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## **Mass Media, Social Control, and Health Behavior Change: A Longitudinal Analysis of Media Effects on Drunk-Driving Behavior, 1978-1995**

Itzhak Yanovitzky

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# Mass Media, Social Control, and Health Behavior Change: A Longitudinal Analysis of Media Effects on Drunk-Driving Behavior, 1978-1995

## Abstract

Previous research in the area of public health communication has predominantly focused on a direct association between information in the media and health behavior change. The dissertation seeks to broaden this theoretical framework by examining complementary routes of media effects on behavior. Specifically, it is argued that by stimulating response from social institutions and facilitating change in the social acceptability of problem behaviors, the media may set in motion formal and informal mechanisms of social control that lead to behavior change. This proposition was tested in relation to the decline in drunk-driving (DO) behavior in between 1978 and 1995. In the first step, an elaborated content analysis procedure revealed that the grassroots movement against DO was instrumental in setting the media agenda for the DO problem but was no more influential than policy-makers. In the next step, the results demonstrated that policy-makers' actions followed the frames and solutions advocated in the media and that the impact of news stories on policy-makers' attention and behavior was primarily manifested in periods of intensive policy-making. The third step of the analysis tested hypotheses regarding the media's contribution to the emergence of an unequivocal social norm against DO. The findings suggested a small independent contribution of media coverage to social disapproval of DD but could not convincingly distinguish between a direct effect (through social learning) and a mediated effect (through social interaction). In the final step, an analysis of all three routes of media effects on DD behavior (i.e., media-behavior, media-policy-behavior, and media-norm-behavior) provided some compelling evidence of mediated media effects on DO behavior and some ambiguous findings regarding direct media effects. In addition, there was evidence that media effects on DO behavior varied by the level of resistance demonstrated by drivers of different age groups to different types of social control efforts. Overall, the results of this study support the argument that by neglecting to consider media effects on health behavior change that are mediated by other social structures, previous studies may have underestimated the contribution of mass communication channels to processes of health behavior change.

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Robert Hornik

MASS MEDIA, SOCIAL CONTROL, AND HEALTH BEHAVIOR CHANGE:  
A LONGITUDINAL ANALYSIS OF MEDIA EFFECTS ON DRUNK-DRIVING  
BEHAVIOR, 1978-1995

Itzhak Yanovitzky


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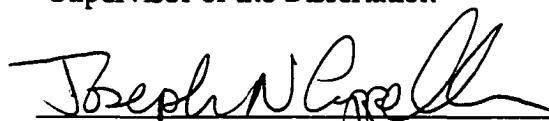
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Communications

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2000

  
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## ABSTRACT

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Itzhak Yanovitzky

Robert Hornik

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## CHAPTER 1

### THE SEARCH FOR MEDIA EFFECTS ON HEALTH BEHAVIOR

Many communication researchers and public health professionals share the belief that the mass media are an important tool for promoting healthier behaviors and lifestyles (Atkin & Wallack, 1990; Brown & Walsh-Childers, 1994; Flay & Burton, 1990; Flora & Cassady, 1990; Gochman, 1997; Hornik, 1997; Lapinski & Witte, 1998; Rice & Atkin, 1989; Rogers, 1996; Snyder et al., 1999). Mass communication outlets have been used in health promotion efforts for many years (Brown & Einsiedel, 1990) and public health communication campaigns have continuously grown in scope and level of sophistication (Lapinski & Witte, 1998). However, whereas dramatic reductions in the prevalence of many risky health behaviors have been recorded over the past several decades (CDC, 1999), research to date remains ambiguous about the contribution of media-based health promotion efforts to these improvements in public health (Atkin & Wallack, 1990; Backer, Rogers, & Sopory, 1992; Brown & Einsiedel, 1990; Hornik, 1997; Lapinski & Witte, 1998; Wallack, 1990b).

This ambiguity is largely a consequence of conflicting empirical evidence about the efficacy of media-based interventions (Atkin & Wallack, 1990; Brown & Walsh-Childers, 1994; Hornik, 1996; Hornik, 1997; Snyder et al., 1999). On one hand, evaluations of comprehensive, well-controlled interventions such as the Stanford Five City Project (Farquhar et al., 1990), the Minnesota Heart Health Program (Luepker et al., 1994), and the Community Intervention Trial for Smoking Cessation (COMMIT, 1995) generated evidence of small or no effects of campaign messages on behavior. In contrast, evaluations of uncontrolled interventions such as the National High Blood

Pressure Education and Control Program (McGovern et al., 1992), the Swiss Stop AIDS campaign (Dubois-Arber, Jeanin, Konings, & Paccaud, 1997), the Netherlands AIDS program (deVroome et al., 1990), and the anti-smoking media campaign in California (Hu, Sung, & Keeler, 1995) found considerable associations between the presence of media messages and health behavior change.

There are several ways to reconcile these contradictory findings. As noted by Hornik (1997), it is tempting to reject the evidence of media effects from uncontrolled evaluations and conclude that public health communication has very little power to promote health behavior change. Health communication scholars, however, seem to agree that this conclusion is premature and that alternative explanations should be explored (Atkin & Wallack, 1990; Hornik, 1997; Rice & Atkin, 1989; Rogers, 1996; Snyder et al., 1999; Wilde, 1993). Some (e.g., Flay & Cook, 1989; Hornik, 1997; Snyder et al., 1999) have argued that many controlled evaluations are not sensitive enough to detect media effects on behavior because they typically rely on small samples and focus on short-term effects. Others (e.g., Backer et al., 1992; Brown & Einsiedel, 1990; Flay & Burton, 1990; Maibach & Parrot, 1995; Valente, Paredes, & Poppe, 1998) have faulted poor message design for the inability of deliberate health communication campaigns to produce change in health-related attitudes and beliefs that underlie risky health behaviors. Finally, there are those (Hornik, 1996; Snyder et al., 1999) who have demonstrated that campaign messages produced by the aforementioned controlled trials have provided only a very small increase in the level of individual exposure to behavior-related information compared to exposure to similar information in national and local media.

## The Research Problem

Each of the alternative explanations presented above provides important insights into some of the obstacles facing efforts to promote health behavior change through public health communication campaigns. Recent contributions to the literature (e.g., Atkin & Wallack, 1990; Backer et al., 1992; Brown & Einsiedel, 1990; Donohew, 1990; Flay & Burton, 1990; Lapinski & Witte, 1998; Maibach & Parrot, 1995; Snyder et al., 1999) have transformed this acquired knowledge into practical recommendations. Campaign managers are, thus, encouraged to adopt realistic expectations of effect size when devising media-based interventions (Hornik, 1997; Snyder et al., 1999); to incorporate into the process of health messages' design some of the recent insights on the importance of audiences' preexisting motivation, attitudes and behavior to information processing (Flay & Burton, 1990; Lapinski & Witte, 1998; Maibach & Parrot, 1995; McGuire, 1989; Rothman & Salovey, 1997; Valente et al., 1998); and to increase exposure to campaign messages by utilizing a combination of different media and diffusion of information mechanisms within social networks (Hornik, 1996; Schooler, Chaffee, Flora, & Connie, 1998; Valente, 1995).

In essence, then, this set of recommendations is aimed primarily at increasing the *effectiveness* of public health communication campaigns and, as such, may prove to be valuable in designing future media-based interventions that are better equipped to produce more favorable behavioral outcomes. At the same time, however, this theoretical and empirical focus does little to advance our understanding of the different ways through which mass media of communication influence health behavior. Specifically, by focusing primarily on a single model of media effects (i.e., a direct effect model), this line of research overlooks other potential routes of media effects on

behavior and, thus, may be underestimating the media's impact on behavior change. To fully understand this argument, it is useful to begin by reexamining the typical conceptual framework of media effects that has been guiding the majority of public health communication interventions to date.

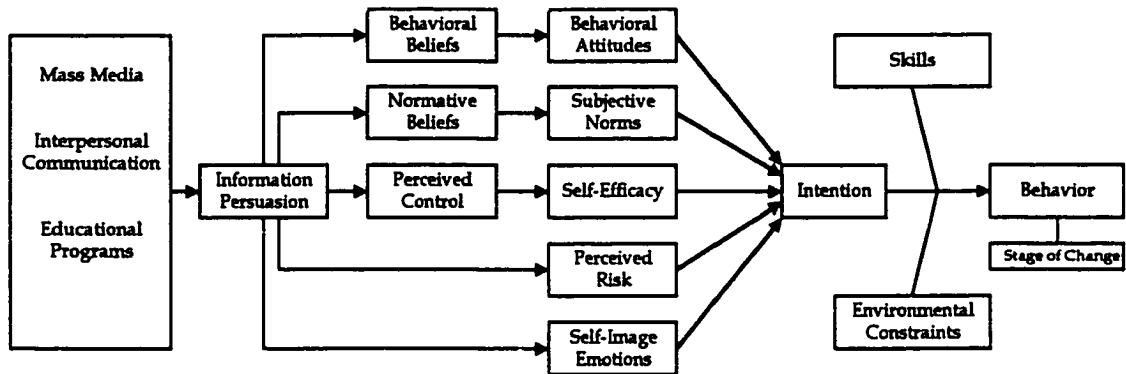


Figure 1.1: An integrative cognitive model of health behavior change

The model of media effects typically utilized in health promotion efforts is deeply rooted in influential theories of behavior change such as the Theory of Reasoned Action (Fishbein & Ajzen, 1975) and its recent extension - the Theory of Planned Behavior (Ajzen, 1985), the Health Belief Model (Becker, 1974; Rosenstock, 1990), Social Cognitive Theory (Bandura, 1986), and Stages of Change Theory (Prochaska, DiClemente, & Norcross, 1992). These theories share a common focus on cognitive elements (attitudes, beliefs, and intentions) as precursors of individual behavior. The model presented in Figure 1.1 integrates a limited number of key elements from these theories that are widely recognized to be important in understanding and explaining behavior change (see Fishbein et al., 1992). Whereas an exhaustive discussion of these theories is beyond the scope of the current research project (see Gochman, 1997), it is suffice to note that, taken together, the model's elements propose that change in

outcome expectancies (i.e., beliefs about the costs and benefits of performing a certain behavior) must precede change in individual behavior. Research to date has provided ample support of this basic proposition, demonstrating that change in outcome expectancies following individual exposure to relevant information often leads to change in respective behavioral attitudes and intentions and, under certain conditions, to changes in the behavior itself (Kim & Hunter, 1993; Maddux & DuCharme, 1997; Reich, Erdal, & Zautra, 1997; Strecher, Champion, & Rosenstock, 1997).

From a cognitive point of view, then, a sensible use of mass communication channels to promote health behavior change involves attempts to increase individual knowledge of outcomes associated with performing a certain behavior as well as to facilitate the acquisition of relevant skills (Lapinski & Witte, 1998). In other words, there is an underlying expectation that the media, serving as an instrument for the dissemination of persuasive health information to the public, will help increase public awareness of potential costs or benefits that are associated with performing a certain health behavior (i.e., facilitate individual learning) and, subsequently, set in motion cognitive mechanisms of behavior change.

The expectation that media messages will influence health behavior directly is both legitimate and plausible. It is also clear that, under certain circumstances, such as a relatively simple behavior change or an adoption of a new practice, this expectation is likely to materialize (Andreasen, 1997; Hornik, 1997). Nonetheless, it is important to recognize that while a direct media effect model may logically complement theories of behavior change, it is by no means the only plausible model of media effects from a communication point of view. In fact, communication theory has long recognized the limits of media to change behavior directly (Katz & Lazarsfeld, 1955; Klapper, 1960;



McGuire, 1986). For one, a person's decision to purchase a product, vote for a certain candidate, or seek a particular lifestyle is based upon a number of factors, not simply personal knowledge acquired from the mass media (Holder & Treno, 1997). For another, mass communication channels seem to be particularly influential in setting the social agenda and promoting social and cultural change (Dearing & Rogers, 1996; Gerbner, Gross, Morgan, & Signorielli, 1986; Wright, 1986). These two related observations suggest that, in addition to their direct impact as agents of information and persuasion, the mass media are also (or even primarily) capable of influencing behavioral decisions indirectly, by influencing the social and cultural context that surrounds behaviors.

This idea represents the current study's point of departure. It may be argued that if some or even most of the media's impact on health behavior is mediated rather than direct, health communication researchers may be underestimating this impact by focusing on direct media effects. The research question addressed in this study concerns, therefore, the plausibility of mediated routes of media effects on health behavior. More specifically, this study aims to demonstrate that the mass media, through their influence on other social structures in society, can facilitate change in the social and cultural context that surrounds health behaviors and, subsequently, shape people's health decisions.

### **The Study's Rationale: The Media as Agents of Social Control and Social Change**

In one way or another, most theories of media effects view the mass media as either an agent of social change or an agent of social control (Demers & Viswanath, 1999). A common thread that runs through contemporary media effects theories is the

notion that the power of the media to promote social and cultural change, as well as to exercise social control on individuals, emanates from the important functions they carry out in modern societies. Among other things, the media are said to be an important source of information and knowledge in society (Rogers, 1996), a primary agent of socialization (Wright, 1986), a cultural signifier (Gerbner et al., 1986), a public opinion leader (Dearing & Rogers, 1996; Lippman, 1922), and a champion of social problems and social wrong-doings (Protest et al., 1991). These functions, no doubt, place the mass media in a central position to promote social and cultural change in society (Katz & Szecsko, 1980; Rosengren, 1986). Still, because media organizations are highly responsive to the interests of elites, media products, intentionally or unintentionally, construct a social reality that generally serves the interests of the groups in power (Fishman, 1980; Gans, 1979; Gerbner et al., 1986; Gitlin, 1980; Herman & Chomsky, 1988; Tuchman, 1978). It follows, that the mass media are, in reality, agents of social control that support the existing social, economic and political order and reinforce dominant values and norms (Donohue, Tichenor, & Olien, 1973; Gerbner et al., 1986; Gitlin, 1980; Herman & Chomsky, 1988).

There is some ambiguity, then, regarding the role of the mass media as agents of social change and social control. Social change implies change in social structure and social behavior and, therefore, proposes a dynamic view of the media's role in society. In this framework, the media are seen as a powerful agent of modernization and development (Schramm, 1964), an important tool of social planning (Rogers, 1973), and a social arena through which social movements and grassroots activists communicate their demands for change and challenge the current social order (Hilgartner & Bosk, 1988; Katz & Szecsko, 1980). In contrast, social control suggests conformity and

preservation of the current social order by way of hegemony (Gitlin, 1980; Gramsci, 1971; Herman & Chomsky, 1988; Williams, 1991), thus, assigns a static role to the mass media in society. Both views, however, fail to explain a social reality in which social change and social control coexist and result in gradual improvements in the status of relatively powerless groups (e.g., ethnic and racial minorities, women, etc.). It is not surprising to discover, therefore, a growing consensus among social scientists that social control and social change go hand in hand (Alexander & Seidman, 1990; Giddens, 1984) and that the media's role as agents of social change cannot be divorced from their role as agents of social control (Demers & Viswanath, 1999). The focus of research, then, is destined to shift away from deciding whether the mass media are agents of social control or change to identifying the social circumstances that place the media in a position to initiate or promote social control through social change and vice versa.

How is this discussion linked to public health communication and the prospects of health behavior change? The answer is through the assumption that any social effort to promote change in individual health behavior is, in fact, an act of social control designed to ensure that people behave in a manner that conform to social conventions and safeguard the well-being of society. One can take this proposition further by organizing social control efforts according to their level of coercion on a continuum ranging from voluntary to forced social control. Voluntary social control is based on the assumption that well-socialized individuals are capable of regulating their own behavior, and are likely to do so, when presented with relevant information regarding the social and individual consequences of performing a certain behavior. Moreover, since people tend to reach behavioral decisions in a rational manner, the most cost-

effective strategy to control their behavior is by imparting persuasive information to the public via mass communication channels.

This static view of the role of the mass media in society (i.e., as an agent of social control) has been, and still is, guiding the majority of public health communication campaigns. With few exceptions, however, this approach has not been successful in promoting health behavior change (Wallack, 1990b). It may very well be that people are easily convinced to use aspirin substitutes instead of aspirin in children to avoid the risk of contracting Reye's Syndrome (Soumerai, Ross-Degnan, & Spira Kahn, 1992) or to change the sleeping positions of infants to reduce deaths associated with Sudden Infant Death Syndrome (SIDS) (Engelberts, de Jonge, & Kostense, 1991). But they follow the recommendation of public health agencies in these and similar cases (e.g., receiving a flu shot) because their own interests happen to match those of society. Things are different when individual and social interests are at odds. Many behaviors, including many lifestyle behaviors (e.g., consumption of alcoholic beverages, driving a vehicle, and smoking), provide a number of important social and personal benefits to individuals who perform them, yet, when abused or inappropriately performed, jeopardize the well-being of other members of society. In such instances, people are less likely to change their behavior as a result of persuasion efforts, and individual conformity is sought by employing additional means of social control (i.e., formal and informal sanctions) that involve change on the part of social institutions. In other words, for society to increase levels of social control on people's behavior requires some type of social change. Social change, in turn, implies a more dynamic role for the mass media in the process of controlling behavior.

## Social Control of Risky Health Behaviors: A Macro-Level Approach

A more dynamic view of the mass media's contribution to health promotion efforts would recognize that the mass media play an influential role in initiating and coordinating social efforts to control risky health behaviors. There are two main mechanisms through which the media perform this role. The first is the gatekeeping function of the media or the process through which media organizations control the flow of information in society (Shoemaker, 1991). Most macro-level formulations treat the media's agenda as a public arena within which different issues compete for recognition as public problems (Hilgartner & Bosk, 1988). Due to the media's limited capacity to simultaneously accommodate a large number of public issues (McCombs, Danielian, & Wanta, 1995), the selection of issues that receive considerable media attention is guided by a limited number of criteria that are universally employed by media personnel. These criteria typically include the presence of conflict, the makings of drama, the focus on a personal angle, proximity (or local angle), novelty, popular taste, and interests of owners and advertisers alike (Baker, 1984; Fishman, 1980; Gamson, 1992; Gans, 1979; McManus, 1994; Tuchman, 1978). Problem behaviors (or behaviors with undesirable individual and social outcomes) that fit these criteria are more likely to be granted a status of public problem on both the media and the public agenda (Dearing & Rogers, 1996). Without such recognition, it is unlikely that mechanisms of social control will be set in motion in order to intervene in individual behavior.

In addition to their gatekeeping role, the mass media are tied to social control efforts through their active role in the construction of social reality (Best, 1995). Due to the process of news selection, media products often cultivate a biased image of social reality among their audiences (Gerbner & Gross, 1976). When combined with the frames

(or conceptual tools) through which media personnel convey, interpret, and evaluate this reality (Gamson, 1992), media representations fundamentally influence people's perceptions and judgments of problem behaviors and other public issues. The media's considerable control over the definition and perceived social reality of public problems permits them to stimulate two related processes of social change: institutional response and social influence.

Institutional response is a result of the interdependency between the mass media and other social systems (Wright, 1986). Although, in principal, the nature of this co-dependency entails reciprocity, the fact that the media are better positioned to criticize and challenge the existing social order (Katz & Szecsko, 1980; Protesse et al., 1991) give them an upper hand in their relationships with other social institutions including the legislative and executive branches of government (Dearing & Rogers, 1996), the legal system (Hans & Juliet, 1991; Studebaker & Penrod, 1997), the economy (Mosco, 1996; Tims, Fan, & Freeman, 1989), the family (Zillmann, Bryant, & Huston, 1994), religion (Hoover, 1998), and education (Brookfield, 1990; Olson, 1974). Other social institutions are quick to respond to a public problem on the media agenda by taking actions that are intended to maintain social order and social equilibrium (Baumgartner & Jones, 1993). These actions increase the level of social control over problem behaviors and tend to be proportional to the severity and scope of the problem as presented in the media (Linsky, 1986; Yanovitzky & Bennett, 1999). They also correspond to media frames regarding the nature of the problem and the favored solution to it (Best, 1995; Iyengar, 1991).

The media also contribute to the social control of problem behaviors by clarifying and reinforcing social norms against them. Normative ambiguity is often a

product of conflicting social cues that are communicated primarily through social interaction within social networks. High levels of ambiguity substantially reduce the prospects of behavior change because there is no clear norm to which individuals can conform. By galvanizing social concern and social action regarding problem behaviors, the media help remove much of the normative ambiguity that surrounds them. Once a clear standard of behavior emerges, informal mechanisms of social control (i.e., social influence) are employed on individuals or groups who perform these behaviors. As a result, an increasing number of individuals and groups quit or reduce their involvement in problem behaviors.

#### Social Control of Risky Health Behaviors: A Micro-Level Approach

Our discussion thus far suggests that to the extent that the mass media are capable of influencing the operation of social institutions regarding individual involvement in a certain behavior, and contributing to changes in the social acceptability of this behavior, they are also capable of promoting health behavior change. These relationships are appropriately conceptualized at the societal-level. What needs to be conceptualized, however, is the theoretical mechanism that links the mass media and social control efforts to individual behavior change.

Discussions of the macro-micro link within the social sciences have always been characterized by an inherent tension between two approaches: structure vs. human agency (Giddens, 1984). The first identifies changes in social structure as the driving force of individual behavior change (i.e., a top-down process). Human behavior, in this perspective, is determined and shaped through socialization and social control with little room for volitional action. Applying this logic to the relationship between social

control and individual health behavior change, one may predict, for example, that legislation aimed at curbing smoking behavior will eliminate smoking altogether. That is never the case, however. Whereas, in theory, the behavior of all individuals is equally subordinated to social laws and standards, in practice, people continue to demonstrate considerable diversity in behavior. Indeed, a reality in which individuals respond in different ways to a common source of social influence on their behavior, helped to undermine the "magic bullet" hypothesis in the context of media effects research.

The opposite approach to the macro-micro link proposes that human agency and changing patterns of social interaction are the forces that drive social change (i.e., a bottom-up process). People master their own destiny because they choose to behave the way they do. Since all people are utilitarian and rational by nature, their interaction with others in their social environment is guided by the desire to maximize personal gain and minimize personal loss. When others change their behavior, they do too or else they increase their personal loss. By the time the majority of individuals have modified their behavior, a social change has occurred. Yet, even the most outspoken proponent of human agency will be quick to admit that this theoretical formulation fits reality poorly, and that it should be guided, instead, by the notion of "bounded rationality" (March & Simon, 1958) or the fact that often times social structure limits rational decisions of individual actors.

Many would agree that the solution to the structure-agency problem is to argue that individuals have the power to choose among socially structured alternatives (i.e., goals and the means to achieve them) (Merton, 1957). Thus, although, in principal, social change is binding and touches the lives of all people, each individual still has some degree of freedom to pursue his or her own interests. Moreover, as people



continually redefine the social rules and resources they apply to their interaction with others, social structure is transformable (or reproducible) through social interaction (Giddens, 1984). In simple words, social actors are more likely to engage in certain kinds of behaviors if they are rewarded for it. The rewards that are attached to a certain behavior are continually restructured by social change and social interaction. When social change and social interaction reinforce one another (that is, both are operating to increase or minimize rewards) many individuals are likely to change their behavior. In contrast, when social change and social interaction pull in different directions, little if any behavioral change is expected.

Social control efforts are therefore linked to individual behavior change through the motivation to change one's behavior. To the extent that social control efforts restructure a person's perception of the rewards and penalties of performing a certain behavior through processes of social change and social interaction, they constitute an external source of motivation for an individual behavior change. Hence, whereas people may not be motivated to change a certain behavior in response to educational efforts because the perceived rewards of performing it supercede potential costs, they still may choose to do so following an increase in the level of social control over this behavior. A concrete example may help to illustrate this point. Following exposure to intensive anti-smoking media campaigns, a casual smoker becomes well aware of the health risks associated with smoking. Still, this person chooses to continue smoking because he or she finds it personally rewarding and enjoyable. However, laws making it illegal to smoke in public places, along with increasingly angered reactions to smoking from non-smokers, push this person to quit smoking in order to avoid formal and informal social sanctions.

## A Proposed Model of Media Effects on Health Behavior Change

We are now left with the task of conceptually linking representations of problems behaviors in the media to actual behavior change. In essence, as Figure 1.2 illustrates, one can think of at least three ways in which the media (or those who use them) may exert control over individual involvement in risky health behaviors. All three paths are concerned with the media's ability to influence behavior by restructuring people's behavioral expectancies, but only one assumes that this process occurs following direct individual exposure to media representations while the other two describe media effects on processes of social control that are mediated by social change (institutional response) and social interaction. Before offering a more detailed account of these paths, however, it is important to begin by reviewing the model's underlying assumptions.

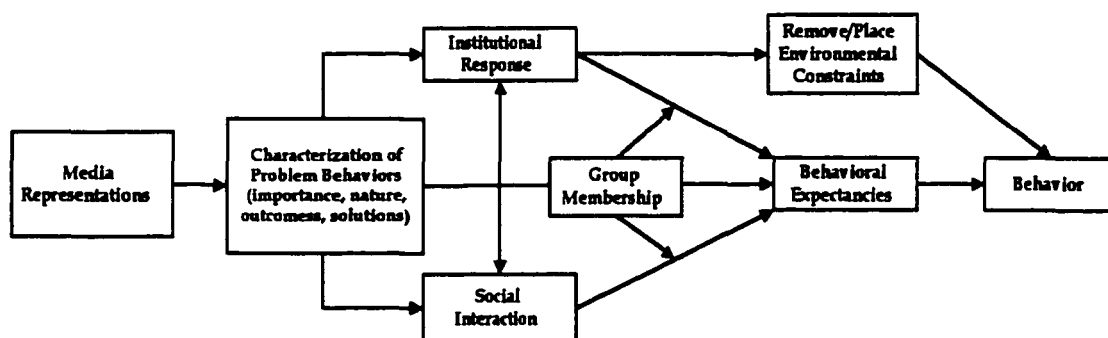


Figure 1.2: A proposed model of media effects on health behavior change

The model in Figure 1.2 describes a process of behavior change at the societal-level. Accordingly, the model's properties are macro-level units of analysis. To allow for cross-level inference (from macro to micro), the model is based on two important

assumptions. The first is that utilitarian considerations (maximizing gain and minimizing loss) guide the behavior of all individuals in society (cf. Bandura, 1986; Becker, 1974; Fishbein & Ajzen, 1975). The fact that not all people behave in the same manner, hence, is explained by the particular social circumstances (or social context) in which individuals or groups of individuals are embedded (Giddens, 1984; Merton, 1959). The second assumption is that individuals or groups of individuals are implicated in any component of the model or the particular process it represents (Pan & McLeod, 1991). That is, journalists and media personnel produce media content that is then consumed directly by individuals as well as by others in their environment such as policy-makers and peers that may use this information to influence these individuals' behavior. Therefore, processes that occur at the individual-level (e.g., agenda-setting, framing, and social interaction) can be analytically extended to represent the same processes at higher levels of analysis (Price, Ritchie, & Eulau, 1991). Both assumptions are almost universally shared by theories of media effects that offer a plausible link between media representations and social change or control. These include agenda-setting (including framing and priming) (McCombs et al., 1995; Price & Tewksbury, 1997), cultivation (Gerbner et al., 1986; Morgan & Signorielli, 1990; Shrum, 1995), knowledge gap (Donohue et al., 1973), media system dependency (DeFleur & Ball-Rokeach, 1989), uses and gratifications (Katz, Blumler, & Gurevitch, 1974; Rubin, 1994), and the spiral of silence (Noelle-Neumann, 1993).

In simple form, the model postulates that the mass media of communication are a principal force in modern society to set in motion processes of social change and control that, ultimately, restructure people's behavioral expectancies regarding risky health behaviors. Processes of social change begin with the group of individuals who

are responsible for the production of media representations (i.e., media personnel) and that typically conform to a stable set of journalistic norms and practices that define the specific social circumstances in which they are embedded (Fishman, 1980; Gans, 1979). In this setting, media personnel (and media organizations, for that matter) assume the role of a social change catalyst through their control of the process by which certain behaviors or lifestyles are constructed as public problems that deserve social attention (i.e., selection and framing of information). Although, in theory, this process is open to inputs from a number of stakeholders such as members of elite groups and social movements, the model assumes that their influence on the selection and characterization of public health problems is already subsumed within the media agenda.<sup>1</sup> For this reason, the model does not specify the various social actors that exert influence on the media agenda and, in contrast to other formulations (cf., Dearing & Rogers, 1996), does not include recursive feedback loops from other components (institutional response and social interaction) to the media agenda. Notice that this formulation does not deny a flow of influence from other agendas to the media agenda. Rather, an assumption is made that at any given time throughout the process of change, the influence of social actors on the definition and social reality of public health problems is evident in the degree of media attention this problem receives as well as the media frames used to describe it.

Once a risky health behavior was constructed as a public health problem on the media's agenda, its prevalence in society may be controlled by one to three ways. The most obvious way is through direct individual exposure to media representations. Whether exposed to deliberate (e.g., public service announcements) or non-deliberate (news and entertainment) media representations of a risky behavior, people may

restructure their own behavioral expectancies through individual or social learning. Individual learning is closely associated with perceptions of personal risk (Slovic, 1987), where risk is defined broadly as any potential individual loss and presumed to be an important source of influence on behavioral expectancies in many theories of behavior change (Becker, 1974; Fishbein & Ajzen, 1975). Hence, for example, a person may decide to quit a risky practice if he or she learns, following exposure to information in the media, that this particular practice can cause them morbidity and mortality or can subject them to legal sanctions they would like to avoid.

Social learning pertains to socialization and internalization of behaviors and skills through observation and imitation of human models (Bandura, 1986). Media representations, in this framework, provide individuals with an image of behaviors that are rewarded by society and those that are not and, consequently, help shaping people's behavioral expectancies. For instance, if considerable rewards are attached to alcohol drinking in media portrayals of this behavior, it is likely that a person who is exposed to them will have positive behavioral expectancies regarding alcohol drinking (Grube, 1995).

The notion that media representations can directly control personal judgments of reality is probably the most widely tested and supported proposition in mass communication research (Demers & Viswanath, 1999). Nonetheless, even if we assume that this influence is independent of the level of personal exposure to the media (Zhu & Boroson, 1997), there is still little definitive evidence that links perceptions of reality to actual behavior change (Finkel, 1993). In fact, attitudinal and behavioral inertia are far more common than attitudinal and behavioral change (Krosnick & Petty, 1995). Therefore, behavioral expectancies may not be readily amenable to change through

exposure to social information in the media, unless other external sources of influence operate as well and provide additional motivation to change one's behavior.

For this reason, the model in Figure 1.2 includes two complementary paths of media effects on people's behavioral expectancies. The first proposes that media representations of problem behaviors may restructure behavioral expectancies by promoting change in other social institutions. Social institutions operate in society through social agents (individuals or group of individuals such as policy-makers, parents, teachers, and religious leaders) that, due to certain social circumstances or arrangements (e.g., legal, moral, or traditional, see Weber, 1968), possess an authority to regulate the behaviors of other individuals by means of formal social control. Because of their special status in society, these social agents are particularly susceptible to the type of direct media effects discussed above (e.g., agenda-setting, framing, priming, and cultivation) as they are particularly interested in maintaining the current social order that benefits them (Baumgartner & Jones, 1993; Yanovitzky & Bennett, 1999). Media representations of public problems, therefore, strongly motivate them to act in order to either avoid loss (Dearing & Rogers, 1996) or increase gain (Kingdon, 1984). What further facilitates their tendency to respond to problems in a similar manner is a process of collective decision-making (Banks & Duggan, 2000) that typically results in two types of formal social control efforts. The first is directed at influencing behavioral expectancies directly, by way of deterrence. By increasing the perceived swiftness, severity and certainty of punishment for individual involvement in risky health behaviors, such policies or programs hope to influence a person's decision to perform a certain behavior (Ross, 1984). The second is designed to reduce individual involvement in problem behaviors indirectly, by placing or removing environmental constraints on

individual behavior (e.g., limit access to alcohol and cigarettes vs. increasing access to condoms) (Vingilis, 1990). Both types of formal social control measures are universally employed on all members of society (or a specific sub-population such as youth) who engage in a certain problem behavior and, thus, at least in theory, are expected to substantially reduce the scope of this problem.

