rely primarily on two industry funded studies to make an assessment about BPA was due, in part, to the industry-studies fulfilling GLP requirements. A collective statement from more than thirty scientists argued that not only are GLP standards out of date, but inappropriate to the task of assessing the risks from low-dose exposures to BPA. These scientists suggested that research studies using GLP would be ineffective as “Detecting endocrine-disrupting effects at low doses of chemicals such as BPA requires sophisticated and modern assays and analyses that have been developed in advanced, usually federally funded laboratories over the past decade” (Myers et al., 2009: 310). The privileging of GLP studies within regulatory bodies is problematic not only because these standards are ineffectual in the study of BPA at low doses, but also
because the GLP used by BPA industry scientists should have been replaced by a new battery of screens and tests by 2000 as mandated by the U.S. Congress in 1996 in the Food Quality Protection Act (1996), but which has, as yet, still not occurred (ibid).

Following the publication of the 2009 Myers et al. consensus paper, considerable debate developed within the page of Environmental Health Perspectives as Rochelle Tyl argued for the continued use of GLP in the study of BPA. BPA researchers who had published peer-reviewed articles finding effects of low dose exposure to BPA responded by continuing to articulate the importance of more advanced and appropriate research practices and methodologies. While it is difficult to declare with certainty which practice is more appropriate in the study of BPA, what is clear is that studies that are industry-sponsored and make use of GLP do not find risks associated with BPA. Thus, the BPA industry has a vested interest in maintaining GLP as a primary means of assessing which scientific research can be used to demonstrate health effects.

The centrality of GLP in determining which research studies are considered acceptable limits policy makers understanding of the impacts of BPA. Industry efforts to defend and maintain this practice ultimately promote skepticism regarding the science. Michaels (2005; 2008) notes the historic practices of industry groups seeking to stave off regulation by arguing that the quality or type of data are invalid or unreliable and that “more research is needed before protective action is justified” (2005: S41). The BPA industry has benefitted from outdated GLP mandates that obscure scientific discourse on BPA and advance the idea that there is little consensus on the risks of BPA. This skepticism allows the industry to maintain that regulatory action is premature and that further study is necessary. The seemingly benign practice of calling for more research is, in fact, a powerful tool for shaping the actions of policy makers.

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Tyl is the researcher responsible for the GLP study that federal agencies relied upon to declare BPA safe. She also maintains ties to the chemical industry.
Distorting Scientific Expertise

BPA industry elites have participated in the effort to delegitimize the work of BPA experts through the act of labeling this research as “junk science”. As Michaels (2005) offers, “the ‘junk science’ movement attempts to influence public opinion by ridiculing scientists whose research threatens powerful interests, irrespective of the quality of those scientists’ research” (40). McGarity (2004), in reflecting upon polluting industries and their capacity to delay regulatory action, suggests that the business community has successfully framed scientific debates in subtle ways that distort the expertise and efforts of scientists. He suggests,

Both the demand for "sound science" in regulation and the call for the elimination of "junk science" in the courtroom are artfully framed appeals to scientific objectivity that carefully avoid the appearance of self-interest. In reality, neither claim is well-grounded in fact. Both are highly contestable and, indeed, surprisingly vacuous assertions. Stripped of their rhetorical flourish, "junk science" means "their science," and "sound science" means "our science" (904).

The practice of denigrating the reputations and the assertions of non-industry affiliated research has been practiced on numerous occasions. Challenging the legitimacy of scientific research and characterizing BPA scientists as overzealous scientists, “chemophobes” and alarmists serves to polarize the debate over BPA regulation. The slandering of individual scientists who produce research that makes the chemical industry vulnerable is widespread within the BPA industry.

In a 2005 Fox News article entitled “California’s Bogus Baby Bottle Scare” Steve Milloy of JunkScience.com criticizes BPA expert Fred vom Saal. Vom Saal’s visibility and willingness to speak publicly about his research findings has made him a key target in many of the industry’s attacks on scientists. In the Fox News article Milloy asks, “What’s behind the BPA scare?” and points to vom Saal’s “activist-research” on “so-called endocrine disruptors” as the cause for concern. Milloy goes on to attack vom Saal’s methodologies and findings and criticized him for
publishing an opinion piece in the “health scare oriented journal *Environmental Health Perspectives*”. The article concludes by suggesting that vom Saal is part of an “extreme anti-chemical activist movement” and questions his expertise as a scientist. A similar article by Milloy published in 2001 also referred to vom Saal as a “cult leader”.

Despite the fact that vom Saal is widely recognized as a preeminent biologist, whose research findings have been confirmed by other scientists, industry attacks on vom Saal have been consistent and potentially damaging to his credibility. vom Saal notes that “You don’t come back from losing trust in the scientific community... whether you survive or die is based on one thing and one thing only: Is what you published right?” (as quoted in Hilbrenner, 2006). Shannon (2008) reported that the ACC requested that vom Saal be banned from speaking at a convocation event at Stanford University. According to this report, the recipient of this request recalled that the “industry spokesman objected to vom Saal's appearance at the prestigious event on grounds that his work was ‘very controversial, and not everybody believes what he's saying’.” The ACC’s request was denied and fortunately, as vom Saal is well-established in his career and widely respected as a scientist, the industry attacks have done little to quell his efforts to publicize the concerns over low-dose exposures to BPA. Industry attacks may, however, deter younger scientists who are still building their reputations and careers may be less willing to handle industry criticisms.

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31 *Environmental Health Perspectives* is the journal of the National Institute of Environmental Health Sciences, a federal agency.

32 Vom Saal has published over 160 articles on his research and has testified at hearings in the U.S. Congress, numerous state legislative bodies, the EU Parliament, and at regulatory agency hearings in U.S., Germany and Japan. He has served on the boards of a number of scientific journals, National Institute of Health grant review panels, on the National Academy of Sciences Committee on Hormonally Active Agents in the Environment, and is an elected fellow of the American Association for the Advancement of Science. In 2010 he was chosen as a Heinz Award winner.
Legislators who advocate regulatory action on BPA are also vulnerable to industry attacks. In the Milloy article, Assemblywoman Wilma Chan of Oakland, CA was criticized for her efforts. The article suggests that Chan’s introduction of a bill to ban BPA in children’s products is a result of “unfounded allegations from a 1990s-era, environmental activist-generated scare about chemicals in the environment supposedly interfering with hormonal processes to cause everything from cancer to infertility to attention deficit disorder”. The article goes on to assert that Chan’s actions are scare-tactics, and do not accurately reflect the scientific consensus on the chemical- which they report is safe.

Where this slandering does not succeed, industry has attempted to appeal to the self-interests of scientists, offering negotiations and funding. In 1997 as vom Saal and colleagues at the University of Missouri were preparing to publish research on the health effects of BPA when they were approached by a representative of the Chemical Manufacturers Association (the former name of the American Chemistry Council) and a scientist for Dow Chemical. This representative, John Waechter, met with vom Saal, his colleague Wade Welshons, a faculty member in the Veterinary Biomedical Sciences department, as well as the chair of the biology department at the university and a visiting faculty member. Vom Saal and Welshons both recall that Waechter told them that the Chemical Manufacturers Association wanted to replicate his research in a larger, industry-funded study and subsequently offered to fund their research. According to vom Saal, Waechter said, "Can we arrive at a mutually beneficial outcome where you withhold publishing this paper until authorized to do so by the Chemical Manufacturers Association?" (Hilbrenner, 2006). The efforts of the industry to acquire and interfere with the scientific investigations at the University of Missouri are indicative of the broader efforts of the BPA industry elite to influence and shape the outcomes of scientific investigations.
Although these examples center on vom Saal’s experiences as a target of industry critiques and his experiences may be outliers given his outspoken nature, my interviews with BPA scientists, which are reported in chapter five, reflected concerns about being seen as “activist-scientists”, while numerous environmental health advocates saw the targeted attacks on vom Saal as a barrier to engaging more scientists in a public dialogue about research findings.

BPA industry attacks on scientists can impact the credibility of scientists, can reduce the effectiveness of their testimonies at public hearings and limits the capacity for experts in the field to have their voices heard. Perhaps even more subtle an outcome is the effect that such practices have on younger scientists who are beginning their careers. The BPA industry’s criticism of individual scientists may silence those scientists who are less likely to take risks or to allow themselves to be publicly identified with a seemingly controversial research topic.

Conclusion

The power and influence afforded the BPA industry is achieved through the interaction of processes designed to reshape policy making structures in ways that serve industry interests. The funding of political candidates who are sympathetic and amenable to corporate influence limits democratic decision making. Along with this, high-powered lobbyists serve to augment campaign funding by securing power and influence even where direct funding fails. In this way, the BPA industry elite has a significant ability to purchase policy outcomes that will serve their business needs. The dominance of BPA chemical elites is further entrenched through the opinion shaping process where financial resources are diverted into public relations campaigns that serve to modernize and greenwash the public’s understanding of BPA. Finally, the science shaping process has come to play a centrally significant role in the effort to regulate the chemical. Much
of the “battle” over BPA has been played out in relation to the scientific research that identifies risks from BPA. From manufacturing doubt through the development of contradictory research studies to challenging the credentials of experienced scientists, the science shaping process has succeeded in slowing the consensus over BPA’s risks and has delayed regulatory action on numerous occasions.

These processes are illustrative of the breadth of the power held by the BPA chemical elite and demonstrate the varied ways in which U.S. regulatory systems are vulnerable to corporate influence. Despite the unprecedented access granted these industry forces, BPA remains a unique case study in that the opposition to corporate meddling in regulatory affairs has been a visible public campaign. The scientists and activists competing with the BPA industry to influence regulatory structures have been successfully challenging corporate power and agitating for increased chemical regulation. The next chapter details the competing side in this battle over BPA and explores how social movement activism surrounding BPA has adopted unique strategies and organizational forms in order to restrict corporate power. While the routes by which activists have attempted to achieve legislative influence and public support vary greatly from those adopted by the chemical industry elite, there are important lessons to be learned about how social movements can attempt to overcome seemingly well-organized and financially powerful industry forces.
CHAPTER FOUR
BPA CAMPAIGNS, ACTIVISM AND NETWORK STRUCTURES

“To stay [sic] experimentation in things social and economic is a grave responsibility… It is one of the happy incidents of the federal system that a single courageous state may, if its citizens choose, serve as a laboratory; and try novel social and economic experiments without risk to the rest of the country.”

- Justice Louis Brandeis, U.S. Supreme Court dissenting opinion

*New State Ice Co. v. Liebmann*, 285 U.S. 262 (1932)

Introduction

The organization and influence afforded to the chemical industry elite generally, and the BPA industry elite specifically, is expansive. Environmental policy outcomes are impacted by the dominance of chemical industry elites who have the ability to derail legislative efforts by distorting scientific debates related to BPA, while also delaying policy efforts through lobbying pressure and coercion. However, despite the well-connected and influential efforts of the BPA industry, BPA legislation to regulate the chemical at the state level has been both frequent and marginally successful, with seven U.S. states having passed BPA regulatory bills as of March 2011. One of the driving forces in the effort to control the chemical at the state level has been a cohesive social movement campaign effort to regulate BPA.

This chapter will explain the emergence and development of a social movement campaign to regulate BPA. I argue that limited political opportunities created the environment in which the campaign was formed; activists recognized that federal level chemical policy reforms would be nearly impossible to pass and that a shift in scale to pursuing state-level regulation would be more feasible and potentially more successful. Constraints in the political system, including an unsympathetic and conservative Congress and president, served as a catalyst for a
shift in strategy, with activists working to build a well-connected movement infrastructure that developed and sustained movement efforts simultaneously in numerous states across the country.

The shift in strategic efforts necessitated by these limited political opportunities also resulted in the development of networked organizational structures that facilitated movement efforts. These mobilizing structures enabled fast and efficient communication and established a sense of cohesion among movement participants that contributed to a well-organized campaign that became a significant source of opposition to chemical industry elites.

I begin this chapter by describing the setting in which the battle over BPA arose, including the particular political opportunities that dictated the goals of the campaign. I will then describe how a networked organizational structure emerged and how it functioned for BPA activists. As this chapter intends to explain how the movement emerged and took shape, the next chapter will explore the specific strategies, ideologies and framing processes that have allowed BPA campaign efforts to form, to remain relevant, and to withstand intense opposition from the BPA industry.

A BRIEF HISTORY OF THE U.S. ENVIRONMENTAL MOVEMENT

Understanding the efforts of BPA activists is impossible without first clarifying the roots of such organizing, which lie primarily in the foundations provided by the American environmental movement and the related environmental health movement. The environmental movement has one of the longest histories of any social movement in the U.S. (Brulle, 2009). Rooted in the notions of conservation and preservation that dominated environmentalism in the late 1800s, the environmental movement initially intended to curb environmental ills brought on
by the rapid growth of capitalism and the expansion of the American population to the far reaches of the country (Shabecoff, 2003; Kline, 2007).

Writers Ralph Waldo Emerson and Henry David Thoreau, as well as artists George Catlin and James Audubon and later, Ansel Adams, played key roles in awakening the American public to the beauty of the environment through artistic mediums (Kline, 2007). Buoyed by the support of Theodore Roosevelt and his efforts to preserve large tracts of land, the conservation and preservation movement grew throughout the late nineteenth century and into the early twentieth. The early 1900s were also marked by the development of environmental organizations such as the Sierra Club and The National Audubon Society, which helped to champion natural preservation, conservation and municipal reform.

The work of these early environmental groups expanded in the mid-twentieth century as the automobile industry exploded and the federal highway system was expanded; as more Americans were able to visit and experience the natural environment, membership and involvement with environmental groups grew to the point where, in the early 1970s, the six largest environmental organizations in the U.S. together claimed nearly one million members (Bosso, 2005: 35). The legacy of the conservation/preservation movement is evident in the legislation of the 1960s and 1970s that preserved land and protected wildlife. While these values remained at the core of American environmentalism for some time, the 1960s also saw these values merged with a broader notion of environmentalism that valued not only wilderness and wildlife, but also recognized environmental concerns closer to home.

While the industrial expansion of the post-WWII era ushered in a new broad-based environmental movement, it also introduced a range of new risks to both the natural environment
and to the human population. The growth of manufacturing industries coincided with an increase in environmental pollutants, made all the more harmful due to the lack of existing regulations to manage these risks. Industrial pollution during this time not only contributed to the deterioration of important ecosystems, but also began to compromise human health as numerous pollutants contaminated drinking water and contributed to growing levels of air pollution. Rachel Carson’s *Silent Spring*, published in 1962, encouraged readers to recognize the relationship between toxic chemicals and health and environmental outcomes. As Americans became increasingly concerned with environmental degradation in both their backyards and the wild, the environmental movement continued to expand and diversify.

The social movements of the 1960s and 1970s served to further bolster the expansion of the environmental movement. Meyer and Whittier (1994) argue that, “the ideas, tactics, style, participants, and organizations of one movement often spill over boundaries to affect other social movements” (277). The spillover from the related and overlapping movements of the sixties and seventies—including the Civil Rights, Women’s and Anti-Nuclear movements—contributed to the growing numbers of participants in the environmental movement and created new spaces for environmental activism. During this time both traditional conservation-oriented organizations expanded while newer organizations arose, focusing on a plethora of environmental issues including environmental health and occupational safety.

In 1975, the majority of Americans recognized the “reduction of air and water pollution” as national priorities (Dowie, 1995: 3), and nearly 20 million people had joined more than 40,000 local environmental groups (Faber, 2008:4). The modern environmental movement, based in the work of earlier conservationists and preservationists ultimately represented a range of Americans
and a variety of environmental concerns that are today reflected in the multitude of smaller movements focused on the different aspects of environmentalism.³³

The U.S. Environmental Health Movement

Rooted in the efforts of the modern environmental movement that maintained widespread support, the contemporary environmental health movement is also based in the anti-toxics movement which sought to transform the process of toxic waste disposal. The anti-toxics movement was highly visible during and after the late 1970s Love Canal, New York disaster in which the Love Canal community experienced negative health effects and demanded federal support after realizing the town sat upon a toxic waste site (Szasz, 1994; Esptein, 1997; Brown, 2007). Incorporating a critique of corporate power structures and global economies, the anti-toxics movement pursued the goal of pollution prevention (Cole and Foster, 2001). Dovetailing in some instances with the efforts of the environmental justice movement (which aimed to reduce inequalities in environmental exposures along class and race lines), the anti-toxics movement retained an interest in the relationship between the environment and health, but tended to remain focused on white working and middle class battles (Brulle and Pellow, 2006; Bullard, 1990; Bryant and Mohai, 1992).

Scientific advancements in toxicology and epidemiology in the 1990s contributed to increasingly clear evidence of the relationships between health and environmental exposures and served to transform the anti-toxics movement into the more formidable environmental health movement. Lois Gibbs, the former housewife who led the effort to relocate the citizens of Love Canal, in conceptualizing what the environmental health movement meant in 2002 “that the

³³ Among these smaller movements are the environmental justice movement, the occupational health and safety movement, ecofeminism, both the farm worker’s and indigenous rights movements, and the environmental health movement.
grassroots leadership of this new movement focuses on protecting public health through building power at the local and state levels to influence federal policies” (Gibbs, 2002). From this perspective then, a newer environmental health movement evolved from the anti-toxics movement into a policy-oriented movement seeking greater legal protections in a precautionary manner before contamination and exposure occurred.

The World Health Organization defines environmental health as a concept that “involves assessing, controlling and preventing those factors in the environment that can potentially affect adversely the health of present and future generations” (Johnson, 2007). Indeed, members of the environmental health movement are concerned about the impacts of chemical substances on health, ecosystems and are also concerned with the social justice implications of the unequal distribution of toxins. The environmental health movement encompasses a number of different social movement organizations and, in many cases, overlaps and coalesces with other environmental movement efforts including worker’s rights and environmental justice. Below is a table that represents some of the historical milestones of environmental health movement work within the U.S. as well as more recent influences. Today, the environmental health movement should be recognized as a component of the broader environmental movement because it continues to articulate concerns in relation to ecosystem protection and preservation, but maintains an independent focus on health issues related to environmental exposures.
<table>
<thead>
<tr>
<th>Role</th>
<th>Timeframe</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Public Health &amp; Sanitation</strong></td>
<td>Early 1900s</td>
<td>Efforts to reduce disease related to water contamination and waste disposal resulted in public works and ongoing interest in understanding connection between disease and the environment.</td>
</tr>
<tr>
<td><strong>Environmental Toxicology</strong></td>
<td>Mid 20th century</td>
<td>Began to study the effects of toxins on the human body and has maintained lines of inquiry relationship between the environment and the body.</td>
</tr>
<tr>
<td><strong>Contemporary or mainstream environmental movement</strong></td>
<td>Mid 1960s-present</td>
<td>Inspired by Carson’s <em>Silent Spring</em>, a new era of environmentalism arose; valued control of environmental contamination and preservation.</td>
</tr>
<tr>
<td><strong>Occupational Health and Safety</strong></td>
<td>1970s-present</td>
<td>Labor concerns over employee health risks resulted in increased tracking of occupational exposures to toxins and created regulatory controls such as the Occupational Health and Safety Administration (OSHA); Dovetails with environmental health movement but is distinct for its overlap with labor and worker’s rights movements.</td>
</tr>
<tr>
<td><strong>Anti-toxics movement</strong></td>
<td>Late 1970s; now subsumed under the broader category of environmental health movements</td>
<td>Recognized connections between health and the environment and advocated for control and regulation of toxic chemicals.</td>
</tr>
<tr>
<td><strong>Environmental justice movement</strong></td>
<td>Late 1970s to present</td>
<td>Highlighted the importance of race and class in environmental health and toxic exposure issues; promoted use of “grassroots” movement efforts.</td>
</tr>
</tbody>
</table>
BPA CAMPAIGNS IN THE U.S.

The activist effort to regulate and control Bisphenol-A falls within the boundaries of the environmental health movement; activists work to advance regulations that will control chemical risks, make efforts to publicize the negative health consequences associated with the chemical, and to take steps to control the distribution, use and disposal of the chemical. The campaigns that have been organized around BPA, while a distinct entity, are embedded within an extensive environmental health movement made up of a variety of social movement organizations (SMOs) (McCarthy and Zald, 1977).

BPA campaigns themselves cannot be considered a traditional social movement, but can be more accurately described as what interviewees described as a “subset of a movement”; as the “environmental health movement coming together in a strategic way”; and most specifically, as “a campaign in [the environmental health] movement” (Personal Interviews, February 15 and 22; March 30, 2010). The usage of the term “campaign” in relation to social movement efforts has remained somewhat limited. Described as collective events or activities that have a specific goal and occur within a finite period of time (Marwell and Oliver, 1984) and as something that can be recognized to have succeeded or failed (Rorty, 1995), social movement campaigns are often recognized as a distinct activity which movement communities use in pursuit of collective goals. Rarely however is the practice seen as a theoretical concept in its own right.

In utilizing the term campaign, social movement theorists tend to recognize the concept as a by-product of mobilizing efforts. This understanding of a campaign has yielded definitions that recognize the practice as goal-oriented yet emotionally powerful (Downton and Wehr, 1991).

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McCarthy and Zald (1977) define an SMO as a “complex, or formal, organization which identifies its goals with the preferences of a social movement or a countermovement and attempts to implement those goals.” (1977: 1218).
as well as a persuasive effort more akin to framing processes intended to generate movement participation (Klandermans, 1992). Tilly (2006) has suggested that movement campaigns are one element that contributes to social movement emergence (in addition to social movement repertoires and public representations or demonstrations that convey political messages—which must employ WUNC, or worthiness, unity, numbers and commitment, to be effective). Tilly describes social movement campaigns in what is perhaps the most explicit definition of a campaign: “a sustained, organized public effort making collective claims on target authorities” that will extend beyond a single event and which are sustained through the day-to-day organizing of a social movement (292).

Most recently Staggenborg and Lecomte (2009), in their research on the Montreal women’s movement community, suggest that although there is variation in campaign processes, short-lived, collective campaigns with limited demands are the most likely sort of campaign to produce tangible outcomes such as policy changes. Where campaigns fail, success is still evident insofar as the mobilization surrounding the campaign serves to connect movement participants in new ways, revitalize participant’s commitments to a collective goal, and in serving to increase movement visibility.

Characterized by interview participants as a collaborative struggle to publicize and control the health risks of BPA, the term “campaign” serves to better represent the work of the activists and scientists I interviewed as it implies an effort that is not meant to be a long-term, sustainable entity, but rather a shorter-lived pattern of collaborative work in pursuit of a limited number of goals (Staggenborg and Lecomte, 2009). The use of the term “campaign” is also representative of the strategic tools used by BPA activists that resemble traditional political campaign efforts.
BPA campaigns are supported and run by individual activists from interconnected, yet separate, environmental health organizations. Working part-time on BPA campaigns while serving other organizational goals, BPA campaigners tend to be professional activists who are expected to advance BPA campaigns while also contributing to the efforts of the organization that employed by them. BPA efforts are best understood, then, as: a robust collective endeavor that has clearly defined goals which, once met, signify the end of the campaign and the redistribution of people and resources into a new campaign or project.

**BPA Campaign Goals**

The goal of the BPA campaign effort centers on legislative efforts to control BPA usage at the state level, a focus that is encouraged and supported by a broader coalition of activists pursuing state-based chemical regulations. Although the BPA campaign functions in many ways independently of the broader environmental health movement, state-based regulatory efforts became a focus in many states because of limited opportunities to pass chemical regulatory policies at the federal level. State-based regulations were thought to be easier to pass, given the greater access activists might have to legislatures. If the assumption that this approach to policy change was correct, it was then presumed that if enough regulatory bills to control toxic chemicals were passed, the energy and support needed to change national policies on chemical regulation would be organized and ready to mobilize at the federal level.

Thus the campaign works on multiple levels to influence chemical regulatory structures. A shifting of political opportunities warranted this two-tiered approach, leading to specific organizational structures, movement strategies, and framing processes. Importantly the development of a networked organizational structure arose in pursuit of these goals, while
particular tactical repertoires and messaging strategies were developed collaboratively within this network structure.

**BPA Legislation**

Since 2008 legislation related to BPA has been consistently and repeatedly introduced into state legislatures. As of March 2011, BPA legislation has passed in seven states, three cities, five municipalities and legislation has been introduced in 27 states. The bills that have passed have varied in their focus and breadth, though many have taken action on specific products that are marketed for children, including baby bottles, sippy cups, and food packaging. In July 2010 if then-pending state bans in New York and California passed, 27 percent of the American population would be covered by legislation, creating a de facto ban for the entire country. Despite the fact that California’s bill did not pass in 2010, the passage of New York’s bill has increased the challenges facing the chemical industry and again contributed to the elevation of this issue in legislative and media circles. Table 4.2 below identifies the status of BPA bills as of March 2011.

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35 i.e. such a high percentage of bans would be in effect that manufacturers would stop using BPA as it would be cost prohibitive to have BPA and BPA-free formulations of the same products.
Table 4.2: BPA Legislation

<table>
<thead>
<tr>
<th>States with Passed Bills</th>
<th>Connecticut</th>
<th>New York</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Maryland</td>
<td>Vermont</td>
</tr>
<tr>
<td></td>
<td>Minnesota</td>
<td>Washington</td>
</tr>
<tr>
<td></td>
<td>Minnesota</td>
<td>Wisconsin</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Municipalities and Cities with Passed or Introduced Legislation</th>
<th>Albany county, NY</th>
<th>San Francisco, CA</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Annapolis, MD</td>
<td>Schenectady County, NY</td>
</tr>
<tr>
<td></td>
<td>Chicago, IL</td>
<td>Suffolk County, NY</td>
</tr>
<tr>
<td></td>
<td>Duchess County, NY</td>
<td>Washington, DC</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>States With Introduced Bills</th>
<th>Alaska</th>
<th>Missouri</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Arkansas</td>
<td>North Dakota</td>
</tr>
<tr>
<td></td>
<td>California</td>
<td>New Jersey</td>
</tr>
<tr>
<td></td>
<td>Georgia</td>
<td>New Mexico</td>
</tr>
<tr>
<td></td>
<td>Hawaii</td>
<td>Oregon</td>
</tr>
<tr>
<td></td>
<td>Iowa</td>
<td>Rhode Island</td>
</tr>
<tr>
<td></td>
<td>Illinois</td>
<td>Pennsylvania</td>
</tr>
<tr>
<td></td>
<td>Kentucky</td>
<td>Rhode Island</td>
</tr>
<tr>
<td></td>
<td>Maine</td>
<td>Tennessee</td>
</tr>
<tr>
<td></td>
<td>Massachusetts</td>
<td>Texas</td>
</tr>
<tr>
<td></td>
<td>Michigan</td>
<td>West Virginia</td>
</tr>
</tbody>
</table>

*For a detailed version of this table that includes information on the scope of these bills, see Appendix B*

BPA Campaign Organizations

BPA campaign efforts are largely supported through the interactions of a number of local or regional environmental health organizations across the country. The SMOs that are highly active in the pursuit of BPA legislation feature a variety of organizational goals and, while some of the organizations represented in the campaign effort are regional organizations that are part of a larger national organization, many of the groups engaged in this work are smaller, localized organizations. Below I briefly characterize the SMOs that were widely recognized by interview.
participants as being vital sources of information, key players in developing innovative strategic plans, and as more generally being major contributors to campaign efforts. In addition to the organizations highlighted by respondents, I also characterize organizations that have a national presence, yet may not have been directly identified by state-based actors. In general, these SMOs adopt fairly top-down organizational structures, supported by outside funders and, in many cases, small numbers of paid members. Within many of these organizations “professional” activists are responsible for the majority of organizing and lobbying efforts while volunteers or community members participating in specific campaign efforts as needed (such as letter-writing, legislative call-in days, or actions and marches).

The SMOs that make up the majority of the elements of the BPA campaign structure came together largely because of two pre-existing coalitional structures that facilitated the development of targeted campaigns. These overarching coalitional forms provided the infrastructure that BPA campaigns were able to fold their efforts into. Rather than seeking out new partners or developing new strategies, BPA campaign efforts have been able to build from within a structure made up of hundreds of labor, environmental justice, legal, health, scientific and international organizations. These two larger coalitions, SAFER and Coming Clean, tend to be less hierarchical and more consensus-oriented and thus, the hierarchical nature of many of the SMOs active in BPA campaigns is often tempered by the pre-existing coalition structure that encouraged shared decision-making and collaboration among members. Sarah Doll describes SAFER as,

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Gould, Lewis and Roberts (2004) distinguish between three coalitional forms: a coalition, which is a formal or informal relationship established by two or more groups; a coalition organization, which is maintained by some source of funding and staff, but is primarily run by member organizations; and an umbrella coalition organization, which is formed with the goal of building long-term movement relationships maintained through a funding source and staff persons. From this vantage point, SAFER and Coming Clean can be recognized as umbrella coalition organizations.
...helping people to take that step back and [see the big picture]... SAFER is more than a network of information, it is strategically focused and active policy-wise and power-wise. We also say, “okay, you have a relationship with the teamsters in New York, we would really like to make that push with the teamsters in Michigan, can we help transfer that relationship?” We’re taking this network to the next strategic level. (Personal Interview, July 19, 2010).

Generally speaking, as BPA campaigns came together, one to two individuals from any given SMO took on the role of active participants and representatives of their organizations. The campaign structure thus reflects a melding of individual organizational goals with the broader coalition effort to support regulations and to increase the visibility of BPA as a health problem. Despite the formalized, hierarchical relationships within many individual SMOs, a reliance upon coalitional practices and shared decision-making is common practice within larger coalition structures and has therefore influenced the form that the BPA campaign effort has taken.

Although it is clear that some SMOs and individuals have a more obvious (or simply louder) presence within these collaborative environments, the commitment to a collective organizational structure is highly valued. In particular, the personal relationships that have been established across organizations (due in part to the longevity of many women leaders, and the history they share in working for similar or related organizations) give particular weight to the desire to work collaboratively. As Cindy Luppi of Clean Water Action notes,

"A lot of our success is women who really like to work together and have a great community and a lot of support for each others’ work and I’m not saying that there’s not men involved, because there are, but I’ve worked on global warming, I’ve worked on mercury, I’ve worked on air pollution and this particular issue is much more proportionally led by women than… and it’s part of why I enjoy working on this issue…it’s the community. (Personal Interview, February 20, 2010).

Thus, the effort to establish and maintain BPA regulatory campaigns at the state level is situated within a larger, long standing community of environmental activists. The connections, relationships and insights they share with one another undoubtedly influence their capacity to
work together in collective ways and in pursuit of shared goals. The presence of two larger, national coalitions serves to create the foundation for campaign efforts that are ultimately carried out by individual and more autonomous organizations, each with their own individual organizational goals, constituents and funding bases.
Table 4.3: Social Movement Organizations related to BPA Campaigns in the U.S.

<table>
<thead>
<tr>
<th>Organization</th>
<th>Type</th>
<th>Description</th>
<th>Connection to other BPA organizations</th>
</tr>
</thead>
</table>
| Coalition for a Safe and Healthy Connecticut (CT) | • Coalition of environmental, labor & health groups.  
• Horizontal ties and shared decision-making structures | 50 + member organizations  
Goal: Legislative changes | Tied to the broader SAFER Network, Coming Clean, works routinely with regional SMOs in MA, VT, ME |
| Breast Cancer Fund (BCF) (CA)         | • Small non-profit, mixed structure of hierarchical and democratic decision-making  
• Supported by individuals and foundations | Goal: Legislation on women’s health; expand research on environmental causes of breast cancer | Leader in efforts to pass BPA legislation; a key resource for states pursing BPA regulations |
| Alliance for a Healthy Tomorrow (MA)  | • Coalition of environmental, labor, faith and health groups.  
• Horizontal ties and shared decision-making structures overseen by a governing board and advisory council | 160 + member organizations  
Goal: legislative changes | Tied to the broader SAFER Network, Coming Clean, works routinely with regional SMOs in CT, VT, ME |
| Alliance for a Clean and Healthy Maine (ME) | • Coalition of environmental, reproductive rights, faith-based and health organizations  
• Horizontal ties and shared decision-making structures | 12 member organizations  
Goal: Legislative changes | Tied to the broader SAFER Network, Coming Clean, works routinely with regional coalitions in CT, VT, MA. Local chapters often connect to national organizations. |
| BPA Working Group                     | • One paid, part-time staff member  
• Connects to larger networked campaign structure for decision-making processes | Goal: Support campaign efforts, aid development of reports such as *No Silver Lining* | Tied to the broader SAFER Network, Coming Clean and |
<table>
<thead>
<tr>
<th>Organization</th>
<th>Type</th>
<th>Description</th>
<th>Connection to other BPA organizations</th>
</tr>
</thead>
</table>
| **Public Interest Research Group (PIRG)**         | • Hierarchical, national organization active in 26 States  
• Membership-based | Goal: Advocate for environmental and consumer rights policies | In both Maryland and Vermont, MDPIRG and VPIRG staffers acted as lobbyists and key organizers. Primarily funded through paid membership, PIRGs are hierarchical organizations with paid professional staff |
| **Washington Toxics Coalition (WATC)**             | • Small non-profit, mixed structure of hierarchical and democratic decision-making  
• Supported by foundations and paid members | Goal: Advance legislative policies related to environment | Tied to the broader SAFER Network, Coming Clean and groups on the west coast |
| **Center for Health, Environment and Justice (CHEJ) (VA, NY)** | • National, hierarchical organization, centralized decision-making | Goal: Reduce environmental health risks through media campaigns; legislative changes | Tied to the broader SAFER Network, Coming Clean and groups in D.C. area |
| **Clean Water Action**                            | • National, hierarchical organization, centralized decision-making | *16 state chapters*  
Goal: Legislative changes | State chapters in MA and CT are tied to broader SAFER, Coming Clean and to CWA regional chapters |
Table 4.3: Social Movement Organizations related to BPA Campaigns in the U.S.

<table>
<thead>
<tr>
<th>Organization</th>
<th>Type</th>
<th>Description</th>
<th>Connection to other BPA organizations</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Environmental Working Group</strong></td>
<td>Hierarchical organization, centralized decision-making</td>
<td>Goal: legislative change; media campaigns</td>
<td>Connected to Coming Clean</td>
</tr>
<tr>
<td>(EWG) (D.C. area)</td>
<td></td>
<td>Tension: Three interviewees reported difficulties working with EWG due to its inability to adapt to certain shared decision making processes</td>
<td></td>
</tr>
<tr>
<td><strong>Coming Clean</strong></td>
<td>Coalition of environmental health, labor, environmental justice SMOs</td>
<td>Goal: Bring together a range of environmental health organizations to pursue shared goals and share resources</td>
<td>Link together many state SMOs working on BPA regulations</td>
</tr>
<tr>
<td>(national)</td>
<td>Horizontal ties and democratic decision making processes</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Funded through foundation support</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>SAFER</strong></td>
<td>Coalition of state-based SMOs working to pass chemical regulations</td>
<td>14 member states Goal: share resources and expertise; strategic decision making on state chemical policies</td>
<td>Connects a range of SMOs nationwide through a list serve and conference call system. Also linked to Coming Clean</td>
</tr>
<tr>
<td>(national)</td>
<td>Horizontal ties and democratic decision making processes</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Funded through foundation support</td>
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</table>
POLITICAL OPPORTUNITIES AND SOCIAL MOVEMENTS

The study of political opportunities has sought to theorize the importance of the broader political system in structuring the prospects for social movement organizing. Such theories suggest that changes in institutional structures or power structures can help to explain social movement emergence. McAdam, McCarthy and Zald (1996) have written at length about the processes that contribute to the development of a social movement. They suggest that political opportunities, mobilizing structures, and framing processes are interactive elements through which movements organize. Tarrow (1998) suggests that political opportunities can be recognized as “consistent-but not necessarily formal or permanent- dimensions of the political environment that provide incentives for collective action by affecting people’s expectations for success or failure (76-7), while McAdam (1996) describes political opportunities as structural changes and power shifts that facilitate movement activity (25-6).

Within this rather broad definition, McAdam articulates four dimensions of the concept to lend greater specificity to political opportunities. These are: 1) the relative openness or closure of the institutionalized system; 2) the stability or instability of elite arrangements that undergird a polity; 3) the presence or absence of elite allies; 4) the state’s capacity and propensity for repression (1996: 27). The first dimension recognizes the importance of legal or institutional structures, the second and third refer to informal structures of power relations, while the fourth dimension is fairly clear, although Della Porta (1995) suggests that state repression may more aptly be recognized as a component of the openness or closure of a political system (10-11).

While political opportunities contribute to an environment that is conducive to social movement organization, mobilizing structures are an important conceptual element in McAdam,
McCarthy and Zald’s (1996) notion of movement development. These are the “vehicles, informal as well as formal, through which people mobilize and engage in collective action” (3). These structures are the “building blocks” of movements and include “tactical repertoires, particular social movement organizational forms…family units, friendship networks, voluntary associations, work units and elements of the state structure itself” (McCarthy, 1996: 141).

Mobilizing structures can be both formal and informal and may or may not be tied to a particular movement (ibid: 143-4). These structures vary greatly from movement to movement and certain structures may be more or less appropriate for taking advantage of an existing political opportunity (150).

Finally, the interactive concepts of political opportunities and mobilizing structures remain “in the absence of one other factor, insufficient to account for collective action” (McAdam, McCarthy and Zald, 1996: 5). The mediating concept is that of framing processes, or the mechanisms by which cultural meanings and definitions related to a particular grievance are shared with the public. Based upon Goffman’s Frame Analysis (1974), framing has taken on particular importance in clarifying the ideas, shared, and social constructed ideas that are used in strategic and conscious ways by groups of people to develop shared understandings that legitimate and motivate collective action (Benford and Snow, 2000; Snow and Benford, 1988; Snow et al., 1986).

Despite the popularity of political process theory, critics have noted the tendency for the concept to “lump under one rubric all of the potentially important causal factors that empirical research has uncovered” ignoring the strategic choice, cultural meanings, and emotions that “would highlight the complex, open-ended quality of social conflict” (Goodwin and Jasper, 1999: 51-2). Given these warnings, this chapter intends to utilize theories of political
opportunities to reveal the circumstances in which BPA activism arose, but hopes to remedy some of the failures of political process theory by remaining cognizant of the culturally-important factors that facilitate movement development.

Political opportunities, mobilizing structures, and framing processes, when considered together, can help to clarify the emergence and development of a particular social movement. These interactive elements are observable within the BPA campaign effort. Political opportunities that limited social movement activity related to chemical policy reforms facilitated the emergence of BPA campaign efforts, while new mobilizing structures arose to meet the needs of this emergent movement campaign. In what follows, I describe the manner in which political opportunities that constrained movement efforts at the federal level resulted in the development of the strategic BPA campaign effort. I suggest that, despite limitations on a national scale, movement actors recognized local political systems as being more open and responsive to movement demands and altered their organizing efforts in response. This strategic turn then required the development of new mobilizing structures, specifically networked organizational forms, which supported and facilitated the needs of BPA campaign activists.

While this chapter seeks to explain how political opportunities and mobilizing structures explain the emergence and development of BPA campaigns, the following chapter explores how social movement framing processes within this movement effort created new avenues for activists to influence public opinion and legislative debates over the chemical. As political opportunities are not limited to external factors and movements themselves may create new opportunities for themselves through their success (McAdam, McCarthy and Zald, 1996; Rucht, 1996; Tarrow, 1998), chapter five will explain how social movement frames can create new spaces for movement actors to contribute to public policy debates.

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POLITICAL OPPORTUNITIES AND THE EMERGENCE OF THE BPA CAMPAIGN

The relative openness of a political system is an important dimension in understanding the emergence and development of a social movement. Movement actors will mobilize in “response to and in a manner consistent with the very specific changes that grant them more leverage” (McAdam, McCarthy and Zald, 1996:10). In keeping with this theoretical notion, I suggest that BPA campaigns arose out of the perception on the part of environmental health activists that there were limited opportunities to agitate for chemical policy reforms on a national scale, requiring organizing efforts to be refocused in ways that would allow greater access to state-level decision-makers.

Limited Opportunities: The Anti-Environmental Bush Administration

The widespread perception that an unreceptive and often “anti-environmental” administration under George W. Bush would derail or prevent chemical policy reforms demonstrated to many activists that federal policy change would be nearly impossible. For many environmental health organizations across the country, the Toxic Substances Control Act (TSCA) of 1976 was recognized as a fundamentally flawed national policy. Richard Denison recalled the feeling that “decades worth of inaction and bad policy has created pent up demand [for policy change] and I think the country is only beginning to acknowledge that tens of thousands of ubiquitous chemicals haven’t been adequately assessed” (Personal Interview, May 14, 2010). With little ability to regulate or assess the safety of thousands of chemicals in commerce, reforming TSCA was a major priority for many national environmental health organizations such as the Environmental Working Group, Environmental Health Fund, and The Breast Cancer Fund.
Despite the formation of the Coming Clean coalition in the early 2000s, which could provide the infrastructure to bring SMOs from across the country together under one larger organizational structure, many organizations perceived that the political opportunities to reform TSCA were not present. With a republican congress and a president in office opposed to increased environmental regulations (Faber, 2008), activists around the nation began to have discussions about how best to alter chemical regulatory mechanisms with a unreceptive and, at times, confrontational administration.

The Chemical Policy Patchwork: Opportunities Generate Strategic Change

Existing limitations within the political system under Bush encouraged environmental health activists to devise a new targets in pursuit of more protection chemical regulations. Tarrow (1996) argues that “as opportunities narrow, even the strong grow weak and movements are forced to change their forms of action and their strategies” (54) and indeed, environmental health activists, in recognizing the barriers in mobilizing for federal policy change, elected to refocus their strategic efforts.

In a meeting of a number of state organizations, the idea for the SAFER state coalition arose as a means to work toward policy reforms despite an inhospitable climate for environmental regulatory reforms. During the early years of the Bush Administration members of environmental organizations from four different states met to discuss action around chemical policy, and ultimately decided that a shift in scale, moving from action on the national level to the state level, would aid in efforts to control chemical risks. One of the initial members of the SAFER coalition recalled, “I think that the original strategy which was to capitalize on political advantage at the local level which is easier for NGO’s in many cases to generate: political
access, a meaningful contribution to the political process, etcetera” (Personal Interview, May 19, 2010). Another member noted that the idea was to have “states working together in a coordinated effort to target the same bad actor same chemicals and by doing so, sort of creating a patchwork of different laws and regulations that chemical companies would then have to adhere to… which would then generate awareness and motivation to do more around comprehensive reform both at the state and federal levels” (Personal Interview, May 7, 2010). Another activist noted similarly,

I would say for the past ten years the environmental health movement has realized that the states are really the catalysts for change, particularly during the Bush administration where there was no hope for moving forward legislation and states were really the laboratories for change. A lot of the focus and attention here in the U.S. have been getting legislation passed in key states to build momentum towards federal change. (Personal Interview, February 22, 2010).

With this strategy in mind, the collective goal emerged to create a “patchwork” of chemical regulations across numerous states that would serve as a catalyst for federal policy change: as more states passed regulation, increasing numbers of the public and legislators would recognize that “the system of chemical regulation is broken” as one organizer put it. The momentum necessary to reform national chemical policy could conceivably build across states until there was a time when the political system would be more receptive to reforms. Sarah Doll, the National Coordinator of the SAFER coalition, noted

In passing policy at the state level the goal is ultimately federal reform of TSCA. We’re now active in 15 states and it’s both the launching of policy campaigns and modeling what we want to see federally. States are really the laboratories of innovation so if we can model a better way to do something, that’s part of our intention, while also building the power and the constituencies and awareness. Then we can then shift that power to pass things federally. When you bring in key constituencies like health care providers, small businesses, moms, that makes a big picture. (Personal interview, July 19, 2010).

Following that initial meeting, the SAFER coalition was formed with four states taking on the task of pursuing chemical regulations at a more localized level. Organizers discussed plans to begin efforts to advance chemical policy legislation at the state level. The limited
political opportunities at the federal level encouraged activists to develop a new type of movement effort that transitioned away from a large-scale attempt to influence national policy structures and moved towards a narrowing of policy-related goals on a smaller scale. This shift in scale was seen as necessary not only because of narrowed political opportunities, but also because elite allies (e.g. key politicians) would be more accessible at the local state level.

Out of this initial coalition of four states, SAFER expanded as other states began to pursue chemical regulation at the state level. With varied interests and individual goals, numerous SMOs came together under this coalition in an effort to strengthen an eventually move toward federal regulation. As previously noted, SAFER is now comprised of 15 states in which different SMOs come together along policy lines. Sarah Doll emphasized that the SMOs involved in the coalition are independent and autonomous and the SAFER coalition was not established to say “this is the bill you have to introduce’ it was more like, ‘here are the core things that we think are important and you as individual state levels can figure out what pieces work for you and how you’re gonna do it’”.

The flexibility within the coalition meant that different states decided to advance different types of legislative efforts, some of which featured individual chemicals, some of which were comprehensive policies that sought to control numerous chemical groups. In this strategic maneuver different states could pursue individual chemical regulatory efforts. Doll noted that, “A lot of states have chosen individual chemicals which is a great way to build power, to actually get a win…these are the things that drive [the chemical] industry nuts- that holistic process and individual actions in different states. So part of the strategy is to have different stuff in different states” (Personal Interview, July 19, 2010). The opportunities that mobilized different SMOs to come together with the shared goal of state-based chemical policy efforts is what ultimately gave
rise to the BPA campaign effort; all of the states in which BPA legislative bills have passed were
members of the SAFER coalition and contributed to the broader coalitional goal of creating a
“checkerboard” of regulations, while also pursuing a goal that benefiting their own state-level
organization.

Closed federal opportunities in relation to chemical policy led environmental health
activists to pursue state-based campaigns. The narrowing of movement goals occurred as many
activists believed that there were greater opportunities to influence local politicians who would
be more responsive to demands from movements and individuals who made up their
constituencies. Activists believed that adopting this new strategy would contribute to the
development of chemical policy change across the nation. The patchwork strategy would allow
activists not only to press for change in their local government, but would also position them in
such a way that they would be able to take advantages of changing political opportunities at the
national level, whenever those shifts occurred.

Although a closed political system encouraged movement actors to change course and
adopt new strategic plans, changes within the broader cultural realm also contributed to the
emergence of BPA campaigns. Cultural opportunities that drew attention to the issues of
chemical safety encouraged environmental health activists to focus their efforts in very specific
ways.

**Cultural Opportunities: Toxic Toys and Public Health Scares**

McAdam (1996), in attempting to specify the concept of a political opportunity warns of
the “conceptual plasticity” of the term and suggests that cultural factors or processes that create
opportunities for movements should remain distinct from political opportunities. With this in
mind however, in an earlier article McAdam (1994) argued that there are certain cultural opportunities that appear to increase movement activity. Of these opportunities, his notion of “the dramatization of system vulnerability” is most salient in the case of BPA organizing. The concept suggests that when events occur that demonstrate the weaknesses of an opponent, framing or other mobilization efforts will be stimulated and expanded.