Besides processes of social change that are intended to increase the level of institutional control over risky behaviors, behavioral expectancies are also shaped through processes of social influence. Social influence occurs when people compare themselves with others to ascertain whether or not their own behavior is appropriate (Turner, 1991). As noted above, at least to some extent, this process takes place through social learning from media representations of problem behaviors (e.g., images in entertainment programs, reports on public opinion polls, etc.). In the context of risky lifestyle behaviors, however, there are at least two reasons to believe that social influence may also be exerted through social interaction. The first pertains to the fact that individual involvement in risky health behaviors is often motivated and acquired through interpersonal communication with peers and family members (Botvin & Botvin, 1992; Dinges & Oetting, 1993). The second draws on the role of issue obtrusiveness in information processing and, particularly, the observation that the media's impact on individual perceptions is limited to unobtrusive issues, or issues with which people have little or no direct experience (Zucker, 1978). Given that many in society possess first- or second-hand experience with many of these risky health behaviors (McGinnis & Foege, 1993), the capacity of media representations to directly exert social influence on individual attitudes and behavior may be quite limited.

The proposed model of media effects, therefore, predicts that social influence will be strongly linked to behavioral expectancies through social interaction. The key role of media representations, in this respect, is helping to clarify and reinforce social norms against risky lifestyle behaviors. This role is carried out by galvanizing public concern with the dire consequences (e.g., health, economic, social, etc.) of these behaviors. As public concern increases, media representations of risky behaviors are more likely to receive attention from people and stimulate discussions within communities and social networks. When a clear norm against these behaviors finally emerges, the social pressure on the individual to refrain from performing them increases considerably. By the time the threat of being exposed to informal social sanctions (e.g., stigma or social isolation) is communicated through social interaction to those who choose to perform risky behaviors, many in the community will quit these practices and conform to the unequivocal norm against them.

Insofar as all three mechanisms of social control (i.e., formal, informal, and voluntary) operate in the same direction on individual expectancies, the proposed model of media effects predicts that, over time, a substantial number of individuals will change their health behavior. More often than not, however, such expectation is unrealistic for two reasons. First, a wide social and institutional consensus about the severity of a public health problem and the best ways to address it is difficult to attain (Allison, Kiefe, & Weissman, 1999; Atkin & Wallack, 1990). Moreover, formal and informal mechanisms of social control are often at odds or employed with different levels of intensity regarding the same behavior. In part, a lack of apparent social consensus may reflect the fact that one-sided discussions of public problems in the mass media are the exception rather than the rule (Allen, 1991; Zaller, 1992). To a larger



extent, it is a product of a competition among different stakeholders (e.g., governmental agencies, citizen groups, scientists, and economic forces) over the definition of the problem and the social resources to be allocated in order to fight it (Gusfield, 1981). In any event, it is clear that without social consensus the prospects of behavior change are reduced, as different mechanisms of social control are not employed with equal intensity. Still, within the area of public health, building a social consensus is possible because social policy and public support tend to converge over time (Fink, Kosecoff, Chassin, & Brook, 1984). Therefore, the rate of behavior change within the general population is likely to increase gradually over time as consensus is built and the intensity of social control mechanisms progresses from lower to higher levels.

Group membership is a second, and more important, reason to expect that different mechanisms of social control would not be able to operate with equal intensity on individual behavior. Groups provide individuals with social status, identity (or a sense of belonging), and support through social interaction that is guided by shared normative conventions about members' behavior. In return, groups tend to place pressure on their members to behave in a way that conforms to group conventions (Turner, 1991). At times, the pressure to conform to group norms is more powerful than the pressure to conform to social conventions (Cohen, 1955; Merton, 1959; Terry & Hogg, 2000). Consequently, group members may choose to undermine or even ignore social conventions and behave in a manner that conforms to group expectations (Moncher, Holden, & Schinke, 1991).

Following this reasoning, the proposed model of media effects treats group membership as a 'social filter' or social circumstances that are likely to be a source of individual resistance to social control efforts. By forming and shaping individual

expectancies, typical criteria for group membership such as age, gender, race, political predisposition, cultural practices, and socio-economic status become, in effect, a basis for resisting the influence of external forces on behavior. In the case of direct media exposure as a voluntary mechanism of social control, resistance is often evident in two forms of audience activism: selective exposure to media messages (Katz et al., 1974; Rubin, 1994; Yanovitzky & Cappella, 1999) and treating media content as a text open to multiple interpretations (Hall, 1980; Liebes & Katz, 1990; Morley, 1992). Resistance to formal social control efforts is rarely manifested in the form of direct confrontation with agents of social control, and is more frequently apparent in people's attempts to find a way around laws or regulations without being sanctioned (Kuczynski & Hildebrandt, 1997). Similarly, the most common type of resistance to informal social control efforts is avoidance, which only in extreme cases, is transformed into counter-cultures or group members' complete rejection of social conventions in favor of alternative ones (Merton, 1959).

In each one of these cases, the level of resistance is contingent upon a number of factors including the level of group cohesion (resistance increases with greater cohesion), the degree of similarity between group norms and widely-shared social norms (resistance increases as similarity decreases), and the frequency of social interaction with members of other groups who conform to social conventions (the greater the frequency, the lower the level of resistance) (Kuczynski & Hildebrandt, 1997). One may expect, therefore, that groups with low levels of resistance (for example, adults) are likely to change their behavior in response to low-intensity mechanisms of social control (i.e., persuasion or informal social control) because their members generally conform to social conventions. In contrast, groups with high levels of

resistance (e.g., youth) are more likely to change their behavior in response to formal mechanisms of social control because their members generally conform to group norms that considerably deviate from social conventions.<sup>2</sup> Thus, the effectiveness of each social control mechanism in bringing about behavior change is likely to vary across different groups of individuals as a function of each group's level of resistance to social control efforts.

### Some Theoretical and Methodological Implications of the Model

The model in Figure 1.2 offers a comprehensive framework for examining a range of plausible media effects on the process of health behavior change. Analytically, this model provides the necessary logical explanation to the relationship between the media as a macro-level phenomenon and behavior change at the micro-level (Price et al., 1991) because it assumes that individuals are implicated in the various processes (i.e., production and consumption of media products, social interaction, and group conformity) that make up this link (Pan & McLeod, 1991). Nonetheless, there are still a number of theoretical and methodological obstacles that need to be addressed before the model can be deemed valid.

First, the model's reliance on the media agenda as the driving force of health behavior change raises an important question regarding the form of media content most relevant to this process. While it is likely that the mass media are a main source of health information for the majority of people in society (Rogers, 1996), previous public health communication efforts that have been largely centered on deliberate media messages (e.g., public service announcements), generated only a few fruitful results. In contrast, there is evidence that the treatment of health issues in the news media (Baillie,

1996; Baker, 1986; Braennstroem & Lindblad, 1994; Brown & Walsh-Childers, 1994; Freimuth, Greenberg, DeWitt, & Romano, 1984; Hertog & Fan, 1995; Holder & Treno, 1997; Hu et al., 1995; Simpkins & Brenner, 1984; Wallack, 1990c; Yanovitzky & Bennett, 1999; Yanovitzky & Blitz, 2000) and images of health behaviors in entertainment media (Grube, 1995; Montgomery, 1990; Neuendorf, 1990; Signorielli, 1993; Singhal & Rogers, 1999; Zillmann & Bryant, 1994) influence people's health decisions. One reason for this pattern of findings is that people are more likely to be exposed to health information in the news and entertainment media (Robinson & Godbey, 1997; Wallack, 1990a) than to messages of deliberate health communication campaigns (Hornik, 1996; Snyder et al., 1999). There is also some evidence that news and entertainment engage audiences more successfully than ads and public service announcements (Gunter, 1991; Keiser, 1991; Montgomery, 1990), although it cannot be conclusively argued that this tendency is linked to enhanced learning and recall of health information (Lang, Sias, Chantrill, & Burek, 1995). Finally, the treatment of health issues in the news media is more likely than deliberate information campaigns to influence both the public and the policy agenda regarding these issues (Baker, 1986; Dearing & Rogers, 1996; Rogers, Dearing, & Chang, 1991; Shoemaker, 1989) and, consequently, more likely to influence behavior indirectly (Yanovitzky & Bennett, 1999). Therefore, the proposed model of media effects holds that the content of news and entertainment media is probably the most relevant source of influence on the process of health behavior change.

Second, by referring to social identity and group membership, the proposed model of media effects seeks to broaden the definition of social norms as commonly used in the literature on health behavior change. With few exceptions (e.g., Brown, 1990; Gochman, 1997; Hornik, 1991), this literature relies on the definition offered by the

Theory of Reasoned Action (Fishbein & Ajzen, 1975) and the Theory of Planned Behavior (Ajzen, 1985). Both theories assume that social norms have an important impact on perceived behavioral outcomes but limit their operationalization to 'subjective norm', or the perceived expectations of important referents (such as family members and peers) in a person's social environment. A more adequate conceptualization, however, would recognize that individual behavior is often guided by the norms and expectations of larger social groups (e.g., social networks and social categories) whose members share the same culture (for example, youth culture) or the same behavior (e.g., smokers and social drinkers) without necessarily being in direct contact with one another (Terry, Hogg, & White, 2000; Turner, 1991).<sup>3</sup> In fact, while some empirical research does not provide much support to the importance of subjective norm in predicting behavior (Ajzen, 1991), other studies have shown that a more general measure of social norms was substantially associated with behavioral intentions (Brown, 1990; Grube & Morgan, 1990).

Third, a question arises regarding the hypotheses testing strategy most appropriate for assessing the validity of the proposed model. The model's predictions are derived from various individual-level processes (e.g., agenda-setting, framing, cultivation, and conformity) that take place within different groups of individuals (media personnel, policy-makers, members of social networks, and individuals who engage in certain behaviors). No doubt, individual-level data are best fit to directly confirm the presence of these individual-level processes, especially if different processes (for example, agenda-setting vs. conformity to group conventions) may produce the same observed outcome at the aggregate. However, given the general difficulty of collecting or obtaining longitudinal individual-level data of reasonable quality (Bijleveld

& van der Kamp, 1998), let alone for different sub-populations, an alternative approach - one that allows for valid cross-level inference from aggregated data - is desirable. Specifically, by analytically extending individual processes to represent similar group or societal-level processes, researchers may use aggregated-data to test the model's predictions with considerable degree of caution and providing that certain concerns are addressed (Price et al., 1991). Although analysis of aggregated-data cannot confirm the presence of these individual-level processes, it can test for their plausibility by comparing a model's ability to explain the variance in some outcomes of interest over time to that of other possible models that imply different individual-level processes (e.g., attitudinal and behavioral inertia, habituation, diffusion, etc.) (Watt, Mazza, & Snyder, 1993). Hence, where possible, such comparisons may be employed to provide a more convincing support for the plausibility of a certain substantive model of effect over others as well as to further elaborate on the nature of associations between variables at the aggregated-level.

Of particular concern is the problem of ecological fallacy, or the risk of mistakenly inferring individual properties from group or public properties (Price et al., 1991). The main problem here is that by aggregating individual-level data, important information on within-group variance is lost. Because more often than not within-group variance accounts for a substantial portion of the total variance in the outcome of interest, associations between aggregated variables tend to be much stronger than parallel associations at the individual-level. A common way to relax this concern is to first identify the sources of within-group variance based on cross-sectional data and then continue to split the research population into different subgroups accordingly (for example, youth vs. adults). Next, by testing the relationships between variables within

each subgroup, a less biased interpretation of these relationships is possible because the analysis is performed on fairly homogeneous groups.

The final point to note regarding an appropriate procedure for testing the model's predictions is that a researcher's ability to test the model with a single analysis strategy is directly related to the quality of the aggregated data used in the study. To the extent that all variables were aggregated from the same population (or comparable populations such as nationally representative samples) and data were gathered at equally-spaced time points, the use of a single analysis strategy is valid. Nonetheless, because the current model of media effects refers to processes that take place within different groups over time, it is more likely that any test of this model will be based on a combination of data sources of different quality that can be aggregated to represent variables at the societal-level. To avoid biased interpretations of associations at the societal-level due to the incompatibility of the data, it is prudent to employ a hybrid combination of time-series data analysis techniques to test each hypothesized association (or link) separately in order to validate the model as a whole. The data analysis technique used should be one that maximizes the information sought by the researchers. As demonstrated in the following chapters, recent advances in longitudinal data analysis techniques (e.g., Fan, 1988; Watt et al., 1993; Zhu, Watt, Snyder, Yan, & Jiang, 1993) provide researchers with useful tools and considerable degree of flexibility in formulating associations between aggregated variables over time.

## **Summary**

The current research project aims at broadening the conceptual framework within which media effects on health behavior are typically examined. Whereas

previous research in the area of public health communication has predominantly focused on uncovering a direct association between exposure to health messages in the media and health behavior change, this study focuses on complementary (or mediated) routes of media effects on behavior. Specifically, the present study sets out to demonstrate that the mass media can be an influential instrument of promoting health behavior change through their contribution to the process of change in the social and cultural context that surrounds risky health behaviors.

To offer a plausible conceptual link between social change in response to representations of risky health behaviors in the media and individual involvement in these behaviors, the study introduces the notion of social control. It is argued that by stimulating response from social institutions and facilitating change in the social acceptability of problem behaviors, the mass media may be able to set in motion formal and informal mechanisms of social control that change the social context in which these behaviors are performed and, ultimately, lead to behavior change by restructuring behavioral expectancies.

The proposed model of media effects on health behavior change, which follows this rationale, identifies three different mechanisms (voluntary change following direct media exposure, formal social control, and informal social control) through which representations of problem behaviors in the media may be able to promote change in individual behavior, but suggests the impact of each mechanism is contingent upon the level of individual resistance to social control efforts as determined by group membership. The validity of these predictions, as well as the model's overall plausibility, are tested next by examining the case of drunk-driving behavior change in the United States between 1978 and 1995.



## Notes

1. This parsimonious assumption is grounded in several research traditions including research on production processes within media organizations (Fishman, 1980; Gans, 1979; McManus, 1994; Tuchman, 1978), research on sources of influence on the media agenda (e.g., Baker, 1984; Gandy, 1982; Gitlin, 1980; Gonzenbach, 1996; Hess, 1984; Kingdon, 1984; Montgomery, 1989; Protesse et al., 1991), and research on the relationship between the media agenda and other agendas (Cook & et al., 1983; Dearing & Rogers, 1996; Lemert, 1981; Linsky, 1986; MacKuen, 1981; McCombs et al., 1995). In these studies and others, the media agenda is understood as a public arena or a public sphere (Curran, 1991; Hilgartner & Bosk, 1988) in which issues and groups compete for public recognition (Barker-Plummer, 1995; Baumgartner & Jones, 1993; Gandy, 1982; Gitlin, 1980; McCombs et al., 1995). The outcomes of these competition and negotiation processes are reflected in media representations of the issue (Best, 1995; Gusfield, 1981) and may be considered, therefore, as adequate representations of the various interests that have produced them.
2. In reviewing the literature on successful intervention in risky health behaviors both Barokas (1995) and Gochman (1997) note that limiting availability of alcohol and cigarettes to youth, either through legal measures of increased taxes, proved to be effective in reducing risky health behaviors while information-communication-education programs were generally not.
3. This approach is also warranted by research demonstrating the media's ability to bring together distant individuals who share similar social values by bridging

across time and space (Anderson, 1991; Meyrowitz, 1985) and providing additional dimensions for group membership through the segmentation and comodification of audiences (Ettema & Whitney, 1994; Mosco, 1996; Turow, 1997).

## CHAPTER 2

### A CASE STUDY: DRUNK-DRIVING BEHAVIOR, 1978-1995

Many contemporary major public health problems are a consequence of risky lifestyle behaviors such as smoking, alcohol abuse, unprotected sex, and consumption of high-fat foods (McGinnis & Foege, 1993). Through repeated personal experience with these behaviors, many people come to value the considerable personal and social benefits that are associated with them (e.g., pleasure, escapism, relaxation, and popularity with peers), as well as acquire the self-efficacy to perform these practices each time. Because the benefits of performing lifestyle behaviors are typically tangible and instantaneous in contrast to the personal health risks that are associated with them, it is hard to motivate people to give up these practices simply by increasing their awareness of the potential health hazards that these behaviors pose (Williams, 1994). Therefore, it is safe to argue that risky lifestyle behaviors present a substantial challenge to those who wish to promote health behavior change through mass communication channels. As such, they also provide an appropriate setting in which to test the validity of the theoretical approach taken in this study.

#### **Drunk Driving Behavior**

One risky lifestyle behavior that has been heavily targeted by health promotion efforts over the past two decades is drunk-driving (DD) behavior. Formally defined as the operation of a motor vehicle after consuming alcoholic beverages to a level of cognitive and psychomotor impairment (Robin, 1991), DD is widely perceived as a major threat to public health in the United States given its prevalence and dire health

consequences (Ross, 1993). Although the majority of driving trips by drivers with blood alcohol concentration (BAC) levels twice the legal limit (currently, 0.08 grams per deciliter of blood, in most states) is completed without accidents (Donelson, 1988), many are still killed or injured as a result of DD behavior. In 1998 alone, 15,935 persons died and 305,000 others were injured in alcohol-related traffic crashes. Alcohol was estimated to be involved in 39% of fatal crashes and 7% of all crashes in 1998. At these rates, about 3 in every 10 Americans will be involved in an alcohol-related crash at some point in their lives (NHTSA, 1998).

There is some good news, however. Over the past two decades, DD-related traffic fatalities and injuries have declined significantly (DeJong & Hingson, 1998; Lane, Stinson, & Bertolucci, 1997; NHTSA, 1998). For example, in 1977, 57% of all highway traffic crash fatalities in the United States were alcohol-related. By 1998, this figure had decreased to 39% of all fatalities (NHTSA, 1998). Likewise, from 1988 to 1998, intoxication rates decreased by about 30% for drivers of all age groups involved in fatal crashes (NHTSA, 1998). These encouraging trends may be interpreted as evidence of a substantial behavior change. However, such a conclusion may be premature before alternative explanations are overruled.

One alternative explanation is that the reduction in DD-related fatalities and injuries was caused by an overall decrease in the prevalence of one or both of the behaviors that comprise it - driving and alcohol consumption. As Figure 2.1 demonstrates, there is a small likelihood that this is the case. For one thing, a substantial downward trend in alcohol-related traffic fatality rates between 1978 and 1995 (-56.5%) is still evident when controlling for changes in the frequency of driving (measured by vehicle miles traveled) over the same time period. Moreover, this reduction was

independent of other demographic trends (not shown in Figure 2.1) such as population growth (-34.41% change per 100,000 population), the number of drivers (-41.39% per 100,000 licensed drivers), and the number of vehicles on the roads (-41.16% per 100,000 registered vehicles) (Lane et al., 1997). It is also clear, given the lower rate of decrease in per capita alcohol consumption (-19%), that the decline in alcohol consumption during this time period cannot fully account for the decline in alcohol-related traffic fatalities. In fact, as reported elsewhere (Greenfield, Midanik, & Rogers, 2000; Stewart & Voas, 1994), alcohol-related traffic fatalities declined a decade before the downturn in overall alcohol consumption levels.

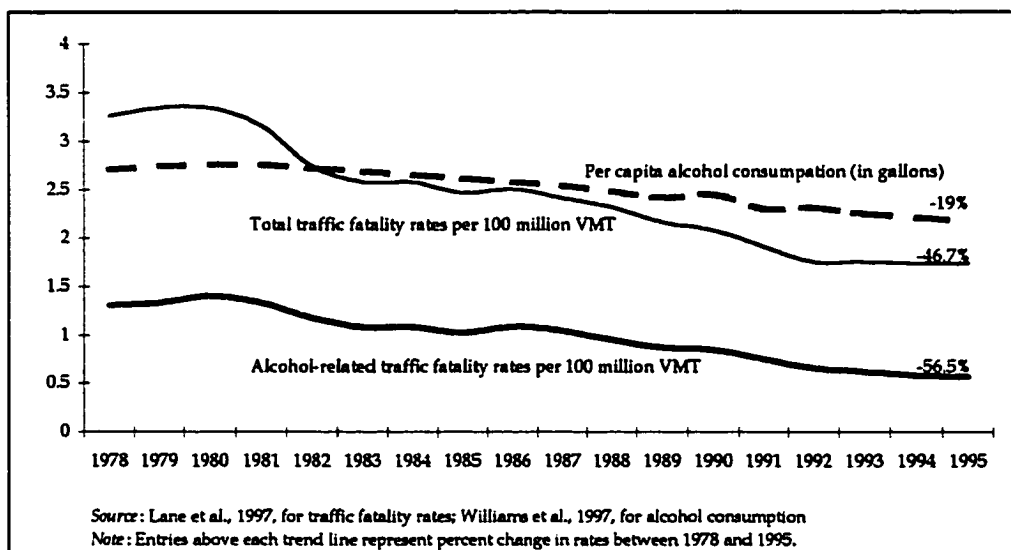


Figure 2.1: Trends in total and alcohol-related traffic fatality rates and in per capita alcohol consumption, United States, 1978-1995

Another potential explanation is that the same exogenous forces that have led to a reduction in overall traffic crash fatalities have also contributed to the observed declining trend in alcohol-related fatalities. Under this hypothesis, the trend in alcohol-related fatalities should be similar to the one in total traffic fatalities, as seems to be the

case in Figure 2.1. After ruling out demographic changes and change in the frequency of driving within the population over time, the only factor other than behavior change (and the possibility of measurement errors which will be discussed later) that can account for the downturn in both alcohol-related and non-alcohol-related traffic fatalities is improvements in traffic safety, namely, safer cars (e.g., airbags, safety belts, child safety seats, and crash-resistant materials) and safer roads (for example, appropriate lighting, clear warning signs, and better road infrastructure). Assuming that these safety measures evenly affect all types of traffic fatalities across the board, one would predict a similar rate of change in alcohol-related and non-alcohol-related traffic fatalities over time. The evidence in Figure 2.1 shows, in contrast, that the relative change in alcohol-related traffic fatality rates over the past two decades was greater than that for total traffic fatality rates (-56.5% compared to -46.7%, respectively).

Examining the association between alcohol involvement in fatal traffic crashes and restraint use further undermines the feasibility of this alternative explanation. Whereas restraint use has greatly increased over the last decade (NHTSA, 1999), drunk drivers are still significantly less likely to use restraint than sober drivers (Klein & Walz, 1998). Under the improved traffic safety hypothesis, this strong inverse relationship would lead to the prediction that, all other things being equal, traffic fatality rate will increase for drunk drivers and decrease for sober drivers. Instead, as Figure 2.2 demonstrates, the proportions of fatalities that are not alcohol-related (BAC 0.00) have increased by between 1982 and 1994, while the proportions of alcohol-related fatalities (BAC 0.01-0.09, BAC 10+) have decreased. Hence, the decline in alcohol-related traffic fatalities seems to be independent of improvements in traffic safety during this time

period, and is more likely to have generated the decline in total traffic fatalities rather than being influenced by it.

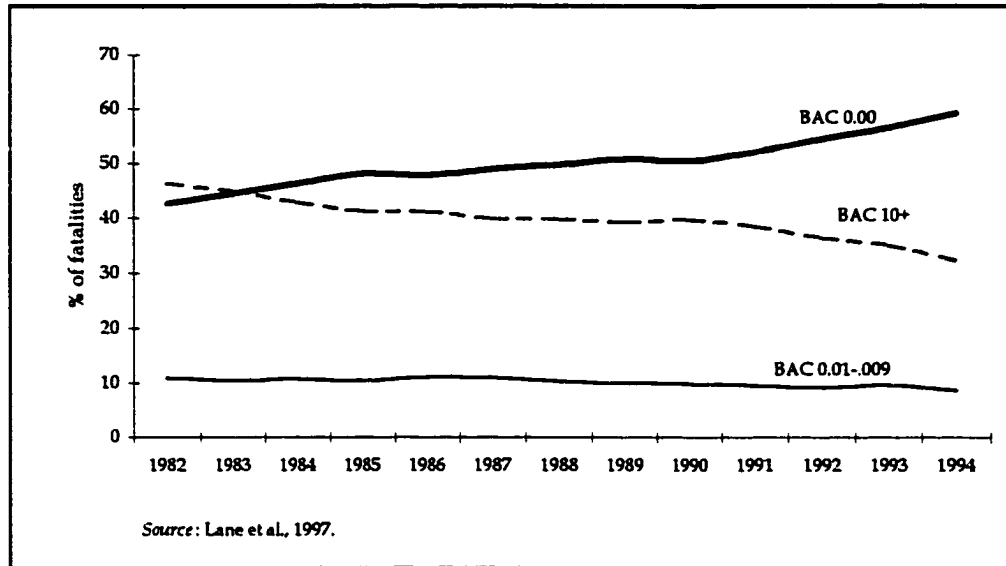


Figure 2.2: Trends in total traffic fatalities by blood alcohol concentration (BAC) level, United States, 1982-1994

### Drunk-Driving Behavior Change: A Critical Review of the Literature

The evidence presented above and elsewhere (e.g., DeJong & Hingson, 1998; Stewart & Voas, 1994) suggests that the decline in DD-related traffic fatalities over the past two decades is largely a consequence of a related behavior change. This conclusion is further supported by the apparent decline in proportions of individuals reporting involvement in DD behavior between 1978 and 1995 based on data from nationally representative surveys (this evidence will be presented in details in Chapter 6). As, over time, people's involvement in DD behavior has gradually reduced, substantial reductions in DD-related traffic fatalities and injuries have become increasingly apparent. Given that, the next step in examining the case of DD behavior is to try and identify the cause(s) of this substantial behavior change.

The first line of reasoning to be explored here is that the observed reduction in DD behavior is directly linked to organized social efforts to intervene in this behavior. Over the course of the last two decades, many intervention strategies have been conceptualized, tested and evaluated for their efficacy. The majority of these strategies share a common focus on prevention and education, and generally fall into three basic intervention approaches (DeJong & Hingson, 1998; Moskowitz, 1989): alcohol control policies, general deterrence, and educational campaigns. Given the current study's particular interest in media effects, an exhaustive review of these strategies is beyond the scope of the discussion offered here (see Borkenstein, 1985; Collins & Frey, 1992; DeJong & Hingson, 1998; Hagen, 1985; Hernandez, Newcomb, & Rabow, 1995; Hingson, 1993; Laurence, Snortum, & Zimring, 1988; Moskowitz, 1989; Robin, 1991; Ross, 1992; Surgeon General, 1989; Voas, Holder, & Gruenewald, 1997). Instead, only key findings are presented and particular attention is paid to media-based intervention in DD behavior.

*Alcohol control policies.* Efforts to control drivers' alcohol consumption have been motivated by the notion that measures taken to reduce average alcohol consumption in the general population will result in a corresponding reduction in excessive drinking, which is strongly associated with the likelihood of involvement in a DD-related accident (Edwards et al., 1994; Scribner, MacKinnon, & Dwyer, 1994). Alcohol control strategies have included limits on the number, density and opening hours of alcohol retail outlets (Blöse & Holder, 1987; Colon & Cutter, 1983; Stewart, 1997), increased alcohol excise taxes (Cook, 1981; Saffer & Grossman, 1987; Stewart, 1997), responsible beverage service in alcohol outlets (Holder & Wagenaar, 1994; Mosher, 1991), and increasing the minimum legal drinking age to 21 (DeJong & Hingson, 1998; Wagenaar, 1983).



Attempts to limit the number, density and opening hours of alcohol retail outlets within a certain community typically failed because alternative alcohol outlets were available to drivers in nearby communities (Chaloupka & Wechsler, 1996; Gruenewald, Millar, Treno, Yang, & et al., 1996). Studies that examined the relationship between physical availability of alcoholic beverages and alcohol-related traffic crashes (e.g., Blose & Holder, 1987; Colon & Cutter, 1983) found only small negative association between measures of the two. Similarly, a quasi-experimental study (Cook, 1981) found that 25 of 38 states that increased their liquor tax between 1960 and 1975 experienced a subsequent reduction in the fatality rate due to automobile accidents. However, much of the initial impact of increasing alcohol excise taxes on alcohol consumption has weakened over time because these taxes have not kept pace with inflation nor have they been equalized for alcohol content across the categories of beer, wine, and distilled spirits (Stewart, 1997). Problems of implementation faced many responsible beverage service programs since such programs did not receive the community-wide support needed for effectively controlling alcohol consumption in bars and taverns (Holder & Wagenaar, 1994; Turrisi, Nicholson, & Jaccard, 1999). On the other hand, increasing the legal drinking age to 21 has been shown repeatedly to reduce alcohol-related fatalities and injuries among young drivers. Well-controlled evaluations of these laws revealed that states adopting age 21 laws in the late 1970s experienced a 10% to 15% decline in alcohol-related traffic fatalities among young drivers, compared with states that did not adopt such laws (DeJong & Hingson, 1998; Klepp, Schmid, & Murray, 1996; Stewart & Voas, 1994; Wagenaar, 1983).

As noted by DeJong and Hingson (1998, p. 367), "prohibition was a failed experiment in the United States." Lack of wide social support for alcohol control

policies in combination with authorities' incapacity to effectively enforce these policies, have continuously hampered their prospect of success. There is little doubt, however, that laws limiting the minimum drinking age to 21 have contributed to the nationwide decrease in alcohol-related fatalities over the past two decades (NHTSA, 1998). Minimum drinking age laws, though, can only account for decreasing trends in DD incidence among young drivers and not for similar (though more moderate) observed reductions in DD-related fatalities among older drivers (Lane et al., 1997).

*General deterrence.* In contrast to specific deterrence strategies that seek to prevent convicted drunk drivers from repeating this offense, general deterrence strategies are aimed at preventing the entire population of drivers from performing this behavior by increasing the perceived certainty and swiftness of punishment (Homel, 1988; Ross, 1984; Vingilis, 1990). This approach was widely employed through a variety of strategies, including administrative license revocation (Klein, 1989; Ross, 1991a; Williams, Weinberg, & Fields, 1991; Zador, Lund, Fields, & Weinberg, 1989), reductions in the legal BAC level limits (or per se laws) (Hingson, 1992; McPhee, 1992), zero tolerance laws for drivers under age 21 (i.e., laws prohibiting young drivers with any amount of alcohol in their blood) (Blomberg, 1992; Hingson, 1992; Zwerling & Jones, 1999), and sobriety checkpoints (Ferguson, Wells, & Lund, 1995; Stuster & Blowers, 1995).

Overall, general deterrence strategies were found to be associated with significant reductions in the incidence of DD-related fatalities. For example, Zador and colleagues (1989) found a 9% reduction nationwide in DD incidence as a result of administrative license revocation laws. Others (Hingson, Heeren, & Winter, 1996) found that lowering the legal BAC limit to 0.08 resulted in an average decrease of 18% in DD

incidence in 5 states that adopted this law, although the effectiveness of these laws by themselves was recently questioned by two studies that critically examined the methodology of such evaluations (Moskowitz & Fiorentino , 2000; Scheinberg & Stouffer, 1999). As for the effectiveness of zero tolerance laws - Hingson (1992) found a 42% decrease in fatalities for teenagers in 13 states that adopted zero tolerance laws compared to 29% in states that did not. Similarly, Blomberg (1992) found a 50% decrease in youth fatalities after enacting this law in Maryland compared to the pre-law period. Finally, only intensive or well-publicized sobriety checkpoint programs were found to be associated with substantial reductions in alcohol-related fatal crashes (Peek-Asa, 1999; Ross, 1992; Stuster & Blowers, 1995).

As noted by others (Ross, 1992; Snortum, 1988; Vingilis, 1990), whereas efforts to reduce DD through general deterrence strategies have been generally successful, their impact has been typically limited to short periods of time. In many instances, dramatic short-term reductions in DD incidence tended to bounce back to pre-intervention levels within a few months of these interventions' conclusion. Furthermore, it is uncertain that general deterrence in itself may have independently contributed to these reductions. For example, the effectiveness of sobriety checkpoints as a deterrence mechanism was found to be largely contingent upon the level of publicity these measures received in the mass media (Mercer, 1985; Ross, 1992). It is also worth noting that the effectiveness of general deterrence strategies varies across communities and social categories. Particularly, these measures seem to be successful in reducing DD incidence in Midwestern and Northeastern states as well as among youth nationwide, and less successful in Southern states and among older drivers (DeJong & Hingson, 1998; Roebuck & Murty, 1996; Stewart & Voas, 1994).

*Educational campaigns.* In recent decades, numerous efforts have been made to educate the general public and drivers in particular about the risks associated with DD behavior. Some of these efforts were channeled to educational programs in schools and in the workplace with no convincing evidence of effect on DD practices (Hagen, 1985; Moskowitz, 1989). The majority of educational programs, however, were employed through mass communication campaigns that have promoted a wide range of objectives, from increasing public awareness to the problem of DD behavior (DeJong & Atkin, 1995; Haskins, 1985) and informing drivers about enhanced enforcement efforts (Holder, 1994; Mercer, 1985; Ross, 1992), to modeling techniques of avoiding DD incidents such as the designated driver (Brown, 1997; DeJong & Wallack, 1992; Winsten, 1994).