This is demonstrated by BPA campaign efforts associated with a spate of health scares related to children’s toys immediately prior to the intense organizing around BPA in 2008-9. In the summer of 2007 there were numerous recalls of toys made in China (Jennings, 2007). In August of that year, Mattel recalled nearly a million children’s toys due to high levels of lead. Despite the recalls, more than 300,000 lead-containing toys were purchased by consumers and prompted the Consumer Product Safety Commission to issue warnings to parents. In October of 2007, an additional 500,000 toys were recalled by manufacturers. In the wake of these recalls, widespread media coverage prompted concerns over a “toxic toy” crisis that the federal government was unable to control (Smith, 2007; Friedman, 2007; Naughton, 2007).

The public recognition that many children’s toys contained high levels of lead, cadmium and other potentially hazardous chemicals created a shift in the capacity for environmental health advocates to agitate for increased regulations. In response to the growing concern over children’s products and their capacity to have negative health impacts, environmental health advocates began to frame their materials and legislative campaigns around children’s health issues, recognizing the saliency that this issue had for parents and legislators when discussed in relation

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McAdam identifies are 1) the dramatization of a glaring contradiction between a salient cultural value and conventional social practices; 2) suddenly imposed grievances; 3) dramatizations of a system’s vulnerability or illegitimacy; and 4) an available master frame within which other challenges can map their own demands (1994: 255-9).
to children’s health. Mia Davis a co-leader of the national markets working group, who has been an active participant in BPA campaigns noted,

We are telling the story that BPA is the tip of the iceberg- that no one is minding the store, that the government isn’t making sure that products are safe before they hit store shelves… I think that the things that have happened leading up to when we were able to really amplify the BPA battle helped us to tell the story that “you are not being protected”. (Personal Interview, February 15, 2010).

Environmental health activists seeking to regulate toxic chemicals elected to orient their strategic efforts in relation to the opportunities available within the political system and in response to culturally relevant issues and events. As BPA was a chemical frequently present in many children’s products and toys, the chemical seemed an ideal place to begin to organize for regulatory change. Shifts in the cultural realm therefore created new pathways for mobilizing efforts as public concern over toxic chemicals encouraged organizers to adopt single-chemical legislative campaigns that would benefit from an increasingly perceptive and supportive public.

**POLITICAL OPPORTUNITIES AND NETWORKED MOBILIZING STRUCTURES**

Where political opportunities explain why social movements emerge, mobilizing structures describe the processes by which movements organize themselves and engage in collective action. McCarthy (1996) defines mobilizing structures as the tactical repertories, organizational forms and modular social movement repertoires that facilitate social movement action (141). These structures enable movement organization and communication and also contribute to the generation of mobilization efforts. BPA campaigns demonstrate that political opportunities and mobilizing structures are interactive elements in social movement development; the opportunities that gave rise to the campaign structure necessitated the adoption
of new strategies-strategies that subsequently required the creation of a decentralized networked organizational structure that could best facilitate geographically dispersed movement actors.

Mobilizing structures are designed to not only aid in mobilization efforts but may also serve as channels through which information may flow, and can contribute to the development of collective identities (Rucht, 1996: 186). Organizational forms are an element of mobilizing structures that influence the development and evolution of any given social movement. Informed in part by existing opportunities and capacities for framing, organizational structure can reflect the ideologies of a social movement (Juris, 2004; 2008), can develop due to constraints or opportunities related to various resources (McCarthy and Zald, 1973; 1977); and may evolve due to political or cultural opportunities (McAdam, McCarthy and Zald, 1996).

McCarthy (1996) argues that there are numerous forms of mobilizing structures, ranging from very formalized to very informal structures that facilitate the work of a movement. Rucht (1996), McCarthy (1996) and Tarrow (1998) note the relevance of hybrid structures in which a range of structures coexist within the framework of a movement. Rucht (1996) characterizes three types of structures: the grassroots model featuring a loose, informal and decentralized structure; the interest-group model where structures of formal organization attempt to influence; and the party-oriented model in which formal organizational structures focus on electoral politics and political parties.

BPA campaign efforts have adopted a hybrid structure in which many of the SMOs actively pursuing policy efforts are formal organizations geared toward the policy process in ways that are consistent with Rucht’s notion of the interest-group model (where organizers seek to influence policy through lobbying efforts and mobilizing public constituents). Along with this,
the campaign, in being rooted in a larger coalitional structure also reflects the grassroots structure Rucht discusses, but is more aptly characterized as a networked organizational structure in which many different movement actors connect through virtual space in a decentralized manner. Information, strategic planning and collective decision-making occur between numerous SMO-centered nodes. The imperative to organize collectively across state borders due to shrinking political opportunities at the federal level necessitated the adoption of a mobilizing structure that was flexible and which allowed multiple stakeholders to connect and interact. What developed to facilitate BPA campaign efforts was a networked organizational structure.

**BPA Campaign: Emergence of a Networked Organizational Structure**

*Networks: An Overview*

In recent years, social movement theory has broadened the notion of what makes a social movement. Scholars have often considered movements to be bound to a particular social or cultural space (Tilly, 1978; Calhoun, 1982). However, recent scholarship has challenged that notion and suggested that social movements can also be recognized as “networks of relationships which connect informally… a multiplicity of individuals and organizations” (Diani, 2000). Networks can be made up of interorganizational ties, exchanges between individuals and organizations, as well as personal interactions.

These horizontal communication networks facilitate the exchange of interactive messages from a variety of sources and locations and at ever-faster speeds (Diani, 1992; Diani and McAdam, 2003; Castells 2007, 1997; Costanza-Chock, 2006). Increasingly mediated by new forms of technology, linkages between nodes aid in the sharing and transmission of information or other resources, while increasing ease of communication and reducing structural holes or gaps.
(Diani 1999; Reagans and McEvily, 2003), and promoting the development of shared visions for social action (Gerlach, 2001; Diani, 1992).

Networks can “at the same time, be flexible and adaptive thanks to their capacity to decentralize performance along a network of autonomous components, while still being able to coordinate all this decentralized activity on a shared purpose of decision making” (Castells and Cardoso, 2005:4). The increasing capacity for connectivity has been further theorized as Juris (2004; 2008; 2008a) offers that the expansion of information technologies throughout the world has resulted in the network being recognized as an emergent cultural ideal, where decentralized and democratic politics are highly valued. In this era of networked movements, the relationships among individuals and social movements are increasingly mediated by technology (Myers, 1994; Diani, 2000; Mosca, 2007). Networks are an appropriate organizational form for BPA campaigns as there is a need for interactive, responsive and virtual structures that inexpensively connect movement activists. These mobilizing structures are vital to building the capacity of BPA campaigns in ways that will allow organizers to increase their visibility and improve their ability to influence the public sphere.

**BPA Campaigns: Networked Mobilizing Structures**

The coalition structure provided by SAFER created the backdrop against which BPA campaigns could develop. In pursuit of the goal of advancing federal policy by passing state-regulations first, numerous SMOs elected to take on policy-based efforts. The coalition structure aided groups in connecting with one another, but did not ultimately inform the path that any state-based group took; each organization decided what type of bill to pursue based on their own
feelings about what would work in their state. However, as individual states began to plan legislative battles, many states selected individual chemicals to develop a campaign around.

Mia Davis recalled the process of different states adopting BPA as a poster-child chemical, “There were a few people who were kind of hip to what a problem BPA really was; not only because of its health effects but its ubiquitousness; they really wanted to shine the light on BPA,” while Cindy Luppi described different states choosing to advocate for BPA regulation as “their stepping stone for broader state and federal policy” (Personal Interviews, February 15, 2010 and February 20, 2010). Sarah Doll of SAFER reflected upon the strategic decision making and noted that SAFER did not pressure states to adopt certain bills and reported that, “You’ve see real variety in how folks have chosen to go about reforms. A lot of states have chosen individual chemicals which is a great way to build power, to actually get a win.”

Naturally, those organizations that chose to pursue legislative efforts related to BPA eventually came together independently of the SAFER group, while still remaining associated and connected to the coalition. The political opportunities that encouraged organizers to shift their strategic efforts to the state-level served also to influence the emergence of a networked organizational structure within the BPA campaign. The geographic distances between states and a related lack of resources necessitated a mobilizing structure that would not only facilitate the efficient sharing of information and resources, but would also conserve scarce resources in the form of money and time. Gretchen Lee Salter reported that “Having many different state campaigns happening at once is certainly helpful, it gives all of us the different feedback, it gives us all different access to different experts and leverages a lot of relationships that we all share.”
Generally speaking, there are three types of network structures through which information may flow, the first of which is a circle, whereby a node or actor in the network passes information along to another node or actor, who then passes it on to the next (Kapferer, 1973; Oliver and Myers, 2003). Although a hierarchical pattern of communication, this node-to-node transmission is what may often be implied by the use of the term network. Networks may also take on the form of a wheel or broadcast network in which a single communication source “is directly received by a very large number of people” (Oliver and Myers, 2003: 184). Finally, Kapferer (1973) writes of the all-channel formation in which the transmission of information is shared in a more decentralized manner, where different node-to-node transmissions occur throughout the network.

The BPA campaign network features each of these forms in different contexts and geographical locations. The development of a networked organizational structure that relies on technology-based communications is, in part, a result of necessity; the political opportunities that made pursuing state-level legislation a specific goal necessitated the development of a structure that could facilitate collaboration across borders and time zones—a practice that required a centralized means of communicating, sharing information, and making decisions. Similarly, a lack of resources required that information, personnel, and campaign materials be shared both easily and efficiently. A networked structure developed among campaigners to meet these needs, demonstrating the interactive nature of political opportunities and mobilizing structures.

In practice, BPA campaigners connect to one another through emails, a list serve and conference calls, rarely meeting face-to-face. Members of the campaign network are geographically dispersed and connect primarily via information and communication technologies (ICTs). In bringing together a range of activists under a broader, networked structure these
campaigns have taken advantage of technologically based infrastructure in order to decrease costs of organization while remaining relevant and active in legislative efforts. Cindy Luppi of Clean Water Action (CWA) noted

We interact with numerous groups through conference calls-I spend my life on conference calls these days- around the joint release of reports, or common statements to pressure points in the debate, or when there are opportunities for public involvement, like public hearings and through on the ground outreach tools. We share lessons learned and tips from successful strategies at the state level and resources like the inflatable baby bottle or fact sheet information. We are really trying hard to not reinvent the wheel here so we interact with all these folks…and also participate in collective actions, e-mail actions, social media, sometimes webinars different tools that give people across the country, and some of our international allies even, an opportunity to interact.

Lindsay Dahl noted that communication technologies greatly facilitated collaboration and efficiency when she was working to help pass the first legislative ban on BPA,

With modern technology and email, I could in a matter of minutes email ten other states that were working on this and they were likely also at their state capital and could quickly write back. Even Blackberry’s, it sounds really silly, but modern technology really helped make these connections happen. (Personal Interview, May 12, 2010).

Dahl described ICTs such as smartphones, emails, and listserves as providing the important connections and feedback that facilitated her BPA campaign in Minnesota. Similarly, Bobbi Chase Wilding noted that BPA campaigns consisted of “an overlapping set of collaborations” that included numerous state groups, along with SAFER, the Safer Chemicals, Healthy Families Campaign, and The Breast Cancer Fund (who has been building support for a federal BPA bill) and “overlapping players and in terms of the mechanics the bulk of the work is being done via email exchanges and conference calls, and then on the ground organizing in each of the particular points of engagement.” (Personal Interview, March 30, 2010).
Richard Denison reflected upon the interactions of the campaign network, marveling at the power that arose from having a diverse set of collaborators working together to regulate BPA:

It’s been a tremendously positive development to have the breadth and depth of groups, many of whom didn’t necessarily work all that well together in the past, come together in a way that helps to balance fragmentism and idealism and broaden the set of issues that we’re trying to gain through legislative reforms...It’s amazing to go into meetings and watch the industry respond when somebody from the Autism Society and Learning Disabilities Association is in the room sitting next to Environmental Defense Fund and the Washington Toxics Coalition. I think that itself sends a message. (Personal Interview, May 14, 2010).

The speed and ease through which different collaborators could connect facilitated the development of a network structure that allowed BPA campaigns to build momentum and generate support nationwide. Although the primary routes of connection included ICTs, the network forms that were generated varied across movement contexts and often reflected the type of technology being utilized.

**BPA Campaign Organizational Structures: Networks and Information Flows**

As the BPA campaign network is both a collective endeavor by which environmental health SMOs collaborate to create a “checkerboard” of regulations and a more localized effort whereby regional or state-based SMOs work somewhat autonomously to pursue their own organizational goals regarding BPA legislation, the BPA campaign structure has a multiplicity of network forms and practices. The connections facilitate the flow of information and help in the development of relationships that are vital to the legislative strategies pursued by campaigners.

Judy Robinson, a co-leader of Coming Clean, in describing the interconnected network structures that support BPA campaigns, points out that the structure is about individuals and
organizations being situated as interlocking pieces that work together. She notes that it is as though there is, “a map-and this is how science fits with media and this is how media fits with production and this is how markets fit in, the whole thing. Being able to show people, this is where you fit in helps them to show up for it, if people don’t have that shared goal, this [convinces them].” She notes that once people recognize this broader picture, campaign work is more easily facilitated across organizational lines (Personal Interview, May 19, 2010). The BPA campaign network brings together a range of SMOs and individuals in a number of different networked connections and structures. The varied network structures that are visible within the campaign are often reliant upon the different types of organizing tools available to campaigners. Different forms of media, including listserves, social networking sites, and conference calls enable the development of different network structures within the larger campaign environment. Open and accessible online communicative processes tend to allow for greater interaction and participation among campaigners; media that allow for greater connectivity among numerous nodes contribute to the development of network structures that themselves are more open.

Circular Structures

Circular network structures represent the flow of information from node- to node. Information and communication move from one organization or individual actor to another, the flow of which may reflect hierarchies amongst actors or groups. Within BPA campaigns this type of structure is visible both within individual SMOs that are pursuing legislative goals and can also be observed amongst inter-organizational relationships among SMOs that are in close geographical or regional proximity to one another.
Within an individual SMO it is fairly evident that the flow of information takes on a circular approach. For the SMOs that call themselves participants in the BPA campaign network, it is common for a small number of staff members (between one and five) of any individual organization to have the specific task of collaborating on BPA legislation. In states where one organization is the driving force behind legislative efforts, more organizational staff will be devoted to that effort. In states where a number of local organizations are coming together to advance state-based efforts, there may be fewer members of any given organization working on BPA policy. In most cases only one or two staff persons will serve as representatives within the larger BPA campaign network structure (although there are no stated limits on the capacity for any individual or person working on policy campaigns to participate, time constraints often prevent complete participation by all BPA campaigners). This means that information is often shared in a node-to-node fashion where an organizational representative will interact with the larger campaign structure and report back to their primary organization with information.

Sarah Uhl of Connecticut’s CWA describes collaborating with other Connecticut-based organizations as part of the Coalition for a Safe and Healthy Connecticut. Uhl, along with one or two other Connecticut-based environmental activists, was an active participant in the larger campaign. The Connecticut coalition participated in the broader BPA campaign network by participating in shared-decision making regarding state-level actions, using the BPA listserve for advice and information, and when receiving support in drafting legislation. Connecticut also relied on the sharing of information in a node-to-node fashion whereby Uhl and other organizational representatives would share information gathered from the larger network and then allow the coalition to make decisions. Uhl says of the coalition however, that the information provided is assessed and discussed by all in pursuing state-level bills:
We have a really broad coalition… it’s a totally democratic process, we operate as a unit…we have a meeting every single week and so the coalition’s other groups are really instrumental in everything…writing the policy… lobby days…weekly press conferences that all groups were part of … Every piece of inside and outside strategy was collaborative in some way.

The diffusion of information from the broader network to state SMOs is therefore not a simple case of transmission and reception; rather, the information is shared, discussed and integrated or rejected by state-based actors. Both Uhl, of CWA and Charity Carbine of Vermont Public Interest Research Group noted the importance of their communications between each other and other activists in states where BPA legislation was moving forward. In many instances advice, information and support was sought directly from individuals that were linked through the larger network. Uhl suggested, “…working on BPA has brought colleagues together around the country. While we were working on our bill it was really in tandem with Minnesota and there was a lot of collegiality across states and sharing of information and at this point I’m still in regular contact with [the people in Vermont].” Carbine noted the value of “state to state communication…I think it would have been impossible for us to get a bill done in Vermont had Connecticut not done it first and if we didn’t have access to that.”

Node-to-node transmissions often occurred during collaborative efforts to generate informational or product testing reports. As the reports tended to be a product of the campaign network’s participants as a whole various activists were able to vet and edit the material, which moved from node-to-node, often in a hierarchical fashion with certain contributors retaining a more dominant role than others. One activist noted, “There’s a couple of organizations and individuals that are leaders in that they are really good at shepherding projects and keeping things in the spotlight and also because they are funded to work on it. So other people who might care about this issue a lot who might not be funded, you know, they are just not getting the same
opportunity to participate.” (Personal Interview, 2010). Although this respondent noted that these types of reports aided the entirety of the BPA campaign, notions of ownership and funding often limited the capacity for network structures to remain entirely participatory and open. More often however, states worked together to share information and resources in equitable and important ways.

**Wheel Structures**

The wheel structure indicates a network in which one actor transmits information to other actors in the network. In the case of the BPA campaign network, the centrally significant actor can best be recognized as the BPA listserve. Although the listserve is maintained by numerous campaigners and functions only to the extent that individual actors disseminate information, resources and campaign materials, the listserve functions as the primary mechanism by which information is transmitted to BPA activists. The power differences inherent in the seemingly one-sided wheel may be ameliorated to some extent by the fact that any subscriber can post information to the listserve and download shared materials.

A wheel structure is also visible in relation to the new forms of social media that BPA campaigners have begun to adopt within their organizations. The increasingly common use of Twitter and Facebook to disseminate messages, information and requests for participation in local/regional events reflects the changing terrain of social movement organizing. Many of the state-based groups who have introduced or passed BPA legislation have used these media tools to publicize legislative hearings, encourage “followers” to write to their representatives and senators, and frequently post links to research reports and news links. The sharing of information in this manner not only allows SMOs to galvanize support for their efforts locally, but also transmits information to other BPA campaigners to whom they are connected. While increasing
the speed and flow of information is achieved through the use of social media, the hierarchical nature of the wheel may limit what information is publicized or deemed legitimate for sharing with the public audience.

For example, in 2010 a video was released which explored the ecological consequences of the use of plastic water bottles. *The Story of Bottled Water* was widely posted on the Facebook and Twitter accounts of many an organization, including many SMOs working on BPA bills, as the plastics industry is intimately involved in efforts to block chemical regulations. That same month, the International Bottled Water Association launched their video response, entitled *Good Stewards of the Environment* in which they articulated how bottled water manufacturers were conscious of environmental and social issues related to bottled water. Despite the fact that the existence of such a video presented an obvious example of greenwashing, an email thread on the listserve advocated *not* sharing the video on social media sites so as to limit the viewing of the video. Although perhaps a prudent attempt to send a message to the bottled water industry that consumers were not interested in this messaging, this example demonstrates the manner in which social media tools remain limited by the dominant parties involved in posting information. Although sites such as Twitter and Facebook (which themselves possess more of a broadcast structure) have user interfaces which allow viewers and followers to post and respond to materials, the network structure still delineates which information is relevant, important and worth sharing.

*All-Channel Structures*

The above examples demonstrate the manner in which information is shared in networked, but often limited ways, with a relatively few individuals or organizations influencing
or channeling the flow of information to others. In practice, the BPA campaign network features numerous participants sharing and disseminating information and making strategic plans in simultaneous and overlapping ways. Although the wheel and circle structures demonstrate the less dense and more mundane paths that information transmission takes, the all-channel structure conveys the numerous connections that make up the BPA network.

As the campaign network is supported by SMOs that are locally based in states across the country, connecting participants in a shared space is accomplished through the use of conference calls and online email discussions in which each organization or individual within the network has a voice. As one organizer put it,

> The technology and communication have made what we’re doing possible. And that was a barrier to nonprofit organizations in the past because the amount of capacity required to phone everybody independently and strategize- it just would have made this impossible to move as nimbly as we do with conference calls, webinars, Skype, etcetera. So that’s huge. That makes a really big difference in terms of emphasizing the connections between people and capitalizing on that.

The ease with which conference calls were planned ensured an active means of continuing strategic conversations with fellow organizers and ensuring that different SMOs and individuals in different states had access to the information, tools and support they needed. The conference call tended to be a shared space, although one participant was usually tasked with leading the meeting, guiding participants through a pre-determined (agreed upon via email exchanges) agenda. The atmosphere in these meetings was supportive, with participants offering encouragement, sharing in defeats, and sharing in achievements or successes. The conference call setting, as one of the primary means of campaign communication, reflects the all-channel structure in that numerous participants shared information in an open-space. Although limited by the reality that many of these participants rarely, if ever, saw each other in person, the ubiquity of
the conference call within the broader Coming Clean and SAFER coalitions made these interactions commonplace for participants and more than adequate for maintaining the campaign network.

Participants in BPA campaign efforts recognized the larger agenda of federal level reforms and agreed to pursue BPA legislative bills in pursuit of this broader goal, while recognizing that local regulatory “wins” would benefit individual states as well. The political opportunities that generated the campaign strategy necessitated the use of an all-channel structure as creating a patchwork of regulations consistently required the fast, consistent and very open sharing of information throughout the network. As Sarah Doll of SAFER noted, “It’s about sharing information, but it’s also about bringing everyone in line on the same agenda and allowing that entrepreneurial spirit to help us all move in the same direction.” In this way, information flows through various channels in order to be leveraged by BPA campaigners in their pursuit of state-level legislation. Judy Robinson of Coming Clean and Environmental Health Fund notes that information is shared so willingly because everyone is working toward a similar goal, she suggested “The reason we’re successful is because it benefits everybody.” The all-channel structure operates well through the medium of conference calls, and to some extent, the listserve.

Although the listserve can be recognized as having a wheel structure, it also facilitates connection amongst various participants in important ways. Often used as a hub for sharing information, the listserve also serves as a place for strategic discussions to take place. As the listserve is open only to subscribers who have been verified by the list administrator to have a legitimate interest in the campaign efforts (as a means of preventing industry from infiltrating), it is often host to strategic discussions where one campaigner will pose a question or request and
other members will respond with advice, additional information and materials. This was described by one organizer as a network-wide “emergency response” to state-level campaign needs.

The widespread sharing of materials and speed with which communication is conducted is further evidenced in the collaborative creation of campaign materials. Information is produced within the campaign network in ways that would not otherwise be possible. Few of the organizations supporting BPA campaign work have the capacity to develop the research reports, biomonitoring studies or campaign materials that serve as cornerstones in campaign activities. Working with limited financial support coming from Coming Clean and SAFER, BPA campaigns members collaboratively author research reports and studies that advance their goals. ICT-mediated infrastructure allows campaigners to share circulate, edit, and collectively develop a variety of information that is vital to their work. This information includes things as complex as research reports (e.g. No Silver Lining or Baby’s Toxic Bottle), but also includes the development of informational materials for legislators, letters to the editor, and updated summaries on scientific research. A collaborative, all-channel structure allows for the work of developing complex information to be shared by numerous SMOs and individuals. The all-channel structure also facilitated strategic decision-making in important ways.