There is a consensus among researchers who evaluated interventions in DD behavior that organized public information campaigns are relatively effective in increasing knowledge of DD-related risks but produce little if any behavioral change (Ashley & Rankin, 1988; DeJong & Hingson, 1998; Haskins, 1985; Hewitt & Blane, 1984; Holder, 1994; Moskowitz, 1989; Nichols, 1994; Vingilis & Coultres, 1990; Williams, 1994). For example, Hewitt and Blane (1984) reviewed 17 evaluations of alcohol prevention mass media campaigns conducted between 1971 and 1982. Five of the studies employed a rigorous evaluation design (pre-post campaign comparison with a control group based on data from representative samples of the population). Three campaigns that were aimed at promoting responsible alcohol consumption could not claim change in either DD-related knowledge or behavior following campaign messages in print and broadcast media. Two other campaigns that were designed to reduce DD incidence produced evidence of knowledge gain but no evidence of change in self-reported DD

behavior. In a similar review of the literature, Haskins (1985) found a single well-designed evaluation of an intervention in Vermont (Worden, Waller, & Riley, 1975, cited in Haskins, 1985) that claimed significant improvement in knowledge, attitudes and behavior among young men. More recent reviews (DeJong & Hingson, 1998; Holder, 1994; Sleet, Wagenaar, & Waller, 1989; Vingilis & Coultas, 1990; Wilde, 1993) have pointed out that the only notable evidence of media effects on reduction in DD behavior comes from programs that used media messages in conjunction with rigorous enforcement or other community initiatives (Barokas, 1995; Holder, 1994; Mercer, 1985; Rogers & Schoenig, 1994; Ross, 1992).

This pattern of findings should be examined carefully before reaching a final conclusion regarding the utility of mass communication channels for intervening in DD behavior. To begin with, scientific evaluations of DD-related media campaigns are rare (DeJong & Hingson, 1998; Haskins, 1985; Vingilis & Coultas, 1990) and, when available, tend to rely on weak or inappropriate research designs (Haskins, 1985; Moskowitz, 1989; Vingilis & Coultas, 1990). Still, as many of those who share this concern have noted (DeJong & Hingson, 1998; Hagen, 1985; Haskins, 1985; Holder, 1994; Vingilis & Coultas, 1990; Williams, 1994), null media effects were also a common finding in more rigorous evaluations of DD-related communication campaigns.

Other concerns expressed by researchers include inappropriate design of DD-related persuasive messages (DeJong & Atkin, 1995), lack of exposure to campaign messages (Haskins, 1985), and ineffective strategies of persuasion that are commonly employed in DD-related campaigns (DeJong & Hingson, 1998). DeJong and Atkin (1995), for example, conducted a content analysis of 137 public service announcements (PSAs) aired nationally on television between 1987 and 1992. They found that most

PSAs were designed to reach the general audience rather than at-risk individuals; that the messages included in these PSAs were typically incredible or unrealistic (e.g., featuring adult figures to promote behavioral change among youth); and that the use of fear appeal and anger in such media messages was, for the most part, unsuccessful. The authors themselves note, however, that these formulations are common in health prevention efforts and reflect the limited resources that are allocated to health communication campaigns. In addition, since most PSAs are donated rather than paid, there is a concern that campaign managers have little control if any over the placement of these ads within the broadcasting schedule and, therefore, cannot effectively reach their target audience (Haskins, 1985). Nonetheless, a recent study that utilized three field-experiments (Murry, Stam, & Lastovicka, 1996) found that donated-media PSA's were as effective as paid-media PSAs in promoting change in DD-behavior.

Finally, some (e.g., DeJong & Atkin, 1995; DeJong & Hingson, 1998; Holder & Treno, 1997) have questioned the persuasion strategy most commonly employed in DD-related media campaigns. These campaigns typically offer supportive arguments against involvement in DD behavior that may result in knowledge gain or even attitude change yet cannot stimulate behavioral change unless specific alternative behaviors are offered. One plausible alternative is the use of a designated driver that was heavily promoted from 1988 onward (DeJong & Wallack, 1992; Winsten, 1994). Evaluation of this program (DeJong & Hingson, 1998) revealed a steady increase nationwide in self-reported use of designated drivers within the overall population (62% prior to the campaign's start in 1988, 66% by early 1989, and 72% by mid-1989) with particular gains among youth and college students (DeJong & Winsten, 1999). Besides the evaluators' failure to separate this increase from the secular trend in designated drivers use and the

fact that designated driver promotion efforts could not be definitively linked to the reduction in the incidence of DD behavior over extended periods of time (DeJong & Wallack, 1992), it is also worth noting that designated drivers often do not abstain from drinking (Glascoff, Knight, & Jenkins, 1994; Shore, Gregory, & Tatlock, 1991; Swisher & Bibeau, 1987).

### **Applying the Proposed Model of Media Effects to the Drunk-Driving Case**

Overall, then, there is a considerable uncertainty regarding the contribution of deliberate interventions to the decline in DD behavior over the past two decades. Many intervention strategies claimed knowledge gains but failed to provide evidence of DD behavior change. In addition, the impact of successful programs was typically limited to distinct sub-populations and to short periods of time. It is likely, of course, that these programs worked in combination to produce considerable gains in DD behavior change. One can imagine, for example, some form of a 'division of labor' among interventions wherein certain programs have had an impact on one segment of the population while other programs have influenced other sub-populations. Other formulations of relationships among intervention strategies that are consistent with this proposition include mutual reinforcement and cumulative impact of programs over time (see Yanovitzky & Blitz, 2000). Indeed, evaluations of recent comprehensive community interventions in DD behavior (e.g., Holder et al., 1997; Holder & Treno, 1997; Lacey, Marchetti, Stewart, Murphy, & Jones, 1990; Simpson, 1987; Voas et al., 1997) provide some support to this proposition, demonstrating that coordinated intervention efforts can lead to substantial reductions in alcohol-related traffic fatalities. Still, organized community mobilization efforts (or other coordinated interventions, for

that matter) were an exception throughout the period examined in this study (1978-1995). The fact that DD-related mass media campaigns were not designed to achieve any specific changes in related public policy (DeJong & Hingson, 1998) is one notable example of lack of organized coordination efforts.

The conceptual framework that guides the current study may better serve researchers in their attempt to make sense of these inconsistencies in the literature and understand the potential role of the mass media in bringing about change in DD behavior. In this framework, measures aimed at limiting alcohol availability to certain populations or deterring potential DD offenders are, in effect, mechanisms of formal social control, whereas education and prevention measures are mechanisms of voluntary social control. Level of individual resistance to social control measures and the degree to which different mechanisms of social control operate in the same direction on DD behavior, are presumed to be central to the success or failure of anti-DD measures. Thus, intensive anti-DD laws may not be as effective in leading to change in DD behavior if such laws are enforced with considerable leniency because many police officers, prosecutors, and judges do not consider DD to be a major crime (Bromley, 1996; Goldsmith, 1992; Kinkade & Leone, 1992; Ross, 1991b). Likewise, persuasion efforts are destined to failure if other sources of influence in a person's environment (e.g., family, peers, entertainment media) treat DD as an acceptable behavior (Barokas, 1995; Perkins & Berkowitz, 1986; Williams, 1994) or if the information contained in persuasive messages is canceled out by previous personal experience with this behavior (Finken, Jacobs, & Laguna, 1998).

From a social control perspective, then, DD is a predictable consequence of two normal and widely spread activities in American society: alcohol consumption and



driving. Since there is no clear line between drinking to the level of impairment and 'safe' drinking, DD-related traffic accidents are often a product of behavior conforming to norms, whether social or those shared by members of a distinct group of people. It follows that the social and cultural climate that surrounds DD behavior has a substantial weight in determining the success or failure of deliberate interventions in this behavior. In other words, in the absence of strong and unequivocal norms against DD, the prospects of achieving behavior change through deterrence and persuasion are low.

This view is shared by an increasing number of researchers in the field of DD prevention. A recurring theme in many recent studies is that the prevalence and social acceptability of DD behavior are probably the most important obstacles to successful interventions in this behavior (e.g., Barokas, 1995; Beck & Treiman, 1996; Brown, 1998; Collins & Frey, 1992; DeJong & Wallack, 1992; Howland, 1988; Jacobs, 1989; Perkins & Wechsler, 1996; Robin, 1991; Ross, 1991b; Snortum, 1988). There is also some evidence that interventions aimed at clarifying and reinforcing anti-DD norms are more successful in promoting change in DD behavior compared to more traditional forms of interventions (Barnett, Far, Mauss, & Miller, 1996; Barokas, 1995; Beck & Treiman, 1996; Collins & Frey, 1992; Holder et al., 1997; MacKinnon, Pentz, Broder, & MacLean, 1994; McKnight, 1990; Voas et al., 1997). These findings are also consistent with the results of similar interventions in other risky lifestyle behaviors such as smoking (Distefan, Gilpin, Choi, & Pierce, 1998) and unprotected sex (Baker et al., 1999; Gage, 1998), thus speak to the validity of the approach taken in this study.

The conceptual shift from cognitive to sociological models of effects on DD behavior has not been left unnoticed by health communication scholars. In recent years,

discussions about the potential role of the mass media in reinforcing social norms against DD are quite common (Barokas, 1995; DeJong & Hingson, 1998; DeJong & Wallack, 1992; Holder & Treno, 1997; Williams, 1994). A typical example of the nature of these discussions appears in DeJong and Atkin (1992) who studied DD-related PSAs. The authors suggest using mass communication channels to reflect galvanized public anger about the DD problem (thus, attaching perceived social stigma to this behavior) and to attack the existing system of knowledge and beliefs that help sustain current DD practices. Whereas such proposed use of the mass media is certainly consistent with attempts to influence the social climate that surrounds DD behavior, it is still anchored in traditional models of media effects that postulate behavior change following exposure to social images of the behavior in deliberate media messages. In contrast, the proposed model of media effects suggests focusing on the media's ability to stimulate and coordinate various mechanisms of social control - an effect that is primarily mediated rather than direct. The fact that, unlike public communication and education approaches, deterrence and norm reinforcement strategies were found to be useful in generating DD behavior change provides further ground to this proposition.

### **The General Research Hypotheses**

Figure 2.3 presents a hypothesized process of change in DD behavior that is a direct application of the proposed model of media effects in Figure 1.2 to the specific case of DD. Each link in the model (link 1 through 7) offers a general hypothesis regarding the relationship between specific elements of the model (a more specific discussion of each hypothesized link and alternative hypotheses is included in the following chapters). Together, these hypotheses outline a process of social change over

time that is proposed to account for the observed decline in DD behavior between 1978 and 1995. It is important to emphasize that this model is not designed to predict personal decisions to perform DD behavior. For this reason, important determinants of individual involvement in DD behavior such as previous experience (Finken et al., 1998) are not included in the model. Instead, changes over time in the relative importance of previous experience and other determinants (e.g., demographic factors) regarding performance of this behavior are assumed to be represented by including one or several criteria of group membership in the model.

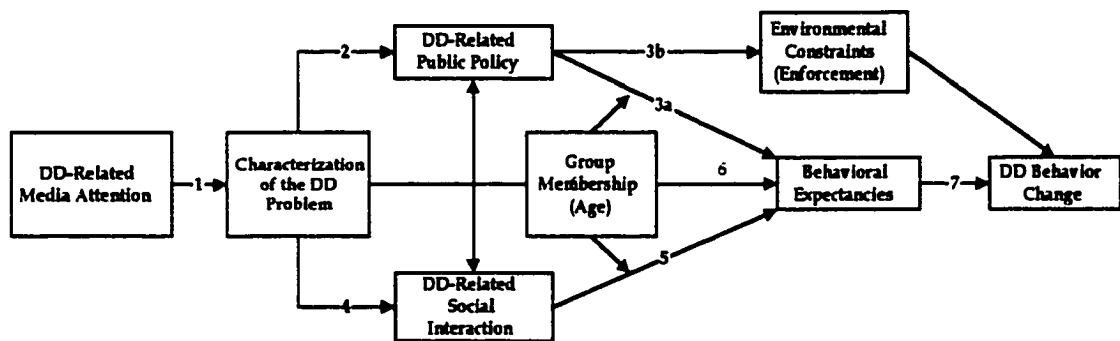


Figure 2.3: Proposed model of media effects on change in drunk-driving behavior

The study's hypotheses regarding the process of change in DD behavior are as follows:

1. Increased media attention to DD grants this behavior a status of a major public health problem. Media frames define the nature of the problem (e.g., either a problem of traffic safety, alcohol, or crime), attribute responsibility to the problem (personal or social), and hold certain individuals or social institutions accountable for the resolution of the problem (link 1). Consequently, people come to hold specific and more crystallized views of DD behavior.

2. In response to the characterization of the DD problem in the media, changes occur in DD-related public policy with the intention of curbing individual involvement in this behavior (link 2). Through legislation and allocation of appropriate resources, formal mechanisms of social control are activated in order to pursue the solutions to the problem most frequently advocated in the media and supported by public opinion. These measures are either aimed at deterring individuals from performing DD behavior (link 3a) or placing external constraints on their behavior such as limiting alcohol availability (link 3b). Deterrence is an explicit formal request for individual conformity that does not necessarily require employment of concrete social actions or resources (i.e., it is the threat of social action and not the social action itself that is expected to influence behavioral expectancies). Nonetheless, since this request often fails to produce behavior change in itself (for example, knowing that a certain behavior is illegal does not motivate all individuals to quit this behavior), more active social actions (e.g., enforcement, taxation, and banning of products) are often pursued.
3. In response to both media attention to the DD problem and related policy measures, the social acceptability of this behavior gradually declines, either through direct individual learning from media images or interaction with other members of the community (link 4). Next, fear of social stigma or other type of informal social sanctions constrains individual involvement in DD behavior (link 5).
4. Besides formal and informal mechanisms of social control, change in DD behavior may be prompted by direct exposure to media content (link 6). There are different variations of this effect (i.e., individual learning vs. social learning), all of which relate to individual knowledge gain and subsequent change in related attitudes and

beliefs among members of the public at large.

5. Over time, sustained social control efforts lead to an increasing number of people who change their DD practices (link 7). However, the impact of various social control measures will vary between groups of individuals as a function of group members' resistance to social control efforts.

The expectation for interaction effects requires further clarification regarding the criteria of group membership most relevant in this context. Decades of research on DD suggest that age is the primary variable that predicts involvement in DD behavior. The prevalence of DD among youth is typically described in terms of an epidemic (Little & Clontz, 1994) as adolescents and young adults are over-represented in alcohol-related traffic fatalities and injuries (NHTSA 1998). One element that distinguishes young from older drivers is high level of sensation-seeking and risk-taking (Jessor, 1992; Johnson & White, 1989; Jonah, 1990). Another element is membership in a fairly homogeneous sub-culture that place great value (and, therefore, greater social pressure) on alcohol consumption as a social behavior (Barnett et al., 1996; Beck & Summons, 1987; Brown, 1990; Dinges & Oetting, 1993). Furthermore, young drivers tend to underestimate the risk of DD-related crashes compared to older drivers (Finn & Bragg, 1986). In addition, differences in media consumption between youth and adults are well documented in the literature on media effects (Bogart, 1989; Robinson & Godbey, 1997).

These elements predict a high level of youth resistance to voluntary and informal mechanisms of social control. The fact that only formal forms of social control (i.e., deterrence and limiting alcohol availability to youth) have generated reductions in DD behavior among members of this particular group is consistent with findings regarding interventions for other risky behaviors (Yanovitzky & Stryker, 2000), and

justifies the current study's reliance on age as the primary criterion of group membership. Other possible criteria of group membership such as gender or race were not found to be associated with resistance to intervention efforts (Jonah, 1990; Perrine, 1990). In addition, whereas a distinction between 'problem drinkers' (or alcoholics) and 'social drinkers' is fairly common in the literature (Perrine, 1990; Robin, 1991), the proportion of DD-related traffic accidents involving problem drinkers (about 11%) remained the same throughout the research period (DeJong & Hingson, 1998) as this specific sub-population requires treatment and do not respond to prevention strategies (DeYoung, 1997; Foon, 1988).

### **Summary**

DD behavior provides an excellent setting in which to test the validity of the approach to media effects taken in this study. DD is one of several lifestyle behaviors with associated morbidity and mortality that were heavily targeted by prevention efforts over the course of the past two decades. While some of these efforts have been successful, none can account for the substantial reduction in the prevalence of these behaviors over this time period. Most notable are findings about the relative ineffectiveness of public health communication campaigns in contributing to the observed change in these behaviors. However, since other potential routes of media effects have not been explored, a conclusion that the mass media had no role in stimulating DD behavior change (see Vingilis & Coultres, 1990) is most likely premature. Rather, it is hypothesized that media attention to the DD problem facilitated related processes of social control and social change that helped reduce individual involvement in this behavior.

## CHAPTER 3

### THE MEDIA AND THE DRUNK-DRIVING PROBLEM, 1978-1995

This chapter examines the dynamics of media attention to the DD problem between 1978 and 1995. Two main questions are addressed here. The first is when and how exactly did the issue of DD climb the media agenda as a public health problem? The second is how was the DD problem constructed and presented in the media? Both questions refer to the first theoretical link in Figure 2.3 (i.e., the gatekeeping function and the social construction of public problems in the media). By answering these questions, more specific hypotheses about the nature of the relationship between media representations of the DD problem and social efforts to control it will be developed and tested in the following chapters.

#### **Setting the Media Agenda for the Drunk-Driving Issue**

Public health problems seldom emerge in a clear-cut fashion on the media agenda. The objective status of a problem, as indicated by trends in real-world indicators such as morbidity and mortality, is often independent of the attention this problem receives in the mass media. In fact, media attention to a public problem often peaks when the scope and severity of this problem is already decreasing (Dearing & Rogers, 1996). The issue of cigarette smoking is one example of this. Prior to the 1970s, smoking was a major public health problem in America, with millions of people dying of lung cancer. It was not, however, an important public issue. It emerged as an important public problem from the 1970s onward, and since then 30 million Americans quit smoking (CDC 1999). Thus, to explain increased media interest in a particular

public problem requires taking a step back in this process to consider the impact of external sources of influence on the media agenda.

A useful framework for examining the mass media's role in the social construction of public health problems is the public arenas model (Hilgartner & Bosk, 1988). According to this model, public issues arise when competing interests vie for distribution of scarce social resources. To gain legitimacy and public support to their claims, issue proponents struggle over media attention with the intention of increasing awareness of their grievances among policy-makers and the public alike. Because the media and the public agenda have limited capacity to carry competing claims (McCombs & Zhu, 1995), competition for media attention is fierce and forces claim-makers to employ strategies that will secure favorable media attention to their agenda. Elites and officials are typically successful in setting the media agenda because they have the weight of authority behind them (Dearing & Rogers, 1996). Other groups are often marginalized (Gitlin, 1980; Parenti, 1985), unless they develop other resources of value to media such as specialized expertise, drama, and reduced political and economic cost of information (Barker-Plummer, 1995; Best, 1995; Gandy, 1982). To be successful in receiving media attention, then, groups must develop a relationship of exchange and symbiosis with media gatekeepers (Gandy, 1982; Reese, 1991).

Similar rules of competition apply to the struggle between different groups of advocates (or stakeholders) over the accepted and authoritative definition of a certain problem (Gusfield, 1981). Traffic crash fatalities, for example, may be defined as a problem of reckless driving, a problem of car safety, or a problem of social control. Each definition is motivated by different interests and implies different ways of understanding the causes of the problem and the social actions needed to fight it. The



group of stakeholders whose claims receive much media attention is likely to be recognized by the public as the legitimate and authoritative “voice” of the problem (Gusfield, 1981). Because this group of stakeholders control the definition of the problem and the information related to it (Gandy, 1982), it also possesses the power to attribute responsibility to the problem and propose actions leading to its resolution (Gusfield, 1981; Larana, Johnston, & Gudfield, 1994). The case of DD, as we are about to see, fits well into this framework.

#### Drunk-Driving: A Brief Historical Account of a Public Problem

DD has emerged as a potential public problem in the United States as early as automobiles became a common aspect of American life (Jacobs, 1989). Until 1960, DD-related traffic crashes were commonly treated as accidents or errors made by unskilled drivers (Gusfield, 1981). At the beginning of the 1960s, a loosely connected cadre of professionals and bureaucrats started to advocate safer cars as a solution to this problem (McCarthy, 1994). Consequently, the automobile industry came under pressure to produce cars that would be safer even for unskilled and reckless drivers. This approach was embraced by President Lyndon Johnson and Congress, and helped creating the National Highway Traffic Safety Administration (NHTSA) in 1966 as a new federal agency responsible for executing the policy of auto safety reform (Borkenstein, 1985).

The legislation that established NHTSA focused almost exclusively on auto safety but made provisions for a thorough and complete study of the relationship between alcohol and traffic safety (McCarthy, 1994). NHTSA-funded studies between 1966 and 1968 revealed for the first time the scope and magnitude of the DD problem

that were reported to Congress in 1968 with a recommendation for additional legal means that would deter drunk-drivers from performing this behavior. DD has consequently transformed into a 'folk-crime' (Gusfield, 1981). In the early 1970s, NHTSA launched the Alcohol Safety Action Project (ASAP) that was the first systematic attempt to prevent DD through enforcement crackdowns. The project, that encompassed 35 communities across the nation, was designed to increase the probability of arrest and convictions for DD, divert offenders to treatment programs and educate the public about these changes. Reductions in nighttime accidents (as a surrogate of alcohol-related crashes) were found in 12 of the 35 communities. Similarly, random roadside surveys conducted in 27 sites found a decreased incidence of DD over the intervention period (Borkenstein, 1985; Ross, 1984).

By the mid-1970s, DD was recognized as a major public problem by federal agencies, state and local police and the research community (Gusfield, 1981). Still, this problem received very little media and public attention (McCarthy, 1994). One study (McCarthy, 1994) found that no DD-related news stories appeared in the early 1960s, and that the limited news coverage the problem received between 1965 and 1967 (with the establishment of NHTSA) had waned and stayed at a low level throughout the late 1970s. Then, at the beginning of the 1980s, media and public attention to the DD problem escalated rapidly. From virtually no national news coverage of DD in 1978 (estimated from 5 national circulation newspapers and 112 local newspapers), the media devoted an average of 30 stories a month to the issue in 1984. A noticeable increase in media coverage was observed between 1981 and 1982, with attention peaking in the course of 1983 and 1984, and a moderate decline in attention thereafter that stayed at

the same level throughout the late 1980s. Similar patterns of coverage were observed for television news as well.

What exactly prompted media interest in the DD problem? There is a consensus among researchers that the rapid increase in media attention to the DD problem at the beginning of the 1980s can only be explained by the rise of citizens' movement against DD (Baumgartner & Jones, 1993; Borkenstein, 1985; Compton, 1988; DeJong, 1996; DeJong & Hingson, 1998; Gusfield, 1981; Haskins & Haskins, 1985; Laurence et al., 1988; Marshall & Oleson, 1994; Marshall & Oleson, 1996; McCarthy, 1994; McPhee, 1992; Reinerman, 1988; Ross, 1991b; Stewart & Voas, 1994). Beginning in the late 1970s, citizen advocate groups against DD began working to reduce the level and consequences of DD. Victims of DD and their relatives constituted the majority of these groups' members. The first group to be founded (1978) was Remove Intoxicated Drivers (RID) that focused on counseling victims' families and raising public awareness to DD (Haskins & Haskins, 1985). Similar goals were pursued by two other groups - Mothers Against Drunk Driving (MADD) that was founded in 1981 and by Students Against Drunk Driving (SADD) that was founded in 1982. While all groups aimed at reducing DD, their actions reflected different approaches ranging from raising public awareness to actively seeking legislative remedies to the problem (McCarthy, 1994).

McCarthy (1994) and Reinerman (1988) offer the most complete account of grassroots activists' success in generating media attention to the DD problem. Both focus their explanation on MADD, the most visible and successful group of activists against DD. MADD was founded by Candy Lightner whose 13-year old daughter was struck and killed by a recidivist drunk driver. In following the criminal justice process of punishing this recidivist drunk-driver, she grew increasingly outraged at the

extraordinary leniency with which DD offenders were routinely handled by the criminal justice system and began channeling her grief and anger into efforts to get tougher anti-DD laws passed by the California legislature. She began holding dramatic press conferences, giving tearful and angry testimony before legislative committees, and organizing a grassroots organization by the name of Mothers Against Drunk Drivers (that was only later changed to Mothers Against Drunk Driving). By 1985 MADD had over 600,000 members and donors, 360 chapters in all fifty states, and a budget approaching \$10 million administered by a full-time professional staff.

MADD, Reinerman (1988) notes, was heaven-sent for many journalists. In the past, without a visible moral entrepreneur to give a human voice to the victims of DD, alcohol-related accidents tended to be treated as episodic, unconnected accidents. But with the rise of MADD, the victims suddenly gain a voice and the media started to find this long-existing phenomenon extremely appealing (which can explain the dramatic increase in the news coverage of DD). MADD helped journalists to present the consequences of DD in terms of human drama, it provided a personal angle to a public problem experienced by many local communities, and focused attention on a desirable kind of conflict from the journalistic point of view, namely, citizens fighting the system to restore justice and social order. This conflict presented a tangible villain (the drunk-driver), an appealing hero (mothers and fathers), a problem that touches many people's lives, and an explicit request for resolution from those who are accountable (legislators, judges, the police).

As it turns out, the group's name was particularly instrumental in securing media attention to the DD problem (Gusfield, 1981; Marshall & Oleson, 1994; McCarthy, 1994; Reinerman, 1988). In the competition for media attention, symbols and emotions

go a long way, especially when the moral authority of mothers is invoked (Gusfield, 1981; Toner, 2000). The Mothers of Plaza de Mayo in Argentina (Bouvard, 1994), Mothers Against Silence in Israel (Sharoni, 1997) and, more recently, the Million Mom March for common sense gun control (Toner, 2000) – are few recent examples of a long-lived tradition of motherhood activism. Most people have strong feelings and opinions about the institution of motherhood. Perhaps the most deeply rooted of these is the notion that mothers are by definition apolitical, far removed from politics and social struggle (Ruddick, 1989). Images of mothers that are ‘forced’ to get involved in public policy are, therefore, powerful enough to suggest that something is fundamentally wrong in society. Coupled with the great credibility that the public tends to attach to mothers’ activism (Orleck, 1997), it is clear why journalists are likely to select issues mothers promote as a group.

Invoking the moral authority of mothers, however, was only one of many deliberate strategies employed by MADD to attract media attention to the DD problem. The group’s ‘repertoires of collective action’ (Ryan, 1991; Zald, 1996) also included peaceful demonstrations, news events, publicized partnerships with local and national organizations, monitoring court decisions in DD cases, and strong presence in DD-related task forces and public hearings (Convissor, Vollinger, & Wilbur, 1990; McCarthy, 1994; McCarthy & Wolfson, 1996; McPhee, 1992; Reinerman, 1988). The volume of activism, no doubt, has contributed to the attention the movement received and helped to construct DD as a major public problem (McCarthy, 1994). Most researchers who studied MADD, however, are fast to point out that the movement’s successes in generating media attention to the DD problem was largely a function of favorable social and political circumstances. Reinerman (1988), for example, places

MADD's success as part of a larger movement toward health consciousness that spread across America in the late 1970s. In addition, MADD's particular focus on the 'killer drunk' as the source of the problem effectively vindicated the alcohol industry and, thus, opened a door for its support of the anti-DD movement as well as allowed media personnel to take a strong position against DD without fear of retribution from advertisers. McCarthy (1994) adds to the explanation of MADD's success the fact that efforts to draw public attention to DD were employed by powerful federal and local actors long before MADD arrived on the scene. Many of these actors considered MADD and other citizen activist groups to be the 'missing link' between policy efforts and media attention and, thus, were extremely sympathetic and responsive to the goals of the anti-DD movement from its inception. In such a one-sided and consensual climate, MADD and its counterparts were almost certain to receive favorable media attention to their claims.

But what empirical evidence exists in support of claims about the role of anti-DD grassroots activism in generating media attention to the DD problem? As noted by McCarthy (1994), there was little systematic evaluation of this contention to date. McCarthy himself offers two tests of the associations between grassroots activism and media attention. The first, the simplest of the two, "would assess whether their mere presence increases media coverage of their primary grievances (p. 148)." The second is more complex and involves a comparison of local chapters' success in generating local media coverage as a function of their organized efforts.

McCarthy (1994) assessed the independent impact of the mere presence of activists in a community on generating media coverage of DD using data from local newspapers between 1979 and 1987. An estimated impact of the presence or absence of

an anti-DD activist group on the presence or absence of DD-related stories in each year was calculated for 111 local communities. Results indicated that the mere presence of an activist group had a strong and significant impact on the likelihood of DD-related news coverage even when controlling for community size and size of the local media market (similar results are also reported by McPhee, 1992). McCarthy then continued to examine the prospects of success by the level of local groups' organized actions (e.g., individual leader effort, group emphasis, organizational structure, etc.) and found that the type and scope of activities mattered. In particular, local groups that emphasized DD victim issues and services were significantly more likely to be successful in generating local news coverage of the DD problem than local groups that emphasized public awareness.

The results reported by McCarthy regarding the activism-media link are certainly instructive but his measure of impact (i.e., the presence or absence of DD-related stories in each year) may not be sensitive enough to capture the dynamic nature of this association over time. In this respect, comparing the number of references to grassroots activists in DD-related news stories before and after the early 1980s may be an additional and useful test of this proposition. Number of references is an adequate (but, by no means, a perfect) measure of activists' impact on news production processes given that reporters routinely cite their sources (Fishman, 1980; Gans, 1979). Hence, if media references to activists in the context of the DD problem were rare prior to the 1980s but fairly common thereafter, this may be additional evidence that grassroots activism played a substantial role in capturing media attention to the problem.

*Hypothesis 3.1: The number of news stories that include references to members and activities of anti-DD activist groups in the media will be small prior to the beginning of the 1980s and substantially greater thereafter.*

### **Media Frames of the Drunk-Driving Problem**

Our discussion thus far has centered on possible explanations for the sudden peak in the *amount* of media attention to the DD problem from the beginning of the 1980s onward. In the conceptual framework of the current study (and much of mass communication theory, for that matter), the volume of media attention a public problem receives is central to the explanation of shifts in people's opinion about this problem (Dearing & Rogers, 1996). Yet, the mere volume of media attention often serves as a cue for people to process the information contained in media messages (Price & Tewksbury, 1997). Rather, it is the way in which a public problem is presented in the media that has important cognitive and behavioral implications in terms of people's response to it (Gamson, 1992; Iyengar & Kinder, 1987; Petty & Cacioppo, 1986).

The concept of 'media frames' provides the logical link between the production of media content and its impact on audiences (Price & Tewksbury, 1997). As noted above, processes of news selection and production within media organizations are guided by a common set of professional conventions and routines that place higher value on certain aspects of reality (e.g., conflict, drama, novelty, proximity, and personal angle) than on others (Fishman, 1980; Gans, 1979; McManus, 1994; Tuchman, 1978). Besides directing media gatekeepers' selection of news, these conventions guide efforts by journalists to present this information to their audiences in a simplified and condensed manner (Jamieson & Campbell, 1992). The result is a stable set of narratives



(or frames) that describe and interpret objects, events, situations, experiences, actions, and other daily occurrences by placing them within a broader social and cultural context (Gamson, 1992). Audiences, in turn, use these frames to construct an interpretive structure (or schema) that helps them to organize their beliefs, attitudes, and alternative paths of behavior regarding these particular events or objects (Entman, 1993).

Media frames, then, are central to inferences about the media's role in promoting DD-related processes of social control and social change. The task of describing and analyzing these frames, however, cannot be divorced from the particular circumstances in which certain frames of the problem (but not others) are introduced and developed by the media. Most discussions of frames and framing processes (e.g., Best, 1995; Entman, 1993; Gamson, 1992; Goffman, 1974; Price & Tewksbury, 1997; Ryan, 1991; Snow & Benford, 1988) resort to a power balance framework (Reese, 1991). According to this approach, media frames of public problems are socially constructed through manipulations by social actors such as elites and social movements. This conceptual framework offers two important insights into the dynamics of the media framing process. The first pertains to the question of who controls the framing process? The second concerns the notion that as power balance between groups shifts over time media frames of issues may be transformed.

According to Gusfield (1981), control over the process of framing a public problem is achieved through two successive steps: ownership and responsibility. Ownership involves the power to create and influence the authoritative public definition of a problem (cf. Best, 1995). Responsibility implies attributions regarding the source of a specific problem (also Iyengar, 1991) as well as the social elements and

appropriate social actions that are expected to lead to its resolution (see Iyengar & Kinder, 1987). Social actors that are frequently mentioned by the media in conjunction with a certain problem are more likely to be publicly identified as the problem's 'voice' and, thus, are likely to 'own' it. Once the battle over ownership is decided, this group is able to both attribute responsibility and hold a specific social element accountable for resolving the problem. Media frames, therefore, are likely to reflect those attributions and solutions to the problem that are advocated by this particular group.

Hypothesis 3.1 suggests that anti-DD activist groups were particularly influential in setting the media agenda for the DD problem. The considerable level of media attention that these groups have arguably received at the beginning of the 1980s, conferred their standing on the problem and allowed them to 'own' it publicly.<sup>1</sup> Following the argument above, it seems logical to expect that the movement particular diagnostic (definition and source of the problem) and prognostic (the appropriate strategy to curb the problem) frames of the DD problem will be widely used by journalists when communicating the problem's attributes to their audiences. Detailed accounts of the anti-DD movement's chronicles (DeJong, 1996; Gusfield, 1981; Haskins & Haskins, 1985; Marshall & Oleson, 1994; Marshall & Oleson, 1996; McCarthy, 1994; McPhee, 1992; Reinerman, 1988; Ross, 1991b) suggest that these frames defined DD as a frequently committed crime, identified individual drunk-drivers as the source of the problem, and called for stiffer punishments to drunk-drivers as an appropriate strategy to reduce DD incidence.

*Hypothesis 3.2: From 1980 to 1995, media representations of the DD problem will*

*(a) refer to DD as a crime, (b) hold individual drunk-drivers responsible for the DD*

*problem, and (c) suggest tougher laws and stricter enforcement as an appropriate strategy for the resolution of the problem, more frequently than any other alternative definition, attribution of responsibility, and prescribed solution.*

Hypothesis 3.2 implies that an appropriate test of activists' impact on media frames involves a comparison between the salience of the frame they promoted and that of some alternative frames. Still, the expectation that a single frame has dominated media coverage of DD between 1980 and 1995, does not necessarily imply that a single group of stakeholders (anti-DD activists) was more powerful than other groups in shaping media representations of the DD problem. In fact, such an assumption is probably naïve. For one, journalists themselves are not neutral to the framing process and tend to transform information they receive from their sources rather than transmit it (Gitlin, 1980; McManus, 1994; Montgomery, 1989; Ryan, 1991). The persistence of a certain frame over time, thus, may simply reflect long-term interests of media organizations (for example, financial, political, or moral gains) that are served well by using this particular frame. For another, it is possible that particular interests of stakeholders who share the same goals (e.g., reduce DD incidence) will converge over time so that a single meta-frame may benefit most or all of them. Under these circumstances, it is almost impossible to link a specific alternative frame to a specific group of advocates and, therefore, separate the effect of one group on media frames from that of others. Rather, the criterion for comparison becomes one that considers which group of advocates is more frequently mentioned in conjunction with the dominant frame at different points in time.

A test that considers co-occurrences (Krippendorff, 1980) of frames and stakeholders over time also resonates with the notion that as power balance between groups of stakeholders shifts in time, media frames of issues may be transformed. This aspect ties directly to the debate about media advocacy strategies (Wallack, Dorfman, Jernigan, & Themba, 1993) and the power of citizens' activism to bring about social and cultural change. Traditionally, social movements were conceived as a force that is independent of governmental structures and is powerful enough to promote social reforms and cultural changes (Gamson, 1990). More recent analyses (e.g., Baumgartner & Jones, 1993; McCarthy, 1994; Zald, 1996) recognize, however, that without the support and cooperation of federal, state, and local functionaries many of these groups fail to promote the changes they seek. In this revised theoretical framework, activist groups occupy the role of a 'social catalyst' that is capable of attracting media and public attention to certain issues that are already actively promoted by governmental agencies.

This suggests that the initial appeal of activist groups to journalists is likely to wane over time and that the power to promote particular frames of public issues will shift to elite groups such as policy-makers and experts that routinely have a greater weight in setting the media agenda. To the extent that the characterization of a certain problem by grassroots activists serves elite groups' interests, it is likely that members of these groups will continue to use this frame when interacting with journalists in relation to this issue. Under these circumstances, one may expect to find that while the dominant characterization of the issue in the media has not changed over time, references to the dominant frame in the media will increasingly appear in conjunction

with references to members of elite groups but decreasingly with references to grassroots activists.

Conversely, when members of elite groups seek to redefine a problem and its solutions in ways that are advantageous to the agenda they promote, it is reasonable to expect that the previously dominant frame (i.e., the frame promoted by activists) will be replaced by a different one (Baumgartner & Jones, 1993). For example, government bureaucrats, and NHTSA in particular, have a strong interest in defining the DD problem as a traffic safety problem that falls under their jurisdiction and permits them to request more federal resources. Similarly, scientists may be interested in defining the problem as a public health or an alcohol-related problem that requires federal investments in research and education programs. In this case, it is likely that frames associated with elite groups will gain more prominence in media discussions of the issue over time while references to the frame associated with grassroots activists will substantially decrease after these activists initial impact on the media agenda. Still, given the evidence that elite groups shared the characterization of the DD problem as promoted by activist groups against DD and used it to promote their own interests (McCarthy, 1994), it seems more reasonable to expect that the dominant media frame (i.e., the crime frame) will be sustained over time rather than transformed or replaced by alternative frames.

*Hypothesis 3.3: The number of news stories that mention the crime frame in conjunctions with references to anti-DD activist groups will increase between 1980 and 1984 and decrease thereafter. The number of news stories that mention the*

*crime frame in conjunctions with references to members of elite groups (policy-makers, bureaucrats, and scientists) will increase between from 1984 onward.*

Notice that hypothesis 3.3 touches indirectly on an important aspect of media coverage of public problems over time – the media issue attention cycle. This concept refers to the well-documented tendency of media coverage of issues to ascend rapidly and then to gradually descend over time (Dearing & Rogers, 1996). Previous accounts of this phenomenon suggest that media attention cycles follow a ‘natural history’ (Downs, 1972), or a set of common stages, that can be explained by mechanisms such as issue competition (Baumgartner & Jones, 1993; Hilgartner & Bosk, 1988), diffusion of attention through intermedia agenda-setting (Danielian & Reese, 1989; Dearing & Rogers, 1996; Trumbo, 1995), and shifts of attention from one aspect of the issue to another following a flow of new information (Rogers et al., 1991). More recently, it has been argued that attention cycles are closely related to narratives developed by journalists to cover the same issue over time (McComas & Shanahan, 1999).

Hypothesis 3.3 suggests that the persistence of a public problem on the media agenda may be related to the dynamics of the framing process. In the discovery phase, journalists follow their professional routines and selection criteria to choose among competing frames of the same issues. During the period in which media attention to the issue peaks rapidly (the mobilization phase), the dominant frame quickly diffuses to other agendas and is adopted by other social actors. Consequently, the maintenance stage (where media coverage levels off) is characterized by journalists’ efforts to place related actions of social actors in the context of the dominant frame. When the power balance shifts from the dominant group of stakeholders to other groups, the media’s

interest in the problem persists (though at a lower level than initially) as long as the transformation from the dominant frame to alternative frames generates additional information and different aspects of the problem (Rogers et al., 1991). In contrast, once the problem itself is institutionalized (i.e., becomes the domain of social institutions), the media are likely to lose their continued interest in it.

The media attention cycle particularly impinges on efforts to promote health behavior change in that it relates to the challenge of maintaining public interest in controlling risky health behaviors.<sup>2</sup> Hence, while a direct test of a relationship between framing processes and the cycle of media attention to the DD problem is beyond the intended scope of the current research project, a number of references to the plausibility of this association are made in the analysis reported below.

## **Methodology**

### **Data**

Media attention to the DD problem between 1978 and 1995 is the primary independent variable in this study. Hypotheses 3.1 through 3.3 propose that the amount of media attention the problem received over this period, as well as the frames used to describe and discuss it, are consequential for changes in DD-related policy, norms, and behavior. They also suggest, in concert with the conceptual model of media effects that guides the current study, that this variable should be representative of the treatment the DD problem received in the national media environment. These two considerations, in turn, informed decisions regarding the relevant sources and content from which data on media attention to the DD problem were collected and analyzed in this study.

Our earlier discussion of relevant media content for inferences about the process of health behavior change (see Chapter 1) suggests that news coverage is probably the most appropriate form of media content. Recall that some of the reasons cited in support of this argument were greater likelihood of audiences' exposure to and reception of health messages, and the causal proximity of news agenda to other agendas (namely, the public and policy agenda). True, depictions of behaviors in advertisements (Atkin, 1990) and in entertainment media (Signorielli, 1993; Singhal & Rogers, 1999) are another important source of media messages in relation to health behaviors. Still, with no systematic way of retrospectively quantifying depictions of DD in these sources, and given that news and entertainment media are embedded in the same organizational and cultural environments, it is probably acceptable to assume that trends in news coverage of public problems are similar to those in the entertainment media (for empirical support of this argument see Atkin, 1989; Brown & Walsh-Childers, 1994; Yanovitzky & Stryker, 2000). Hence, media attention to the DD problem is operationalized in this study as the number of DD-related news stories in national media outlets.

Three major national news sources, the *New York Times*, the *Washington Post*, and the *Associated Press* (AP) wire service, were selected to represent the national media environment. The *New York Times* and the *Washington Post* were chosen for their intermedia agenda-setting power and the strong relationship that exists between these daily national newspapers and other national news sources, including television networks (Dearing & Rogers, 1996; Neuman, 1990; Yanovitzky & Bennett, 1999). In addition, there is evidence that both newspapers are central to elites and policy-makers (Bennett & Yanovitzky, 2000; Dearing & Rogers, 1996; Hess, 1984) for whom this study



will make later inference. The *Associated Press* (AP) wire service was included because it feeds many national and local news outlets (both print and electronic), and thus approximates well the national news environment (Fan, 1988).

Using a single news story as a coding unit, the Lexis<sup>®</sup>-Nexis<sup>®</sup> on-line database was searched to generate a census of all DD-related news stories that appeared in these national news sources between January 1, 1978 and December 31, 1995. Because a conservative measure of media attention was sought, only news stories whose primary theme was the issue of DD were included in the analysis. To qualify, a story had to be one of the following: (a) a report on DD-related accident, (b) a report on DD-related actions by the police or the criminal justice system (e.g., arrests or prosecution of drunk-drivers, court decisions in DD cases, and notifications on coming DD-related police activities such as sobriety checkpoints), (c) a report on DD-related legislative measures (i.e., laws or bills that were passed or introduced in Congress or state legislatures), (d) a report on DD-related scientific studies or DD-related local and national statistics, (e) an interview with DD victims, activists, or public officials, (f) an editorial, op-ad, or a letter to the editor concerning the DD problem, or (g) a thematic story on one or more aspects of the problem (for example, a profile of MADD's leader, a historical account of anti-DD measures, a discussion about the efficacy of different measures and their social implications, etc.). The main criterion for exclusion was any mentioning in passing of DD. For example, a news story in the *Washington Post* that simply compared the success of a citizens' group against child molesters to that of citizen groups against DD (Mathews, 1982), was excluded from the analysis.

While the use of on-line databases is fairly common for retrieving newspaper stories (Roberts, 1997), sampling errors may challenge both the internal and external

validity of the study. Beyond failures to select data sources that are representative of the entire universe of sources (see discussion above), sampling errors are typically a product of a misspecified search phrase (Salton & McGill, 1983). A well-specified search phrase is measured against its ability to minimize two types of errors: errors of omission (recall) and errors of commission (precision). Recall addresses the concern that the search phrase used does not adequately capture the entire universe of relevant content items. Precision, on the other hand, addresses the concern that the search phrase used captures a substantial number of non-relevant content items.

In order to formulate an appropriate search phrase that will effectively retrieve only (or mostly) relevant DD-related news stories, several approaches were tested. One way of obtaining relevant stories is by limiting the retrieval process to stories in which the word 'drunk-driving' or a synonym (driving while intoxicated or DWI, driving under the influence or DUI, drunken-driving, etc.) appears in the headline (e.g., McComas & Shanahan, 1999). Following a test of precision as prescribed below, this strategy was found to substantially underestimate the actual frequency of relevant DD-related stories (specifically, 74% of stories counted as relevant were filtered out by this procedure). Next, an attempt was made to incorporate into the basic search phrase concepts that are unique to the topic of DD such as any combination of 'against DD' (i.e., MADD, SADD, etc.) and words such as 'alcohol', 'NHTSA', and 'blood alcohol level (BAC)'. The result was a lengthy and cumbersome search phrase that, according to the precision test, left out 58% of the relevant news stories because syntactical rules that link concepts by setting the distance in words between them could not be appropriately specified given the large number of concepts that were included in the search phrase (in other words, a problem of over-specification). In contrast, the final approach limited the

search to stories in which references to DD appeared at least twice (in syntax form: 'atleast2 drunk! or drink! or intoxicated or impaired w/1 driv!') and proved to be a parsimonious and effective strategy for retrieving relevant DD stories based on the procedure described below.

To estimate the levels of recall and precision associated with different search phrases, a procedure suggested by Wray and his colleagues (Wray, Maxwell, & Hornik, 1998; also see Yanovitzky & Bennett, 1999; Yanovitzky & Blitz, 2000) was followed. First, of the 216 months of media coverage included in the analysis, one-third (75 months) were randomly selected to generate a sub-sample of DD-related news stories. As these 75 months were equally distributed over a period of 18 years, this sub-sample was sensitive enough to detect sampling errors that are associated with semantic changes over time (that is, changes in the exact terms or key-words used to signify DD, such as drunk-driving, DUI, or DWI). Next, to capture the entire universe of DD-related news stories that appeared during these months, an open search phrase (the combination of 'drinking and driving' anywhere in the text) was employed. This procedure generated a total of 2,123 news stories that were then reviewed to determine whether or not they were relevant to the topic of DD following the criteria described above. Of these, only 1,058 news stories (49%) were found to be relevant. In the next step, the proposed search phrase (i.e., the one requiring at least two references to DD) was used to retrieve relevant news items from the same sample. This procedure generated 1,026 news items of which 1,014 (98.8%) were relevant by the same criteria. To minimize the possibility of a selection bias, a second coder was asked to review the sub-sample of news stories and then to determine their relevancy. Agreement on relevant DD-related stories between the author and the second coder was calculated

using Scott's Pi (Scott, 1969) and reached an acceptable level after correcting for chance agreement ( $Pi = .82$ ). Similar results ( $Pi = .87$ ) were generated from an intra-coder agreement test that compared the author's consistency in analyzing the same sample of content at baseline and six months later.

An estimate of news stories recall was calculated separately for each month by dividing the number of relevant news stories retrieved by using the proposed search phrase by the number of relevant news stories retrieved by using the open search phrase. On average, the proportion of news story recall for each month was found to be high (recall = .96, SD = .025). News stories precision was calculated separately for each month by dividing the number of relevant news stories retrieved by the proposed search phrase by the total number of both relevant and non-relevant news stories retrieved by the same search phrase. On average, the proportion of precision for each month was high (precision = .98, SD = .013). Hence, concerns regarding the semantic validity (Krippendorff, 1980) of the proposed search phrase were removed and it was used for retrieving a census of all DD-related news stories from 1978 to 1995 (N = 15,914 news stories).

## Variables

In order to test Hypotheses 3.1-3.3, all DD-related news stories were content analyzed for the presence or absence of several variables (see Appendix A for a complete list). The first set of variables was designed to record basic information about each story's non-substantive characteristics such as date, source, length (in words), and location (section and page). The second set of variables measured whether or not each news story included references to one or more groups of stakeholders (i.e., grassroots

activists, scientists, policy-makers, law enforcement representatives, and representatives of the alcohol, car, and car insurance industry). The third set of variables examined different frames of the DD problem. One item focused on the presence or absence of certain definitions of the problem (crime, alcohol problem, traffic safety problem, public health problem, and a normative problem). Two other items focused on the identity of individuals or groups most frequently mentioned as the source of the problem. Besides individual drunk-drivers, these items recorded any reference to youth, given the expectation that age would play an important role regarding the type of solutions sought to the DD problem. The remaining items in this category included references to possible solutions (tougher laws, stiffer punishments, strict enforcement, treatment, education and prevention, and passive safety measures), and whether the discussion of DD in the news story was episodic (report on a discrete event) or thematic (linked to the problem in general through state and national statistics). The final set of variables measured the news story valence by counting references to opinions that favor or oppose measures aimed at reducing the DD problem.

#### Content Analysis Procedure

Due to the large number of news stories in the analysis, computer-assisted content analysis was used to quantify occurrences and co-occurrences of variables in the text. Similar to other methods of computer-assisted content analysis (Fan, 1988; Nacos et al., 1991; Roberts, 1997), the particular procedure used in this study followed four basic steps. The first step involved the construction of a dictionary of words (and as many of their synonyms as possible) that journalists typically use to describe and discuss different aspects of the DD problem. This was done by reviewing the DD-

related news stories that were included in the sub-sample of 75 months (N = 1,058 news stories) and recording words and combination of words that refer to certain frames or objects.<sup>3</sup> Once a dictionary is constructed, the next step is to develop a syntax that will allow the researcher to specify different relationships between words in the text (e.g., the sequence of words, the distance between them, etc.). Such a syntax is typically an intrinsic feature of the computer program used, such as Lexis<sup>®</sup>-Nexis<sup>®</sup> in this case. The third step involves the development of an extensive set of syntactical rules that specify for the computer program a list of words that reference the ideas or objects the researcher would like to capture and the distance (in words) between them. For example, when the word “crime” appears within 20 words of the idea “drunk-driving” (that is captured by the search term previously used to retrieve relevant stories) it is frequently (98% of the time) an indication that DD is framed as a crime in this specific news story. By instructing the computer to search the database for this combination, all stories in which DD was framed as a crime are coded as such.<sup>4</sup>

The final step of any computer-assisted content analysis is to ascertain that the procedure used does, in fact, generate a valid and reliable coding of content categories. At one level, high recall and precision scores are, in themselves, evidence of a valid and reliable procedure. To this end, tests of recall and precision were performed for each particular content category. First, criteria for relevancy were established for each content category (see Appendix B) and then employed in the coding of each article by formulating a search phrase that specifies the distance in words between ‘drunk-driving’ and a set of keywords that capture a certain idea (e.g., definition of DD as a crime, tougher laws as a solution to the DD problem). In other words, each search phrase included the basic search phrase (i.e., the one used to retrieve relevant DD

stories), a fixed distance (in words), and a phrase that represent a particular frame or content category. Next, recall was calculated for each content category by dividing the number of relevant news stories retrieved by using the complete search phrase by the number of relevant news stories retrieved by using an open search phrase (i.e., a search phrase that did not specify a particular distance between 'drunk-driving' and a particular frame but used the Boolean 'AND' instead). Recall level for the variables in the analysis ranged from .91 to 1 (mean = .96, SD = .0026). Precision was calculated for each content category by dividing the number of relevant news stories retrieved by the complete search phrase by the total number of both relevant and non-relevant news stories retrieved by the same search phrase. Precision level for the content categories in the analysis ranged from .84 to 1 (mean = .96, SD = .004). A complete account of this procedure and the results of recall and precision tests appear in Appendix C.

Still, a computer-assisted procedure should perform equally well or better than human coding before concerns regarding the plausibility of using a machine to decode meaning could be alleviated (Nacos et al., 1991). Computer-assisted coding is presumably more reliable than human coding because it is stable over time, accurate and highly reproducible (Fan, 1988; Krippendorff, 1980). Furthermore, since syntax rules are designed by the analyst to capture the ideas he or she are interested in, coding decisions made by a computer are more likely to agree with the analyst's own coding decisions than with those of other human coders who bring their own predispositions and interpretations to the coding process (Krippendorff, 1980; Nacos et al., 1991). This feature of computer-assisted coding is particularly desirable in instances where accurate coding requires prior knowledge of a certain phenomenon (McComas & Shanahan,

1999) such as the fact that a legislation setting the minimum drinking age to 21 is an anti-DD measure and not an unrelated attempt to limit alcohol availability to youth.

To test this proposition in the context of the current study, 10 independent coders were asked to code a randomly selected sample of 20 stories using the coding sheet in Appendix A. As part of their training for the task, they were asked to read a detailed set of coding instructions prior to and during the coding process (see Appendix B) with the intention of minimizing disagreement. All coders (including the author and the computer) completed this task.

Table 3.1 compares the level of author-computer and author-human agreement across selected variables using the rigorous Krippendorff's alpha (Krippendorff, 1980) that corrects for chance agreement and ranges from '0' (for agreement no better than what would be expected by chance) to '1' (for perfect agreement).<sup>5</sup> The results in Table 3.1 support the argument that computer-assisted coding of DD-related news stories is equally and, often, more reliable (i.e., more consistent and accurate) than human coding (for similar results see Nacos et al., 1991). Specifically, for 6 of the 16 comparisons in Table 3.1, computer-assisted coding yielded higher level of intercoder reliability than human coding, and performed equally well on the others. It is important to recognize that the results of this comparison are not simply an artifact of the number of coders included in each comparison (2 vs. 11) since the calculation of Krippendorff's alpha takes this factor into account by comparing agreement across each pair of coders.

It is also worth noting that this particular analysis was based on a small sample of text (20 stories). Others (Fan, 1988; Nacos et al., 1991) have convincingly argued that when large numbers of news stories are analyzed (as in this study), a computer-assisted method captures trends in coverage over time more accurately than human coding.



Table 3.1: Intercoder reliability of human and computer-assisted coding of news stories about drunk-driving (N = 320 coding decisions)

Variable	Analyst-Computer	Analyst-Human Coders
Reference to:		
Activists	.86	.82
Scientists	.81	.80
Policy-Makers	.85	.77
Police	.86	.83
Alcohol Industry	.82	.78
DD defined as:		
Crime	.84	.79
Alcohol Problem	.83	.76
Traffic Problem	.74	.75
Health Problem	.84	.82
Normative Problem	.74	.67
Advocated Solutions:		
Tougher Laws	.83	.76
Stiffer Punishments	.86	.85
Treatment	.88	.92
Education & Prevention	.86	.82
Valence:		
Pro	.76	.65
Con	.78	.60

Note: Entrees are Krippendorff's (1980) alpha coefficients of intercoder agreement.

## Results

### Setting the Media Agenda for the Drunk-Driving Issue

Figure 3.1 displays the number of DD-related news stories in each month from 1978 to 1995. While the monthly number of stories is quite volatile over this time period, the pattern of change in media attention to the DD problem is immediately apparent. There was little media attention to the DD problem between 1978 and 1980 (an average of 7 stories per month). Then, media attention to the problem peaked rapidly between 1981 and 1983 (by about 80%), and from 1984 onward, stayed at about the same level (perhaps even started to decline at the beginning of the 1990s). This curvilinear pattern is even more apparent when the data are smoothed by a natural logarithm transformation (Figure 3.2).

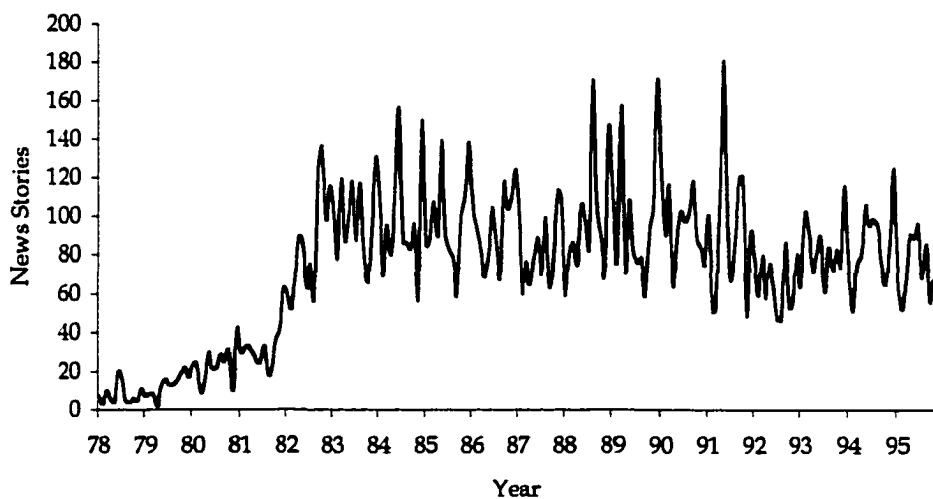


Figure 3.1: National news coverage of the drunk-driving issue, United States, 1978-1995 (N = 216 months)

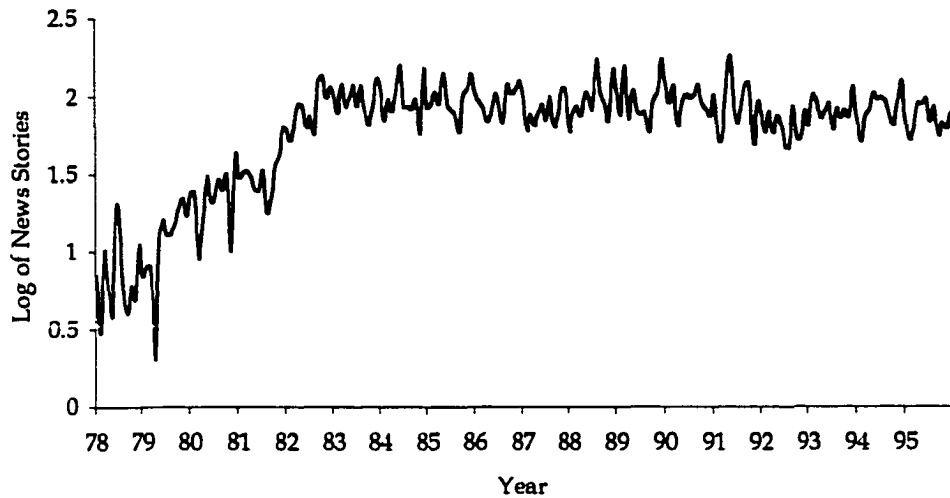


Figure 3.2: Natural-log distribution of national news coverage of the drunk-driving issue, United States, 1978-1995 (N = 216 months)

The trend in national media attention to the DD problem in Figure 3.1 is not only typical of media attention to public problems in general (Dearing & Rogers, 1996), but also identical to the one reported by McCarthy (1994) based on a sample of DD-related news stories from 5 national daily newspapers, 112 local newspapers, and the three major television networks. As previously suggested, this pattern of media attention is often an indication that some type of a structural change prompted a sudden increase in media coverage of this issue. Two complementary statistical tests were employed to validate this argument regarding the pattern of media attention in Figure 3.1. The first, Augmented Dickey-Fuller (ADF) unit root test (Dickey & Fuller, 1979), tests the null hypothesis that changes in the level of a series over time are due to a stochastic trend (a random-walk or a drift). The results of this test (ADF = -1.07) rejected the null hypothesis at the .10 level (critical value = -2.58), suggesting that changes in the level of media attention over time were due to some deterministic or non-random component. The second, a Chow breakpoint test (Chow, 1960), which is a

special application of an F-test, tests the statistical validity of dividing a series into two or more sub-samples. The procedure involves a comparison of the sum of squared residuals obtained by fitting a single equation to the entire sample with the sum of squared residuals obtained when separate equations are fit to each sub-sample of the data. The generated F-statistic tests the null hypothesis that there are no significant differences in the estimated equations (where a significant difference indicates a structural change in the series). The results of this test show that September 1981 was a statistically significant division point for the entire series ( $F[1, 214] = 6.55, p < .001$ ).

The timing of this underlying structural change certainly coincides with that of the arrival of anti-DD activist groups on the scene. A closer examination of references made to various groups of stakeholders in DD-related news stories in Figure 3.3 is even more informative in reaching a conclusion that these two events are associated.

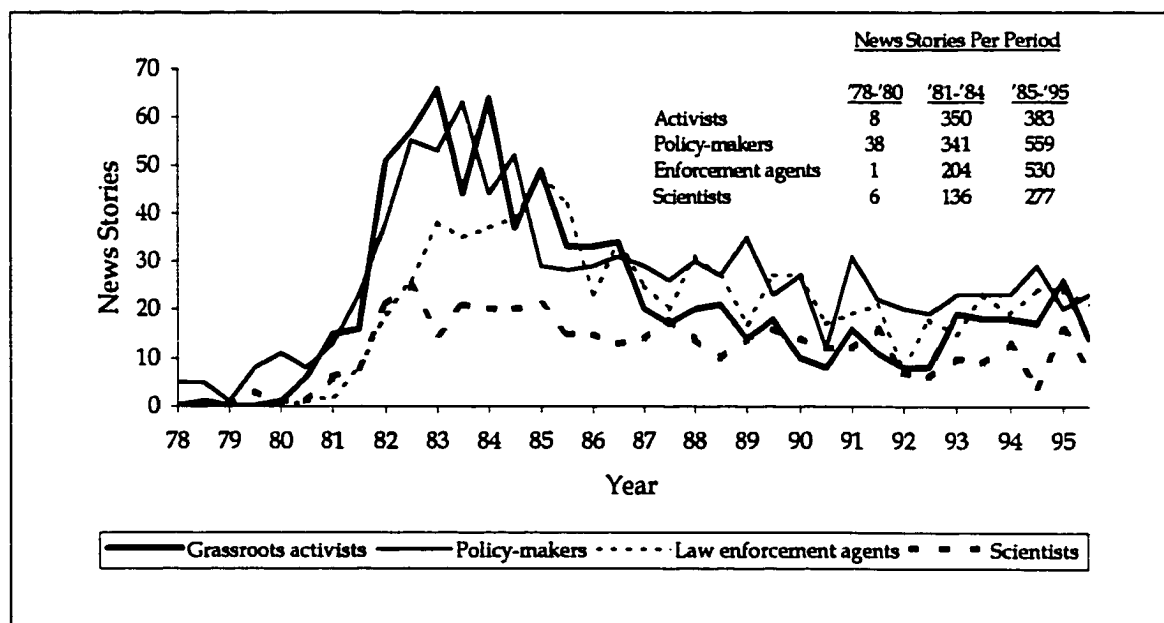


Figure 3.3: References to various social actors in national news coverage of the drunk-driving issue, United States, 1978-1995 (N = 36 six-month periods)

The line representing the number of news stories referencing grassroots activists in Figure 3.3, as well as the summary of cumulative news stories per period, demonstrate that references to anti-DD grassroots activists were practically absent from news stories on DD between 1978 and 1980 (a total of 8 news stories), then peaked rapidly from 1981 to 1984 (to 350 news stories), and declined thereafter. This pattern is consistent with Hypothesis 3.1 according to which the rapid increase in references to anti-DD grassroots activists in the media at the beginning of the 1980s is evidence of these groups' impact on attracting media attention to the DD problem. Still, a comparison of references to other groups of stakeholders is particularly instructive in reaching a conclusion about the role of activists in setting the media agenda for the DD issue given that the number of references increased for all groups of stakeholders between 1981 and 1984 and decreased thereafter. Most notably, policy-makers (e.g., legislators and government bureaucrats) seem to have been equally important in influencing the media agenda between 1981 and 1984 (341 news stories referencing policy-makers compared to 350 referencing grassroots activists), and increasingly important from 1985 onward (559 references compared to 383, respectively). Notice, however, that from 1978 to 1980, policy-makers were more frequently mentioned in conjunction with DD than members of any other group but their input was not enough to secure considerable media attention to the problem (cf. McCarthy, 1994). When grassroots activists entered the picture and media attention started to peak, policy-makers were already prepared to answer media queries about the DD problem and were often interviewed in conjunction with activists (about 82% of the stories that mention grassroots activists also mention policy-makers). Soon after (from 1987 onward), mostly due to journalists' tendency to rely on official and authoritative

sources, policy-makers remained an important source of information regarding the DD problem whereas input from grassroots activist declined. This pattern of findings seems to be consistent with the notion that grassroots activism is often a catalyst of media attention to problems that were previously identified and constructed by others (McCarthy & Wolfson, 1996; Zald, 1996).

Figure 3.3 also demonstrates that law enforcement agents (police, prosecutors, judges, etc.) and scientists were often mentioned in DD-related news stories. Law enforcement agents were frequently mentioned in news reports from the “field” on DD-related accidents or in conjunction with reports on enforcement crackdowns. Scientists became more visible in DD-related media coverage when results of NHTSA-funded studies were routinely publicized in the media. Scientists’ presence was particularly prominent in discussions about potential solutions to the problem and the evidence that supports them. The rapid peak in the coverage of both groups at the beginning of the 1980s is clearly related to the general increase in media attention to the problem. Representatives of the various industries (alcohol, car, and insurance), in contrast, were practically absent from discussions of the problem. Less than 1% of news stories included some reference to members of this group. These were mostly letters to the editor by advocates of the alcohol industry complaining about the unnecessary rise of the minimum drinking age following the DD hype in the media. Previous works (e.g., Reinerman, 1988) suggest that this group of stakeholders made a conscious decision to avoid the DD issue whether to escape the same opprobrium the tobacco industry was suffering (in the case of the alcohol and car industry) or simply because their interests were served by the movement against DD (in the case of the insurance industry).