The ease of communication amongst BPA campaigns has created a highly responsive network in which difficult strategic decisions can be made in a collaborative way. Lindsay Dahl was an organizer in Minnesota when that state passed a legislative bill. Her former organization played a large role in helping to craft legislation with the legislators sponsoring the bill and she

38 These product testing reports represent an important product of campaign collaboration. These reports were often developed collectively over email, conference call and listserv participation. These will be discussed more fully in the next chapter and full citations to these reports are included in the works cited.
recalled an instance in which a decision to weaken the pre-existing bill so that it might pass was made with the aide of the larger campaign network,

An example of maintaining a united front was when legislators had the option to take out infant formula cans out of our bill and there was a pretty strong assurance that the governor would sign if it didn’t have infant formula on it. I had some hard conversations with my colleagues about whether or not to continue our support for a weakened bill. I asked them, “do we continue to support a lesser bill we know will pass a bill, do we take the pretty sure win? And does our doing so set the bar a little bit lower for subsequent efforts?” or “do we withdraw support and watch the bill fail if we don’t mobilize supporters?” and so we as a community made the decision to support a weaker bill and I think it ended up being a good one.

Similarly, Gretchen Lee Salter of Breast Cancer Fund in California noted that the relationships that developed within the network were vital to maintaining a commitment to legislative bills that advanced collective goals. Salter recalled the practice of “adopting a state” where “we saw that all these states were introducing BPA legislation where we didn’t know a soul and we called [the organizations] running the bill and offered our expertise and guidance so that they would… build a pact, and not pass that bill or take an agreement that would harm other states’ efforts.” In these instances, the network facilitated the building of relationships and broadening network ties in hopes of maintaining a collective effort toward a shared vision of appropriate legislation.

These tacit agreements could however, just as easily serve as a source of tension within the network. While many organizations remained intensely and closely connected and committed to the campaign network’s goals, some organizations did prioritize their own autonomous goals. In one instance, a state-based organizer reported that she felt that another group had stepped out of line when they pushed for a BPA bill that did not meet the standards that had been informally agreed upon by the group. She said,

One of the things that came out of that meeting [the one in-person BPA meeting held in 2008] was an agreement on the bottom line that didn’t entirely pan out. One of the take
home messages that I remember was that the baby bottle and sippy cup industry had already [taken BPA out of many products]...I think [we] were a little bit surprised to see [the other state] going for a bill that dropped the bottom line.

This organizer reported that she was uncertain about how to begin to challenge the actions of campaign efforts that did not meet expectations, and were perceived as being detrimental to the broader efforts of state activists. Although this state’s behavior was generally out-of-the norm, it highlights the difficulties in working within a predominately virtual space where a lack of face-to-face time may affect accountability and group solidarity.

Finally, an all-channel structure has contributed to the capacity for the BPA campaign structure to compete with industry groups. The adoption of geographically decentralized efforts was not only a strategic means of passing legislation during a time that posed little in the way of legislative opportunities, but was also advantageous in keeping industry on the move. In 2008 and 2009, bills were routinely introduced in state legislatures, often at the same time that other states began introducing legislation. With numerous nodes of the network all actively working during the same period of time, industry attempts to overpower activists in terms of lobbying time and media outreach were tempered by the sheer volume of BPA activity around the country.

One activist described how, as BPA industry officials made their way through the circuit of legislative hearings on BPA, state activists shared the information about the arguments made by industry so that a response to their claims could be crafted. Lindsay Dahl describes this practice,

I asked my other state colleagues...really helped us to decipher what was hogwash and what were standard industry lines and what things were just kind of random that the local lobbyists had cooked up. Then the information sharing was absolutely key to our success.

Matt Prindiville of the Natural Resources Council of Maine similarly noted, “I was talking to organizers in California and New York and Connecticut and we’re definitely working the broader network not only to develop our strategy but also to understand what the opposition
is likely to say but also to access key documents and information.” Gretchen Lee Salter noted that

[All of these state campaigns] keep the opposition on their toes because having everybody focused on one state is no good. As we do with BPA, this past legislative session—the 2009-2010 session—I think we had bills running in 30 states and localities. It sometimes feel that the amount of money they have is pretty bottomless in order to fight these efforts but it’s still much better for them to have to fight a war on 30 fronts than just the one. (Personal Interview, June 2, 2010).

Another organizer described instances in which BPA officials were “flying in and out” of
different states for different hearings and were required to be constantly on the move, and although state organizers did not have the funds to travel to other states for hearings, they were able to advise states about what opposition they were likely to encounter. The shared effort of states in introducing BPA legislation was often able to aide activists in anticipating industry talking points and worked to decrease the credibility of industry officials. In many states, legislators perceived the state campaigners as being more truthful than out of town industry representatives.

As Sarah Uhl of Connecticut’s CWA recalled “when legislators think of us, they think of the local winning team and they know us and [with every battle] it’s the same lobbyists, the same people, the same individuals telling some of the same lies and so it really hurts their credibility”. Similarly, Cindy Luppi recounted an instance where a member of the Massachusetts House of Representatives confronted a BPA industry official, saying, “‘you have a credibility problem with me, last year you said this and it has not been borne out, so I am less likely to believe you this year...’”. The preparation of state organizers and their efforts to remain consistent and credible aided efforts to combat industry arguments and also created a moving target for industry officials. An all-channel structure facilitated the sharing of strategies and information in ways
that were highly responsive to industry efforts, preparations which afforded state campaigners increased credibility and maneuverability.

**Resource Scarcity and Networks**

The adoption of a network structure is shaped not only by the need to share information and expertise, but by the dearth of resources needed to sustain campaign efforts. Theories of resource mobilization (RM) suggest that organizational dynamics, resource management, and political transformations influence the trajectory of social change (McCarthy & Zald, 1977; Ferree and Miller, 1985; Jenkins, 1983). From this perspective “mobilization is studied as the deliberate political process by which movements establish control over resources rather than as the psychological processes by which individuals come together to form crowds, groups and other collectivities able to act as a unit” (Ferree and Miller, 1985: 39).

BPA campaigns are constantly engaged in a battle to acquire, maintain and grow financial resources, while also consistently working to develop informational resources that can contribute to campaign efforts. Nearly all of the SMOs actively engaged with BPA regulatory work rely to some extent on foundations for financial support. While some of the national organizations such as Clean Water Action rely on paid memberships and individual donations, the majority of the organizations require external funding obtained via grant writing to pay staff and to support this work. For all of the organizations involved, BPA campaigns are one of numerous campaigns aimed at regulatory structures, manufacturers and retailers of consumer products that contain hazardous chemicals. This means that the resources allotted to BPA campaigns are necessarily meager. Most interviewees were only given a certain portion of their work hours to devote to this effort and the norm was for one or two staff persons in any given SMO to be working on the issue of BPA regulation.
In part, a lack of financial resources has necessitated the use of a networked organizational structure in which resources, information, people, and decision-making became shared across a large spatial divide. From scientific data, information on industry personnel, or specific tools to use in legislative hearings, information that is developed in one state campaign is regularly shared with the entire group. Mike Schade noted, “Funding is always a challenge especially in this economic climate and to be honest we haven’t gotten a ton of funding on our work with BPA… and we have relied a lot on the work that a lot of our allies are doing at the state and federal level.” (Personal interview, February 22, 2010). The circulation and sharing of information through the network structures described above aided in the conservation of resources and allowed states to collectively share the burden of developing letters to the editor, talking points to use to lobby legislators, as well as various media-outreach tools that became very important to the campaign’s work. Pippa Norris (2001) notes that digital politics (akin to the ICT-mediated networks utilized by BPA campaigns) have the “potential to amplify the voice of smaller and less well-resourced insurgents and challengers… which have difficulty being heard through the conventional channels of the traditional mass media, but which have the flexibility, skills and innovative capacity to produce new coalitions…” (239). In this light, resource limitations may actually generate the types of innovation and strategic thinking that allow BPA campaigns to flourish in a contemporary culture.

Along with a general lack of resources devoted to BPA campaigns, the economic crisis not only reduced donations made to SMOs by individuals, but coincided with a major funder of environmental health organization, The Beldon Fund, choosing to end their status as a granting agency. The absence of this support contributed to even greater resource scarcity at the exact same time that there was a surge in public interest in BPA and legislative support for regulatory
action. The lack of funding opportunities created an environment in which it was therefore more important to reduce redundancies throughout the campaign and streamline strategic efforts such that little time, energy or other resources were wasted.

The effect of such financial changes created the added pressure placed for state organizations to “win” regulatory battles in order to demonstrate the organization’s success and fundability to granting agencies. One activist noted her observations that another state “had to pass something to stay fundable and to keep their base engaged.” This added pressure to win has resulted in distinct sources of tension within the movement over movement trajectory and ownership.

Concerns over ownership developed in cases where numerous groups were working on collaborative efforts. A common strategy of the campaign, facilitated by a network structure, has been to collectively release statements regarding a particular policy or political development as well as informational reports that demonstrate the cause for concern. From product testing reports, to biomonitoring studies and statements detailing conflicts of interest that threaten the integrity of legislative or governmental decisions, many state groups choose to pool resources and co-release materials that will advance the goals of the all state campaigns to regulate BPA.

While a very successful endeavor as these efforts make up a substantial proportion of all media stories on BPA, ownership of this literature is often problematic. In most cases, all materials that are co-released are appropriately labeled with each contributing organization’s name and the individuals responsible for its production. However, in some cases, larger or more financially stable organizations are better positioned to take advantage of the media opportunities these reports present. In particular, one well-funded national organization was pointed to by state-based activists as an organization that consistently and repeatedly took credit for efforts that
were collaborative:

The way that funding does come into play…is the credit thing. You know, there are organizations that are out there that are working on BPA… that feel very strongly that they need to have some ownership over this topic because it not only increases their funding to keep working on BPA, but because it will increase their future funding for other projects and certainly that’s understandable…but some funders or some organizations just don’t really play that way and sometimes there’s a credit issue.

In another instance, one state-based organizer pointed out the problems her organization had had in working within a state coalition. Similar to the issue highlighted above, tensions developed over ownership of the successes of the group. This activist noted that concerns over receiving credit actually caused one major rift within their coalition when certain participants pulled out of the legislative effort mid-way through the legislative session as they perceived that their interests were not being met by the group effort. The increasing pressure for funding and recognition can thus serve as a key point of contention within organizing groups.

In many ways, access to resources remains a pivotal element of any social movement effort. Although resource mobilization theory has routinely been criticized for its neglect of social and cultural explanations of social movements and the overstatement of the rationality of movement actors (Buechler, 1993; Ferree & Miller, 1985; Jenkins, 1983; Klandermans, 1984), the theory remains useful in recognizing the significance of resources in movement efforts. In the instances described above, the scarcity of resources can also be recognized as a catalyst in the adoption of a networked structure that could meet widespread campaign needs despite budgetary constraints.

THE LIMITATIONS OF NETWORKS

A networked organizational structure provides many advantages to social movement actors. The ease of communication and the heightened “nimbleness,” as one interviewee called
it, the increased capacity for connection, and the ability to share resources make such a structure a vital component of campaign organization. Despite the successful emergence of such a structure in relation to available opportunities, it is important to acknowledge some of the limitations of this network structure.

**Unequal Use by Campaign Participants**

With numerous SMOs connecting in the BPA campaign network nationwide, a network structure has been utilized to support campaigns through shared decision-making. This sharing of responsibility allows many campaigns to work in tandem to put pressure on legislative bodies in complementary ways that build momentum for one another. However, participation in this network remains voluntary with informal practices of accountability. As such, some of the SMOs and individuals within the network participate more routinely than others.

Lopsided network structures in which some segments of the network were more active than others has meant that not all actors or SMOs will participate uniformly within this network. At the height of my participant observation in 2009, groups from states that had pending legislation on BPA were the driving force within the network; they tended to organize conference calls and webinars and initiated the circulation and sharing of information, while also leading efforts to develop new types of informational resources. Although vital decisions that affected all BPA campaign effort made use of collective decision-making structures and reiterated the importance of horizontal ties, more active network participants were sometimes able to voice opinions that carried more weight than others. This asymmetry in participation creates slight power differentials that can influence the capacity of all SMOs or individuals to voice their concerns or opinions openly during decision-making processes.
The Digital Divide

Although the majority of the organizations participating in the BPA campaign network are organizations with paid staff and enough funds to support, at the very least, internet and word processing use (while many larger organizations have far more expansive technological capacity), it remains vital to acknowledge the barriers that an almost exclusively online infrastructure creates. Those who lack access to the internet, while increasingly rare in the U.S.,\[^{39}\] are marginalized and excluded from BPA campaign practices. Although a range of organizations are included in this process, it is important to recognize that internet “have-nots” (Castells, 2001) are absent from this organizing structure.

The Question of Praxis

Certain social movements today involve a “cultural logic of networking” that includes the formation of horizontal ties and connections among diverse groups, the free and open circulation of information, decentralized and consensus-driven collaboration, and self-directed networking (Juris, 2004; 2008). BPA campaign efforts are, in some ways, representative of this cultural logic of networking, with the larger coalitional structure formed by SMOs active on BPA campaigns adopting a decentralized, horizontal decision-making structure. However, many of the participating SMOs are themselves hierarchical in nature.

Juris (2008, 2008a, 2004) has studied the anti-corporate globalization movement and noted the degree to which, in this movement, organizational forms may come to reflect political values. The democratic decision-making that is present within coalition structures is less a reflection of actively chosen political preferences within the movement and more likely a result

\[^{39}\] 77 percent of American are reported to have access to the internet and make up 17 percent of internet users worldwide (Internet World States, Retrieved November 1, 2010 [http://www.internetworldstats.com/stats14.htm]).
of numerous coalition participants having experience with movements that did articulate consensus or democratic decision-making as a political goal. The impetus behind the collective structures of SAFER and Coming Clean that feed into BPA campaign efforts is less ideologically motivated and related to the presence of political opportunities at the state level and barriers to policy action at the federal level. In part this is due to the reality that many of the formalized SMOs that are the driving force in the campaign tend to rely on network structures for instrumental purposes, whereas coalitional structures which might wish to adopt more politically-motivated forms utilize networks less for the day-to-day work of organizing and more for informal connection and collaboration.

The shared decision-making processes facilitated by the network appear to be pragmatic as conference calls and list serve postings tend to replicate normative communicative structures with one or two meeting facilitators leading conference calls and discussions and the same 20-30 actors consistently posting on the list serve. BPA campaign participants do not make use of ICTs to transform the nature of their organization, but use it to broaden the reach and the scope of their efforts in a cohesive and collaborative way. It appears that BPA campaigns, while adopting an organizational structure that has the capacity to transcend organizational power dynamics, have not succeeded in transforming organizational structures outside of this narrow space.

**Conclusion**

BPA movement campaigns demonstrate the changing nature of the environmental health movement. Constraints and barriers to passing reforms at the federal policy level, and the perception on the part of movement actors that policy change might be more readily achieved at the state level created the impetus for a different approach to environmental policy change.
Shrinking opportunities within federal policy realms and the very real advantages that existed at the local level encouraged BPA campaigners to refocus their strategic efforts. This strategic decision was further influenced by cultural changes that elevated public concern over toxic chemicals. In combination these opportunities encouraged environmental health activists to adopt a narrowly focused campaign strategy that targeted smaller state legislatures and selected BPA, a hazardous chemical in many children’s products, as the poster-child for their legislative campaigns.

In shifting the focus of their demands from the national to the state level, BPA activists had to overcome the distances that separated them while remaining cognizant of resource limitations. These challenges required the adoption of a mobilizing structure that best suited this decentralized campaign effort. What arose was a networked organizational structure that allowed information to flow easily, reduced the need for extensive resources, and created a “nimble” movement structure that often out-maneuvered powerful chemical industry forces (Personal Interview, May 11, 2010). Importantly, a variety of network forms arose within this structure to meet the demands of campaign work; the range of ICTs that were used to facilitate campaign work often dictated which type of network structures arose.

These findings suggest the importance of political opportunities in movement emergence while also demonstrating the capacity for political opportunities to inform the mobilizing structures that movements adopt. BPA campaigns arose because of shifting opportunities and these opportunities in turn influenced the strategic choices of movement actors as well as the movement forms the movement adopted. Tarrow argues that “the most effective forms of organization are based on partly autonomous and contextually rooted local units linked by connective structures and coordinated by formal organizations” (124). BPA campaigns reflect
this form; with state-based groups maintaining their own autonomy and organizational goals while also connecting and collaborating through a large network of shared ties, supported by a network-based infrastructure. Tarrow (1998) suggests that this hybrid form of organization is highly effective and, as the next chapter will demonstrate, the development of such a structure has been pivotal to the gains of BPA campaigners.
CHAPTER FIVE
IMPERILED CHILDREN & SCIENTIFIC DISCOURSE: STRATEGIC FRAMING AND MOVEMENT OUTCOMES

“For the environmental health movement, there is a lot of focus on protecting children while they are in the womb, while they are infants, while they are developing, but I think that’s because that is so raw and applicable to most people. They understand that children shouldn’t be exposed to toxic chemicals.”

-Mia Davis, co-leader of the National Markets Working Group
(Personal Interview, February 15, 2010)

Introduction

Given the marked opposition on the part of the chemical industry and an unsupportive political climate, Bisphenol-A regulatory efforts have still been relatively successful. With legislative successes reported in seven states, five municipalities and two cities, it is important to assess the specific context and climate in which these campaigns succeeded. BPA campaigns offer a snapshot of environmental health movement practices as they have unfolded during the dominance of neoliberal policies and environmental deregulation. As legislation has been introduced in Congress that advocates for significant changes to overarching chemical policy, examining successes at the state level can be used to inform the broader effort to impose stricter standards on chemical substances.

Establishing a cause and effect relationship between movement actions and political outcomes is a complex proposition. Measuring the influence of a social movement or group is often difficult given the multiple and competing messages that are targeted toward decision-makers (Giugni, 1998; 1999; Andrews, 2004; Diani, 1997). In the policy realm, this notion is exacerbated by the scale and number of competing messages related to the thousands of legislative bills introduced each legislative session. Scholars have written of the barriers to the study of movement outcomes or success, noting the difficulties in establishing causal attribution
between a movement’s activities and policy responses and the problems inherent in defining the notion of success as a movement’s stated goals may differ from its actual impact, or may result in unintended consequences or outcomes that may or may not qualify as “success” (Diani, 1997; Andrews, 2004).

Therefore, rather than trying to determine whether or not BPA campaigns succeeded in pressuring legislators or chemical producers, I intend to explore the influence that campaigners generated through strategic framing processes. Diani (1997) has noted that, despite the above noted limitations, research on movement impacts has been achieved through the narrowing of the focus of analysis, reducing the study of outcomes to specific mobilizations or campaigns. He warns, however, that care should be taken not to reduce “success” to those outcomes observed in policy realms. Andrews, (2004) similarly urges scholars to recognize the range of movement outcomes that may fall outside of a movement’s stated goals. Bearing these limitations in mind, this chapter intends to narrow the focus of BPA campaign outcomes to observable endpoints in media and policy outlets. Although it is plausible, and quite likely, that BPA campaigns have achieved other outcomes and successes, I elect here to explore the extent to which the campaign’s frames have successfully created new opportunities and extended the reach of the movement efforts.

The use of consistent and repetitive framing throughout the entire BPA network structure encouraged similar media coverage in news outlets across the country. The proactive framing of messaging points, in particular those related to children’s health and to scientific research, facilitated widespread media coverage in local, regional and national news outlets. Tarrow (1998) suggests that movements, once formed, can create new opportunities for themselves. BPA campaigns, in carefully selecting and disseminating frames that resonated with a wide audience,
increased interest in news coverage on the issue. Extensive media coverage in turn afforded new opportunities as state legislators’ interest in the issue was invigorated by media coverage and public concern.

In this chapter I explore framing processes and their significance in BPA campaign efforts. In doing so, my goals are to: 1) explain and contextualize the varied ways in which BPA campaigns strategically framed the concern over chemical safety; and 2) examine the extent to which BPA campaign frames have been adopted and replicated in various public forums and have shaped the battle over BPA. I begin with a discussion of how political opportunities and a networked organizational structure influenced the strategic decisions and tactical repertoires of BPA activists, including the development of narrowly defined frames regarding children’s health. I then describe the primary strategic frames that were developed and disseminated by BPA campaigners. Next, I explain how campaign frames were adopted and transmitted by media outlets. I conclude in arguing that the active framing practices of BPA campaigners contributed to the ongoing transformation of the regulation and use of BPA in consumer products. Although not all changes in media coverage and public debate are the direct result of activist pressures, such changes demonstrate the importance of political opportunities, network structures and strategic framing practices have contributed to the extensive media coverage in BPA policy debates.

**OPPORTUNITIES, NETWORK STRUCTURES & TACTICAL REPERTOIRES**

Political opportunities and mobilizing structures cannot tell the whole story of the emergence and development of BPA campaigns. In order to fully understand the process by which this social movement campaign developed, it is also important to clarify the messaging
points and meaning-making processes that BPA campaigners engaged in. As McAdam, McCarthy and Zald (1996) suggest, even where political opportunities and appropriate mobilizing structures are present, they remain insufficient in explaining collective action until the shared meanings that encourage people to mobilize are accounted for. Framing is an active strategic process for BPA campaigners as they seek to influence public opinion to demonstrate support for legislation related to BPA.

While framing processes and strategies related to media coverage are the focus of this chapter and were an important element in BPA campaigns, lobbying and direct action tactics were also prominent within BPA campaigns and successful components of campaign efforts. Andrews (2004) notes that movements are most influential when leveraging multiple mechanisms or ways of agitating for change. BPA campaigners attempted to expand their influence in policy debates through the use of numerous strategic efforts. Although media strategies yielded powerful results, the other mechanisms utilized can still be recognized as contributing to the campaign’s outcomes.

**Lobbying**

Like many SMO efforts focused on policy change, a primary activity of BPA campaign participants was lobbying. For many activists this meant routinely visiting state legislative houses and speaking directly to legislators, while also developing relationships with sympathetic or supportive politicians who might be willing to sponsor or co-sponsor a bill. For some activists like Charity Carbine of Vermont Public Interest Research Group (VPIRG), who has consistently worked on chemical regulatory bills and routinely lobbying state senators and representatives, noted the importance of this consistency in building rapport and organizational cache, “I’ve been
here for about three years now so I think my name up at the state house is synonymous with whatever chemical you want to talk about.”

Carbine believed that her long term relationship and role as a trusted environmental advocate was essential in combating larger and well-funded industry lobbyists, she noted that “we certainly had opposition that we had to overcome and I think what really helped move the bill was quickly putting out fires”. She noted that she spent two days prior to the passage of Vermont’s BPA bill walking the halls of the state house debunking industry claims about the chemical.