## Media Frames of the Drunk-Driving Problem

Hypothesis 3.2 shifts the focus of the analysis from the amount of DD-related news coverage to its content. Drawing on the primacy of anti-DD activist groups and their agenda in the framing process, this hypothesis makes three specific predictions: (a) the definition of DD as a crime will dominate discussions of DD in the news media, (b) individual drunk-drivers (and not society at large) will be presented as the source of the problem, and (c) advocated solutions will primarily include tougher laws against DD and stricter enforcement of these laws.

Figure 3.4 gives a general idea about the content of DD-related news stories over the research period. The majority of DD-related news stories (81%) can be simply characterized as episodic journalistic reports on actual DD incidents (accidents, arrests, court proceedings) that took place in communities nationwide. The remaining stories were (though not exclusively) reports on DD-related policy measures such as legislation and appropriation, publicized police sobriety checkpoints and other enforcement efforts (particularly around major holidays), reports about DD-related studies (e.g., evaluations of anti-DD measures such as raising the minimum drinking age and setting lower legal BAC levels), and more thematic discussions of the social implications of DD behavior. Ninety-six percent of these stories were coded as favorable toward social measures against DD (i.e., a one-sided issue). The importance of these content attributes will be discussed in the context of their impact on DD-related attitudes and behavior. For now, it is suffice to note that episodic media frames of issues tend to be associated with individual rather than social attributions of responsibility among audiences (Iyengar, 1991), and that one-sided media representations have greater persuasive potential than two-sided representations (Zaller, 1992).

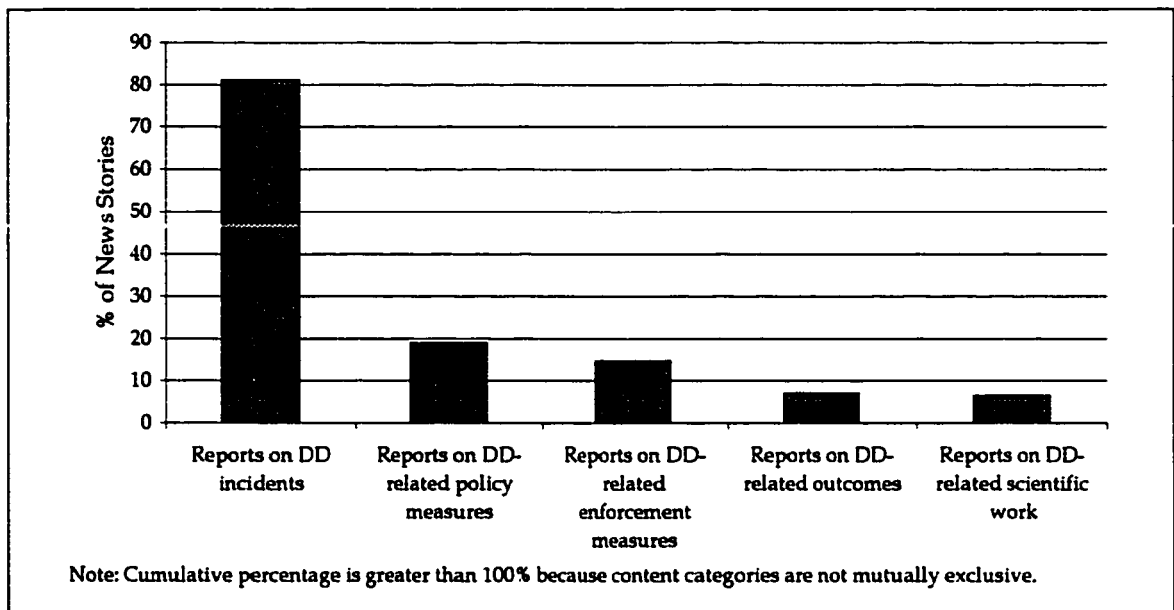


Figure 3.4: Content of drunk-driving-related news stories, 1978-1995 (N = 15,914)

Figure 3.5 examines different definitions of the DD problem in the media and compares their frequency over time. The results of this comparison seem to support the first prediction of Hypothesis 3.2 that the crime frame dominated representations of DD behavior in the media. With very few exceptions, the crime frame was the one most frequently used in DD-related news stories over the entire research period. Most notable is the absence of this definition from DD-related news stories before 1981 and the rapid peak in its frequency through 1983, when anti-DD grassroots activism became visible. Also notable is the fairly sharp decline in the prevalence of the crime frame from 1983 to 1991. Explanations for this decline will be studied more closely later on.



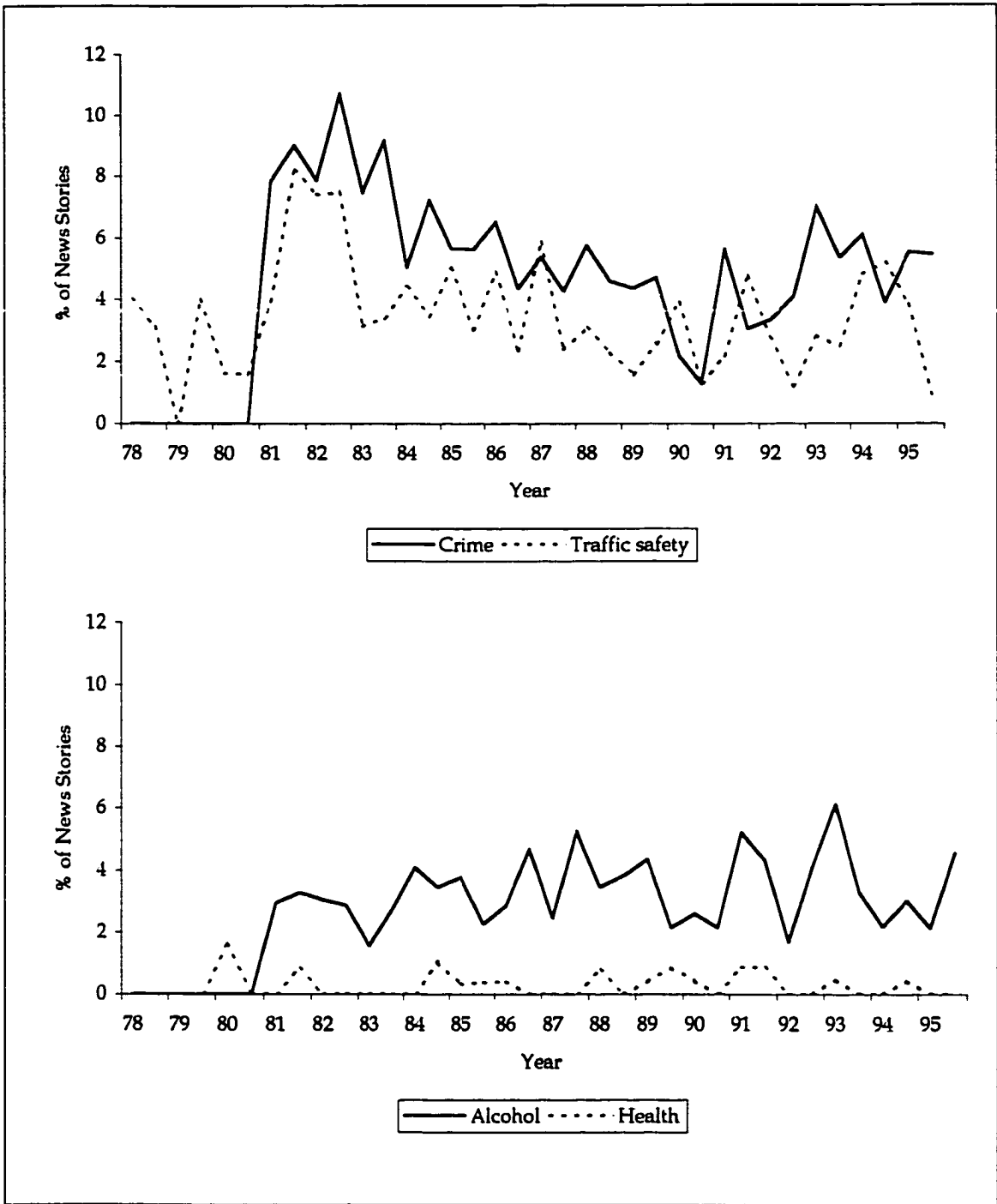


Figure 3.5: Different definitions of the drunk-driving (DD) problem in DD-related national news coverage, United States, 1978-1995 (N = 36 six-month periods)

Further indications as to the prominence of the crime frame in media discussions about DD come from analyzing the semantics of this frame. For example, the phrase “drunk-driving is the most frequently committed violent crime in America”, was used in as many as 1,415 news stories between 1981 and 1995. Some editorials even went as far as to argue that “a car with an intoxicated driver is precisely as dangerous as a loaded gun in the hands of someone who is blinded by rage” (*Washington Post*, October 19, 1981, D-1), and that “drunk-driving is truly murder” (*New York Times*, December 31, 1982, A-18). Finally, most national news sources were quick to quote President Ronald Regan declaring, “The drunk-driver has turned his car into a weapon, a weapon that threatens the lives and safety of the innocent.... Enough is enough. Let’s get these killers off our roads and get them off now” (*New York Times*, January 2, 1983, A-16).

Notwithstanding, Figure 3.5 also points to the relatively high frequency in which the definition of DD as a traffic safety problem appeared in the media. This definition, that was promoted primarily by NHTSA, was clearly visible in media discussions of DD before 1981 and more so afterwards. While the increased frequency of this definition is clearly related to the general surge in media attention to the DD problem, it may also be associated with the high visibility and accessibility of policy-makers and government bureaucrats during this period (see Figure 3.3). This proposition will be examined more closely below by linking frames to groups of stakeholders. Other possible definitions of DD appeared less frequently in media representations of DD. Media discussions of DD as an alcohol problem were part of the debate about limiting alcohol availability to youth. The relatively low frequency of the alcohol problem frame may be explained by strategic choices made by different actors to abstain from placing the responsibility for the problem on the alcohol industry.

Similarly, references to DD as a public health problem were few because there was no clear way of medicalizing the problem given the prominence of the crime frame and its emphasis on the DD problem as a problem of social control (Gusfield, 1981; Reinerman, 1988). Finally, as demonstrated below, the definition of DD as a normative or a culturally-determined problem (not presented in Figure 3.5 due to its very small frequency) did not stick because responsibility for the problem was placed primarily on individuals and not on society at large.

The second part of Hypothesis 3.2 concerns attributions of responsibility for the DD problem in the media. Figure 3.6 reviews the evidence in support of the proposition that these attributions placed the blame on the individual drunk-driver rather than on society. The three lines in Figure 3.6 represent the frequency in which news stories identified young drivers, drunk drivers, and society in general as the source of the problem. Young drivers were overwhelmingly associated with DD incidents in the early 1980s both in the media and in reality. Many articles in the early 1980s described youth involvement in DD behavior in terms of an epidemic, highlighting the fact that DD was the most frequent (and almost exclusive) cause of death among youth. The reduction in references to youth from 1984 onward seems to correspond to the significant reduction in DD behavior within this sub-population that was often publicized in the media. It is worth noting, however, that the media was quite ambiguous about blaming youth for the DD problem. Often times, young drivers were presented as victims rather than villains. To cite one of many editorials on this issue, "not only do 18-year-old drinking drivers need to be saved from themselves; the rest of us need to be saved from them" (*New York Times*, March 21, 1982, D-20).

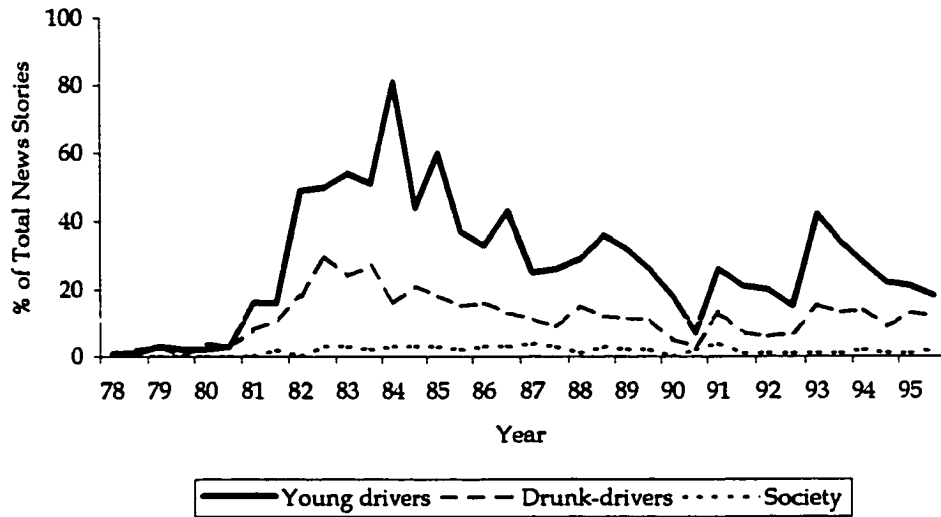


Figure 3.6: Attributions of responsibility to the drunk-driving (DD) problem in DD-related national news coverage, United States, 1978-1995 (N = 36 six-month periods)

There was little ambiguity, however, regarding the responsibility of drunk-drivers in general for the dire consequences of this behavior. As Figure 3.6 illustrates, well over 20% of all news stories in the beginning of the 1980s directly identified the “killer-drunk” as the source of the problem. “Why do Americans persist in describing deaths from drunk driving as accidents?”, asked one of the editorials dedicated to DD in the end of 1982, “drivers are adults, fully aware of what drinking and driving can lead to” (*New York Times*, December 31, 1982, A-18). Others were quick to dismiss attempts by drunk-drivers to present themselves as victims of alcohol abuse or to hold alcohol servers and party hosts liable for DD-related traffic crashes. This state of mind, in turn, is manifested in Figure 3.6 in the relatively negligible percent of news stories suggesting that the DD problem is rooted in social and cultural conventions that encourage individuals to engage in this behavior.

As Hypothesis 3.2 suggests, it is reasonable to expect that the perceived nature and source of the DD problem will be related to the type of solutions advocated in the

national news media. The third part of this hypothesis, that follows this basic logic, postulates that the solutions advocated in the news media will primarily be those aimed at increasing formal social control over the problem (i.e., tougher laws and penalties combined with strict enforcement). The findings in Figure 3.7 generally support this argument. Tougher laws and strict enforcement were introduced in the media as an effective resolution to the DD problem even before media attention to the problem peaked in the early 1980s (an average of 2.71% and 1.3%, respectively, of all DD-related news stories). Nonetheless, their prominence on the media agenda clearly increased between 1981 and 1984 (to an average of 9.37% and 6.53%, respectively). As noted above, this finding may indicate that while these particular solutions were pursued actively by NHTSA from the mid-1970s onward, they gain prominence in the media only upon the arrival of grassroots activists on the scene at the early of the 1980s.

Media discussions of tougher laws typically focused on two categories of anti-DD legislation: increasing legal penalties for DD and limiting alcohol availability to young drivers. Journalists and their interviewees often complained about the leniency of punishments for DD and overwhelmingly sided with initiatives aimed at effectively deterring DD offenders. The reason given for this unequivocal stand was that “increased penalties - from faster and longer liftings of licenses to longer prison sentences for repeat offenders - can serve to scare off more would-be offenders” (*Washington Post*, February 18, 1988, A-22). This general deterrence argument was frequently (71.8% of all such stories) accompanied by references to scientific evidence of successful reductions in DD incidence following the enactment of such measures.

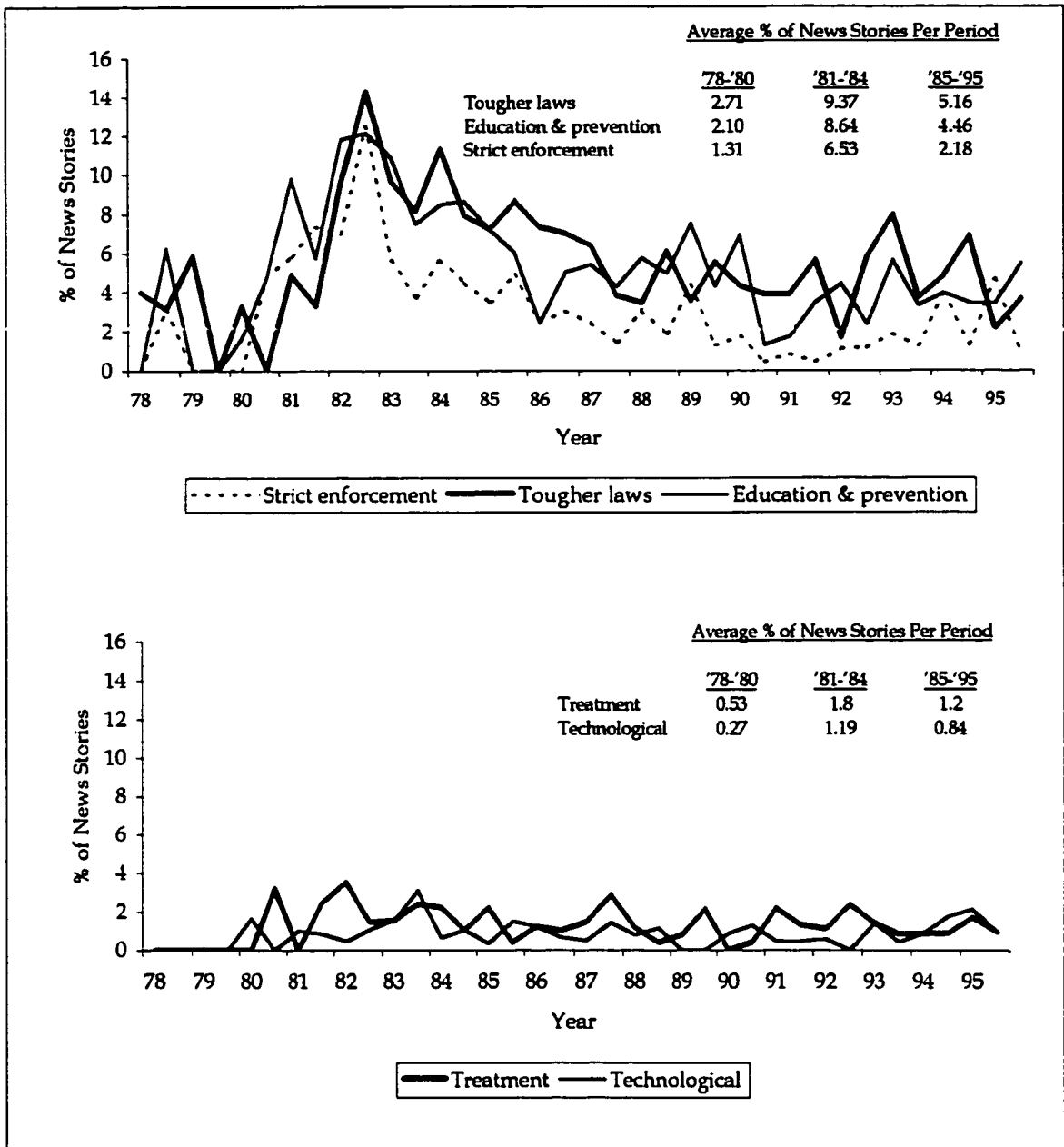


Figure 3.7: Solutions to the drunk-driving (DD) problem advocated in DD-related national news coverage, United States, 1978-1995 (N = 36 six-month periods)

A more paternalistic approach characterizes the news media support of limiting alcohol availability to youth. While many articles recognize the moral and practical difficulty of denying alcohol to all underage drivers, they also provided two compelling

reasons to justify these measures. "One is that the change would save lives among young adults... The other is that, since the victims are not only youthful drunk drivers, the change would save lives of all ages" (*New York Times*, May 21, 1984, A-16). Here too, state and national statistics of reductions in youth representation in DD-related fatalities was frequently (about 83% of all such stories) presented as evidence in support of such legislative measures.

Somewhat surprising is the news media considerable emphasis on education and prevention as solutions to the DD problem. As Figure 3.7 illustrates, on average, this solution was advocated in 2.10% of all DD-related news stories prior to 1981 and 8.64% between 1981 and 1984. While advocates of all solutions clearly benefited from the surge in media attention to the DD problem (as indicated by the fact that all follow the same trajectory on the media agenda over time), the emphasis on education and prevention is surprising given that no apparent group of stakeholders actively promoted this solution. One would hypothesize that this particular emphasis could be traced back to the scientific agenda, but the empirical evidence suggests the opposite. Less than 5% of stories that contained calls for education and prevention efforts also referred to scientists or scientific work (including NHTSA-funded studies). This fact seems to suggest that this particular frame was developed primarily by journalists who reached the conclusion that "the best controls are an educated public and strict motor vehicle laws strictly enforced" (*New York Times*, December 1, 1985, D-14).

Finally, as expected, treatment of drunk-drivers for alcohol abuse and technological solutions (i.e., passive safety measures) received little attention in the media compared to other advocated solutions. On average, only 0.27-1.8% of all DD-related news stories mentioned these solutions. This low visibility can be explained by

the considerable emphasis in the media on attributing individual responsibility to the problem and the absence of powerful actors who were promoting these solutions. Thus, if DD is widely perceived to be a volitional act that is independent of alcohol addiction or unsafe vehicles and road structure, there is no apparent reason for society to spend resources on treatment and enhanced safety.

Figures 3.8 and 3.9 provide further insight into the dynamics of the framing process by examining co-occurrences of frames and references to various groups of stakeholders. Figure 3.8 does this in relation to the definition of the DD problem. Figure 3.9 focuses on the solutions to the DD problem that were advocated in the media. Both test Hypothesis 3.3 that pertains to shifts in power balance between stakeholders over time in relation to the media agenda and its influence on framing the DD problem as well as on the media attention cycle. Specifically, this analysis tests the proposition that the dominant definition of the problem (crime) was sustained over time in media discussions of the issue due to different groups of stakeholders promoting it at different stages along the way. Thus, this proposition will be supported if the data demonstrates that from 1981 to 1984 the proportion of news stories mentioning grassroots activists in conjunction with the representation of DD as a crime is greater than that for elite groups (i.e., policy-makers and scientists), but from 1985 onward, elite groups are more frequently mentioned in conjunction with this frame. Notice that the alternative hypothesis, namely, that the dominant frame has changed over time as elite groups regain their power to set the agenda, is effectively undermined by Figure 3.5 that show that the crime frame was the most frequent definition of the DD problem throughout the 1980s and the 1990s.



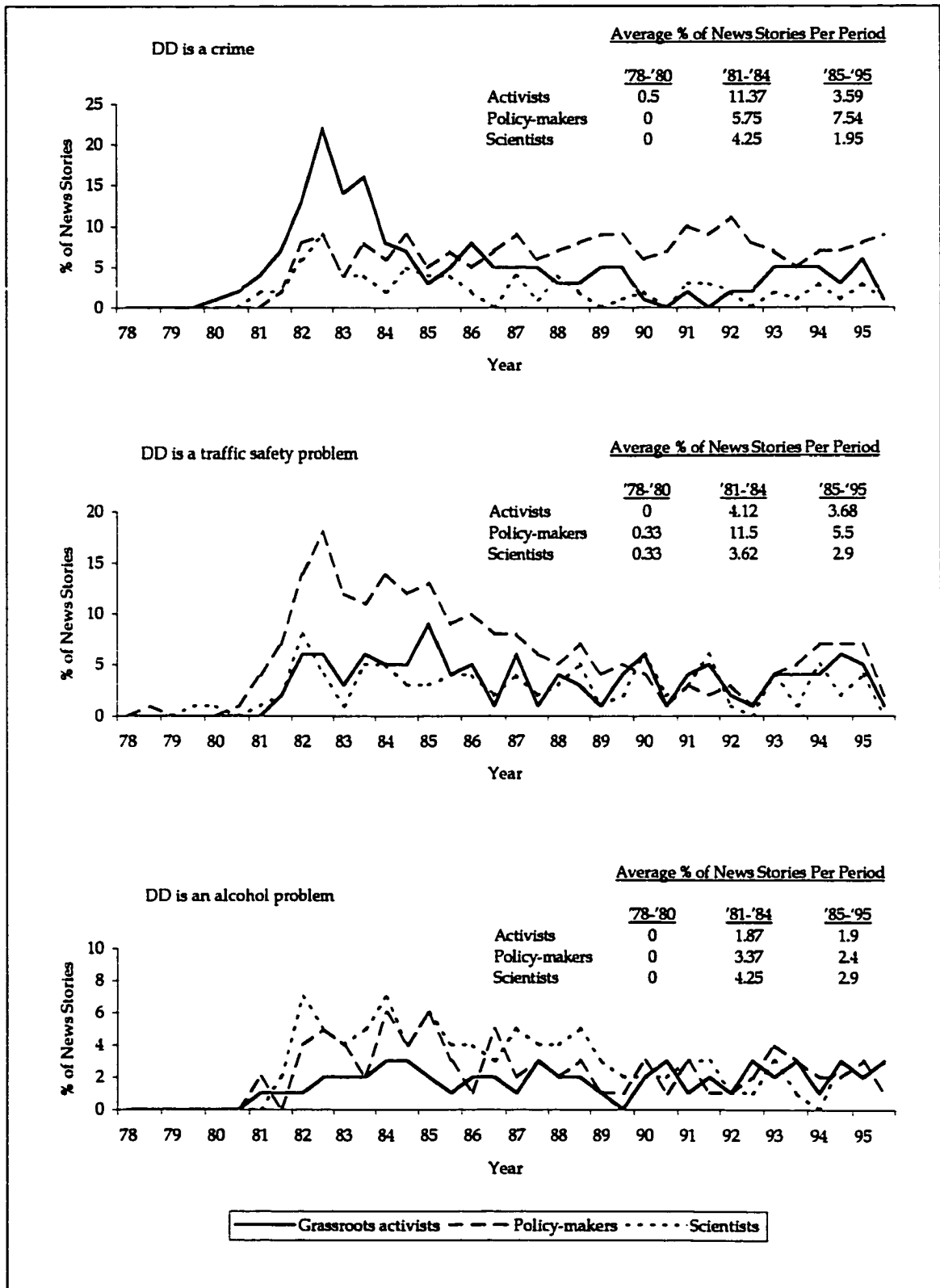


Figure 3.8: Different definitions of the drunk-driving problem in the media by reference to social actors, United States, 1978-1995 (N = 36 six-month periods)

Figure 3.8 offers two interesting comparisons of definition-per-stakeholders co-occurrences. The first is within each particular definition of the DD problem and pertains to possible changes in the identity of stakeholders who promote this particular definition. The second is between various definitions of the DD problem and focuses on changes over time in definitions promoted by a single group of stakeholders over time. The top panel of Figure 3.8 shows, as expected, that the crime frame was heavily promoted by anti-DD grassroots activists between 1981 and 1984. A comparison across periods show that the average percentage of DD-related news stories that mentioned the crime frame in conjunction with grassroots activists increased by about 11% during 1981-1984 in comparison to the period between 1978 and 1980 but, as hypothesized, decreased to an average of 3.6% of all news stories in the following period (1985-1995). Instead, as we learn from the mid-panel in Figure 3.8, grassroots activists seem to have developed some interest in the traffic safety frame during this period. Consistent with the prediction of Hypothesis 3.3, the continued prominence of the crime frame on the media agenda from 1985 onward (see Figure 3.5) seems to be explained by the increasing role of policy-makers in sustaining the salience of the crime frame during this period. Specifically, from no reference to DD as a crime between 1978 and 1980, policy-makers use of this definition has increased monotonically over the remaining two periods to an average level of 7.5% of all DD-related news stories. A closer look at the content of these news stories, as well as more direct evidence about policy-makers increased use of this frame that will be presented in the next chapter, reveal that the main reason for this was policy-makers' frequent references to the criminal aspect of DD as a way to justify the need to introduce additional measures to curb DD.

The decline in references made by policy-makers to DD as a traffic safety problem (mid-panel in Figure 3.8) is particularly instructive in this respect as it suggests that policy-makers may have come to a realization that the crime frame does not contradict the traffic safety frame and was more instrumental in securing public support in favor of greater social control of the problem. A comparison across the different definitions of the DD problem shows that policy-makers entered the framing process with the definition of traffic safety in mind (an average of 11.5% of all DD-related news stories between 1981 and 1984 compared to 5.75% regarding the crime frame and 3.37% regarding the alcohol frame). However, a more elaborated analysis reveals that this tendency was more prevalent among government bureaucrats (i.e., NHTSA) than among politicians and legislators. Of all news stories that included reference to DD as a traffic safety between 1984 and 1995 (N = 2,672) 53.7% mentioned government bureaucrats compared to 21.2% that mentioned politicians or legislators (Chi-square = 238.3, df = 1, p < .001). In contrast, of all news stories that defined DD as a crime during this period (N = 3,163), 48.2% cited or otherwise mentioned politicians and legislators compared to only 13.6% that mentioned government bureaucrats (Chi-square = 458.25, df = 1, p < .001).

Finally, definitions of DD as an alcohol problem in the media (bottom panel in Figure 3.8) were mostly (but not exclusively) promoted by scientists, particularly between 1981 and 1984. This fact turns out to be somewhat misleading, however, if the content of these news stories is examined more closely. About 78% of these particular news stories (N = 774) included discussions about problem-drinkers and recidivist drunk-drivers for which the recommended course of action is treatment for alcohol abuse. Consequently, many of these news stories cited physicians and scientists who

supported such measures regarding this distinct sub-population of drunk-drivers. As Figure 3.8 demonstrates, these views were also shared by policy-makers and grassroots activists.

Figure 3.9 tests the predictions made by Hypothesis 3.3 in the context of advocated solutions to the DD problem. The top panel in this figure shows that grassroots activists and policy-makers were particularly visible in promoting tougher laws between 1981 and 1984 and less active thereafter. References to activists in the context of this solution occupied an average of 9% of all DD-related stories between 1981 and 1984 and 2.86% thereafter. References to policy-makers constituted an average of 6.37% and 2.54% in the respective periods. Nonetheless, there is no evidence that the sustained (though decreasing) level of media attention to this particular solution was due to rotation over time between different groups that promote tougher laws. In contrast, evidence of such a pattern seems to exist regarding strict enforcement as an advocated solution (mid panel in Figure 3.9), wherein policy-makers had greater visibility than grassroots activists in promoting this solution during the later period (2.72% compared to 2.13% for 1985-1995) while grassroots activists were more visible in this respect in the preceding period (5.25% compared to 4.5% during 1981-1984). Finally, no particular group seems to have promoted education and prevention as solutions to the DD problem (bottom panel in Figure 3.9). While grassroots activists and policy-makers seem to be more active in promoting this solution, the overall pattern of stability over time in the input of groups advocating this solution is noticeably different from the pattern of change in this variable in Figure 3.7, suggesting once again that journalists themselves may have developed and promoted this particular solution.