Sarah Uhl of Connecticut’s Clean Water Action reiterated the importance of local environmental advocates pushing for these regulations by also emphasizing lobbying: “At the state level, it really helped us to solidify relationships with a lot of legislators.” She reported that the combination of public support for Connecticut’s ban on BPA, and lobbying efforts to challenge industry claims aided in the passage of the bill in that state. She noted that each time there was a chemical regulatory bill being voted on “it’s the same lobbyists, the same people, the same individuals telling some of the same lies and so it really hurts their credibility.” In both Uhl and Carbine’s perspectives, sustained and credible lobbying on the part of local organizations was invaluable in challenging powerful industry forces. Lobbying as described by these campaigners depicts the generation of social capital in legislative domains that contribute to greater political influence and leverage in policy domains. Although used in limited capacity by BPA campaigners, lobbying that increases the positioning and influence of activists can be recognized as an important movement outcome (Diani, 1997).
Direct Action Strategies

Although limited in their use by BPA campaigns, direct action strategies have been used to develop support and, in some cases, have helped to garner media attention for BPA campaigns. Direct action strategies such as protests, sit-ins and marches are often important strategic components of social movement efforts (Juris, 2008; McAdam, 1984; Piven and Cloward, 1979). BPA campaigns, given their highly professionalized nature and the lack of a large base of public participants willing to demonstrate spontaneously, have only relied on direct action strategies in limited ways.

The most common strategy has been that of small-scale demonstrations outside of legislative hearings with symbolically significant inflatable structures. Using an inflatable baby bottle, BPA campaigners and local supporters have repeatedly gathered outside of legislative hearings to pass out literature and demonstrate public support for regulatory changes. The vibrant imagery of these demonstrations along with the capacity of BPA campaigns to mobilize parents and children to appear during such demonstrations has resulted in press coverage and has further extended the reach of the campaign’s efforts. Although direct action practices may have limited impact on the outcomes of legislative decisions, the practice remains important for its capacity to mobilize and excite potential participants and more powerful actors (Andrews, 2004).

Media Outreach

Of central importance to BPA campaigns has been a media strategy that retains long-term interest in the issue by producing innovative research reports that provide information on the ubiquity of BPA in our bodies or our environment. BPA activists are proactive in their approach to the media, creating press releases, lists of experts available for interviews and by producing
their materials in eye-catching ways. Particularly successful are small-scale research reports that test products (food packaging and baby bottles are two examples). These reports present scientific data in simple, easy to understand ways and are accompanied by visually appealing graphics and photos. These specialized reports help to “make news” when there is little other coverage of BPA in the media.

These media strategies are augmented by the efforts of Stephenie Hendricks, a media specialist who works to foster press coverage of environmental health issues. Hendricks routinely works in close contact with media outlets in hopes of garnering press attention to stories on environmental health. Although Hendricks works on other topics and issues, BPA campaigners have routinely worked with her to develop media outreach strategies and to expand coverage of BPA stories. With this support, BPA campaigns have had some guidance and support in their efforts to broaden their influence in media outlets. Most importantly perhaps has been their proactive approach to increasing interest in BPA regulations through the creation and distribution of their own research reports.

Information on scientific data, BPA in consumer products, and industry forces have all been significant in the passage of BPA state-level bills. Activists played a key role as intermediaries who developed, packaged and disseminated this information. Not only did they recognize a need for concise and readily understood forms of information, they worked collaboratively within a networked organizational structure in order to develop the type of specialized knowledge that would allow this issue to remain relevant, palatable to legislators, and supported by the public.
In working to secure media coverage to develop support for legislative campaigns, BPA campaigners engaged in an active process of framing. Discussions about how best to present and package a story were routinely a feature of campaign discussions, while efforts were made to ensure that the media had access to the most appropriate and well-spoken experts for news stories.

**MEDIA OUTREACH AND STRATEGIC FRAMING**

**Social Movements and the Media**

In contemporary society, the mass media is given a place of primacy in the political landscape. Castells suggests that all political messages are inherently media messages because of the dominance of the media in shaping public consciousness (1997; 2007). He suggests that although “the media are not the holders of power, they constitute by and large the space where power is decided” (2007: 242). From this perspective, movement attempts to gain media attention can be seen as a vital struggle over the political and cultural power to influence the public’s opinions on certain issues. As such, social movement efforts to control media coverage are an important strategic component of movement work.

Social movement scholars have routinely recognized the importance of media coverage in relation to movement success (Carroll and Ratner, 1999; Gamson and Wolfsfeld, 1993; Ryan, Carragee, and Schwerner, 1998; Gitlin, 1980). The mass media is often a site of political contention, as movements attempt to have their voices heard within and their messages communicated to the public. The news media is an important element of social movement efforts, providing validation of a movement’s importance, helping to mobilize new constituents,
and also broadening or narrowing the scope of a social movement issue via coverage and media content (Gamson and Wolfsfeld, 1993).

The relationship between media outlets and social movements is never that of equals (Gamson and Wolfsfeld, 1993; Gitlin, 1980). The mass news media are able to choose from an array of stories and are unlikely to follow one social movement or develop long-term relationships with movement actors. The availability of many competing stories affords the media more power than social movements. Koopmans (2004) argues that, despite this historically unequal relationship, social movement actors are increasingly reliant on the mass media for information about other points of view and that the media aid movements in “learning about others’ reactions to their actions” such that “media discourse is both a crucial source of strategic information… and a sounding board for the evaluation of strategies” (370). For Koopmans then, the lopsided power differential between social movements and the news media may be ameliorated to some degree by the strategic use of information reported by the media.

Gamson and Wolfsfeld suggest that movement actors read their success in symbolic arenas in terms of how well their messaging points are conveyed within the media. In the case of BPA, participants can consider their work a success-with coverage ranging from editorials and short articles to lengthier, in-depth stories, coverage has tended to be sympathetic to movement efforts. The most common coverage is that which has focused on the increasing scientific evidence of negative health effects and the ubiquity of the chemical in consumer products. Less common, but still important (and widely reprinted) were stories regarding political conflicts of interest within federal safety assessment processes.

**Social Movement Framing**
As a sociological concept, framing originated with Goffman’s *Frame Analysis* which sets forth a definition of frames as "schemata of interpretation" that allow individuals or groups "to locate, perceive, identify, and label" events and occurrences (1974: 21). In other words, frames are cognitive structures, unconsciously adopted, that guide the perception of reality. For Goffman, frames are structures that shape and guide our experience of life and the world of objects and events around us. The difficulty of measuring latent frames has been recognized as a potential catalyst for the theoretical shift towards a consideration of frames that are consciously manufactured and purposefully adopted.

Recent notions of framing in relation to social movements reject framing as an unconscious notion, offering instead that framing is an active process of constructing meaning and attracting participants (Oliver and Johnston, 2000; Snow and Benford, 1988; Snow, Rochford, Worden and Benford, 1986). In this light, SMOs actively and strategically create and use frames (Zald, 1996). McAdam, McCarthy and Zald (1996) argue that social movement action, while dependent on the presence of appropriate structures and opportunities, cannot occur without appropriate frames that convey meaning and motivate participants.

While the media make use of frames to condense complex events into interesting and appealing sound bites, individuals intercept these frames and use them to make sense of and discuss an issue, while policy-makers may rely upon frames to define policy options and reach decisions (Scheufele, 1999). In each of these contexts, frames allow for the simplification of complex issues or ideas. In the process, frames help to communicate why an issue is problematic, who or what might be responsible, and what action should be taken to redress the issue (Feree, et al., 2002).
Frames are important not only in mobilizing actors at the SMO or individual level, but are also vitally important in encouraging the media to cover social movement interests (Ryan, 1991). Although frames are actively created and strategically deployed in an effort to influence the public sphere, framing processes are a contentious process, both internally (at the SMO level) and externally (in competition with movement opponents) (Gamson and Meyer, 1996; Ryan, 1991). Internal disputes over framing arise when there are differences in opinion over which meanings, language or symbols are not only the most important or most representative, but also the most provocative or likely to attract media attention. Along with internal debates over the creation of frames and their strategic use is the reality that SMO frames, when they enter the public sphere, join a public space in which there is competition over how an issue is defined and which frames the media will adopt. Although the “media are not neutral to this process” of competition, reporters and editors choose how to transform competing frames into a coherent story, a process that is itself contentious as reporters must “also respond to their [employer’s] wishes as well as to market demands” competition (Zald, 1996: 270). The media is not, therefore, an impartial distributor of information, but a contested terrain in which movement actors must work to ensure that particular frames are advanced within media circuits.

**STRATEGIC FRAMING IN BPA CAMPAIGNS**

BPA campaigners actively use the term framing to describe their efforts to make their issue salient and visible to their intended audience. Rather than conflating their frame with their overarching ideology, activists tended to construct a narrowly defined frame that recognized children’s health as the fundamental problem related to BPA. This frame is immediately visible when briefly examining any of the materials set forth by BPA campaigners. Images of babies, bottles, and children’s toys are figured prominently into research reports and websites. The frame
has even been extended into the goals of the campaigns themselves; with many of the proposed and successful legislation being limited to children’s and infant’s products.

BPA campaigners have taken a proactive and strategic approach to media coverage, in hopes of increasing media stories and favorable or sympathetic coverage. As had been the practice with other campaigns with SAFER and Coming Clean that targeted specific problems related to chemical substances, BPA campaigns elected to conduct a series of product-testing reports- one that targeted baby bottles and another that focused on BPA in cans. These reports tested the levels of BPA found in consumer products, and packaged this data with messaging about the scientific data demonstrating the risks associated with BPA, while also articulating a platform for chemical regulation. In many instances the three-point story arc provided by BPA campaigners was easily transferred and translated into media stories on the topic. The typical three-point message that: 1) Demonstrated the problem using evidence of high levels of BPA in consumer products; 2) Clarified the scientific evidence which illustrates cause for concern; and 3) Suggesting routes for ameliorating the problem through policy or consumer practices provided clear story lines and allowed media outlets to promptly adopt and disseminate campaign messages.

Frames were strategically adopted and honed by BPA campaigns in ways that would attract and sustain media attention. As Gamson and Meyer suggest, “the media spotlight validates the movement as an important player” (1996: 285). The “portrayal of injustice and the definition of pathways to change” (or the diagnostic and prognostic framing processes identified by Snow and Benford, 1988) are important factors in the construction of meaning and development of frames around a particular issue (Zald, 1996: 268). In creating popular frames that the media and the public identified with, BPA campaigners efforts were often rewarded with
media coverage that validated BPA campaign efforts and lauded the benefits of increased regulation. In this process, campaigners were often recognized as valuable experts on the issue and were looked to as key sources of information for media outlets and, over time, legislators.

Mike Schade of CHEJ, a co-leader of the national markets working group, who has been an active participant in BPA campaigns, offered that there was a “perfect storm” of events and circumstances that, in tandem, altered the political playing field in such a way that legislative efforts were successful. He suggested that this storm included (among other things) extensive media coverage, including both traditional reporting and blog coverage, a children’s health frame, and shareholder resolutions related to BPA. Other interviewees echoed similar sentiments regarding the successes of BPA campaigns. Rather than seeing this as a perfect storm, however, I would suggest that this is a “perfectly generated storm” that in many ways has been actively developed and sustained by SMOs.

Stephenie Hendricks, a media strategist working with BPA activists, emphasized the importance of having appropriate and well-tooled information at the ready, “I liken it to a big wave, we’re surfers and we’re waiting for the big wave to come so we can surf the wave. So that we can have the elements in place and be part of breaking news stories.” Anticipating media interest and being ready with information aided campaigns in their capacity to influence media coverage. While media outreach efforts increased the campaign’s visibility within media circles, the adoption of emotive frames related to children and messaging points that emphasized the scientific concern over the chemical contributed to the widespread coverage of BPA campaign concerns in local and national media.
Campaigners prioritized and focused on frames related to BPA exposure and children’s health in active ways. This narrow frame, while limiting the scope of the problem to a specific population, created a diagnostic frame that resonated strongly with parents and was widely adopted in the media. As such, this frame was the most widely used and discussed by campaigners. In addition to children’s health, BPA campaigners actively worked with scientific experts to craft accurate, yet accessible language regarding the science supporting BPA regulation. The use of scientific language and expertise shaped not only media outreach efforts, but came into play throughout legislative battles. Framing reports, press releases and op-eds as personal concerns or grievances relating to children were bolstered by the legitimacy provided by scientific research and expertise that was available and strategically deployed by campaign activists.

**Strategic Framing: Children’s Health and Children’s Products**

Many BPA campaigners interviewed described the reliance on and commitment to a children’s health frame was the best way to galvanize popular support for the issue and build media interest. Although many activists recognized the limitations of such a narrowly conceived frame, they also believed that the use of the frame could not be underestimated. Mike Schade of CHEJ noted, “I think that one of the key reasons that we have been so successful is because this has been framed around the harm that BPA poses to children’s health and particularly infants.” The active recognition and deployment of certain frames was strategic in that many state-level SMOs chose to describe and articulate the concern over BPA as a children’s health issue; in lobbying efforts, press releases, newspaper op-eds and letters to the editor, and legislative testimonies, the issue of children’s health was routinely the frame that took center stage.
As Bobbi Chase-Wilding, the National BPA campaign coordinator observed, a children’s frame worked because it was emotionally-laden and created an interesting foundation for news stories:

I think that the children’s health story, it’s set in a narrative that’s working, because people get really riled up about their kid’s health… it’s something the media can use as a story that’s got drama to it and I think that’s why the children’s frame works in getting publicity… to be able to run these smiling faces and then tell that they’re imperiled. I think that’s really the narrative that’s attracting their attention.

A frame that generated an emotional response was repeatedly recognized as an important element to campaign efforts. Lindsay Dahl of IATP offered,

…the children’s health frame…tells a story about how children are disproportionately impacted by chemicals…it moves people-republicans and democrats alike- whatever your worldview, people care about their children more than they care about anything…people understand (whether or not they know the science behind it) the unique vulnerability of children and I think that has been really key to not only inspire people to think, but to act.

In a similar statement, Mike Schade recognized that messaging around children’s “unique vulnerabilities” to BPA were powerful in telling a broader story, opening up ways to discuss “the varied ways in which infants and young children are exposed to BPA through the food that they eat… the containers they drink from…We know that BPA is not just in these products, it’s not just getting into the food, we know that BPA is getting into our bodies”.

A focus on children’s health paved the way for campaigners to focus on specific children’s products as problematic sources of exposure. The children’s health frame was actively deployed as BPA campaigners developed a product testing report that measured the levels of BPA in children’s products and compared those levels to scientific research on the health effects.

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40 The notion of unique vulnerabilities comes from the growing recognition that there are critical windows of development during which children may be particularly susceptible to the negative impacts of chemical exposures. The belief that the “timing makes the poison” rather than the dose has helped activists to convey a sense of urgency regarding BPA regulation.
of BPA. The report, *Baby’s Toxic Bottle: Bisphenol-A Leaching From Popular Baby Bottles* (2008) tested baby bottles and, using colorful images of babies and baby bottles, explained that when the bottles were heated, the levels of BPA observed were in the range of exposure that was known to cause harm in animal studies. The report articulated the vulnerability of children to the chemical and called regulatory action while also suggesting that manufacturers phase out the use of the chemical. In reflecting on this report, and similar efforts by media outlets such as *Consumer Reports*, Cindy Luppi of CWA noted, “the media and the public have been able to latch onto this issue through what is concrete in their general lives and that has meant using a product frame. I have had some great interaction, particularly with TV producers on these kinds of issues because they see people really being curious about the water bottle or the baby bottle…it’s more compelling than thinking about you know, these barrels of hazardous waste in some away place.”

This children’s health and product focus was easily folded into other campaign strategies when a large, inflatable baby bottle was purchased and shipped from state to state for use in staging demonstrations outside of state legislatures. As BPA came to increasingly be associated with children and children’s products, the baby bottle provided a powerful symbol that activists could use to draw attention to the issue and which also generated media attention. As Gamson and Meyer (1996) note, the media “rewards novelty” and is more likely to cover stories that are exciting and interesting visually (288). Thus, the framing of BPA along these lines not only attracted attention and media interest, but also generated new images and symbols that reflected the concerns over the chemical.
In describing the impact that media coverage had on BPA campaigns, activists tended to feel that the coverage generated a wider audience for their message. Gretchen Lee Salter of California noted,

We have a lot of mainstream reporting on this now. For awhile there was a lot of reporting in scientific literature or scientific journals or these obscure places and now you have *Time* magazine and *USA Today*. All these different places that a legislator could happen to subscribe to or the average person could see and get concerned about. I think the media has made the issue a mainstream issue as well as a common sense no-brainer kind of issue.

Numerous campaigners described the emergence of “mommyblogger” support for BPA regulations. Mommybloggers have become a popular genre of blogs where mothers write about their experiences raising children. On these blogs, parents exchange advice about typical parenting issues and also frequently discuss environmental health issues as they related to their children. As Steph Hendricks suggested, a children’s health frame created new spaces of media coverage, and broadening the typical coverage of campaign efforts. Hendricks noted that the frame is very “promotable and it’s probably the best frame to have, especially when you’re talking about in utero effects—because that’s really the big thing that sets BPA apart. I do think that in the blogosphere, in social media, that with the mommy bloggers and the parent community online who are looking for information.”

A commitment to the consistent use of this frame and the repetition of language that reflected the unique vulnerabilities of children and infants created interesting and memorable concepts for media outlets. These frames circulated throughout the campaign network via the transfer of the inflatable baby bottle from state to state and the collaborative development of product testing reports, suggesting that although there are limitations to this particular frame, there is widespread agreement within the campaign that such a frame was helpful in attracted
attention. Although the chemical industry articulated their own set of messaging points regarding children’s health, as I explain in later sections, environmental health frames were still widely adopted by media outlets.

**Framing Scientific Research and Expertise**

In addition to the widespread usage of children’s health and product frames, BPA campaigners recognized the importance of articulating the concern over BPA in clear, yet precise ways. Although the science behind BPA is relatively new, the mounting evidence that the chemical causes harm at low doses has been an important component of framing processes. In particular, the process of translating complex scientific research findings into clear, digestible language has been a vital component of BPA campaign efforts.

Nisbet (2010) in reflecting upon the lack of scientific literacy among the American public has argued that science must be framed in ways that “make a complex science topic accessible and personally meaningful for a targeted audience along with the particular frame devices that instantly translate these intended meanings” (56). He suggests that scientists, as sources of authority and expertise, have a “duty” to be active in the process of framing so as to avoid the distortion of scientific ideas and a loss of information. Although Nisbet warns that scientists who engage in framing processes—because they are not media specialists—should be wary of hyperbole (which can reduce public trust in science), he recognizes scientists as vital characters in the process of communicating science to an audience. The legitimacy and expertise, when used appropriately can encourage public participation and mobilization around scientific issues.
In an earlier chapter I discussed the notion of a *science shaping process* whereby chemical industry elites actively worked to curtail scientific consensus on chemical hazards by funding their own research that contradicted peer-reviewed research; by attacking individual scientists and their credibility; and by supporting a reliance on less applicable or appropriate models of scientific assessment. In contrast to that process, BPA campaigners engage in a process whereby they transform scientific research into accurate and simplified forms that are easily understood and transmitted to the media and the public. This *scientific rendering process* is a strategic and active form of framing whereby activists work to present a diagnostic frame that offers reasons for concern over BPA exposure. The rendering process requires that campaigners, who are rarely trained scientists themselves, a) communicate and interact with scientists and their research; and b) translate and transform complex scientific research into something readily understood. As Nisbet suggests, the credibility and expertise afforded scientists has been invaluable in articulating messaging points regarding BPA.

In reflecting upon their experiences developing media attention for BPA legislative efforts, campaigners shared a belief that scientific research was a fundamentally important element to their efforts. They noted, “there’s been more science coming in that you know is increasingly conclusive, that adds to the story”; “There’s a reason BPA is in the media…it’s because there’s a body of scientific evidence”; and “I think what this campaign has really done and what the media has done has given a science lesson to the public and to legislators.” As Cindy Luppi offered,

You can have all the political momentum in the world and if you don’t have the science case with you, you also won’t achieve success. From our perspective, you need to have good scientific information with the right spokespeople being willing to come forward, which usually means health professionals or scientific voices or people who can validate and confirm the science.
The importance of science in this process and the recognition that framing processes needed to not only have an emotional, children’s health focus, but needed to also have strong scientific reasoning encouraged BPA campaigners to reach out to scientists who had specific expertise on BPA. The process of communication and interaction between scientists who study BPA and activists has often been mutually desired and important. Maricel Maffini, Research Professor at Tufts University, and one of the preeminent BPA scientists in the country, recognized that she had an obligation to share her research in a public way:

There’s a lot of confusion and scientists in other fields don’t feel like they have the obligation to talk to the people. As a scientist who is funded by taxpayer money, it is my obligation to return to the people what I do. Because the papers I publish… they’re hard to read, you have to be able to produce something that the public can profit from… I think that in the field of endocrine disruption, in particular, the scientists are committed to bring the science back to the public and keep it in the spotlight. (Personal Interview, May 18, 2010).

Similarly, Dr. Patricia Hunt, a molecular biologist at Washington State University, and one of the earliest scientists to raise a red flag in regards to BPA reported,

I feel compelled to speak to parent groups, to use things when there’s a bill coming out in front of the legislator and actually provide my side of the story… I decided it’s my role to make sure that the other science that’s out there is well understood and that it’s not just possible for industry to dismiss it… I wouldn’t describe it as becoming an activist but I do think that you really, when you move into this field and start to see how the regulatory agency works and how industry lobbies heavily and tries to control and run damage control, I think if you’re a responsible scientist, you do end up getting drawn into this to a certain extent. (Personal Interview, July 16, 2010).

The willingness on the part of scientists to create greater opportunities for BPA activists to acquire the expertise needed to render scientific information. Scientists often went out of their way to make themselves available to speak at legislative hearings, to speak with reporters, or to translate scientific information for activists. Maricel Maffini reiterated her feeling that there was a responsibility attached to scientific discovery, as well as a personal interest in seeing research accurately portrayed, “sometimes people think they understand what they’re talking about and
they don’t reach out to scientists to get a better explanation…so I think we, as scientists, have to really think about how we communicate our science and try to get out of this so-called ivory tower.”

Fred vom Saal, of the University of Missouri, was lauded by many people as an important expert who contributed his time and energy to the task of clarifying scientific research on BPA. Thinking about her interactions with vom Saal, Hunt and Maffini, Mia Davis noted that “without those key people who are making that information more understandable, I actually don’t have a scientific background- but I love it- and I am able, with the help of these other people, to transform that into something that the lay person can actually understand”.

This openness and interaction has allowed campaigners to improve their proficiency in understanding scientific research papers and to develop frames that they can then bring to public settings or media outlets. Pam Miller of the Alaska Community Action on Toxics noted that she had worked with scientists to develop seminars “for legislative staff, legislators and agency people on environmental health issues” where scientists were asked to speak to legislators because “we realized that there’s just a lot of ignorance and that we have a huge road ahead in terms of bringing the awareness necessary to prompt the kind of policy changes that we want not only about Bisphenol-A but a whole range of chemicals that we’re concerned about”. (Personal Interview, June 29, 2010).

The rapport that developed between scientists and activists also allowed for BPA campaigners to rely on scientists as media opportunities arose. Media strategist Steph Hendricks noted that, “there are scientists that I have where I can call reporters and tell them, ‘talk to them’ and they will talk about with no notice, no preparation at all, which is unusual for scientists. So
we’ve got to that point where we have this understanding where I can give their names to reporters for stories.” These relationships developed out of mutual interest in raising awareness about BPA risks and increased the credibility and legitimacy of activists media outreach. Hendricks, in recounting the effect that improved credibility (which undoubtedly also been developed from Hendricks’ experience and expertise, not just through the presence of scientists) has provided in working with the media offered, “we’ve now established ourselves as resources that reporters go to directly, which was my goal, especially the format of the news advisory to have the experts and their direct contact information in there.”