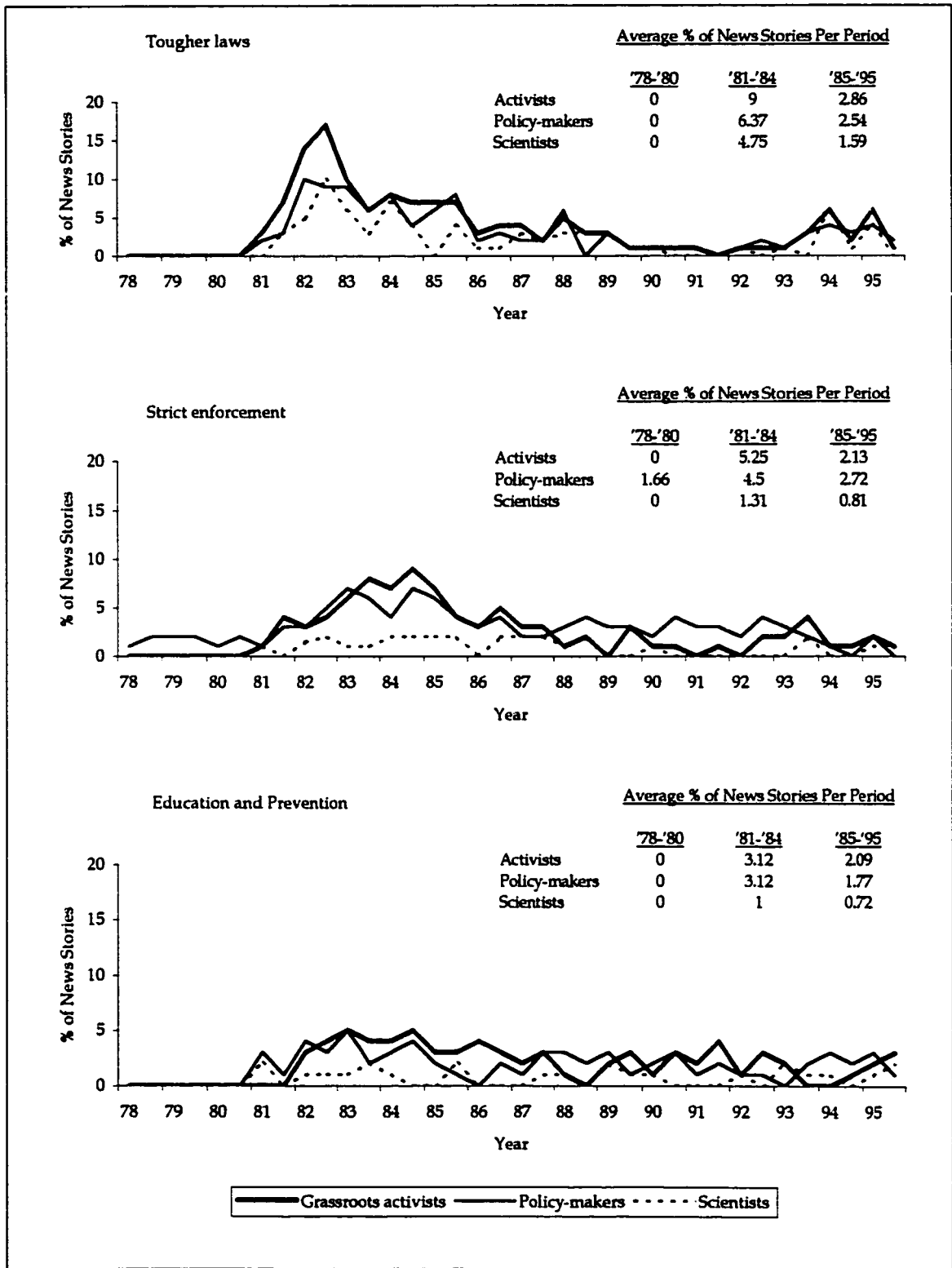


Figure 3.9: Potential solutions to the drunk-driving problem in the media by reference to social actors, 1978-1995 (N = 36 six-month periods)

## Summary

The findings regarding media attention to the DD issue between 1978 and 1995 support the argument that grassroots activism was particularly instrumental in setting the media agenda for the DD problem. However, contrary to the popular view that attributes significant impact to these groups, the findings suggest that the role of grassroots activism is limited to that of a social catalyst of media attention to problems that were previously identified and constructed by others. This aspect, in turn, is evident in the way particular DD-related frames were introduced, promoted, and sustained as part of the media's attention to the problem.

Several prominent media frames of the DD problem emerge from the content analysis of related news stories. First, DD was frequently defined in the media as a crime but also as a problem of traffic safety. These two frames coexisted on the media agenda because they did not contradict one another and because both activists and policy-makers had equal power to frame the DD issue. Once the initial appeal of grassroots activists to journalists waned (during the mid-1980s), policy-makers were the ones who sustained the crime frame until the media lost interest in the DD issue altogether. Second, the crime frame also reflected attributions of responsibility to the DD problem in the media. The crime frame, by definition, held individual drunk-drivers responsible for the problem and vindicated society at large. While the group of young drivers was often presented as the most problematic in this respect, a considerable degree of ambiguity about their responsibility was inherent in many media discussions of the subject. Next, by holding individual drunk-drivers responsible for the problem, the logical solution was to increase formal social control. Both grassroots activists and policy-makers advocated these solutions in the media, calling

for increased legal penalties for drunk-drivers, continued efforts to limit alcohol availability to youth (minimum drinking age laws), and strict enforcement of these measures. Somewhat independently of these groups, news coverage of DD also emphasized public education and prevention as part of the solutions to the problem. This emphasis seems to be one that was promoted primarily (though not exclusively) by journalists themselves.

The following chapter begins to estimate the impact of both the level of media attention to the DD problem and the frames used to discuss it on related processes of social control and social change. The particular focus of this chapter is the response of other social institutions to the DD problem as presented on the media agenda, with particular focus on DD-related policy-making.

#### Notes

1. Reinerman (1988) notes in this context that in a continued set of name recognition surveys throughout the 1980s, MADD was the single organization most commonly identified with the DD problem nationwide.
2. Consider, for example, the case of the AIDS (Acquired Immunodeficiency Syndrome) epidemic throughout the 1980s and the 1990s (Rogers et al., 1991). Although the first cases of AIDS in the United States were diagnosed in the early 1980s, the issue did not receive media attention until 1985, after more than 10,000 people were diagnosed with the disease. Since then, breakthroughs in AIDS research and treatment, coupled with extensive prevention efforts, managed to reduce substantially the scope of the epidemic in the United States. Consequently, media attention to AIDS has almost diminished, raising recently the concern that

public fear of AIDS is now suppressed to a level of a potential return to old, risky sexual and drug injection practices (Auerbach & Coates, 2000).

3. For example, reference in the text to scientists or scientific works typically included words such as “scientist(s)”, “expert(s)”, “study”, “research”, or “university”. Typical words used for framing DD as an alcohol problem are “alcohol abuse”, “alcohol problem”, “alcohol-related problem/disease”, “alcoholic(s)”, and “problem-drinkers”.
4. To get to this point, however, the analyst must test different combinations of rules (typically by manipulating windows of words) and select the one that maximizes the recall and precision of relevant news stories. While this process may be labor intensive, it allows the researcher to filter out irrelevant items and more precisely code for the presence or absence of a certain idea in a large database.
5. Reliability for each variable was calculated based on the number of coding decisions (20 for each variable, the same as the number of stories), the number of decisions categories (2, ‘yes’ or ‘no’) and the number of coders (ranging from 2 in the author-computer combination to 11 in the author-human combination).



## CHAPTER 4

### MEDIA COVERAGE AND INSTITUTIONAL RESPONSE TO THE DRUNK- DRIVING PROBLEM, 1978-1995

This chapter focuses on institutional response to the DD problem between 1978 and 1995 (links 3a and 3b in Figure 2.3) and its relationship to media coverage of this problem (link 2 in Figure 2.3). Institutional response implies organized efforts by social institutions to resolve public problems and refers to actions taken by formal agents of social control such as parents, teachers, legislators, and religious leaders who possess an authority to draw limits on others' behavior. The scope and intensity of their efforts are presumed to be influenced by the attention this problem receives in the mass media. Specifically, high volume of media attention is expected to be predictive of increased institutional attention and action while media frames are expected to be predictive of the nature of actions pursued by social control agents. These propositions are tested here in relation to DD-related policy-making as one, particularly visible, expression of institutional response.

#### **The Media-Policy Connection**

##### **A Societal View**

Early discussions of the relationship between the mass media and public policy-making were motivated by the notion that the mass media occupy a role of a liaison between citizens and governments (Siebert, Peterson, & Schramm, 1956). First, the media cover issues that are prioritized by governments and elites. Then, media representations of these issues stimulate public discussions that help to crystallize

individual opinions on these matters. Finally, the media collect individual opinions and present them in the form of public opinion that policy-makers then rely on for feedback on their own performance as well as to learn about the issues the public cares about. While much of this basic logic was preserved as research on the media-policy link became the domain of agenda-setting research in the last three decades (Dearing & Rogers, 1996), more recent accounts of this relationship prescribe a more active role for the media in influencing the policy agenda. One notable example is the muckraking model (Leff, Protess, & Brooks, 1986; Protess et al., 1991) that was inspired by the role of journalists in the Watergate affair. According to this model, by bringing certain problems to public attention, investigative journalists are able to mobilize public opinion and, subsequently, put pressure on policy-makers to prioritize issues that receive much media attention.

Like other 'powerful media' models, this approach has a number of important weaknesses. One is the failure to recognize that media and policy-making are part of the same ecology (Molotch, Protess, & Gordon, 1987) and that both are open to input from other social institutions and actors. Related to that is the critique about the unidirectionality of the model or its emphasis on one-sided rather than reciprocal relationship between media and policy-making (Kingdon, 1984). Furthermore, as research on this topic evolved, researchers have come to realize that a direct link often exists between the media and policy agendas because policy-makers tend to infer the public's stand on issues from the media agenda (Linsky, 1986). Since, in addition, research on the effect of media on policy-makers reached contradictory conclusions (Edwards & Wood, 1999), the notion that media effects on policy-making are limited to particular instances seems to be prevalent in the current literature (Baumgartner &

Jones, 1993; Dearing & Rogers, 1996; Edwards & Wood, 1999; Kingdon, 1984; Linsky, 1986). The key question, then, becomes one that inquires about the particular circumstances or conditions under which media effects on policy-making are likely to occur and the way they are manifested. The first step in this direction is to explicate the reasons for expecting media effects on policy-makers to begin with.

### A Psychosocial View

Communication theory prescribes that media exposure is the primary condition for media effects on individual judgments and behavior (McGuire, 1989). There is little doubt that policy-makers meet this requirement. A recent study that explored patterns of media use by members of Congress (Bennett & Yanovitzky, 2000), found that, on average, legislators spend 1.8 hours each day reading a daily newspaper, and 1.5 hours a day watching television news programs. An overwhelming majority of them also consider national and local news media to be the single best source of information on national events and events in legislators' states or districts (compared to interpersonal communication channels). Similar patterns of policy-makers' media use were also recorded during the 1970s (Weiss, 1974), the 1980s (Bybee & Comadena, 1984), and the 1990s (Riffe, 1990).

Beyond exposure, however, media effects are contingent upon a person's motivation to attend to the message and process the information it contains (McGuire, 1989; Petty & Cacioppo, 1986). Motivation, in turn, is a function of both individual characteristics (e.g., education, interest, and predispositions) and message attributes such as presentation, frames, and quality of persuasive arguments (Kuhn, 1991; Petty & Cacioppo, 1986; Price & Tewksbury, 1997). Policy-makers have a strong incentive to

process information in the news media (Linsky, 1986). On one hand, given the fluid and competitive nature of the political arena, unresponsiveness of policy-makers to issues that climb the media agenda may compromise their current position of power in government (Lemert, 1981; Linsky, 1986). Moreover, allowing the media to construct issues and mobilize public opinion is a politically dangerous position for elected officials and bureaucrats who then risk losing control over how the issue is defined and resolved (Dearing & Rogers, 1996). On the other hand, media construction of a public problem opens a window of opportunity for political gain (Kingdon, 1984). The policy-making process is often opportunistic, and policy-makers regularly use the media to accomplish their political goals (Hess, 1984). Favorable media coverage may increase the ability of policy-makers to get their policies successfully adopted and implemented (Linsky, 1986) or win them some important political gains with key constituencies (Diani, 1996; Edwards & Wood, 1999). In short, as one Senator put it: "the media makes and breaks the politicians" (cited in Molotch et al., 1987, p. 27).

Policy-makers' high stakes in media coverage of public issues motivates them to actively seek, attend, and process related media messages. As a result, they are likely to engage in central processing (Petty & Cacioppo, 1986) of this information. Ironically, this tendency makes them less susceptible to persuasion efforts since they draw upon their prior experience and knowledge to carefully scrutinize and resist persuasive information in the media. Political predispositions, for instance, seem to be particularly powerful in this respect (Bennett & Yanovitzky, 2000; Linsky, 1986). Thus, while heightened media attention may attract policy-makers' attention to certain issues (Linsky, 1986; Rogers et al., 1991), there is very low likelihood that this coverage will alter their beliefs and attitudes regarding issues they believe to be important, unless

they are challenged by cogent contrary information (Kingdon, 1984). Instead, the effect of media coverage of issues on policy-making is likely to be manifested in two forms: the timing of intensive issue-related policy-making and the type of policy choices pursued by policy-makers.

Similar to media organizations, policy-makers' work is guided by routines (Edwards & Wood, 1999; Kingdon, 1984). At any given moment, the political system is grappling with a great number of tangible problems that vie for leaders' attention. Because leaders can only attend to a very small number of them at a time, they typically rely on these routines to prioritize their activities (Hilgartner & Bosk, 1988). As a result, policy-making tends to be characterized by long periods of relative stability and incrementalism (Baumgartner & Jones, 1993). From time to time, however, this equilibrium is punctured or interrupted by sudden demands for a dramatic change that force leaders to respond quickly in order to restore equilibrium without fundamentally changing the nature of the system (Baumgartner & Jones, 1993). Because the majority of these sudden demands are communicated through the media (Edwards & Wood, 1999; Kingdon, 1984), policy-makers tend to interpret sudden fluctuations in media attention as a cue for action (Linsky, 1986). One would, therefore, expect that the volume of issue-related policy measures would be higher following increased media attention to this issue. Over time, as media attention to this issue wanes, the volume of policy measures should stabilize once again. Furthermore, the degree of policy change in response to increased media attention will depend on the tone set by the media (Baumgartner & Jones, 1993; Zaller, 1992). Enthusiastic, one-sided treatment of the issue will result in a rapid policy change. Debate and criticism are predictive of slower and gradual policy actions.

Following this logic in the DD case, we note, based on the previous chapter's findings, that media attention to the DD problem peaked rapidly between 1981 and 1984 and stayed at the new level through the beginning of the 1990s, when media attention to the problem started to wane. In addition, the tone of this coverage was one-sided and particularly enthusiastic about the need to curb DD behavior. Furthermore, policy-makers were already actively involved in fighting the problem prior to the 1980s, though it was not high on their agenda. All of these give a reason to expect that policy attention to the DD problem and the actions taken to fight it increased rapidly between 1981 and 1984 in response to increased media attention to the issue. As noted above, policy attention is less likely than policy action to be constrained by institutional and organizational routines. Therefore, as long as the media maintain a relatively high level of interest in the DD issue (as was the case for the period between 1985-1989), policy attention is expected to remain high as well. When media attention to the DD issue begins to wane (1990-1995), policy attention to this issue is likely to decline as well. In contrast, a fixed level of media attention to the DD problem between 1985 and 1989, following a period of rapidly increasing coverage, is less likely to put on policy-makers the same kind of pressure to produce short-term solutions to the problem (that is, policy-makers may not experience the same sense of urgency as they did when media attention increased). Rather, ad-hoc, intensive policy-making is likely to be transformed to incremental policy actions that are guided by organizational and institutional routines. For that reason, it is reasonable to expect that policy actions between 1985 and 1995 will continue to increase at a slower pace in comparison to the period between 1981 and 1984 (i.e., increase at a decreasing rate).

*Hypothesis 4.1: The trend in the volume of DD-related policy attention and actions between 1978 and 1995 will be positively and strongly associated with the volume of media attention to the problem. Specifically, the volume of DD-related policy attention and actions will increase rapidly between 1981 and 1984 following the increase in media attention to the issue. Between 1985 and 1989, policy attention will remain high but will gradually decrease from 1990 onward, following the similar pattern of media attention to the DD issue. In contrast, the volume of policy actions will continue to increase at a decreasing rate from 1985 to 1995.*

Besides influencing the timing and intensity of policy-making, media attention to issues may also be related to the particular policy choices pursued by policy-makers regarding a certain problem. In much the same way that media representations of issues shape lay people's judgments (Gamson, 1992; Iyengar, 1991; Iyengar & Simon, 1993; Price & Tewksbury, 1997), they are likely to influence policy-makers' view of public problems (Linsky, 1986). For example, policy-makers may use media representations to attribute responsibility to a problem (Iyengar, 1991), learn about some of its solutions (Price & Tewksbury, 1997), or use it as a benchmark against which to evaluate their own performance in dealing with the problem (Iyengar & Kinder, 1987). Nonetheless, as noted above, policy-makers are less susceptible to such effects (i.e., priming and framing) because personal knowledge and experience as well as ideological and organizational constraints (e.g., budgetary constraints or the party's stand on issues) effectively inoculate them against media frames (Edwards & Wood, 1999; Kingdon, 1984). Bennett and Yanovitzky (2000), for example, found that policy-makers have an almost uniform tendency to disagree with the statement that many of

their policy decisions (and of other policy-makers, for that matter) are influenced by media coverage of issues. Rather, policy-makers are likely to follow media prescriptions of responsibility and solutions to problems if they already fit into their own belief structure (Gusfield, 1981; Roessler, 1999) and if they present an opportunity for political gain (Kingdon, 1984). When these conditions are met, one would expect that the majority of policy actions following peaks in media attention will be in line with those prescribed in the media (i.e., immediate, short-term solutions to the problem), but as media attention fades over time, institutional and long-term solutions are preferred (Baumgartner & Jones, 1993).

Returning once again to the DD case, the results of the content analysis in Chapter 3 demonstrate a great degree of overlap between overall media frames of the DD problem and policy-makers own understanding of its nature as reported in the press. No great effort was therefore needed to convince policy-makers in the beginning of the 1980s that DD carries with it individual responsibility and requires better social control of the drunk-driver. Hence, once a window of opportunity for political gain was opened with the appearance of grassroots activism and the increased media attention that followed, policy-makers were likely to adopt additional measures of deterrence (i.e., stiffer laws and punishments, stricter enforcement, and limiting alcohol availability to youth). As one legislator put it, the DD issue was “simply too popular to oppose” (*Washington Post*, January 29, 1983, B1). However, this initial ‘policy frenzy’ has probably stabilized over time, as media attention to the problem leveled off throughout the mid-1980s, and policy-makers’ preferences may have shifted from short-term policy solutions (deterrence) to long-term ones (education-prevention programs and



maintenance of current governmental units that are assigned to handle the DD problem).

*Hypothesis 4.2: Between 1981 and 1995 the majority of DD-related policy actions will focus on deterrence of drunk-drivers and will be associated with the level of media emphasis on such measures. From 1985 onward, deterrence measures will continue to increase at a decreasing rate while policy measures aimed at public education and prevention will increase at an accelerated rate.*

## **Methodology**

### **Data and Measures**

There is little agreement in the literature regarding appropriate measures of policy-making (Dearing & Rogers, 1996). Some studies utilized measures of policy attention such as the number of Congressional hearings on a certain issue (Baumgartner & Jones, 1993), the number of days of Congressional hearings (Edwards et al., 1994), and the number of references in the *Congressional Record* database to a particular policy issue (Trumbo, 1995). Others focused on policy actions such as issue-related federal legislation (Yanovitzky & Bennett, 1999), the annual amount of federal funding appropriated for fighting a public problem (Gonzenbach, 1996; Rogers et al., 1991), or the creation of new government bodies (Walker, 1977).

Both policy attention and actions are theoretically important for testing this chapter's hypotheses. Level of policy attention taps into the more immediate response of policy-makers to increased level of media attention to a problem. In this respect, one can think of policy attention as a cognitive response to media cues. Policy actions, on

the other hand, are measures of policy-makers' behavior. As such they are slower to change in response to increased media attention as they are constrained by external circumstances and organizational routines (e.g., legal and budgetary considerations, committee work, etc.). For this reason, both types of measures are included in this study.

*Policy Attention.* The current study utilizes two measures of policy attention. The first is the number of congressional hearings on the issue of DD. All Congressional hearings (N = 87) between 1978 and 1995, that were indexed under the term 'drunk-driving', were retrieved from the Congressional Information Service (CIS) database that is available both on-line (Lexis<sup>®</sup>-Nexis<sup>®</sup>) and through the Library of Congress archives. As some (e.g., Edwards & Wood, 1999) have suggested that hearings involving routine congressional work (e.g., appropriations, nominations, and reauthorizations) are likely to falsely inflate policy attention, routine and non-routine (or ad-hoc) hearings were recorded separately. In addition to producing a more reliable and valid measure of policy attention, this procedure also allows one to compare the trends in routine and ad-hoc congressional hearings over the research period and, therefore, test more explicitly the hypothesis that media coverage of DD is more likely to influence the non-routine work of policy-makers.

The second measure of policy attention is all DD-related bills that were introduced to the United States Congress from 1978 to 1995. The study utilized introduced bills rather than actual laws because the latter is heavily dependent upon external constraints (e.g., time, cost, the legislative procedures) and do not adequately represent legislators' motivation to act in response to increased media attention to issues. Introduced bills are superior in this respect because they are closer in time to the

actual stimulus and are less constrained by political obligations, administrative processes, or economic cost compared to passing a bill in Congress.

Information on all DD-related federal bills (N = 118) was obtained from CIS by using the keyword 'drunk-driving'. Records included in this database provide information on the date, number, and content of bills introduced each year to the United States Congress. Each bill was then coded for type and content. Types of bills included bills aimed at increasing deterrence (including reducing the legal minimum drinking age), bills to establish drunk-drivers' liability for damages to property, appropriation bills, and public education bills aimed at increasing public awareness of the DD problem. In addition, each bill's text was content analyzed for the presence or absence of a reference to DD as a crime (the dominant definition of DD in the media).

*Policy Actions.* Two measures of DD-related policy actions are used in this study. The first is the annual amount of federal appropriation for curbing DD between 1978 and 1995. The annual amount of federal funds is indicative of the volume of activities against DD carried out by a governmental agency (NHTSA, in this case) (Gonzenbach, 1996; Rogers et al., 1991). This measure was further broken down to funding for enforcement of anti-DD laws and funding for education and prevention programs. Data were obtained directly from NHTSA following a specific request by the author. These data, however, may also be obtained through NHTSA 'Budget in Brief' annual reports. To allow for estimates of real changes in levels of federal expenditures from year to year, all annual expenditures were converted into constant (or 1995) dollars using the gross national product (GNP) deflator.

The second measure of policy actions is the adoption of anti-DD laws by all 50 states and the District of Columbia between 1978 and 1995. Federal anti-DD laws were

often aimed at mandating state legislators to adopt tougher laws against DD, particularly per se laws (laws setting the legal BAC level at .10 or less), minimum drinking age laws, and mandatory administrative license revocation (ALR) laws. Federal funding for highway safety and maintenance programs was withheld from states that did not comply with these guidelines, thus, serving as an incentive to state legislatures. For this reason, states' adoption of anti-DD laws better represents the legislative behavior of policy-makers nationwide. Data were obtained from a NHTSA-funded study that examined the relationship of alcohol safety laws to DD behavior with particular focus on ALR and per se laws (Voas & Tippetts, 1999). To estimate the level of adoption, the researchers calculated the proportion of drivers in all 50 states and the District of Columbia that were covered by anti-DD laws in each year. Besides tapping into legislators' behavior, this measure is particularly desirable for two other reasons. First, it provides an over time estimate of the proportion of drivers nationwide at risk of being legally penalized for DD (a property of the data that will be useful for estimating the effect of DD-related policy-making on DD behavior in Chapter 6). Second, it permits one to examine a more dynamic relationship between cumulative media coverage of DD and cumulative policy actions that is lost when simple counts of variables are used.

## **Results**

### **Drunk-Driving-Related Policy Attention and Actions**

Hypothesis 4.1 proposes a strong and positive association between media attention to DD and related policy attention and actions. Specifically, it is hypothesized that the volume of policy attention concerning the DD problem between 1978 and 1995 will follow a pattern that is similar to that of media attention to this issue over time. The

volume of policy attention is, therefore, expected to be very low between 1978 and 1980, substantially higher from 1981 to 1984, fixed throughout 1989, and gradually lower thereafter. Figure 4.1 examines this prediction regarding three measures of DD-related policy attention between 1978 and 1995: the number of DD-related bills introduced in the United States Congress, the number of ad-hoc DD-related congressional hearings, and the number of routine DD-related congressional hearings.

From 1978 to 1980 only 5 DD-related bills were introduced in Congress. The number of bills jumped to 25 in the following period (1981-1984), continued to increase (though not monotonically) from 1985 to 1988 (39 bills), and then gradually declined from 1989 to 1991 (25 bills) and from 1992 to 1995 (24 bills). Thus, while the volume of DD-related bills was quite volatile during the research period, the general trend in this variable, as suggested by Hypothesis 4.1, seems to follow the trend in media attention to the DD problem.

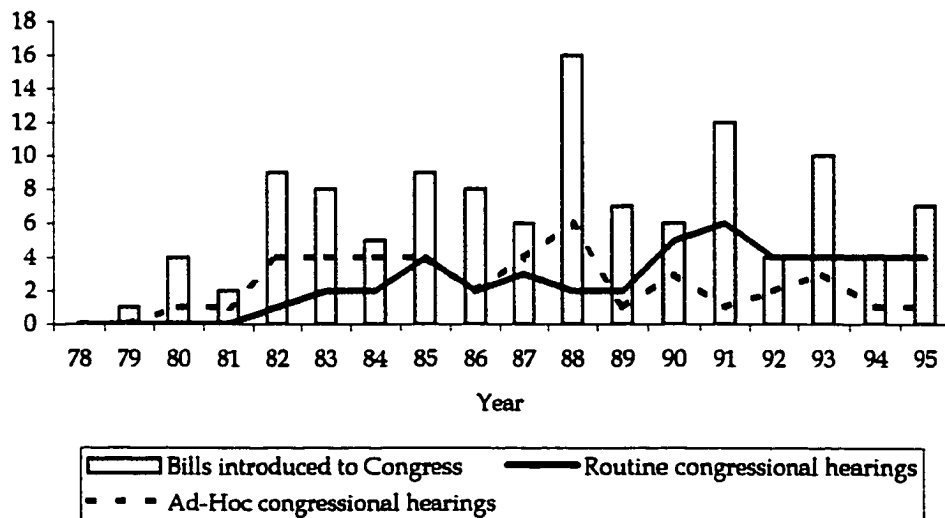


Figure 4.1: Policy attention to the drunk-driving problem, United States, 1978-1995 (N = 18 years)

A similar pattern characterizes DD-related congressional hearings as an additional measure of policy attention. Ad-hoc DD-related congressional hearings focused on topics such as the legal minimum drinking age, strategies to curb DD, bans on alcohol advertising, alcohol warning labels, and the creation of nationwide information systems for the close monitoring of recidivist drunk-drivers. Routine DD-related congressional hearings, on the other hand, centered on DD-related appropriations, reauthorization, and nominations. Recall that media attention to the DD problem is expected to be associated with ad-hoc congressional hearings that, unlike routine hearings, are less likely to be influenced by institutional and organizational routines. As expected, the number of DD-related ad-hoc congressional hearings increased rapidly from 1981 to 1984 (a total of 13 hearings) in comparison to the previous period (a single hearing between 1978 and 1981). While the number of routine congressional hearings increased as well during this time, the observed change in the volume of routine hearings (from 0 in the first period to 5 in the second) was not as substantial as the one observed for ad-hoc hearings. From 1985 to 1988, the number of ad-hoc hearings continued to be higher than that of routine hearings (16 compared to 11) but, as expected, routine hearings were increasingly more common from 1989 to 1995 (29 vs. 12 ad-hoc hearings).

Table 4.1 offers a closer look at the nature of policy attention to the DD problem by examining types of anti-DD congressional bills and their distribution over the research period. The main finding is that the number of bills aimed at increasing legal deterrence of drunk-drivers was substantially higher than that of other types of bills in each period. Overall, deterrence bills occupied about 60% of the DD-related congressional legislative agenda. If we assume that policy attention is predictive of

policy actions (both in volume and in emphasis), the apparent focus of policy attention on deterrence throughout the entire research period is in line with the prediction of Hypothesis 4.2 that the majority of policy actions will be focused on deterrence. This pattern also seems to be consistent with the general argument that the nature of media attention to the DD problem (i.e., media frames) is predictive of the nature of policy attention to this problem.

Table 4.1: Drunk-driving-related congressional bills by type, United States, 1978-1995 (N = 118)

	1978-1980	1981-1984	1985-1988	1989-1991	1992-1995
Deterrence	5	13	23	13	17
Appropriation	0	5	10	7	6
Public Education	0	4	5	4	1
Liability	0	3	1	1	0
<b>Total</b>	<b>5</b>	<b>25</b>	<b>39</b>	<b>25</b>	<b>24</b>

DD-related policy actions between 1978 and 1995 are examined in Figure 4.2. Hypothesis 4.1 predicts that the volume of policy actions will increase rapidly between 1981 and 1984. Hypothesis 4.2 suggests that policy actions will focus primarily on deterrence and that, beginning in 1985, policy actions will increase at a decreasing rate. Figure 4.2 tests these predictions regarding three measures of deterrence actions (states' adoption of administrative license revocation laws, states' adoption of lower legal BAC levels laws, and federal appropriation for enforcement) and a single measure of prevention actions (federal appropriation for DD prevention).

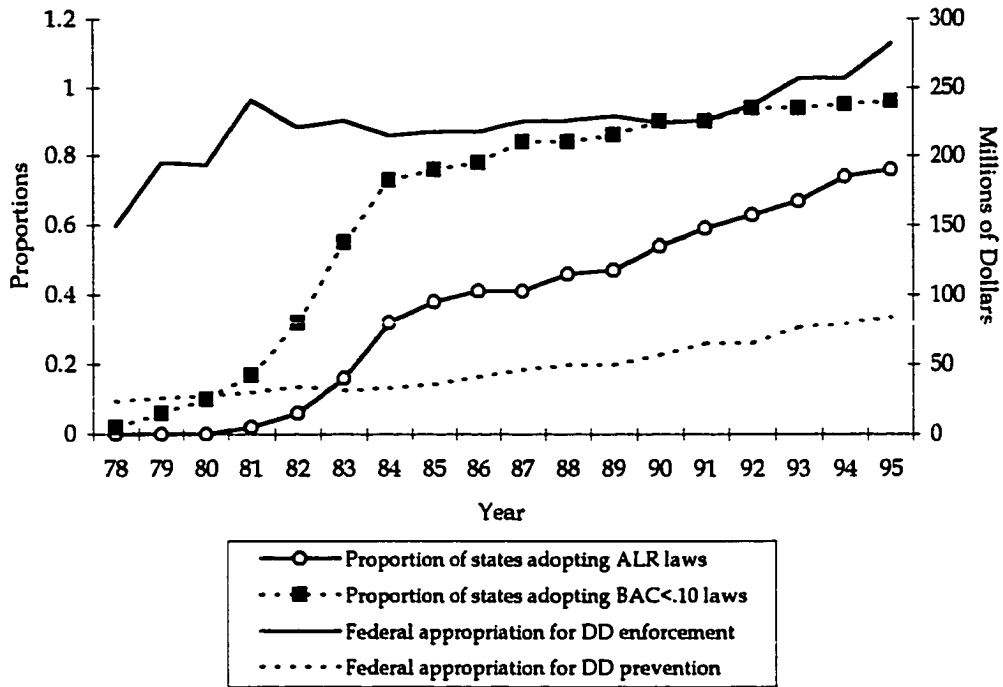


Figure 4.2: Drunk-driving-related policy actions, United States, 1978-1995 (N = 18 years)

The first thing to note in Figure 4.2 is that policy actions in the beginning of the 1980s centered primarily on deterrence measures. On average, appropriation for enforcement of anti-DD laws was about 4 times higher than that for education and prevention programs both at the early 1980s and throughout the remaining research period. In addition, the proportion of state legislatures that adopted tougher anti-DD laws such as administrative license revocation (ALR) and lower legal BAC levels increased rapidly between 1978 and 1984 (0 to 0.32 and 0.1 to 0.73, respectively) and continued to increase more gradually thereafter. This focus on deterrence is consistent with the findings regarding the nature of policy attention to the DD problem as well as with the overall logic of Hypothesis 4.2. In contrast, the Hypothesis 4.1 expectation that all types of policy actions will rapidly increase between 1981 and 1984 seems to hold only for two of the four measures (i.e., states' adoption of ALR and BAC laws). A



possible explanation is that different types of policy actions vary in the level of institutional and organizational constraints that are attached to them. Specifically, federal appropriation is the outcome of a lengthy and stable political process that encompasses many governmental units and bureaucratic routines and, therefore, is less susceptible to rapid change in response to sudden inputs to the political system.