Where activists benefited from scientific expertise and influence, it was recognized that there could, for some scientists, be a disincentive to become active in policy realms. From one perspective, two different activists mentioned concern over how scientists would be perceived when adopting a public presence. One noted her perception that, “the few scientists that have gone out there are mislabeled and they’re kind of harassed by their colleagues and definitely targeted and harassed by industry.” Patricia Hunt, while noting that she had a positive experience in taking on a public persona in relation to BPA, offered

I might have worried about this if I had been a really junior person, it could have really damaged my program. Because I think industry tries to attack as strongly as it can and for younger people who are not established in the field, that can be potentially really damaging…it could cause somebody to not get tenure or cause their institution to say “their research is really controversial and we’re not sure it’s right…” powerful industry opposition could discourage the participation of scientists.

In overcoming this barrier to scientific literacy and greater dissemination of scientific research, Dr. Maffini noted that she “wished there would be more scientists willing to spend time working outside the lab” but recognized that the lack of financial incentive to speak publicly about research, in combination with the professional demands for conducting research and
acquiring grants reduced the time that scientists could spend working to disseminate their work to a wider audience. Both Maffini and Hunt noted that to remedy this blockage they would like to see (and were trying to themselves foster) a paradigm shift in which new scientists are trained in interacting with the media, with the public and within policy realms. Hunt reported that “what I’m trying to instill in my trainees now is… you should be able to break into any audience no matter how broad, no matter how far away they are from science, because you should be able to break it down for your grandmother. If you can’t do that, then you’re not doing well. The speaking and the writing parts of our job are critical.”

Although this paradigm shift has yet to occur, the willingness of numerous scientists to share their knowledge and research on BPA with activists helped to not only legitimize campaign efforts to control the chemical, but also created a richer and more complex story that further advanced a children’s health frame. Without strong evidence of scientific concern over the chemical’s effects, a children’s health frame would have lacked the sense of urgency that a strong scientific base and coterie of experts provided.

**BPA CAMPAIGNS AND THE MEDIA**

Media coverage of BPA spiked in 2008, with over 700 articles published in major U.S. and world news sources.\(^41\) *The New York Times, Newsweek, Time, The Wall Street Journal, ABC, CBS and NBC nightly news programs have all covered this issue (as have many regional and local papers, news stations and radio programs). From January 1, 2005 through January 1, 2008, between 400 and 500 articles about BPA were published during the course of each year. Importantly, 2008 was a significantly active time for BPA campaigns, with 18 states introducing

\(^41\) These numbers are based on a query of LexisNexis for the issue of BPA. Articles that appeared in more than one news outlet were included as they indicate the volume of BPA coverage. The search was conducted on September 15, 2010.
BPA legislation and when many conflict of interest issues were raised. The number and variety of these stories reflect the media’s sustained interest in the issue and reflects the “media attention cycle” in which news stories about a particular issue go through waves, tending to over-represent social movements in the middle of their efforts and under-represent their beginnings and ends (Oliver and Myers, 2003; McCarthy et al. 1996).

In particular, the Milwaukee Journal Sentinel was a significant driver of the BPA media coverage nationwide. Running their “Chemical Fallout” series of more than two dozen articles beginning in 2008, MJS covered a range of politicized and influential stories on BPA, frequently reporting on what one interviewee referred to as the “tobacco industry style tactics” used by the chemical industry. This active coverage on the part of MJS contradicts the assumption that media outlets rarely follow the trajectory of one issue or movement concern, suggesting that the sustained efforts of BPA campaigns to produce interesting information and stories have contributed to the ongoing coverage of BPA in the media.

Given the asymmetry present in the relationship between the media and SMOs; where the media has nearly all of the power to dictate and disseminate movement messaging and frames, Carroll and Ratner (1999) suggest that SMOs must often adopt media strategies as part of their political project (2-4; 26). In developing strategies to gain media coverage, Carroll and Ratner argue that SMOs need media coverage in order to mobilize participants, to validate movement efforts as a politically important cause, and to enlarge the scope of the conflict by drawing in other parties with a stake in the issue in hopes of shifting the balance of forces in a favorable direction for SMOs (3). Media coverage then allows movement actors to engage in “counter-hegemonic” projects, including the critique of existing social structures, the disruption of
dominant discourses and the articulation of alternatives (1999: 2). BPA campaigns provide an example of the strategic use of media for the counter-hegemonic purposes that Carroll and Ratner articulate; in the creation and dissemination of messages and frames related to children’s health, children’s products, and scientific urgency, BPA campaigns routinely adopt media strategies that articulate counter-hegemonic goals. The framing of BPA as a children’s health problem with scientific backing allowed for the critique of existing chemical regulations; the disruption of dominant discourses by suggesting that new paradigms of scientific inquiry must be adopted in order to assess new chemical risks; and the articulation of alternatives as campaigns argued for increased chemical regulation at the state and national levels.

As BPA became an increasingly common topic within the news media, BPA campaign frames were widely adopted and used to tell the story of BPA. As sympathetic media coverage blossomed, BPA campaigns began to not only engage in outreach efforts (e.g. Steph Hendricks’ efforts to provide reporters with material, quotes, or direct contact with spokespersons) but also developed new strategies to attract media attention, including direct actions. Most important, however, were the creation of product testing reports that, in striking visual fashion, articulated counter hegemonic messaging points that were often adopted and disseminated by media outlets. The narrowness of the frames selected by BPA campaigners, when combined with product testing reports yielded a media campaign that generated extensive media coverage.

MEDIA ADOPTION AND DISSEMINATION OF BPA CAMPAIGN FRAMES

The framing processes BPA campaigns have engaged in are important in garnering media attention. Gamson et al. (1992), Edelman (1988) and Bennett (1988) warn that the media, in

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42 A counter-hegemonic project as described by Caroll and Ratner attempts to circumvent structures that dominant cultural dimensions through the use of innovative, participatory and democratic strategies that establish and give voice to marginalized organizations and groups whose perspective would otherwise be absent from public view.
adopting social movement messages, tends to promote cynicism and apathy rather than encouraging action. Bennett notes that the news media sets “limits on the imaginable and the politically possible; arriving too late (and doing too little) to educate people and get them involved in policy making” (1988: 63). However, newer approaches to the role of media in social movement processes suggest that, technological advancements have enabled SMOs to have greater access to traditional media outlets, as well as non-traditional outlets such as blogs and online communities and networks (Myers, 1994; Juris, 2008; Castells, 1997). Koopmans (2004) suggests that while the mass media plays a vital role in legitimating movement activities and increasing visibility of movement actors, social movements are increasingly able to make use of their own media to communicate through communicative networks and online environments. In any case, media attention and coverage are important to social movement outcomes and have been an important component of BPA campaigns. Where traditional media outlets were blocked, campaigns created new mechanisms to gain attention. In the process of developing a media presence, many activists found themselves filling roles as spokespersons and experts on the topic of BPA, which in turn opened up pathways for activists to access policy making realms and legislators. The legitimacy created by media coverage created increasing opportunities for movement actors to influence policy debates. In what follows I analyze media depictions of BPA and describe the varied ways in which media coverage advanced campaign efforts.

Product Testing Reports

Recognizing the importance of developing media attention in an effort to raise awareness and public support for BPA regulation, campaigners chose to release a series of product testing reports that used to generate media attention. The first report released in early 2008, Baby’s Toxic Bottle, tested six major brands of baby bottles sold in the U.S. and Canada. Finding that
every bottle brand leached BPA when heated— at levels shown to cause harm in animal studies—the report called for more stringent chemical regulation of the chemical. The report’s publication was widely covered in major news outlets including primetime network television news programs. More than 40 media outlets covered the report’s release, including national and local or regional papers as well as online blogs.43

In one widely circulated and reprinted story from the PR newswire, a news distribution outlet that serves more than 85,000 journalists, the children’s health and product frame figures prominently into the story. To begin, a mother’s reaction to the report articulates the problem: "Parents shouldn't have to be chemists to know what is safe to buy for our children. As a parent and consumer, I was shocked to learn that baby bottle manufacturers use contaminants like Bisphenol-A, with full knowledge of animal studies that show adverse effects." This statement bridges the children’s health frame and brings scientific language into the article’s coverage as well.

Counter-hegemonic efforts to critiquing legislative policies, embracing new scientific discourse, and articulating an alternative approach are all visible in this coverage. The article included an interview with Mia Davis, where Davis calls for regulation noting, "We can use our consumer power to get swift action from manufactures and retailers selling products with BPA, but we can't simply shop our way out of this problem. Ultimately, we need government officials at all levels to enact new safeguards to protect our health.” Along with this, the story articulates the relevancy and legitimacy of low dose science, offering “Scientists, physicians, and public health professionals suspect that existing scientific evidence on BPA indicates a real risk to human health.” The article concludes by summarizing the cause for concern and reiterates the

43 LexisNexis search conducted on November 5, 2010. Returned 45 results for “Baby’s Toxic Bottle”.

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alternatives in this situation: increased regulation and increased responsibility on the part of manufacturers to phase-out BPA.

This story was reprinted and picked up by many news outlets across the country. As such, much of the framing and counter-hegemonic articulations evident in this story were adopted in news media across the country. Importantly, this article was authored by staff members at the Center for Health, Environment and Justice (CHEJ), an SMO active in BPA work. As such this example provides an instance in which campaigners not only created the story that would attract media attention, but also created the news coverage that promoted their goals and messages.

In the spring of 2010 No Silver Lining was released by BPA campaigners to demonstrate that canned food is a significant source of daily BPA exposure. Testing 50 cans from 19 U.S. States and parts of Canada, the report found BPA in 92% of the cans tested. As with Baby’s Toxic Bottle, news media picked up the story and heavily reported on BPA exposure and health implications. Three weeks after the release of the report, Foxnews.com featured an extensive article on the hazards of BPA in canned foods, articulating a clear argument about the need for research and funding for the study of BPA exposures, particularly for children. Similar to the PR newswire piece from CHEJ, the Fox article interviews a mother about her reaction to BPA exposures in food and consumer products. The article then notes that regulatory agencies are reviewing the chemical and that legislative action might be necessary to control chemical risks.

The news article also spends significant time referencing the work of environmental health scientists Fred vomSaal, Hugh Taylor and Shanna Swan, suggesting that their research on low dose exposures was an important key to understanding how to control BPA risks. The

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article also gives ample space to BPA industry spokespersons from the American Chemistry Council, the Grocery Manufacturers Association, the North American Metal Packaging Alliance and Dow chemical who assure that the chemical is safe and that they “welcome” federal testing of the chemical. Despite the space provided these industry officials, the article concludes in suggesting that parental concern for the issue will remain a centerpiece in this debate. Although the article does not contain the same articulation of alternatives that the CHEJ pieces does, the fact that a conservative news outlet that infrequently reports on environmental health issues is suggestive of a shift in media responsiveness to this issue.

The success of these reports is a result of the work of savvy strategists within these campaigns: each report is visually appealing, contains a narrative about the problem at hand, presents scientific data in a publicly accessible way, diagnoses structural flaws in chemical policy systems as a key problem, and ends with some type of “action item” or ways for sympathizers to become involved with the issue. These meticulously packaged reports essentially take care of a reporter’s work, reducing a complex environmental health issue into a digestible (though highly formulaic issue, complete with villains-the chemical industry/ government failures, and heroes- parents and citizens trying to reduce exposures to toxic chemicals). The reports themselves clearly articulate health concerns, product frames, and the validity of scientific research on low dose exposures, while espousing the need for action to regulate the chemical. The conscious packaging of counter-hegemonic language in highly accessible and easily adopted ways has contributed to the widespread media attention devoted to the topic of BPA in ways that advanced campaign goals.

**Adoption of Campaign Frames in Mainstream Media**

While product testing reports helped BPA campaigns to create the news coverage that
advanced their objectives and goals, it also had the effect of bringing the issue of BPA into mainstream media outlets. As local and regional press began to print coverage on the work of state-based activists and their expertise on the topic of BPA, mainstream news media began to cover the topic as well. The ripple caused by the product testing reports contributed to a media flurry that resulted in increasingly common coverage of BPA in the mainstream press. Like the stories that grew out of the product testing reports, mainstream media outlets tended to adopt the proffered campaign frame, highlighting the children’s health effects and the scientific evidence that supported a cautious approach to the use of BPA in consumer goods. Below I analyze the coverage given by The New York Times and Newsweek as these outlets have a large readership and a popular forms of media. In these two articles campaign frames are present, and the counter-hegemonic elements present in product testing reports is also present in these reports.

The New York Times

Although the NYT has published a number of articles on the topic of BPA, the most popular piece that was reprinted and widely discussed on the NYT online message boards is a recent article by journalist Denise Grady (2010). The article begins by recognizing that parents concerned about children’s exposures to BPA are a driving force in the desire to regulate the chemical, but Grady used a tone of skepticism to suggest that the scientific evidence regarding BPA has a complicated past. In the article she interviewed a number of environmental health scientists, including Patricia Hunt, and reported on the discrepancies between the scientific studies on BPA conducted by industry and those conducted by government funded scientists. In setting up the contested battle over BPA regulation, Grady spends much of the article discussing the scientific study of the chemical and a long discussion of what low-dose response mean to the study of BPA. While noting that there remains some scientific debate remaining, the article’s
primary interviews are conducted with scientists who discuss the risks associated with BPA while precious little space is given to BPA skeptics. Thus, although the article suggests that there is no consensus on the chemical, the interviews used suggest that many scientists are in agreement that BPA is a harmful endocrine disruptor. In this way, the article succeeds in the counter-hegemonic project of disrupting the dominant scientific discourse on BPA. Grady also offers some regulatory critique, citing the lack of evidence and action on the chemical, as well as the scientific disputes within the federal government as a roadblock to drawing formal conclusions on BPA.

Although this particular article lacks an articulation of alternatives, the comments left on the NYT website by readers (among them some of the very campaigners interviewed for this research) are able to articulate an alternative vision, calling for a transformation of chemical regulatory policies. Furthermore, another major story published by the NYT in May of 2010, made many of the same critical points about chemical regulation and clearly articulated an alternative vision by reporting on the status of the Safe Chemicals Act, the regulatory structure that would potentially regulate numerous toxic chemicals (Kristof, 2010).

*Newsweek*

In addition to the successes of specific product testing reports, biomonitoring has also been strategically used to increase the visibility and recognition of chemical policy campaigns. Coming Clean coordinated a biomonitoring study in which 35 citizens from seven states were tested for 35 different chemicals, including BPA, which was found in all 33 participants who submitted urine samples. Although this report was co-released with numerous environmental health organizations across the country, the extension of the public health frame utilized by BPA
campaigns benefited all chemical policy groups due to the constant development of news stories that discussed chemicals and health. Even organizations working on different chemical policy bills or reforms have benefitted from the widespread media coverage of BPA. This serves as an important example of how coalitional relationships have the potential to benefit numerous SMOs simultaneously.

Following the publication of this report and the launching of a related website, in 2008 *Newsweek* published an article “The Chemicals Within” detailing the results of the study and pointing to the failures of TSCA as a key factor in the human exposures observed in the biomonitoring study (Underwood, 2008). The counter-hegemonic frame advanced by BPA campaigns that demands federal policy reform and the reevaluation of scientific practices is immediately visible as the author points out that, due to regulatory inaction on the part of the federal government “we really don’t know the health effects of many chemicals on the market today”. The author continues by quoting members of the SMO Environmental Working Group describing how this issue affects children.

The article then moves on to discuss the scientific expertise on low-dose exposures to BPA, advancing alternative scientific discourses. The article gives short shrift to the American Chemistry Council’s assertion that BPA is safe and continues by discussing the low-dose exposure research of Patricia Hunt. The author concludes by reporting on upcoming legislative decisions related to chemical regulations and points to manufacturer efforts to reduce exposures as key solutions. In a relatively short article, the author reports on the major elements of BPA campaign work and advances the counter-hegemonic goals of the campaign.
As the above examples illustrate, the adoption of BPA campaign frames including an emphasis on children’s health and critiques of chemical policies has occurred within the mainstream national news media as well as within local and regional outlets. The examples above represent a sampling of the available coverage and do not include the variety of television stories that focused on the issue. The examples above demonstrate that the work of BPA campaigners has paid off; their framing of the problem has been given ample media attention and coverage, publicly clarifying their specific challenges to both regulatory and scientific assumptions.

**BPA Framing and Non-Traditional Media Outlets**

In addition to traditional media coverage in mainstream news outlets, BPA campaigns have also benefited from the resonance of this issue with parents. The nature of the chemical BPA is such that small exposures during certain stages of life, or what many environmental health activists refer to as “critical windows of development” can have significant impacts later in life. In addition to the scientific studies suggesting the long-term implications of exposure, first hand experiences of previous generations with the chemical DES have also played a role in the extreme caution afforded by parents. DES is a chemical similar to BPA in that it is a synthetic hormone. Beginning in 1941, DES was prescribed to between 5 and 10 million pregnant women. In the decades that followed, “DES daughters” or those children born to women who took DES during their pregnancy and experienced negative health outcomes such as rare forms of cancers of the reproductive organs, began to publicize the issue of in-utero exposure to estrogenic chemicals (Bell, 2009). The legacy of this particular endocrine disruptor and the “embodied health movement” (Bell, 2009; Brown, 2007) surrounding DES has provided some context for BPA campaign efforts and provides a familiar narrative for concerned parents.
The ubiquity of BPA in polycarbonate plastics in children’s goods (baby bottles and certain plastics toys for example) encouraged many parents to become outspoken about the dangers of chemical exposures. These parental concerns were routinely voiced on what a number of BPA campaigners I interviewed referred to as “mommy blogs”. Mike Schade noted, “parents who have blogs… the “mommy bloggers” played a very important role in this fight, particularly in identifying and promoting safer alternatives to BPA and a lot of great mommybloggers who have put together parenting guides to safer BPA-free alternatives.” Situated within a broader blogging space devoted to modern American parents, many of these mommy blogs fastidiously wrote about the issue of BPA.

On one mommy blog, www.thesoftlandingbaby.com, BPA is a common thread, with the site’s main author, Alicia, highlighting new scientific studies and urging readers to choose BPA free products. Importantly, the blog also highlights key SMOs such as the Safer Chemicals, Healthy Families coalition that is promoting federal reform of TSCA, and posts reports from BPA campaigners. Although not a member of a traditional media outlet, blogs such as the Soft Landing serve to legitimate the actions of BPA campaigners while also mobilizing potential participants (Koopmans, 2004).

Embodying what Castells (2005; 2007) refers to as “mass self-communication”, such blogs reflect the evolving nature of the information society, where communication practices evolve and the mass media system becomes increasingly diversified and flexible; social movements must adapt to the expansion of this cultural space by not only recommitting to efforts to influence transitional mainstream media, but also by adapting these self-communication mechanisms into their own strategic efforts. Lawson-Borders and Kirk (2005) suggest that blogs have created a new form of “participatory media that bypasses traditional gatekeepers and allows
more individuals into public discourse” a reality that allows the audience to “become more involved, interactive and a producer, not just a consumer of information (556). As such, non-traditional media outlets contributed to the capacity of BPA activists to generate media coverage that promoted and advanced their goals. Mommyblogs such as Softlanding, Zmama and Safemama adopted the children’s health and product frames and noted the extensive scientific evidence that was generated about the concern over the chemical. The blogs, while often articulating alternatives to the problem in the form of consumerist practices, routinely critiqued regulatory policies and articulated the need to control chemical risks.

In practice, this has resulted in many SMOs starting their own blogs and Twitter pages in order to compete in this alternative communicative space. BPA-related mommyblogs alleviate some of the pressure on SMOs to maintain a presence in the blogosphere and reflect the continual transformation of media systems into a segmented system of globalized media conglomerates on the one hand, and localized horizontal networks of self-communication on the other.

In addition to the coverage provided by these blogs, the ubiquity of social media such as Twitter and Facebook has also altered the landscape in which campaign work is done. A number of the organizations advocating policy change or leading legislative efforts have Facebook pages and Twitter accounts that they routinely update with links to videos or campaign partner pages, and requests for followers to sign petitions or call their legislators. Although this practice is not unique to BPA campaigns, it does signify a shift in the manner in which this work is done; organizing is now a 24/7 endeavor. Activists are constantly engaged in framing practices and media outreach efforts.
Along with the adoption of BPA campaign frames in the media, it is important to consider how campaign work has influenced legislatures, a key target of BPA efforts. The extensive media coverage of BPA created new opportunities for many activists. In areas where local media covered the issue and interviewed campaigners, those people were often approached by legislators interested in the issue and open to pursuing legislation. In many states seasoned activists who had worked on other state chemical regulations already had the necessary rapport with legislators to advise and assist them in learning about BPA. In states where these relationships were in their infancy, media coverage could open doors and create the starting point for regulatory efforts. Although it is a complex proposition to argue that BPA campaigns are the reason that state bans have passed, it is possible to assess whether or not the frames, language and critiques articulated by legislators echoes common themes of BPA campaigns.

**NEW OPPORTUNITIES CREATED BY STRATEGIC FRAMES**

To the extent that counter-hegemonic frames are present in legislative statements about BPA bills, it is possible to infer that BPA campaigns have influenced regulatory structures. In order to assess this, I have collected a number of press releases and statements by legislators in support of BPA bans. I have chosen a selection of these from states in which BPA bans have passed. Although the language used in states where bills have failed is likely to be important as well, I hope to clarify why legislators say they support regulatory action rather than why they do not.

*New York*

In June of 2010, New York State became the seventh state in the country to pass a BPA bill. The bill that passed bans the sale of children’s products that contain BPA. In a news report on the
issue, Antoine Thompson, the Chair of the New York State Senate Environmental Conservation Committee said, “The passage of the BPA bill is just one part of my overall commitment to making the future better for our children. Bisphenol-A can be harmful to a child's health…studies have shown that BPA has been linked to early onset of puberty, polycystic ovarian syndrome, and breast and prostate cancer” (Adcock, 2010).

In a press briefing on this legislation, Senator Schumer, a supporter of the ban noted, “BPA is not only harmful for our children but for an overwhelming majority of Americans…We have to worry because manufacturers are still using this chemical widely, and it’s getting into our foods” (Savedge, 2009). In this same briefing, Senator Gillibrand added, "As the mother of two young boys, I expect to have faith and confidence that the products my family consumes are safe ... allowing Americans to continue to be this broadly exposed to potentially dangerous levels of BPA is unacceptable.”

In these two reports, three different legislators articulate that BPA presents a health risk to children, report on low-dose scientific research findings, and point to manufacturing practices as problematic. In New York BPA campaigners have been particularly active, consistently lobbying and speaking with legislators on this issue. The articulation of not only the primary frames within the broader BPA campaign and the decisive critique of regulatory structures is demonstrative of the capacity of these frames to resonate with, and be adopted by legislators.

Connecticut

In 2009, Connecticut was one of the first states to pass a BPA bill and has passed one of the more comprehensive bills in the country. Their bill bans the sale of products containing BPA
marketed for the use of children under the age of three years, including reusable food containers, jars or cans containing food or beverage products that contain BPA.

A report from the Connecticut House of Representatives newsroom featured an interview with Representative Beth Bye, who said, “With the Food and Drug Administration asleep at the wheel, individual states have been forced to take action…There is a national movement to keep this toxic chemical out of our products, especially ones used by children whom this chemical can harm the most” (CT Government, 2009). Senator Joe Crisco in a statement in support of the bill offered, “Studies have shown that when BPA has been used to manufacture polycarbonate and other plastics it has been linked to…disease in humans. The banning of BPA in baby bottles and in some other products is one way to help protect the health of the young children in our state” (CT Government, 2009a).