Finally, Hypothesis 4.2 postulates that, beginning in 1985, policy actions aimed at deterrence will increase at a decreasing rate while education and prevention measures will increase at an accelerated rate. Table 4.2 tests this prediction by comparing rates of change in all four measures of policy actions across different periods.<sup>2</sup>

Table 4.2: Rate of change in Drunk-Driving-related policy actions by period, United States, 1978-1995

	1978-1980	1981-1984	1985-1988	1989-1991	1992-1995
ALR laws adoption	0	.98	.09	.07	.065
BAC laws adoption	.44	.70	.03	.02	.01
Enforcement appropriation	.09	.026	.012	.0001	.005
Prevention Appropriation	.047	.052	.10	.09	.065

The results in Table 4.2 (and Figure 4.2, for that matter) support the prediction of Hypothesis 4.2 regarding the rate of anti-DD laws adoption nationwide between 1978 and 1995. The adoption rate of both ALR and BAC laws increased rapidly between 1981 and 1984 in comparison to the remaining periods (both before and after). Furthermore, from 1985 onward, the rate of adoption continued to increase but in a more gradual pace than before. A somewhat different pattern characterizes appropriation for

enforcement of anti-DD laws. As Table 4.2 shows, appropriation for enforcement increased rapidly between 1978 and 1980, before media attention to the DD problem increased. From 1981 to 1995, rates of change increased at a decreasing rate. As noted above, a possible reason for the deviation of the pattern in this particular measure from that in adoption of deterrence laws is that appropriations are more constrained by institutional and organizational routines. Finally, the pattern in federal appropriation for prevention and education programs seems to follow the Hypothesis 4.2 prediction that, over time, policy actions aimed at long-term solutions to the problem will increase at an accelerated rate. Between 1984 and 1995, appropriation for DD-related prevention and public education programs more than tripled (from 33.4 million dollars in 1984 to 83.4 million dollars in 1995), and as Table 4.2 shows, the rate of change increased at an accelerated rate (though most of these changes were incremental).

To recap, policy attention to the DD problem seems to follow the same pattern that characterizes media attention to the problem. From very little attention to DD between 1978 and 1980, policy attention peaked rapidly from 1981 to 1984, remained relatively high throughout the late 1990s, but declined thereafter. There is also evidence that policy attention centered primarily on increased deterrence as possible solution to the DD problem, which is consistent with the relatively high volume of policy actions aimed at increasing deterrence throughout the entire research period. As expected, the volume of policy actions peaked between 1981 and 1984 (with the exception of federal appropriation for enforcement and prevention that increased more gradually) and continued to increase at a slower pace thereafter. Finally, a closer examination of the rates in which the volume of policy actions progressed from 1985 onward, revealed a pattern of deterrence measures that increase at a decreasing rate and prevention

measures that increase at an accelerated rate. While most of these findings are consistent with the predictions of Hypothesis 4.1 and 4.2, they are suggestive, at best, regarding the relationship between the observed patterns of policy-response to DD and media attention to this public problem between 1978 and 1995. To test both hypotheses' claims about this relationship, more direct tests are needed.

#### The Media-Policy Association

The first of these tests pertains to the extent that media representations of the DD problem were, in fact, associated with policy-makers' perceptions of DD. Figure 4.3 examines the relationship between the number of references to DD as a crime in the news media and those made by members of Congress when introducing a DD-related bill. While both variables have a curvilinear association with time, the direct association between them has a clear linear shape, where the R-square value (.62) indicates a substantial and significant association. Although a causal direction cannot be determined from this analysis, it is clear that a more intensive use of the crime frame in the media was associated with an intensive use of this frame by policy-makers.

Table 4.3 summarizes the zero-order associations between media attention to the DD problem and related measures of policy attention and actions. Two separate measures of media attention are considered: first, the total number of news stories in each year and, then, the total number of stories in each year that presented DD as a crime or suggested that increased deterrence (i.e., stiffer laws and stricter enforcement) is the solution to the problem. As policy attention and actions focused on deterrence, the use of the latter measure may be more informative regarding the nature of the association between these variables.

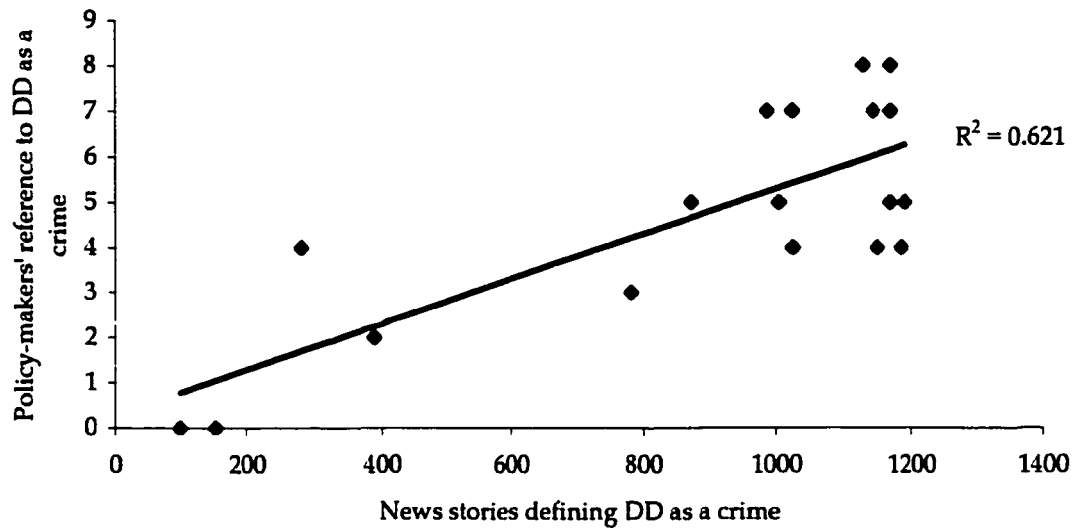


Figure 4.3: A scatterplot of drunk-driving-related news stories and legislators' reference to drunk-driving as a crime, United States, 1978-1995 (N = 18 years)

Overall, the zero-order correlations in Table 4.3 suggest substantial associations between media coverage of DD from 1978 to 1995 and policy response to the DD problem. The trends in both measures of policy attention (introduced bills and ad-hoc congressional hearings) correlated strongly and significantly with the trend in media coverage of DD. Introduced bills were more strongly associated with the overall media attention to the problem, while ad-hoc congressional hearings were slightly more strongly associated with stories that included particular reference to deterrence. As expected, the trend in routine congressional hearings was not significantly associated with media attention to the DD problem.

As far as policy actions are concerned, media attention, in particular stories that focused on deterrence, was strongly and significantly associated with states' adoption of anti-DD laws (ALR and BAC). On the other hand, the associations between media attention and federal appropriation for enforcement and prevention seem to be more equivocal, as both were significantly correlated with the overall trend in media coverage

but the measure of deterrence (enforcement appropriation) was not significantly correlated with stories that focused on deterrence.

Table 4.3: Zero-order correlations between media attention to drunk-driving and related policy attention and actions, 1978-1995 (N = 18 years)

	All Stories	Deterrence-Framed Stories
<u>Policy Attention</u>		
Introduced bills	.727**	.449**
Ad-hoc hearings	.651**	.669**
Routine hearings	.152	.156
<u>Policy Actions</u>		
ALR laws	.54**	.69**
BAC laws	.63**	.72**
Enforcement appropriation	.504*	.13
Prevention appropriation	.42*	-.09

\*\*  $p < .05$ . \*\*  $p < .001$ .

Zero-order correlations, however, cannot establish the causal direction between media coverage and policy response. To this end, a common time-series regression technique, first-order distributed-lag models (Ostrom, 1990), was used. This technique relies on a simple structural equation model that can be estimated by an ordinary least square (OLS) regression and is mathematically expressed as follows:

$$Y_t = b_0 + b_1 Y_{t-1} + b_2 X_{t-1} + e$$

Where  $Y_t$  is the dependent series at time  $t$ ,  $Y_{t-1}$  is the dependent series lagged by a single time point, and  $X_{t-1}$  is the independent series that is also first-order lagged. The model estimates three parameters: the constant or intercept ( $b_0$ ), and two partial time-series regression coefficients ( $b_1$  and  $b_2$ ). Similar to the logic of a Granger Causality test (Granger, 1969),  $X$  is said to cause  $Y$  when lagged values of  $X$  are significantly related to  $Y$  after controlling for the previous history of  $Y$  (i.e., lagged values of  $Y$ ). The benefit of including the previous values of the dependent variable as an additional independent predictor is the ability to control for external influences on this association (such as the impact of grassroots activism on both policy-making and media attention) that may lead to a spurious relationship. Moreover, since most time-series in social sciences are first-order autoregressive processes (McCleary & Hay, 1980), including the first-order lagged values of both variables, effectively addresses the requirement of pre-whitening (i.e., making a series stationary) them before they enter the regression model (Granger, 1969).

Distributed-lag regression models are often a useful alternative to more common approaches to time-series data such as autoregressive integrated moving average (ARIMA) models, particularly when the number of observations is relatively small (i.e., less than 50). Nonetheless, they have some important weaknesses that are particularly relevant to the analysis here. The first is that estimates of effects drawn from a small sample may not accurately estimate the true association between variables. Second, by relying on annual data, little can be inferred about the time lag of effect from news coverage to policy-making. Given that four weeks appears to be a typical time lag for agenda-setting effects (Wanta, 1997), predicting policy-attention at present from media coverage in the previous year seems somewhat counterintuitive and is likely to produce

an underestimate of this effect. Finally, time-series regression can only formulate a linear association between variables and is less appropriate for examining relationships that are essentially non-linear over time. For these reasons, the use of time-series regression here is a useful (but not a definitive) test of the general hypotheses regarding the likely causal direction between variables.

To ensure that the OLS regression assumptions are not violated when estimating the model, three statistical tests were employed. The first, the Durbin-Watson test of correlated errors (serial correlation) is designed to detect first-order autocorrelations. When there is no serial correlation, the expected Durbin-Watson value is approximately 2, where a value under 1.5 indicates a positive serial correlation and a value above 2.5 a negative serial correlation. The second, tolerance, estimates the amount of variation in a single predictor that is not explained by its association to other predictors in a multiple regression model. Tolerance values range from 0 (perfect collinearity) to 1 (no collinearity). Finally, the autoregressive conditional heteroscedasticity (ARCH) test (Engle, 1982) was used to test the null hypothesis of homoscedasticity in the residuals. This statistic has a Chi-square distribution with 1 degree of freedom, where a non-significant result (i.e., a value of 7.8 or lower) indicates that the errors are homoscedastic.

Table 4.4 summarizes the results of this analysis. Overall, tests of serial correlation, multicollinearity, and heteroscedasticity did not detect any significant violation of OLS regression assumptions. Note that all of the regression models in Table 4.4 test the hypothesis that media coverage causes policy-making. Regression models testing the alternative hypothesis (i.e., that policy-making causes media coverage) were also estimated but omitted from this table because none had shown a significant

contribution of policy-making to DD-related news coverage over and above that of news coverage on itself.

Table 4.4: Time-series regression tests of a causal relationship between drunk-driving-related media attention and policy-making (N = 17 years)

	B (SE)	adjusted-R <sup>2</sup>	ΔR <sup>2</sup>	DW	T	ARCH
<u>Dependent: bills</u>						
DD-related bills <sub>t-1</sub>	-.48 (.29)					
DD-related news <sub>t-1</sub>	.007 (.003)*	.314	.31*	2.28	.82	1.78
<u>Dependent: Ad-hoc hearings</u>						
DD ad-hoc hearings <sub>t-1</sub>	.48 (.19)*					
DD-related news <sub>t-1</sub>	.008 (.001)*	.68	.12*	2.26	.75	1.75
<u>Dependent: Routine hearings</u>						
DD Routine hearings <sub>t-1</sub>	.49 (.17)*					
DD-related news <sub>t-1</sub>	.0001 (.001)	.68	.003	2.02	.77	1.74
<u>Dependent: Enforcement appropriation</u>						
Appropriation <sub>t-1</sub>	.70 (.20)**					
DD-related news <sub>t-1</sub>	.008 (.01)	.47	.016	2.3	.79	1.78
<u>Dependent: Prevention appropriation</u>						
Appropriation <sub>t-1</sub>	1.06 (.06)**					
DD-related news <sub>t-1</sub>	.0008 (.003)	.97	.09	2.5	.77	1.65
<u>Dependent: ALR adoption</u>						
ALR adoption <sub>t-1</sub>	.91 (.045)**					
DD-related news <sub>t-1</sub>	.008 (.001)	.98	.009	1.8	.86	1.72
<u>Dependent: BAC adoption</u>						
BAC adoption <sub>t-1</sub>	.71 (.055)**					
DD-related news <sub>t-1</sub>	.002 (.001)	.98	.018	1.6	.71	1.74

\*  $p < .05$ . \*\*  $p < .001$ .

ΔR<sup>2</sup> = R-square change due to the unique contribution of media coverage.

DW = Durbin-Watson test of serial correlation.

T = Tolerance (test of multicollinearity).

ARCH = Auto Regressive Conditional Heteroscedasticity.



More importantly, of the seven variants of media-policy relationships, a possible causal flow from media coverage to policy response (both attention and action) tested positively only for the two measures of policy attention: anti-DD bills introduced in Congress and ad-hoc congressional hearings. While an accurate estimate of the magnitude of this effect may deviate from the one generated by this analysis, DD-related media coverage clearly had an independent contribution to the trend in policy attention to the problem over the research period (i.e., an R-square change of .31 for DD-related bills and .12 for DD-related ad-hoc congressional hearings). This finding is consistent with the expectation that media attention to DD positively affected the level of policy attention to the problem throughout the entire research period (as predicted by Hypothesis 4.1).

In contrast, there was no evidence in support of a causal flow of influence from media coverage to policy actions. Similar to the evidence of null media effects on the volume of routine congressional hearings, this pattern of findings may indicate that the mass media has little power to influence policy-makers' behaviors that is primarily guided by institutional and organizational routines. Nonetheless, this pattern may also be an artifact of examining the linear association between media attention and policy actions while neglecting non-linear associations. The analysis presented in Figures 4.4 and 4.5 supports this proposition by demonstrating that while the relationship between media coverage and policy attention is captured well by a linear association (Figure 4.4), the one between media coverage and policy actions (Figure 4.5) is more likely to be non-linear than linear (that is, a cubic trend fits this association better statistically).

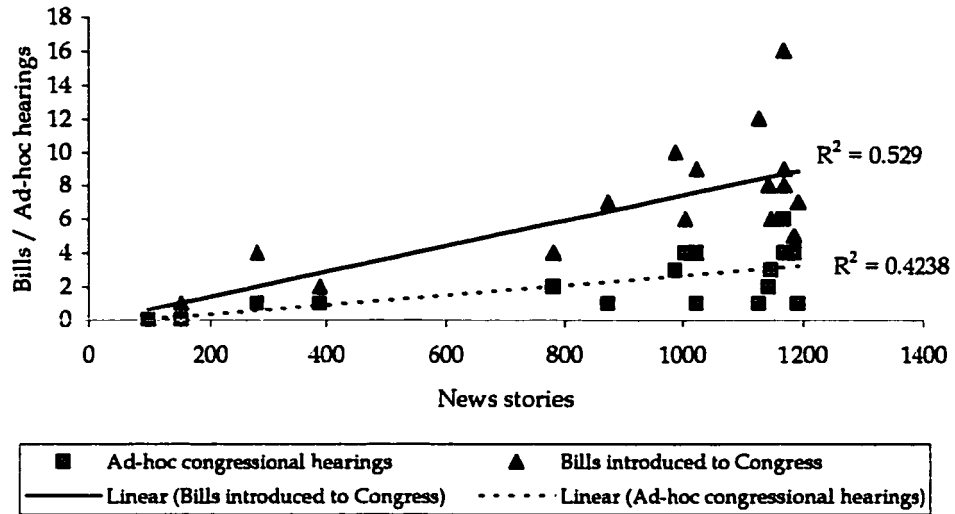


Figure 4.4: A scatterplot of the association between media and policy attention to the drunk-driving problem, United States, 1978-1995 (N = 18 years)

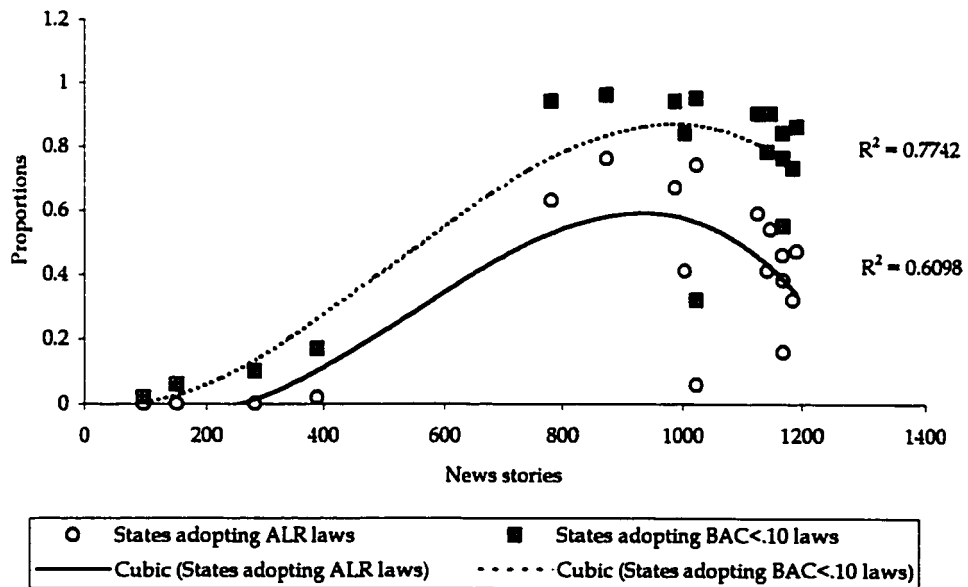


Figure 4.5: A scatterplot of the association between media attention and policy actions regarding the drunk-driving problem, United States, 1978-1995 (N = 18 years)

Hence, to better estimate the dynamic relationship between news coverage and policy attention and actions, more flexible longitudinal data analysis techniques were employed. The first of the two pertains to the media's impact on policy attention and focuses on the proposition that periods of intensive media coverage are likely to result in heightened policy attention to the problem. Assuming that this proposition is correct, the presence of media messages should facilitate changes in policy attention that otherwise would be slower to occur. Specifically, DD-related news coverage should contribute to the likelihood that DD-related bills would be introduced in Congress at certain dates over and above the contribution of the past history of this variable to this likelihood.

To test this prediction, Cox regression (or proportional hazard) models were used (Cox, 1972). A Cox regression utilizes a partial maximum likelihood estimation method to model the instantaneous probability of a certain event to occur at a certain date or time-interval. The variance in the probability of experiencing an event is assumed to be a function of both time-varying and time-invariant random variables (Allison, 1997). The specific model used is represented by the following equation:

$$\log \frac{P_{it}}{1 - P_{it}} = \alpha + \beta X_{it}$$

Where  $P_{it}$  is the probability of a DD-related bill to be introduced to Congress at time  $t$ ,  $\alpha$  represents the baseline likelihood of this event occurring, and  $X_{it}$  is a vector of time-varying explanatory variables that are measured at each time-interval in the analysis (216 months in this case). When the likelihood of a repeated event (such as

introducing a DD-related bill) is concerned, the proportional hazard model requires that each time-interval (a single month in this case) be treated as a single observation (Allison, 1997). Subsequently, the analysis is performed on all available time-intervals (216 months in this case) where the criterion for censoring is whether or not an event occurred during a particular month.

Nonetheless, this particular estimation method may introduce a downward bias into the estimated regression coefficients and standards errors due to unobserved heterogeneity (i.e., dependence among multiple observations). One method to correct for unobserved heterogeneity is to include the cumulative number of bills that were introduced up to a certain interval as a control variable (for an actual application of this approach see Myers, 1997). Therefore, the regression model estimated in this analysis included a single predictor (the cumulative number of DD-related news stories in each month) and the control variable, where a statistically significant coefficient implies that media coverage affected the likelihood of introducing a DD-related bill in Congress. Substantively, this model tests the proposition that periods of increased media attention to DD create a sense of urgency among legislators and push them to introduce DD-related bills faster than otherwise expected. This proposition was examined separately for all DD-related bills (N = 118) and bills aimed at increasing deterrence (N = 72). Given that increasing deterrence of drunk-drivers was the dominant response of policy-makers to the problem, examining the latter case is useful for estimating the impact of DD-related media frames on policy-making in addition to the volume of media attention to this problem. The results of this analysis are summarized in Table 4.5.

Table 4.5: Cox regression of the effect of drunk-driving-related media attention on the likelihood of introducing a bill in Congress during a certain month between 1978 and 1995

Explanatory Variable	b (SE)
<u>All Bills</u>	
Previous bills	-.75 (.13)**
All news stories (past month)	-.036 (.004)**
-2 log likelihood	675.7
Chi-square	399.3
Degrees of freedom	2
N	216
<u>Deterrence Bills</u>	
Previous bills	-.76 (.20)**
Deterrence news stories (past month)	-.08 (.012)**
-2 log likelihood	265.15
Chi-square	209.8
Degrees of freedom	2
N	216

Note: Regression coefficients represent the predicted change in log likelihood of an event for a unit increase in the explanatory variable.

\*\*  $p < .001$ .

The results in Table 4.5 support the proposition that DD-related media coverage was influential in attracting policy attention to the DD issue. For both DD-related bills in general and bills aimed at deterrence in particular, this analysis shows a statistically significant contribution of media coverage to the likelihood of introducing a bill in Congress when controlling for the number of previous bills. Nonetheless, the coefficients that describe the size of this effect are not easily interpretable since they represent the predicted change in the log likelihood of an event in discrete time. However, by using the exponential transformation  $100(e^{\beta} - 1)$  for quantitative predictors,

these estimates are expressed as the predicted percent change in the likelihood of this event to occur faster than expected for each additional unit of the explanatory variable (Allison, 1997). Once transformed, the coefficients suggest that media coverage of DD was associated with a 3.53% decrease in the expected time of introducing any DD-related bill and a 7.68% decrease in the expected time of introducing a DD-related bill aimed at increasing deterrence. The fact that the contribution of deterrence-framed news stories on the introduction of deterrence bills was more than twice the contribution of all DD-related news stories to the introduction of DD-related bills in general, suggests as hypothesized, that both media attention to the DD problem and the frames used to describe it were important determinants of DD-related policy attention between 1978 and 1995.

A second advanced longitudinal analysis technique, Fan's (1988) ideodynamic model, was used to estimate the effect of DD-related news coverage on policy actions more accurately. This model utilizes a non-linear estimation procedure to predict changes in public opinion and behavior from media coverage of issues. The four important assumptions of this model are that media messages can both persuade and dissuade individuals to change their attitudes and behaviors, that the media's persuasive force is proportional to the ratio of adopters to non-adopters in the population, that an impact of a single news story declines over time in an exponential manner with a half-life of one day (i.e., a story retains half of its impact in the following day)<sup>1</sup>, and that when media coverage is neutral or absent, public opinion or behavior are characterized by inertia (Hertog & Fan, 1995). The basic ideodynamic equation reflects all of these assumptions:

$$P_t = P_{t-1} + k_1 \left( \sum_{i=0}^t P_{news_{t-i}} 0.5^{(i-t)} \right) (1 - P_{t-1}) - k_2 \left( \sum_{i=0}^t C_{news_{t-i}} 0.5^{(i-t)} \right) (P_{t-1})$$

Where  $P_t$  is the predicted proportion of adopters at time  $t$ ,  $P_{t-1}$  is the predicted proportion of adopters at the previous time point,  $k_1$  and  $k_2$  are recruiting constants for adopters and non-adopters respectively, and  $P_{news_{t-i}}$  and  $C_{news_{t-i}}$  is the cumulative number of persuasive (pro) and dissuasive (con) news stories prior to time  $t$  whose persuasive force declines over time in an exponential manner with a half-life of one day. The  $k$  parameters are, therefore, an estimate of the proportion of the population who will change their minds at the direction of the position advocated by a single news story on any given day (i.e., these estimates are presumed to be constant over time).<sup>3</sup>

Figure 4.6 presents the application of the ideodynamic model to the relationship between DD-related news coverage and rate of adoption of ALR laws by state legislatures nationwide (a measure of policy-makers' behavior). The specific model used to generate the estimate of adoption rate from media coverage deviates in three important ways from the basic ideodynamic model that is described above. First, as DD-related news coverage was overwhelmingly one-sided, the impact of dissuasive information was irrelevant and the dissuasive recruitment parameter ( $k_2$ ) was set to zero accordingly. Second, because the rate of states' adoption of tougher anti-DD laws is likely to be a function of related federal legislation, federal bills (yes/no for each day estimated) were included in the model as an additional predictor (with an additional parameter to be estimated). Finally, while the basic ideodynamic model does not give much thought to the time lag of media effects on behavior, an effort was made to identify the optimal lag of effect from DD-related news coverage to legislators'

behavior. Substantively, the expected time lag of effect for attitudinal change is already specified in the ideodynamic model under the assumption that the impact of a single news story declines over time in an exponential manner with a half-life of one day. Since behavior and not attitudes are predicted here, it is reasonable to expect that external constraints on policy-makers' behavior (such as organizational routines) will produce an additional time-lag, needed for attitudinal change to be transformed into actual behavior. This time-lag was determined empirically by testing models with different lagged values of news stories (where lags ranging from 1-4 weeks and then from 2-12 months) and selecting the model that best fit the data.<sup>4</sup> Accordingly, it was determined that the optimal time lag of media effects on legislators' behavior was three months.

Figure 4.6 tests three alternative hypotheses regarding the observed trend in state legislatures' rate of adopting ALR laws. The first is that the observed trend is a linear function of time (i.e., merely represents the secular trend in this behavior). This hypothesis is particularly viable given the monotonic increase in this series over the research period. The second suggests that the trend in state legislatures' rate of adopting ALR laws is determined primarily by the amount of federal legislation aimed at encouraging states to adopt such laws. The third proposes that both federal legislation and DD-related news coverage can better account for this trend in legislators' behavior. To estimate how well each of these alternative models fits the actual data, three goodness-of-fit statistics were used. The first, the R-square is self-explanatory. The two others, Akaike Information Criterion (AIC) and the Schwartz Information Criterion (SIC), are often superior to R-square as a measure of goodness-of-fit because they penalize more harshly for loss of degrees of freedom (particularly the SIC) and are more



stable in small samples (Diebold, 1998). Contrary to the R-square statistic, AIC and SIC values range from  $-\infty$  (minimum) to  $+\infty$  (maximum) where smaller values indicate a better fit to the data.

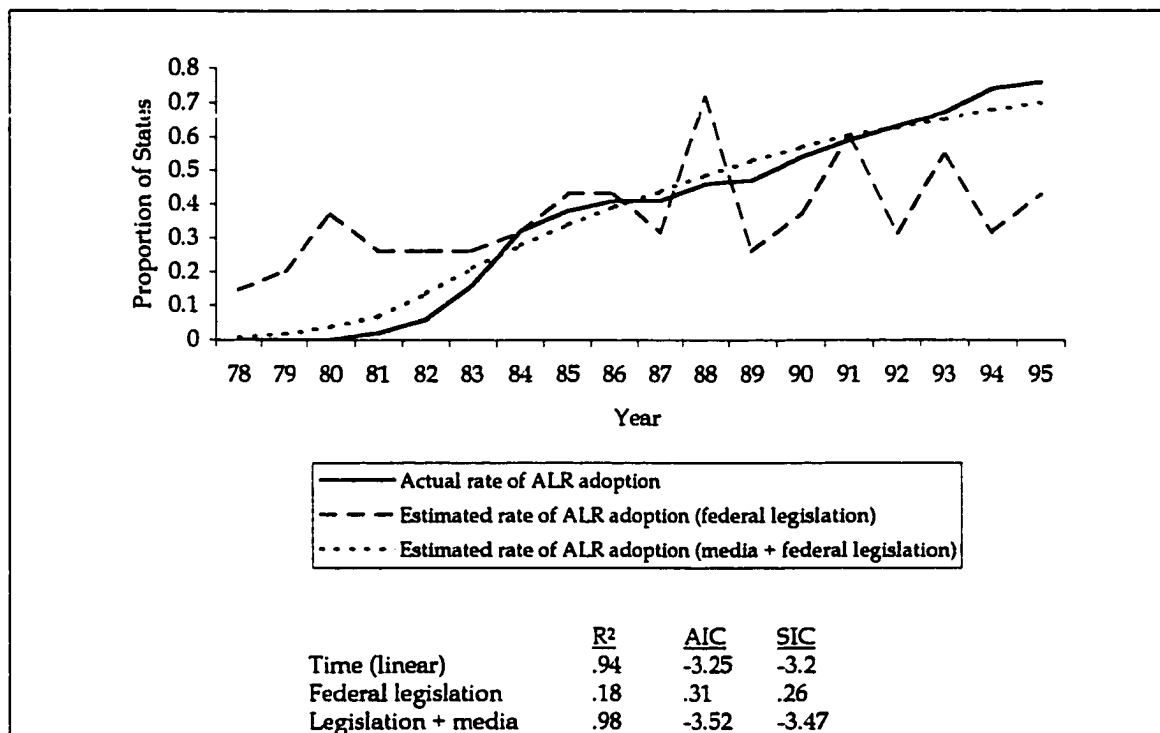


Figure 4.6: Predictions of administrative license revocation (ALR) laws adoption from drunk-driving-related federal legislation and media coverage using the ideodynamic model, 1978-1995 (N = 18 years)

The goodness-of-fit statistics at the bottom of Figure 4.6 confirm what is already apparent from the graphic representation, namely, that the combination of federal legislation and DD-related news coverage generated an estimated series of legislators' behavior that fits the actual series exceptionally well, slightly better than that of the secular trend in this behavior. Estimates of recruitment coefficients indicate a change of .0003% in adoption rate for each additional news story and .004% for each additional DD-related federal bill (.005 for bills aimed at increasing deterrence).<sup>5</sup>

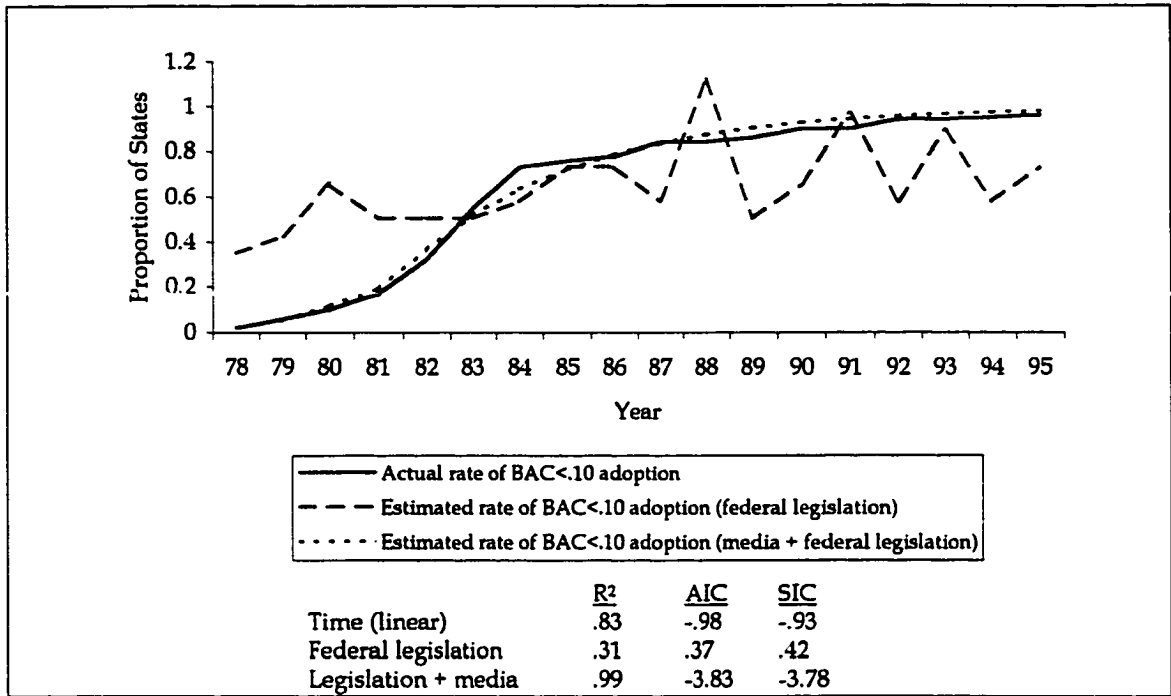


Figure 4.7: Predictions of BAC laws adoption from drunk-driving-related federal legislation and media coverage using the ideodynamic model, 1978-1995 (N = 18 years)

Figure 4.7 shows similar results regarding the observed trend in state legislatures' rate of adopting per se laws. This series' curvilinear shape suggests that a linear model representing the expected secular trend in this behavior will not fit the actual series well, as confirmed by all three goodness-of-fit statistics. As before, estimates of the series from federal legislation alone fall short of representing the actual series although they seem to be in the right direction. In contrast, the series estimated from both federal legislation and DD-related news coverage fits the actual series well with an estimated .0007% change in law adoption rate nationwide for each additional news story and .0008% for each additional DD-related federal bill (.0011% for bills aimed at increasing deterrence).