On her government website, representative Elissa Wright noted that “This chemical has generated international concern in recent years due to its persistence in the environment and associated adverse human health effects. According to leading medical research, infants and young toddlers are particularly at risk of its harmful endocrine or hormone disrupting potential.” The statement of support for the BPA bill also features a discussion of the consumer products that contain BPA.

In the above instances, BPA campaign frames are once again visible, including a children’s health frame, the continual referencing of low-dose scientific studies and calls for changes to both federal legislation and manufacturing practices. The counter-hegemonic language and rhetoric that factor into much of the campaign-generated and mainstream media are visible here.
Vermont and Wisconsin

Vermont’s legislature chose to ban BPA from bottles, sippy cups, formula containers and baby food jars in early 2010. Often an environmentally conscious state, legislators speaking on the issue continued to reference low-dose chemical exposures and children’s health concerns as primary reasons for taking action on the chemical. Vermont public radio also covered the legislative efforts in the state and quoted Senator Virginia Lyons as saying, “It has effects on their little developing bodies, and it's affecting neuro-biological development. And this stuff is affecting later consequences on development including obesity, Type 2 diabetes, and cancers when they get older” (VT Public Radio, 2010).

Like Connecticut and New York, Vermont and Wisconsin’s legislators maintained a narrow focus on the importance of BPA regulation, maintaining this as a children’s health problem and consumer rights issue. In the wake of the publication of the Baby’s Toxic Bottle report, Wisconsin became the first state in the country to pass legislation regulating BPA in 2009. This initial ban paved the way for subsequent bills to pass. In press statements about the signing of the bill, Senator Sandy Rummel referenced children’s health as the primary reason for regulation: "The bill protects babies. Babies are the most vulnerable of all of us, in terms of the chemicals in the environment that we get exposed to, because their development is going so fast” (Healthy Legacy, 2008). Representative Karen Clark echoed similar sentiments noting, “This is a great victory for Minnesota’s parents. After January 1, 2011, parents will know that regardless of what store they are in, the baby bottles and “sippy” cups will be BPA- free.”

While there are a variety of variables that likely influenced the legislative outcomes in these four states, the influence of BPA campaign work cannot be underestimated. In all four of
these states, SMOs that are part of the BPA network developed relationships with key legislators, provided information on the science behind BPA exposures and effects, and in many cases, BPA activists testified in support of bans. Although causality is difficult to ascertain in social movement situations, the similarity and repetition of BPA frames across state lines is illustrative of movement impact on these legislative processes and the resonance that the narrow frames advocated by activists have had within policy realms.

**Market-Based Opportunities**

The saliency of children’s health frames and the success of BPA campaigners in messaging around the hazards of BPA exposure were bolstered by efforts to target particular manufacturers and retailers who used BPA in production practices. This occurrence is related in some part to BPA campaign strategizing that offered a dual message of reforming chemical policies and encouraging consumers to purchase alternatives. With chemical policy legislation as a short-term goal, BPA campaigners pushed what they saw as a “market solution”. This market strategy relied upon the strategic use of information that resonated with BPA manufacturers and producers.

On various conference calls and in meetings, it was noted that state or federal level action would be slow and tedious, but that putting pressure on certain manufacturers or retailers that used BPA was an effective means of circumventing state structures and reducing the use of BPA in consumer products. Rich Liroff of the Investor Environmental Health Network (IEHN), a group of investors and shareholders concerned about environmental health, reported on the efforts to advance this market-based strategy within the BPA campaign structure:

Our general idea was to encourage companies to adopt safer chemicals, principles and
practices across the board, committing to identifying chemical concerns in their products and taking steps to reduce them. In 2008, as the issue began to mature, we produced a report on the market for Bisphenol-A…that basically described how companies were responding and we used the BPA case to underscore some of our messages having to do with companies needing to be smart about what chemicals are in their products of supply chain. Companies can see how they’re doing with the competition and understand which chemicals are hot and substitute out if they can. And the flipside of that is, for these specialty chemical companies, the existence of all these pressures from downstream users and retailers create a market dynamic.

In this light, a market-oriented node of the BPA network was able to develop technical information about the business case for phasing out toxic chemicals, which was then disseminated through the campaign structure. Activists used this report to demonstrate to legislators how manufacturers were successfully dealing with environmental health issues and to demonstrate to manufacturers that changing production practices was possible. The report published by IEHN was covered by more than 20 media outlets and ten different public blogs.45

This market strategy supported BPA campaigners legislative strategies and, in many cases, helped to facilitate legislative reforms. For example, in the 2010 passage of Washington State’s BPA bill, baby bottles and sippy cups were the primary products regulated by this bill. As the majority of major baby bottle manufacturers (as well as most sports bottle manufacturers) had already phased out the use of BPA in their products, the bill appears to do little in the way of meaningful legislative action; rather it appears to be a bill that promotes political candidates images of support for children’s health issues and provides Washington State environmental health advocates with another “win” in their legislative efforts. Two activists whose bills had passed noted that, given the actions of many plastic bottle manufacturers in phasing out BPA, there is less and less opposition to banning BPA in children’s products. Putting pressures on manufacturers through these market-focused reports contributes to the campaign goal of

45 LexisNexis Search on October 12, 2010. Search criteria included the report title and all newspaper outlets. Google search of report title, conducted on October 12, 2010, resulted in ten blogs reporting IEHN findings that manufacturers are moving away from using BPA.
reducing exposure to the chemical through changes in production practices and regulatory structures.

In addition to the IEHN report, the aforementioned *Baby’s Toxic Bottle* report not only influenced parents and legislators, but also impacted the practices of manufacturers. Published in 2008, the report noted that the six of the top baby bottle manufacturers in the country produced bottles that leached BPA at levels known to cause effects in lab animals. In the following months those same six manufacturers, Avent, Playtex, Gerber, Evenflo, Dr.Brown’s and Disney all declared that they refrain from using BPA in their bottles (Layton, 2009). Pressures from parents, retailers such as Target, Wal-Mart and CVS and legislators (Attorneys General in Connecticut and New Jersey wrote to the bottle makers and asked them to voluntarily stop using the chemical) resulted in a complete move away from the use of BPA in this product sector.

The strategic use of information by BPA campaigners has contributed to the pressures experienced by manufacturers. The effect of legislative changes around the country, media coverage and reports targeting individual manufacturers has altered the landscape in which BPA producers function. The simultaneous pressures on these three realms limits the choices manufacturers can make while maintaining their profits.

**FRAMING LIMITATIONS**

Although narrowly constructed frames helped to generate attention regarding BPA campaign efforts, they also constrained activism around the issue. While the use of a children’s health frame was often recognized as having mobilized numerous parent groups and “mommy bloggers”, some organizers reported that the children’s health frame was limited due to its narrow scope. Bobbi Chase-Wilding of New York felt that the children’s health frame faced limitations and that “a vulnerability of where we are right now “is that the frame can “become
rigid… if people can’t take out that frame and see the bigger frame, that’s an issue.” Matt Prindiville of Maine noted that “I think people get tired of the kids frame. There’s a lot more to it. I think it’s important to have the full spectrum of chemical exposures. There’s room for that.” Similarly, Lindsay Dahl said that adult populations were affected by chemical exposures, “I think if we still only talk about children’s health, we’re limiting ourselves… because chemicals affect healthy aging, Parkinson’s and Alzheimer’s- throughout the entire age spectrum we’re being affected…we need to think about that.”

It was often suggested that the frame would have to expand to include pregnant women or other adults. As Cindy Luppi suggested although children’s health and product frames had been “strategic…But [they] also present challenges for us at the same time because to truly protect babies, we have to protect adults of childbearing age and it’s harder to get attention there, so it’s a double edged sword.” In this manner, campaigners felt that broadening a children’s health frame would be required in order to maintain interest in the topic and, as Cindy notes, to continue to push for policy changes that would protect adults as well as children.

While the limitations of children’s health was, for some activists, related to the narrowness of the frame, other organizers saw the frame’s strength challenged externally as the BPA industry worked to manage the public image of BPA. Bobbi Chase-Wilding noted that the industry was successful at leveraging the children’s health frame in order to limit the scale of the problem: “I think that industry did an effective job of saying ‘well, if there’s any problem, it’s with infants’ in terms of locking down the risks so that it didn’t expand out of children’s health. Steph Hendricks offered, “I was just reading an industry analysis…it said basically that they thought [the BPA issue] was contained and they didn’t see as much of a threat to other product sectors.” Hendricks also noted that, in trying to encourage media outlets targeted towards parents
to cover BPA-related stories that the chemical industry’s influence prevented children’s health stories from being adopted: “I’ve had an amazingly tough time getting stories about BPA into parent magazines- because if you flip through the pages, it’s full of advertising. It’s Kraft foods, it’s Coca Cola, it’s all the companies that are committed to blocking restrictions on BPA.”

Despite the limitations presented by the use of a children’s health frame within BPA campaign efforts, many organizers were optimistic about opportunities for transforming the frame in the near future. Bobbi Chase Wilding noted the importance of the No Silver Lining report in signifying to the public that BPA was a much broader issue. She suggested that the report’s demonstration that adult exposure through the consumption of canned foods is on par with levels known to cause harm in animal studies can successfully broaden the narrative surrounding BPA. Judy Robinson, in speaking about the evolution of the frame, recognized that expanding the frame to include adults would be feasible and was already happening as the public gained expertise on the issue:

Even though we weren’t going to go there [adult-focused frames] immediately, we knew we could eventually… it very organically occurred that it was, “But what if you don’t have kids? Adults don’t get affected? How is that possible?” So I think the need to change frames came fairly organically- the public will let you know when they’re ready for the next message and they are ready… So it worked beautifully. It was just how we planned and yes, [a children’s health frame] has limitations because children aren’t the only ones exposed. I think we were aware of those limitations and figured we could capitalize, leverage them to build a broader awareness about the problem and support for a set of solutions.

Thus, although the children’s health frame was perceived as having limitations in its scope, numerous campaigners not only felt that it was the most appropriate mechanism for attracting media attention and public support, but that it was also a frame that would lend itself to a broader frame at a later point in time.

Along with the limitations of a children’s health frame, a reliance upon scientific
evidence and expertise presents constraints as well. First of all, the complexities of the science on BPA limit who can speak to the issue; while a coterie of scientists have made themselves available to discuss the scientific conclusions on BPA exposures with the media, the public and with legislators, not all BPA campaign actors are entirely comfortable discussing the intricacies of this science. Although many have made a concerted effort to learn how to explain and describe scientific research, they may still suffer the credentials that the media or public may seek to legitimate their points.

Problematic as well is the reality that this science is new and evolving. Not only is the field of endocrine disruption one that many lay persons may find unfamiliar, but new research on BPA continues to flood the publication circuit, such that few individuals are likely to keep up with the latest research findings. As such, the ability of activists to make use of science contains limitations that, while not detracting from the power of such evidence to convey concern over exposure, may limit the ease with which scientific evidence and frames are deployed.

Conclusion

Framing processes with BPA campaigns have played an integral role in the advancement of BPA regulations across the country. Narrowly devised frames that were strategically deployed through product testing reports, mainstream media and new social media served to create substantial media coverage. The simplicity and urgency of the children’s health and scientific frames were easily translated in numerous media outlets. This coverage in turn afforded BPA campaigners a legitimate and visible voice, opening up new opportunities within legislatures. Such opportunities allowed movement actors to advance a counter-hegemonic critique of policy structures that provided an alternative view on chemical reforms and represented a departure from previous media representations of chemical policy reform that did not feature children’s
health concerns or issue of corporate corruption. These counter-hegemonic framings included new narratives that disrupted scientific discourse by clarifying the scientific consensus on endocrine disruptors and by advancing alternatives to current regulatory practices. The dissemination of clear and concise campaign frames has not only contributed to changes in regulatory realms, but also served as a catalyst in altering market practices in the children’s product sector.

Although there are certainly intervening factors and other variables that can account for some of the changes surrounding BPA, the pressures created by BPA campaigns have altered the playing field on which this battle plays out. Though BPA activists cannot perhaps take credit for all of the changes that have occurred in relation to BPA, their continued strategic efforts and their innovation in producing and disseminating information can be recognized as contributing to a landscape in which BPA in consumer products is increasingly rare.
CHAPTER SIX
CONCLUSION

The proliferation of toxic chemicals in the past four decades has impacted the environment, human health, and ecosystems in a multitude of ways. From observed reductions in the viability and health of humans, wildlife, and plants to the ongoing contamination of the air and water, a global reliance upon synthetic chemicals has created a legacy of environmental degradation whose effects will likely impact generations to come (Brown, 2007; Bullard, 1990; Colburn et al., 1997; Davis, 2002; Faber, 1998; Geiser, 2005). While the ecological consequences of increased chemical production and use are an alarming and pressing issue, this research has sought to explore the sociological factors that not only contribute to the expansion of the chemical industry, but also how responses to the unfettered use of toxic chemicals alter the landscape in which chemicals are controlled and regulated.

In exploring these dynamics, I have sought to examine how competing forces, the chemical industry and social movement actors, attempted to gain access to decision-making structures in ways that would influence regulatory outcomes in the case of BPA. The chemical BPA was selected as a case study through which to examine these oppositional entities because it was a well-researched chemical that was, in 2008 when I began this research, part of a highly visible and contested regulatory debate. Both the chemical industry and environmental health activists had come out in force to articulate their side of this battle over BPA. With the industry tending to advocate for little regulation and health advocates arguing for increased control of the chemical, this regulatory debate has transcended typical policy realms and become a discussion that includes activists, legislators, the public, and industry officials.
In uncovering the interactions and dynamics of this regulatory battle, I chose to focus on the competing forces at play, exploring the mechanisms by which both an anti-regulatory chemical industry and a precautionary, pro-regulatory environmental health campaign have attempted to access and control regulatory debates. I asked a number of key questions including: How are the tactics used to achieve influence similar or different for industry and for social movement entities? In pursuit of influencing or controlling the debate over BPA, how do these opposing groups frame the issue of BPA? Which frames are the most dominant and which might be considered successful? Similarly, as the scientific evidence behind a chemical’s effects on health or the environment are a critical component of regulatory decisions, in what ways do activists or industry officials make use of science or scientific expertise? Asking these questions has allowed me to clarify the differences between corporate elites and social movements in relation to environmental regulatory decision-making.

**Tactical Choices: Purchasing Access versus Cultivating Opposition**

The question of accessing and influencing decision-making structures yields very different results for industry and for social movement entities. Whereas industry has been able, through the leveraging of financial resources and political clout, to purchase access to politicians and legislators making chemical regulatory decisions, social movement actors have adopted measures to achieve influence by cultivating political pressure through public opinion and through a scaling down of regulatory efforts from the federal to the state level.

**Regulatory Failures, System Vulnerabilities and Corporate Elite Influence**

The failures of the current system to regulate toxic chemicals are far-reaching. The primary mechanism of chemical regulation, the Toxic Substances Control Act, and the standard
venues through which regulations are enforced- EPA and FDA- have largely failed to assess the safety of the majority of chemicals on the American market. With the percentage of the 80,000 plus chemicals in commerce assessed for safety in the single digits, little is known about the implications of the continued use of many chemical substances. The shortcomings of such policies and laws (including the reliance upon complex models of risk assessment and cost-benefit analysis, as well as the inability for such regulations to acknowledge differential impacts of chemicals on vulnerable populations or overburdened environmental justice communities) demonstrate the structural deficiencies and limitations inherent in the liberal regime of environmental regulation which has dominated the landscape of environmental policy since the 1970s. This liberal regime of environmental regulation privileges models of chemical control and assessment that do not reflect new developments in scientific research and are overly reliant upon rigid bureaucratic structures which are unable to adapt to changing circumstances. Although attempts have been made to revitalize and reform chemical control policies, little headway has been made in altering the landscape of federal chemical regulations.46

These regulatory failures have allowed the chemical industry to flourish and prosper as they manufacture chemicals with little or no oversight. These shortcomings are further problematic as the chemical industry has been able to leverage their financial prowess to maintain weak regulatory structures that facilitate the unrestrained production of chemical substances. Faber’s (2008) notion of the polluter industrial complex aides in explaining the processes by which the chemical industry has engaged in a range of activities that have restructured the state in ways that promote “cooperation” between government and business. Although Faber sets out a series of processes to explain how polluting industries colonize and

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46 On April 14, 2011 the most recent iteration of the TSCA reform bill, the Safe Chemicals Act, was introduced in Congress by Senator Frank Lautenberg. Previous versions of the bill have failed on numerous occasions.
restructure the state to best serve their interests, I chose to adapt his theory and explain the routes by which the chemical industry elite dominate state structures as three interrelated processes which include the Candidate Selection Process, the Opinion Shaping Process and the Science Shaping Process.

The first of these processes, the Candidate Selection process suggests that the chemical industry more generally, and the BPA industry specifically, have the financial capital necessary to aid politicians in their political campaigns. Chemical industry contributions to political campaigns number in the millions of dollars; a practice that cultivates support for chemical industry desires and renders many politicians beholden to corporate interests. Direct contributions are supplemented with the funding of lobbyists who create added pressure on politicians to meet anti-regulatory demands. The purchasing of political support contributes to the maintenance of ineffective regulatory policies and creates additional barriers to passing new legislation or toxic chemical bans.

The Opinion Shaping Process is the process whereby the chemical industry has attempted to influence the opinion of the public and that of politicians through the use of public relations campaigns. These campaigns attempt to clean up the image of the chemical industry or, in the case of BPA, advocate for the safety of the chemical through the creation of campaigns that suggest that no further chemical regulation is needed. Known in some instances as greenwash or astroturf campaigns, these public relations campaigns often manipulate or distort the efforts of environmental activists to raise concern over the chemical. BPA industry officials, in attempting to assure the public that BPA was safe, noted how important having a pregnant woman as a spokesperson would be given the notoriety of BPA as a health risk to children and infants. This process of influencing opinion, although a prominent tactic of the chemical industry, has largely
failed as the media and activists have repeatedly brought such deceptive practices to light. However, the more subtle strategy of the chemical industry “coming to the table” and agreeing for the need to reform chemical policies has allowed the industry to restore some of their lost authority, although critics note that this regulatory change of heart is largely baseless. This process demonstrates the ability of the chemical industry to be active on numerous fronts simultaneously; with much of their funds, energy and staff spent directly advocating their interests to political officials, the presence of a large and expensive public relations campaign regarding chemical substances (including BPA) illustrates the breadth and depth of the power of the chemical industry elite.

The third process through which the chemical industry has attempted to influence regulatory structures is the Science Shaping Process. This process of ideological control is achieved through the production of scientific data that serves corporate interests, and is also advanced when questions are raised regarding the validity of scientific research used to make policy decisions (Michaels, 2008; Rosner and Markowitz, 2002). This process is well documented in the case of BPA, where the industry has routinely developed their own research studies that find no evidence of harm from exposure to BPA, despite the fact that more than 200 non-industry funded studies have found negative effects, (vom Saal, 2009; Vogel, 2009). The chemical industry has also engaged in the practice of attacking individual scientists whose research suggests the need to control chemical risks as part of this process. Additionally, the chemical industry’s efforts to install business-friendly advisors on scientific regulatory panels further demonstrates the vulnerabilities inherent in environmental policy structures. This process is relevant and important in the effort to reform TSCA to be more protective of health and the environment, but is particularly insidious in the case of BPA, where scientific research is
relatively new; the ability of the chemical industry to challenge scientific findings can delay or prevent regulatory action, even where it is warranted.

Political Opportunities and BPA Campaign Activity

Where the chemical industry has been able to purchase their access to decision-making structures and have spent time and energy working to delay regulatory action through scientific distortion and public relations campaigns, environmental health activists have worked to achieve influence through different mechanisms that have required far fewer financial resources.

Recognizing the problems of the federal system of chemical regulations, environmental health activists were actively mobilizing around the issue of chemical policy reform in the early 2000s. At that time however, the opportunity to pursue such reforms at the national level was perceived to be nearly impossible. A Republican president and Congress that were unfriendly toward environmental causes and embraced neoliberal policies (e.g. those with a focus on deregulation, privatization, free market solutions and voluntary compliance) required social movement actors to rethink their decision to pursue federal legislation. The political constraints and limited opportunities for policy reform encouraged environmental health activists to alter their strategic endeavors- moving their target for improved regulation from the federal to the state level.

The lack of political opportunities encouraged activists to develop a new form of movement organizing that would, they believed, build momentum from the local to the national level; as different states passed different chemical policy bills, the message that the federal system of chemical control was broken would become more and more obvious to the American public. This new form of organizing, the chemical campaign, sought to bring together locally based activists and organizations from across the country in a collective effort to pass a
“patchwork” of regulations. While limited opportunities existed at the federal level—where politicians were more difficult to reach and were often invested in industry efforts to curtail regulations, activists believed that great political opportunities were present at the state level where social movement actors were themselves constituents of local politicians and where there was greater access to legislators. In working to implement this patchwork strategy, different movement organizations routinely adopted chemical campaigns where, in most cases, legislation regulating one chemical was pursued. Although a range of individual chemicals were chosen to facilitate the state-based policy battle, BPA was as a highly common chemical selected for campaigns because of its ubiquity in the consumer products and human bodies and for its endocrine disrupting properties. What therefore emerged was a BPA campaign supported and run by individual activists from interconnected, yet separate, environmental health organizations. The campaign can be characterized as a collective endeavor that has clearly defined goals which, once met, signify the end of the campaign and the redistribution of people and resources into a new campaign or project.

The development of this campaign was facilitated by the scaling back of legislative efforts from the national to the state level requiring individual states to work both independently to advance legislative goals and necessitating the establishment of a decentralized movement that connected geographically dispersed individuals and groups. The political opportunities that served as catalyst for a shift in movement strategies also informed the structure of the new movement effort that occurred; as different states began to organize around BPA, they also developed a networked organizational structure that facilitated the flow of information, the sharing of strategic goals, and cheap and efficient communication.
The adoption of this strategy and its concomitant mobilizing structure allowed organizers to conserve resources and created a cohesive and connected movement effort. The development of a technologically mediated infrastructure allowed collaborative decision-making and resulted in highly responsive and interactive moments of movement organizing. The result of such structures is that BPA campaigns have created a united front with frames and messages that have been consistently utilized nationwide, opening channels to policy-making structures and contributing to a highly visible public debate over the safety of BPA.

In generating new opportunities and opening up access to policy makers, BPA campaigners developed frames and messages that had widespread appeal. The adoption of narrowly devised frames that emphasized the physical harm BPA presented to children and which staunchly defended the scientific findings of endocrine disruptor research were strategically deployed through product testing reports and through the cultivation of mainstream and new social media. Such counter-hegemonic frames contributed to the evolution of the debate over BPA and created opportunities for BPA campaigners to advance support for policy reforms. Despite the critical nature of these counter-hegemonic frames, the purposeful use of simple and emotionally-laden frames regarding children’s health allowed for the instant adoption of these stories by the media and the public- this coverage in turn afforded BPA campaigners a legitimate and visible voice, opening up new opportunities to influence policy debates.

While the chemical industry has attempted to control policy discussions through force, financial clout and manipulation, environmental health activists have elected to deploy their limited resources in very strategic ways, developing targeted campaigns close to home and cultivating public opinion through the generation and repetition of resonant frames.
Deploying Science: The Importance of Scientific Expertise

Although the battle over BPA has primarily been a debate with industry forces competing with social movement entities to achieve political influence, the primacy of scientific information and scientists themselves cannot be underestimated. Both the chemical industry and social movement actors recognized the importance of utilizing scientific information to make cohesive arguments regarding BPA.

Industry efforts to control or manipulate science often hinged upon the sponsorship of new scientific research that contradicted the findings of endocrine disruption research. In some instances this has meant that the industry creates entirely new research studies while in other instances it has meant that the credibility of non-industry scientists has been attacked. Although most scientists would agree that scientific debate is healthy and that uncertainty in experimentation is to be expected, industry efforts to manipulate and challenge the large body of endocrine disruption research represent an attack on scientific practices that is highly problematic. In contrast, BPA campaigners have made substantial efforts to understand and translate the state of the art research being done on BPA into useful campaign frames instead of participating in a scientific debate. Rather, activists have worked closely with scientists to understand the ins and outs of the research and have routinely made efforts to frame or package the complex field of endocrine disruption research in ways that the public and legislators can understand. Importantly, these efforts have paid off as many of these frames have worked their way into media coverage and legislative hearings.

This scientific rendering process whereby research is translated by activists into manageable frames would be impossible without the participation and contributions of a number
of scientists who have been actively engaged in the effort to publicize the hazards of BPA exposure. These scientists have proved to be a pivotal component in social movement efforts to regulate BPA. The expertise they provide has aided movement actors in their efforts to render scientific information accessible, while their willingness to speak publicly during legislative debates or in media outlets has provided a sense of legitimacy to BPA campaign assertions and demands. Although the scientists working on BPA were often willing and able to participate in public ways, both activists and the scientists I spoke with noted the challenges scientists with public personas might face. Scientists and activists alike recognized the need for greater participation from scientific experts in the policy debates, a paradigm shift that is complicated by expectations from the scientific academy and made further complex when the chemical industry launched direct attacks on the reputations of outspoken scientists.

**Implications**

This research makes important contributions to the study of social movements and our understanding of power structures. In examining the interaction and tactical choices utilized in the battle over BPA, I have demonstrated the different ways that competing political forces may achieve influence in policy realms. As a contribution to social movement understandings of political opportunities, mobilizing structures and framing processes, this dissertation not only advances an understanding of the routes by which movement access decision-makers and agitate for policy change, but also serves as an important demonstration of the ways in which social movement actors can compete with powerful industry forces.

The study of political opportunities as advanced by McCarthy, Mayer and Zald (1996) has demonstrated how the interaction of forces external to social movements and internal
decision-making processes can influence the trajectory of social movement efforts (18-20). They note the need for “sketching the relationship between these factors…to yield a fuller understanding of social movement dynamics” (7). This dissertation has attempted to explore the interaction of these forces, demonstrating that the relationships between political opportunities, mobilizing structures and framing processes are indeed interactive. The political opportunities available to environmental health activists not only influenced the strategic choices made, but also contributed to the development of a networked mobilizing structure. The adoption of a decentralized state-based BPA campaign required new structures and new forms of interaction to be deployed and utilized in order for mobilization to occur. In turn, the presence of a network structure that joined diffuse forces together facilitated the framing processes that were utilized from state to state nationwide.

These findings demonstrate not only the continued relevance of political process theories in explaining movement dynamics, but also illustrate the importance of innovation and creativity in social movement organizing; the use of networked mobilizing structures reveals how advancements in organizing practices can allow resource poor movements to compete with more powerful oppositional forces. While social movement theories should continue to recognize the value and importance of the interactive elements of political process theories, environmental movements can also learn from this research.

Despite the overwhelming power and financial resources available to the chemical industry, BPA campaigns have remained a dominant and visible force in the chemical policy realm. With numerous state bills passed and dozens more currently in the legislative pipeline, the efforts of BPA campaign demonstrated here should be instructive to other environmental policy efforts. The narrowing of both movement goals and frames contributed to the easy adoption of
movement messages within numerous media outlets, while a networked mobilizing structure
allowed these finely honed messages to be repeated in numerous states across the country
simultaneously. In many other environmental policy debates, polluting or environmentally
harmful industries have arisen as powerful opposition to environmental regulations. The case of
BPA demonstrates how movements can adapt to changing opportunities and out-maneuver
industry forces when activists use creative and collaborative organizing strategies that open up
avenues of political influence. Important in the BPA policy debate has been the successful use of
scientific information and scientific expertise to make a clear case for regulation and well-
packaged frames that allow BPA campaigners to acquire an air of expertise and legitimacy in
public arenas such as the media. Although not all environmental policy debates will have the
same opportunities to mobilize as BPA campaigns have, the specific practice of shifting the scale
of movement targets, narrowing frames, and cultivating scientific expertise should serve as
lessons in future environmental policy debates.

Along with the study of social movements, this research should contribute to the ongoing
understanding of chemical policy in the U.S. The current system of regulation is inadequate to
the task of controlling and assessing chemical risks. The volume of chemicals in commerce, the
global proliferation of chemicals, and the ongoing “chemicalization” of everyday life has
resulted in an environment in which every living being is now born with a chemical body
burden. Ulrich Beck (1992) has written of the inevitability of risk in modern capitalist society
and suggests, “the promise of security grows with the risks and destruction and must be
reaffirmed over and over again to an alert and critical public through cosmetic or real
interventions in the techno-economic development” (20). Modernization thus brings with it
numerous benefits- a reduction in disease and mortality rates, increased inefficiency in various
arenas of life, greater access to a variety of goods and services—although such benefits come with great risks. BPA represents a perfect example of the necessary reaffirmation required from an ongoing reliance on chemical substances, but also demonstrates the increasingly difficult prospect of controlling the system of chemical production of which BPA is a part. While measures to control or reduce the use of BPA are real interventions, they are actually more cosmetic in that they are but one miniscule component of the chemical universe. The shortcomings of TSCA contribute to the inability of capitalist systems to adequately control risks; the complexity of the problem of chemical proliferation is such that anything but a complete shift in regulatory practices will not reduce this problem. The continued reliance upon a liberal model of chemical regulation prevents the development of new policies that might better control chemical risks. However, as this research demonstrates, the power and dominance of the chemical industry elite in controlling or interfering with environmental policy debates severely limits the likelihood that anything but the most cosmetic of policy changes is likely to occur at the federal level in the current political climate. This research, while highlighting the weaknesses of current regulatory policies, also demonstrates the problematic vulnerabilities of a regulatory system that continues to allow corporate interference in political realms.

Given the problems inherent in our current system of regulation and the dominance of corporate elites in environmental policy realms, the best chance for meaningful policy changes includes a revitalization of our current approach to regulating toxic chemicals. Rather than attempting to control chemical risks through the use of technological models, it would be more advisable to reduce our reliance upon toxic chemicals and ensure that the risks of the chemicals we do use are as well understood as possible. The efforts of the BPA campaign illustrate the importance of public dialogue surrounding toxic chemicals and, while increasing the scientific
literacy of the general public, also serve to influence the evolution of chemical policies in the U.S. The range of social movement organizations, scientists, legislators and laypersons who have begun to call attention to the lack of chemical control policies is the first step in moving to cleaner forms of production and chemical use. Although there are many barriers to chemical policy reform, the existence of the BPA campaign and the broader environmental health movement provide some promise that we do not have to accept excessive chemical contamination as an inevitable byproduct of modern living.

**Areas of Future Study**

Although this dissertation was designed to explore the two sides of the battle over BPA, the act of including both oppositional forces has limited the extent to which the dynamics of either can be fully articulated. There are many areas in which future research could seek to address the issues and concepts that arose during the course of this work. To begin, the practice of studying the chemical industry elite was limited; I had no opportunities to access or interview any chemical industry officials myself. In relying upon publicly available documents and records, the specific motivations and meanings behind the actions of industry groups and officials are unclear. Future research should attempt to truly “study up” and interview or observe the actions and practices of the chemical industry first hand. Doing so might provide a more comprehensive understanding of the chemical industry’s efforts to influence policy debates.

Similarly, the use of BPA as a case study for exploring chemical policy debates would benefit from a closer analysis. Had this been a traditionally structured social movement dissertation, I might have spent more time on the other practices of BPA campaigns, their intimate connection to the broader environmental health movement, and the intricacies of the
relationships among organizers, scientists and legislators. Theories of resource mobilization and new social movements are relevant to many of the movement dynamics I observed and could certainly be further theorized.

Scientific expertise has been a central component of this research. In the future it would be beneficial to clarify and expand upon the work of engaged scientific researchers who participate in policy debates. Questions remain regarding their motivation to participate, the reality of what being a publicly active scientist means for an academic career, and how environmental activists might be best situated to collaborate and learn from scientific experts. Future research should work to clarify these questions and develop recommendations for how interactions between scientists and policy domains might best be achieved.

Along with this, the notion of the science shaping process should be further theorized. There is ample evidence of this practice within environmental policy realms and the continued development of this notion would serve to support efforts to increase transparency in the regulatory process and could generate ideas for how to reduce corporate meddling in scientific and regulatory realms.

Finally, this research would benefit from comparative studies that explore how similar dynamics play out in other environmental policy debates or similar chemical campaigns. For example, some of the same activists working on BPA campaigns have also worked on other individual chemical campaigns. Research that explored similarly constructed campaigns would help to clarify how the gains of the BPA campaigns are specific to this campaign and which movement practices and successes are attributable to movement dynamics observed here. Continuing to study chemical policy debates and the capacity for regulatory change to occur is
vital to creating a healthier and more environmentally equitable society. Highlighting the deficiencies and vulnerabilities within our regulatory system and clarifying how social movements and the general public can demand more protective policies will continue to be an important project for sociologists, for activists, and for the general public.
APPENDIX A: INTERVIEW GUIDE

Below are the questions used to guide the interview process. For individuals who fit into neither category, questions were altered or changed to best meet the interests of the interviewee. As this is merely a guide, additional questions or topics came up in the course of conversation and may not be reflected in these questions.

For BPA Campaigners:

1. Tell me a little bit about how you got involved working with BPA and describe what you’re currently doing.

2. How would you describe the current effort to regulate BPA?

3. How do you connect with other people working on BPA campaigns?

4. Where do you get information about BPA? How do you share information with others?

5. What role does technology play in your work with BPA?

6. What role does scientific expertise play in your work?

7. Much of the BPA work to date has targeted state-based efforts to regulate BPA. How was this strategy decided upon and how has the recent federal level emphasis impacted your work?

8. Where does funding for your work come from and how does that complicate or facilitate your work?

9. BPA efforts have been highly successful in the mainstream media. Why do you feel that is?

10. Assuming that the regulation of BPA is the goal of this work, what do you see as the primary barriers to passing regulation at the state or federal level?

11. What are the broader goals of BPA efforts outside of legislation?

12. Anything else you’d like to add about your BPA work?
For Scientists:

1. What is your history studying BPA? What are your primary research areas?
2. What do you feel your role as a scientist is in studying environmental health issues? Who is your audience?
3. What role do you think BPA science has played in regulatory debates over BPA?
4. How have you interacted with state-based BPA organizers?
5. What does the term “independent science” mean to you?
6. Are there limitations or barriers to doing publicly engaged scholarship?
7. Is public service of this nature recognized or rewarded in your line of work? Are your colleagues supportive?
8. What are your visions for the future of BPA research?
### APPENDIX B: STATE AND MUNICIPALITY LEGISLATION

States with Passed Bills (also includes information on all introduced bills in those states)

<table>
<thead>
<tr>
<th>State</th>
<th>Bill #</th>
<th>Date Introduced</th>
<th>Description</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Connecticut</td>
<td>H.B. 6572</td>
<td>3/24/2009</td>
<td>Banning any children's products containing BPA marketed for the use of children under the age of three years; prohibiting the replacement of the use of BPA with certain carcinogenic substances; banning any reusable food containers or jars or cans containing food or beverage products that contain BPA; requiring the labeling of certain products containing BPA.</td>
<td>Signed into law 6/3/09</td>
</tr>
<tr>
<td></td>
<td>H.B. 5499</td>
<td>1/22/2009</td>
<td>Prohibiting the sale of children's products intended for children age three or younger that contain BPA.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>S.B. 791</td>
<td>2/2/2009</td>
<td>Banning any children's products containing BPA that are marketed for the use of children under the age of three years.</td>
<td></td>
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<tr>
<td>Maryland</td>
<td>H.B. 15</td>
<td>1/14/2009</td>
<td>Includes baby bottles, sippy cups and children's toys; Prohibiting the manufacture, sale, or distribution of child care articles containing BPA; requiring a person to use the least toxic alternative; prohibiting a person from using specified carcinogens or specified reproductive toxicants when complying with the Act; requiring a manufacturer to indicate conspicuously on the child care article that the article does not contain BPA; providing for a penalty; etc.</td>
<td>Signed into Law 4/13/10</td>
</tr>
<tr>
<td>State</td>
<td>Bill</td>
<td>Date</td>
<td>Description</td>
<td>Signed into law</td>
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<tr>
<td>New York</td>
<td>S03296H</td>
<td>3/13/2009</td>
<td>Bottles, sippy cups, straws - anything used in a reusable beverage container for kids ages 3 and under - and pacifiers</td>
<td>7/30/10</td>
</tr>
<tr>
<td></td>
<td>A.B. 6919</td>
<td>3/17/2009</td>
<td>BPA-Free Children and Babies Act. Prohibiting the manufacture, distribution and sale of child care products and toys containing BPA; prohibiting the manufacture, distribution and sale of beverage and food containers containing BPA; requiring product labeling.</td>
<td>7/30/10</td>
</tr>
<tr>
<td>Vermont</td>
<td>S. 247</td>
<td>1/5/2010</td>
<td>Bans BPA from bottles, sippy cups, formula containers and baby food jars as of July 2012</td>
<td>5/19/10</td>
</tr>
<tr>
<td></td>
<td>H.B. 373</td>
<td>3/17/2009</td>
<td>Prohibiting the manufacture, sale, or distribution in commerce of any food or beverage container, child care article, or toy containing BPA in any concentration.</td>
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<tr>
<td></td>
<td>S.B. 76</td>
<td>2/10/2009</td>
<td>Prohibiting the manufacture, sale, or distribution in commerce of any food or beverage container, child care article, or toy containing BPA in any concentration; requiring the use of the least toxic alternative when replacing BPA.</td>
<td></td>
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<tr>
<td>Washington</td>
<td>S.B. 6428</td>
<td>1/4/2010</td>
<td>Bans BPA from bottles, sippy cups, sports water bottles</td>
<td>3/19/10</td>
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<tr>
<td></td>
<td>H.B. 1180</td>
<td>1/14/2009</td>
<td>Prohibiting the manufacture, distribution, or sale of certain food and beverage containers containing BPA intended for children three years and under; prohibiting the manufacture, distribution, or sale of all sports bottles containing BPA.</td>
<td></td>
</tr>
</tbody>
</table>
S.B. 5282  1/19/2009  Prohibiting the manufacture, distribution, or sale of certain food and beverage containers containing BPA intended for children three years and under; prohibiting the manufacture, distribution, or sale of all sports bottles containing BPA.

Wisconsin  S.B. 271  8/21/2009  Ban in Baby bottles and sippy cups plus a label indicating it is BPA Free  Signed into Law 3/5/10

### Municipality Legislation

<table>
<thead>
<tr>
<th>Municipality</th>
<th>Description</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chicago</td>
<td>Prohibits the sale of empty containers composed of BPA by amending the Municipal Code of Chicago § 7-28.; Bans BPA from baby bottles, sippy cups</td>
<td>Signed May 2009</td>
</tr>
<tr>
<td>Suffolk County</td>
<td>Bans sale of children's beverage containers containing BPA; Prohibiting the sell or offer for sale children’s beverage containers that contain BPA within the County of Suffolk.</td>
<td>Signed May 2009</td>
</tr>
<tr>
<td>Albany county</td>
<td>Bans sale of children's beverage containers containing BPA</td>
<td>Adopted August 2009</td>
</tr>
<tr>
<td>Schenectady</td>
<td>Bans sale of children's beverage containers containing BPA</td>
<td>Approved July 2009</td>
</tr>
<tr>
<td>Dutchess County, NY</td>
<td>Bans sale of children's beverage containers containing BPA</td>
<td>Passed Board of Supervisors but County Executive didn't sign</td>
</tr>
</tbody>
</table>
Annapolis, MD  Notification of BPA in products; introduced by Mayor Ellen Moyer--changed to voluntary program  Did not pass

Rockland County, NY  Baby bottles and sippy cups  Passed

San Francisco  Asks retailers to remove baby bottles containing BPA  Passed 2006

Washington DC  Bans the use of BPA in baby bottles and sippy cups  Ongoing

<table>
<thead>
<tr>
<th>State</th>
<th>Bill #</th>
<th>Date Introduced</th>
<th>Description</th>
<th>Status</th>
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</thead>
<tbody>
<tr>
<td>Hawaii</td>
<td>H.B. 796</td>
<td>1/24/2009</td>
<td>Prohibiting the manufacture, sale, or distribution of toys and child care articles containing certain toxic chemicals; requiring manufacturers to use the least toxic alternatives.</td>
<td>Carried to 2010 session</td>
</tr>
<tr>
<td>Hawaii</td>
<td>H.B. 1633</td>
<td>1/28/2009</td>
<td>Requiring the Legislative Reference Bureau to perform a study, working with information from the Centers for Disease Control investigating the risks involved in the use of BPA in consumer products, including children's toys and childcare products.</td>
<td>Carried to 2010 session</td>
</tr>
<tr>
<td>Hawaii</td>
<td>S.B. 815</td>
<td>1/23/2009</td>
<td>Prohibiting the manufacture, sale, or distribution of toys and child care articles containing certain toxic chemicals; requiring manufacturers to use the least toxic alternatives.</td>
<td>Carried to 2010 session</td>
</tr>
<tr>
<td>Illinois</td>
<td>H.B. 6088</td>
<td>2/11/2010</td>
<td>Includes baby bottles, sippy cups, formula and baby food containers as well as all reusable food containers. Also requires labeling provision for all food containers</td>
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<tr>
<td>Bill</td>
<td>Date</td>
<td>Description</td>
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<tr>
<td>H.B. 2485</td>
<td>4/3/2009</td>
<td>Child-Safe Chemicals Act. Prohibiting the sale or distribution of products intended for a child under three years of age that are used to contain food or liquid if the product contains BPA.</td>
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<tr>
<td>S.B. 2170</td>
<td>2/20/2009</td>
<td>Child-Safe Chemicals Act. Prohibiting the sale or distribution of products intended for a child under three years of age that are used to contain food or liquid if the product contains BPA.</td>
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<tr>
<td>H.R. 154</td>
<td>3/4/2009</td>
<td>Urging the FDA to expedite its current review of the safety of BPA in products that contact food and to take appropriate action based on its findings.</td>
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<tr>
<td>S.R. 130</td>
<td>3/6/2009</td>
<td>Urging the FDA to expedite its current review of the safety of BPA in products that contact food and to take appropriate action based on its findings.</td>
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<tr>
<td><strong>Massachusetts</strong></td>
<td></td>
<td>Administrative action by the Department of Public Health issued limited ban on baby bottles sippy cups in March 2010. Trying to get formula included in ban proposed in March 2010</td>
<td></td>
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<tr>
<td>H.B. 2068</td>
<td>1/19/2009</td>
<td>Establishing regulations categorizing BPA as a hazardous substance when it is contained in toys or child care items manufactured, sold, or distributed in the Commonwealth.</td>
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<tr>
<td>S.B. 432</td>
<td>1/19/2009</td>
<td>Prohibiting the manufacture, sale or distribution in commerce of any toy or child care article that is intended for use by a child under three years of age if that product contains BPA.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>State</td>
<td>Bill/Act</td>
<td>Date</td>
<td>Prohibition</td>
<td></td>
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<tr>
<td>Michigan</td>
<td>H.B. 4522</td>
<td>3/10/2009</td>
<td>Prohibiting the manufacture, distribution, or sale of any bottle, cup, or other container that contains BPA at a level above 0.1 parts per billion, if the container is designed or intended to be filled with any liquid, food, or beverage primarily for consumption from such container by infants or children three years of age or younger.</td>
<td></td>
</tr>
<tr>
<td>Missouri</td>
<td>H.B. 848</td>
<td>2/24/2009</td>
<td>Prohibiting the manufacture, distribution, or sale of any bottle, cup, or other container that contains BPA at a level above 0.1 parts per billion, if the container is designed or intended to be filled with any liquid, food, or beverage primarily for consumption from such container by infants or children three years of age or younger.</td>
<td></td>
</tr>
<tr>
<td>New Jersey</td>
<td>A.B. 3646</td>
<td>1/13/2009</td>
<td>Prohibiting the use of “toxic-free” labeling on children’s products containing BPA.</td>
<td></td>
</tr>
<tr>
<td>New Mexico</td>
<td>H.B. 225</td>
<td>1/22/2009</td>
<td>Prohibiting the sale of children's toys that contain certain levels of BPA.</td>
<td></td>
</tr>
<tr>
<td>Oregon</td>
<td>H.B. 2367</td>
<td>1/12/2009</td>
<td>Prohibiting the sale or distribution of children's product that contain BPA in a concentration that exceeds 0.1 parts per billion.</td>
<td></td>
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<tr>
<td>Pennsylvania</td>
<td>H.B. 221</td>
<td>2/3/2009</td>
<td>Prohibiting the manufacture, distribution, or sale of food and beverage containers containing BPA at a concentration that exceeds 0.1 parts per billion intended for children three years and under.</td>
<td></td>
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<tr>
<td></td>
<td>H.R. 94</td>
<td>2/24/2009</td>
<td>Urging Congress and the FDA to encourage the use of reduced BPA in the manufacture of plastic food containers and bottles and to eliminate the importation, sale and advertising of polycarbonate baby bottles.</td>
<td></td>
</tr>
<tr>
<td>State</td>
<td>Bill Number</td>
<td>Date</td>
<td>Description</td>
<td></td>
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<tr>
<td>Rhode Island</td>
<td>H.B. 5038</td>
<td>1/8/2009</td>
<td>This act would prohibit the manufacturing, sale or distribution of certain toys or child care articles containing BPA; requiring a person to use the least toxic alternative; prohibiting a person from using certain carcinogens or certain reproductive toxicants in child care articles and/or toys.</td>
<td></td>
</tr>
<tr>
<td>H.B. 5132</td>
<td>1/22/2009</td>
<td></td>
<td>Banning the use of BPA from all products intended for use by children, such as teething and toys.</td>
<td></td>
</tr>
<tr>
<td>Texas</td>
<td>H.B. 792</td>
<td>1/26/2009</td>
<td>A product containing BPA shall be conspicuously labeled with the warning: &quot;This product contains bisphenol-A, a chemical that has been shown to be a developmental, neural, and reproductive toxicant.&quot;</td>
<td></td>
</tr>
<tr>
<td>H.B. 1524</td>
<td>2/19/2009</td>
<td></td>
<td>Prohibiting the manufacture or sale of certain products intended for children three years and under.</td>
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<tr>
<td>H.B. 2775</td>
<td>3/9/2009</td>
<td></td>
<td>Prohibiting the manufacture or sale of certain products intended for children three years and under.</td>
<td></td>
</tr>
</tbody>
</table>

**Pending and Introduced Federal Legislation**

<table>
<thead>
<tr>
<th>Date</th>
<th>Bill Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>3/12/2009</td>
<td>S. 593</td>
<td>Treating BPA as adulterating the food or beverage. Applicable to all food and beverage containers.</td>
</tr>
<tr>
<td>3/16/2009</td>
<td>H.R. 1523</td>
<td>Treating BPA as adulterating the food or beverage. Applicable to all food and beverage containers.</td>
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</tbody>
</table>
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