In contrast to the results of the time-series regression analysis (Table 4.4), these findings support the prediction that a positive and strong association exists between DD-related news coverage and policy actions over the research period. Specifically, the results suggest that the increased volume of DD-related policy actions between 1981 and 1984 was largely driven by increased media attention to the problem. As media attention waned from 1985 onward, policy actions continued to increase but at a decreasing rate. This may imply that the media's role in promoting policy change has shifted from mobilization to maintenance.

### **Summary**

This chapter tested the proposition that media attention to the DD problem helped to set in motion processes of formal social control by stimulating institutional response to the problem. More specifically, it was hypothesized that heightened media attention to the DD problem as well as the characterization of the problem in the media have significantly contributed to the volume of policy attention and actions in response to the problem and the type of solutions pursued by policy-makers.

Consistent with these hypotheses, the findings presented in this chapter demonstrate that increased media attention to the problem in the beginning of the 1980s attracted considerable degree of policy attention to a problem that was previously low on policy-makers' agenda. We also learn that the volume of DD-related news stories was instrumental in creating a sense of urgency among policy-makers to generate immediate, short-term solutions to the problem. Yet, once the volume of media attention to the problem started to wane, policy-makers pursued more vigorously long-

term solutions (education and prevention programs). Finally, given that policy-makers were already in favor of the solutions advocated in the media (i.e., tougher laws) at the early 1980s, a strong policy emphasis on deterrence measures comes as little surprise. Still, the results of the analysis reported above (particularly those of the more advanced approaches) suggest that increased media attention to DD helped to increase policy-makers' focus on deterrence at the early 1980s and to maintain this focus thereafter.

The extent to which DD-related policy actions that were stimulated by news coverage of the issue actually lead to changes in DD behavior will be addressed in Chapter 6. The following chapter focuses instead on the media's ability to influence informal mechanisms of social control in relation to the DD problem as another possible indirect path of media effect on behavior. Particularly, this chapter examines the way media treatment of DD may have influenced the social acceptability of this behavior over the research period.

## Notes

1. Theoretically, this assumption is justified based on the second law of thermodynamics (Fan, 1988) and because it captures the rate of memory decay after exposure to a message in the mass media (Watt et al., 1993; Zhu et al., 1993). Furthermore, previous work in this area (Fan, 1988) found this formulation to be the most efficient in estimating cumulative media effects on opinions and behaviors.
2. The rate of change between periods was calculated using the following formula:

$$\text{Rate} = \left( \frac{F_s}{B_s} \right)^{\frac{1}{k}} - 1$$

Where  $F_s$  represents the score at the end of a given period (i.e., 1980, 1984, 1988, 1991, and 1995),  $B_s$  is the score at the end of the previous period (1978, 1980, 1984, 1988, and 1991) that serves as a baseline for a comparison, and  $k$  is the length of the interval (3 or 4 years). This procedure is appropriate for comparing rates across compounded intervals of differential length.

3. To estimate  $k_1$  and  $k_2$ , the researcher employs a non-linear estimation procedure (the Generalized Reduced Gradient code, for details see Fylstra, Lasdon, Waren, & Watson, 1998) that minimizes the square of the distance between the observed values of the outcome measure (proportion of adopters) and those predicted from media coverage that operates on some baseline of the outcome measure (typically, the first observation of adopters to non-adopters ratio in the dataset). In addition, the model's reliance on a moving average process and difference equations permits the researcher a considerable flexibility in estimating linear and non-linear models as well as effectively removes the concern that estimates of media impact will be biased due to serial correlation (Gonzenbach & McGavin, 1997).
4. As the estimation procedure requires that the researcher specify a certain day on which the outcome of interest is to be estimated, the last day of each year (December 31) was chosen. Insofar as the choice of this date is flawed (i.e., does not accurately represents the actual time where measures of the observed outcome were taken), the fit between the predicted and observed values of the outcome variables should not be good regardless of the time lag used.
5. The recruitment coefficients estimated by the ideodynamic model are not easily interpreted. While, in theory, they represent the average impact of a single news story on the outcome of interest (rate of adopting a new law in this case), in practice

they are vulnerable to the sampling procedures used (i.e., the number of news sources from which the sample of news stories was retrieved). Specifically, additional news stories would decrease the magnitude of these constants. Therefore, whereas the sample of news stories used in this analysis is assumed to be representatives of the national news environment, limiting the use of these coefficients for the purpose of comparing effects of media coverage across different models is probably more helpful.

## CHAPTER 5

### **MEDIA COVERAGE AND THE SOCIAL ACCEPTABILITY OF DRUNK-DRIVING BEHAVIOR, 1978-1995**

This chapter focuses on changes in informal mechanisms of social control in response to media coverage of the DD problem (link 4 in Figure 2.3). Conformity to social norms and processes of social influence are important determinants of people's behavior and may be linked to media representations of certain behaviors both directly or through the media's ability to stimulate social interaction. Particular attention is given here to the media-social acceptability link in the context of risky behaviors (though this association can be generalized to other behaviors as well).

#### **Media, Social Acceptability, and Risky Behaviors**

People's decisions to pursue risky behaviors are rarely motivated by personal whims. None of us, for example, are born with a pressing physiological urge to smoke a cigarette or drink alcohol. Even behaviors that are dictated by basic biological needs, such as reproductive behavior and consumption of foods, can still be pursued in a safe manner. Rather, the initiation of risky practices tends to be determined by our social environment (Barokas, 1995). Through daily interaction with other members of society such as family members and peers, we acquire behaviors that are performed and accepted by others and avoid those that are not (Bandura, 1986). While hedonistic factors may account for the persistence of risky habits, widely shared standards of behavior continue to exert substantial impact on the level and frequency in which risky behaviors are performed (Beck & Treiman, 1996; Brown, 1990).

The distinction between socially acceptable and unacceptable behaviors is not always clear to the individual. Many behaviors (including risky lifestyle behaviors) are surrounded by a considerable degree of normative ambiguity. In part, this ambiguity reflects the difficulty of separating behaviors that are only or mainly harmful to self (e.g., consumption of high-fat foods and lack of exercise) from those that are also harmful to others (smoking and DD, for example). To another extent, it is a product of normative differences among sub-cultures in society (for example, youth culture vs. adult culture), as well as changes in the social definition of a single behavior over time (e.g., the decline in the social acceptability of cigarette smoking over recent decades). High levels of ambiguity substantially reduce the prospects of behavior change because there is no clear norm to which individuals can conform (Merton, 1959). This is particularly true when formal social conventions (laws and regulations) are at odds with informal ones (Bonnie, 1981; Glantz, 1996; Marlatt & Kilmer, 1998; Moskowitz, 1989). Under these circumstances, the ability of laws to curb risky individual behavior is effectively cancelled out by informal social norms that support it.

It follows that to be successful in reducing people's involvement in risky behaviors, society must first remove much of the normative ambiguity that surrounds them by clarifying and reinforcing social values and norms (Barokas, 1995; Williams, 1994). The mass media can potentially contribute to this process both directly and indirectly. A direct path of effect involves a process of social learning at the individual-level. People can learn about the social acceptability of risky behaviors just by being exposed to news, commercial advertisements, and entertainment programs. After all, a significant portion of social learning and socialization occurs through exposure to the mass media (Atkin, 1989; Gerbner et al., 1986; Signorielli, 1993). In this framework,



media representations mirror the ever-changing boundaries of what is acceptable or not in society, and as such, serve as a yardstick against which the individual can compare his or her own behavior (Lazarsfeld & Merton, 1948).<sup>1</sup> Several prominent research traditions in the area of media effects such as agenda-setting (Iyengar & Kinder, 1987; McCombs et al., 1995), cultivation (Gerbner et al., 1986; Morgan & Signorielli, 1990) and the spiral of silence (Noelle-Neumann, 1993) have already demonstrated that media portrayals influence audiences' judgments of social reality, including that of social values and norms (Ball-Rokeach, Power, Guthrie, & Waring, 1990; Shah, Domke, & Wackman, 1996). It is possible, therefore, that an intensive and unfavorable treatment of risky behaviors by the media will directly reduce their perceived social acceptability among members of society.

The alternative (indirect) path of media effects on the perceived social acceptability of risky behaviors pertains to processes of social influence (i.e., processes that occur at the group or social network level). Social influence occurs when people compare themselves with others to ascertain whether or not their own behavior is appropriate (Turner, 1991). There are at least two reasons to believe that, in relation to risky behaviors, social influence is primarily exerted through social interaction within groups and social networks. The first is that individual involvement in risky behaviors is often motivated and acquired through interpersonal communication with peers and family members (Botvin & Botvin, 1992; Dinges & Oetting, 1993). The second draws on the role of issue obtrusiveness in information processing and, particularly, the observation that the media's impact on individual perceptions is limited to unobtrusive issues, or issues with which people have little or no direct experience (Zucker, 1978). Given that many in society possess first- or second-hand experience with many of these

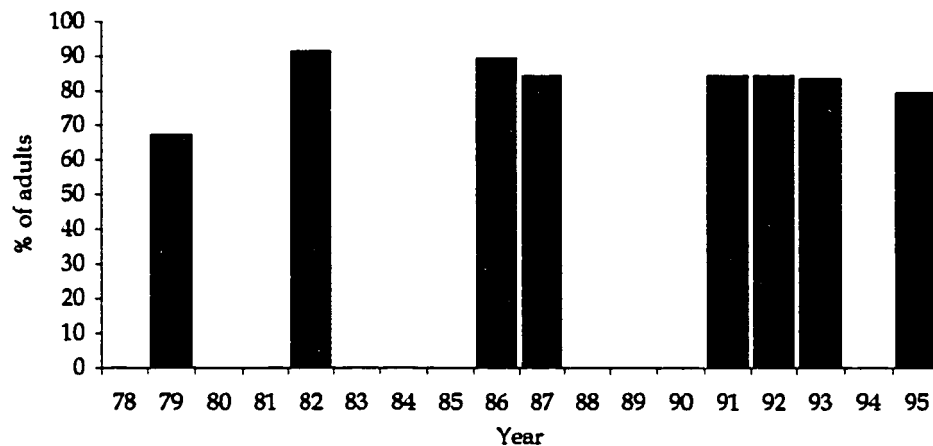
risky behaviors (McGinnis & Foege, 1993), the capacity of media representations to directly exert social influence on individual attitudes and behavior is quite limited.

If social influence processes operate primarily through social interaction (Turner, 1991), the media's contribution to the clarification and reinforcement of social expectations is likely to be indirect. Besides prompting a formal recognition (through laws) of certain behaviors as socially unacceptable, the media may contribute to this process by galvanizing public concern. As public concern increases, media characterizations of risky behaviors are likely to stimulate discussions within groups and social networks (Katz & Lazarsfeld, 1955; Weimann, 1994). When clear social norms against these behaviors finally emerge, individuals are likely to experience social pressure to refrain from performing them through interactions with others in their environment (Goffman, 1963; Turner, 1991).

#### Media and the Social Acceptability of Drunk-Driving

There is little doubt that the social acceptability of DD behavior in American society has declined over the past two decades (DeJong & Hingson, 1998). Still, no study to date has attempted to link this trend to media coverage of DD. At best, some anecdotal evidence supports this proposition. For example, Figure 5.1 examines the trend in the percentage of American adults who admitted to having a great level of concern about threats posed to themselves or to their families from DD behavior. These data were collected by Roper Public Opinion Center (RPOC) from nationally representative samples of adults using the question "How concerned are you about the problem of people drinking and driving?" While the majority of Americans were very concerned about the DD problem in any given year, the notable increase in public

concern between 1979 and 1982 (from 67% to 91% of the public) is particularly instructive given that media coverage of the problem peaked during the same time. Moreover, from the mid-1980s onward, when DD-related media coverage leveled off, the level of public concern remained at the same level.



Source: Roper Public Opinion Center online database.

Figure 5.1: Public concern about drunk-driving behavior, United States, 1978-1995

Other potential evidence of association between DD-related public opinion and the characterization of the DD problem in the media comes from RPOC's polls that examined the public's attribution of responsibility to DD and support of tougher measures against it. In a 1985 public opinion poll, 72% and 65% of the respondents opposed the idea that bartenders and party hosts, respectively, should be held liable for DD accidents caused by their customers or guests. Eight years later (in 1993) these percentages were still high (64% and 60%, respectively). In addition, 84% of the public in this 1993 survey opposed the idea of holding alcohol manufacturers and retailers liable for DD accidents. Similar tendencies were recorded regarding public opinion on

the best solution to the problem. Public opinion polls in the years 1982, 1983, 1985, 1989 and 1993, have consistently show that well over 90% of the adult American population favored bigger fines, longer jail sentences, and administrative license revocation for first-time convicted drunk-drivers. Ironically, these opinion polls also showed that 62-68% of the public believed that the criminal justice system does not deal harshly enough with drunk-drivers. Finally, in a public opinion poll conducted in 1995, 69% of American adults strongly agreed with the statement that most people would feel shame if it were known that they were convicted for DD.

This anecdotal evidence (particularly, the first two entries in Figure 5.1) may suggest some degree of overlap between DD-related media frames and attention and the decline in the social acceptability of this behavior. Still, in the absence of systematic evidence, such an association cannot be deemed sufficient to make a strong claim of effect. Moreover, even if one accepts the premises that DD-related media attention influenced the perceived social acceptability of this behavior, there is no way of telling whether this effect was direct or indirect. Still, the literature on DD behavior change provides some evidence in support of indirect media effects. Specifically, intervention strategies that targeted peer influence as a mean of promoting change in DD behavior proved to be effective (Barokas, 1995; Beck & Treiman, 1996; Brown, 1998). However, before attempting to sort out the nature of the media's contribution to the decline in the social acceptability of DD, this study takes on the more modest task of establishing an association between these variables over the research period.

*Hypothesis 5.1: Media attention to the DD problem will be associated with an increase in the proportions of individuals who disapprove of DD.*

Hypothesis 5.1 pertains to an association between media representations and social acceptability at the societal-level. For this reason, evidence in support of this hypothesis cannot directly confirm the presence of a certain mechanism of effect (i.e., direct exposure vs. effects that are mediated through social interaction). Nevertheless, some insight into the process that produced this association may still be gained by testing some assumptions about underlying communication processes. Specifically, by pitting a model that assumes an exclusive flow of social information through social interaction (i.e., a diffusion model) against a model that assumes an additional direct flow of social information from the media, the plausibility of direct and indirect paths of media effects can be compared.

Finally, as people's behavior is guided by standards that are set by social institutions (Merton, 1957), individuals are also likely to learn about a shift in society's norms concerning risky behaviors through their interaction with agents of formal social control. Because many of these agents are an integral part of a person's social environment (e.g., parents, teachers, and community leaders), formal and informal mechanisms of social control are rarely independent of one another and tend to demonstrate a considerable degree of codependence. Hence, DD-related policy actions are likely to be associated with a decline in the social acceptability of this behavior.

*Hypothesis 5.2: The volume of DD-related policy actions will be positively associated with an increase in the proportions of individuals who disapprove of DD.*

## Methodology

### Data and Measures

In the absence of systematic longitudinal data on DD-related public attitudes and beliefs, the current study utilizes data from Monitoring the Future (MTF) project (Johnston, O'Malley, & Bachman, 1998). MTF is a series of repeated annual cross-sectional surveys of a nationally representative sample of high school seniors (12th graders), college students, and young adults (aged 19-32) aimed at measuring change in attitudes, beliefs, and behaviors over time, including those related to drug and alcohol use and abuse. The project is funded by the National Institute on Drug Abuse and administrated through the University of Michigan Survey Research Center since 1975. A multi-stage random sampling procedure is used for securing the nationwide sample of students each year. Data from approximately 50,000 students in about 420 public and private secondary schools are collected during the spring of each year and sampling weights are used to correct for unequal probabilities of selection that occurred at any stage of sampling. While a representative sample of 12th graders by no means represent the entire U.S. adult population, an assumption is made that the *trend* in the social acceptability of DD within this sub-population is a close approximation of this trend within the general population.<sup>2</sup>

Each year's MTF questionnaires include many drug and alcohol-related questions, of which two were selected for the purposes of this study. Beginning at 1984, respondents were asked directly about their disapproval of DD ("Do you disapprove of people 18 years or older doing each of the following: driving after having five or more drinks?")<sup>3</sup>. However, the use of this variable, that was not measured in the beginning of the research period (1978-1983), would lead to misleading findings regarding the

association between DD disapproval and media coverage. Specifically, the association between these variables would have a negative sign, which is not only counterintuitive to the direction implied by the study's hypotheses, but also an artifact of the available data. For this reason, a measure of 12th graders' disapproval of binge drinking ("Do you disapprove of people 18 years or older doing each of the following: have five or more drinks once or twice each weekend?") was used instead as it was available for the entire research period. Binge drinking is the single best predictor of DD (Duncan, 1997) and, as Figure 5.2 demonstrates, DD and binge drinking disapproval between 1984 and 1995 were practically identical ( $r = .91$ ,  $N = 12$ ,  $p < .001$ ). Hence, the percentage of respondents in each year who reported to disapprove or strongly disapprove of binge drinking behavior served as a surrogate measure of DD disapproval in this analysis. This measure was already adjusted for sampling errors by MTF project's managers and, therefore, provides a close approximation of the true trend in this measure within this population (Johnston et al., 1998).

## **Results**

Figure 5.2 describes the trend in DD-related news coverage and policy actions in relation to high school seniors' disapproval of binge drinking (as a surrogate of DD). State legislatures' rate of adopting per se ( $BAC < .10$ ) laws was used in this analysis as a measure of policy actions because these laws were shown to reduce youth DD (Blomberg, 1992) and since they are strongly correlated with other measures of policy actions (see previous chapter). As hypothesized, disapproval of binge drinking increased by about 10% between 1978 and 1995, but this increase was slow and gradual compared to the rapid increase in both media attention and DD-related policy actions at

the early 1980s. This pattern seems to suggest that the impact of media attention on self-disapproval of binge drinking was not nearly as substantial as its impact on policy actions. In fact, the change in binge drinking disapproval from 1981 onward seems to be a part of the secular trend in this variable. Therefore, any potential effect of media coverage or policy actions on this variable is likely to be incremental, at best.

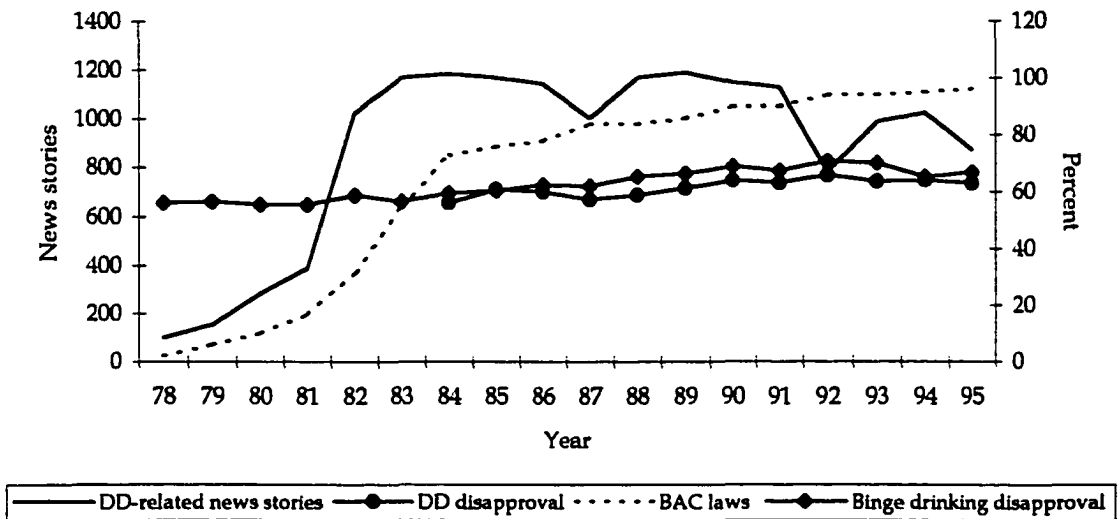


Figure 5.2: Disapproval of drunk-driving (DD) and binge drinking among high school seniors and DD-related news coverage and policy actions, United States, 1978-1995

The impact of the strong secular trend in binge drinking disapproval becomes apparent when examining statistically the association between this variable and DD-related media attention and policy actions. The zero-order association between binge drinking disapproval and media attention to the DD issue was .53 ( $N = 18, p < .05$ ). Binge drinking disapproval's association with policy attention was .86 ( $N = 18, p < .01$ ). However, when controlling for the secular trend in binge drinking disapproval (i.e., the previous values of this variable), the association between binge drinking disapproval



and policy actions reduced by about half ( $r = .48$ ,  $N = 17$ ,  $p < .05$ ), while binge drinking disapproval's association with DD-related media coverage was small and barely significant ( $r = .082$ ,  $N = 17$ ,  $p = .048$ ).

These results support Hypotheses 5.1 and 5.2 claims about the possible association between these variables, but fall short of addressing the question of causation. Given the pattern of change in all three variables over time (particularly at the early 1980s), it is very unlikely that the gradual and incremental changes in binge drinking disapproval accounted for the rapid increase in the volume of media attention and policy actions. While a reversed causal direction seems more likely, testing this proposition with annual data presents some major difficulties. Besides the obvious problems associated with testing hypothesis based on a small sample size (see the discussion in the previous chapter), annual data makes it difficult to separate lagged from instantaneous associations. A second problem with the data available for this analysis is that not all potentially important variables are observed. Specifically, a very small and marginally significant impact of DD-related media attention on binge drinking disapproval may suggest that much or all of the media's contribution to the gradual change in this variable was mediated by a third variable, the volume of related discussions within groups and social networks, that is not directly observed in this study. Similarly, the association between policy actions and binge drinking disapproval may be mediated by the activities of agents of social control such as parents and teachers that are not observed as well.<sup>4</sup>

In this respect, the use of the ideodynamic approach (Fan, 1988) may be more informative than time-series regressions in examining the relationship between media attention to DD and disapproval of binge drinking. This approach allows the

researchers to compare three different substantive mechanisms of effect that may account for the observed trend in binge drinking disapproval. The first and most obvious of these accounts is that the observed increase in self-disapproval of binge drinking between 1978 and 1995 simply mirrors the strong secular trend in this series. If anything, the graphic representation of this variable (Figure 5.2) suggests that this particular model is a strong contender. As in the previous chapter, this relationship was modeled by regressing the dependent series on time and fitting an OLS regression line to the actual values of the series.

Diffusion of social influence within social networks offers another potential explanation for the increasing trend in self-disapproval of binge drinking between 1978 and 1995. Simply stated, a diffusion model assumes that all relevant information regarding a certain behavior (both persuasive and dissuasive) is communicated through interpersonal channels of communication. Those who are favorable or unfavorable of binge drinking share their opinions with others in their social environment and, subsequently, recruit them to adopt the same position. The rate of recruitment of adopters and non-adopters is therefore proportional to their ratio in the population at any given time. This basic logic is expressed mathematically as follows:

$$P_t = P_{t-1} + k_1 P_{t-1}(1-P_{t-1}) - k_2 P_{t-1}(1-P_{t-1})$$

Where  $P_t$  is the proportion of high school seniors who disapprove of binge drinking at time  $t$ ,  $P_{t-1}$  is the predicted proportion of those who disapprove of binge drinking at the previous time point, and  $k_1$  and  $k_2$  are recruiting constants (i.e., describing the percentage of the population recruited as time advances) for adopters

and non-adopters respectively. These constants are estimated using the ideodynamic model as prescribed in the previous chapter.

A diffusion model that assumes no media effects on binge drinking disapproval is an appropriate benchmark for estimating whether or not media coverage of DD had an independent contribution to this change (D. P. Fan, personal communication, June 3, 2000). Hypothesis 5.1 was derived from the assumption that changes in DD disapproval (as measured by binge drinking disapproval) are primarily a function of relevant social information (i.e., information about social norms) that diffuses within social networks. If this assumption is correct, similar information in the media should add nothing to the rate in which this information is diffused and received by individuals. By adding a mass communication component to the basic diffusion model and examining its independent contribution to this process, this assumption may be tested. This model is represented mathematically as follows:

$$P_t = \begin{cases} P_{t-1} + \left[ k_1 P_{t-1} + k_3 \left( \sum_{i=0}^t P_{news_{t-i}} 0.5^{(i-t)} \right) \right] (1 - P_{t-1}) \\ - \left[ k_2 (1 - P_{t-1}) + k_4 \left( \sum_{i=0}^t C_{news_{t-i}} 0.5^{(i-t)} \right) \right] (P_{t-1}) \end{cases}$$

Where  $P_t$ ,  $P_{t-1}$ ,  $k_1$ , and  $k_2$  are the same as in the previous (diffusion) equation,  $k_3$  and  $k_4$  are media recruitment constants for adopters and non-adopters respectively, and  $P_{news_{t-i}}$  and  $C_{news_{t-i}}$  represent the number of pro and con news stories with exponentially declining half-life of one day at time  $t-i$  (where  $i$  ranges from 0 to  $t$ ). Notice that the top part of the equation estimates the impact of pro-transmissions in both mass and interpersonal channels of communication on the previous proportion of

non-adopters in the population, while the lower part estimates the impact of con-transmissions on the previous proportion of adopters in the same population. As was the case in the previous chapter, the recruitment constant for adopters from con-transmissions ( $k_4$ ) was set to zero as news coverage of DD was overwhelmingly one-sided (i.e., depicting DD as a socially undesirable behavior). Consequently, the non-linear estimation procedure used by the ideodynamic model was programmed to solve for the remaining three parameters ( $k_1$ - $k_3$ ).<sup>5</sup> In addition, while policy actions may have contributed to the decline in social disapproval of binge drinking, including this variable as an additional predictor in the equation has little value, as it adds no additional relevant information for the prediction of future proportions of adopters. This is because policy actions, as demonstrated in the previous chapter, are predicted almost perfectly from DD-related news coverage that is already included in the ideodynamic model. Figure 5.3 summarizes the results of this analysis.

Overall, all three estimated models in Figure 5.3 tightly fit the actual trend in binge drinking disapproval. As previously suggested, this particular series is characterized by small variance over time and a strong secular trend that seems to govern its future values. As a result, not much room is left for improving predictions of changes in the level of this series. Still, as indicated by the various goodness-of-fit statistics, while the pure diffusion model was not able to improve linear predictions of actual binge drinking disapproval, the combined diffusion-media model was able to improve this prediction by about 5% (where this change in R-square was statistically significant at the .05 level) and, therefore, represents a better approximation of the true process that generated the trend in this variable. Nonetheless, this difference is not substantial enough to support the notion of a direct association between unfavorable

media representations of DD and social disapproval of binge drinking and cannot be used for overruling the possibility that social interaction was instrumental in this respect.

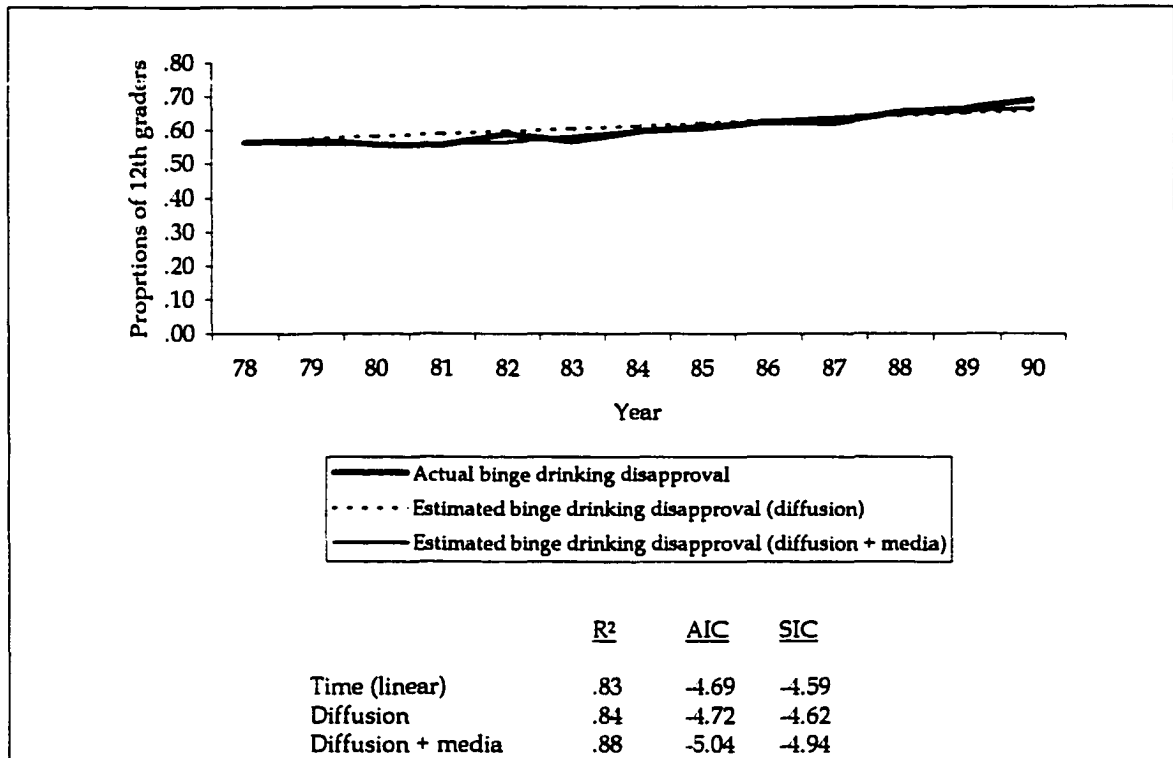


Figure 5.3: Predictions of binge drinking disapproval from drunk-driving-related media coverage using the ideodynamic model, 1978-1995 (N = 18 years)

### Summary

This chapter examined the association between DD-related media coverage and policy actions and the social acceptability of this behavior between 1978 and 1995. Anecdotal evidence from public opinion surveys suggest that the social acceptability of DD behavior declined over the research period and that the public at large shared the

views expressed in the media regarding the causes of the problem and its proposed solution. Still, the only evidence that may be circumstantially linked to the media attention cycle to the DD problem is the increase in public concern about the problem between 1979 and 1982 (see Figure 5.1). Hence, the main goal of this chapter was to demonstrate an association over time between social disapproval of DD and media attention to the problem. It was also hypothesized that policy actions aimed at curbing DD will be positively associated with this shift in social norms.

The results of the analysis that followed are ambiguous about the nature of these associations. On one hand, the trend in DD disapproval (using disapproval of binge drinking as a surrogate measure) was positively and still significantly associated with both media attention and policy actions even after controlling for the secular trend in DD disapproval. In addition, predictions of DD disapproval from media attention (coupled with an estimated diffusion process) using the ideodynamic model were significantly improved by about 5%. At the same time, the quality of the data available for the analysis (that was limited in terms of measures of variables and shorter intervals of measurement), did not allow to fully explore the nature of the association between these variables. Specifically, it is unclear whether the association between institutional response to the DD problem and the decline in the social acceptability of this behavior is instantaneous or lagged time-wise and whether this association is direct or mediated by agents of social control in a person's environment such as parents, teachers, and the police. Also left unanswered, for the most part, is the question regarding the way media representations of DD behavior are linked to the decline in the social acceptability of this behavior. The ideodynamic analysis was designed to compare predictions of DD disapproval from two competing (or complementary) processes of communicating

social information (i.e., a process of diffusion through interpersonal communication within social networks vs. a direct flow of information from the media to the public), but the results could not conclusively support the plausibility of one process over the other.

Notwithstanding, the results of this chapter and the two that precede it suggest that all three mechanisms of social control (i.e., direct exposure to information in the media regarding the negative consequences of DD, formal social control, and informal social control) were employed regarding the DD problem. Under these conditions, a substantial behavior change is expected to occur. The following chapter estimates the impact of various mechanisms of social control on the decline in actual DD incidence and the role of group membership in facilitating or constraining people's reaction to these efforts.

## Notes

1. Lazarsfeld and Merton (1948) have proposed in this context that one of the functions of the mass media in modern societies is to enforce social conventions by publicly exposing conditions or behaviors that constitute a blatant deviation from existing social norms. Many social norms, they argue, prove inconvenient for individuals in society as they suppress individual needs and impulses to behave in a certain way. Consequently, individuals tend to apply these social norms with significant leniency to oneself and to others. Yet, when a deviation from the norm receives much media attention, individuals are forced to take a normative stand on the issue in public, and, consequently, to reevaluate their own morality and behavior.

2. To support this assumption the following test was conducted. By making use of the cohort component within MTF (that is, the sub-sample from each senior class beginning with 1976 that has been followed up after high school on a continuing basis), attitudes regarding the social acceptability of binge drinking were compared across three different age groups (high school seniors, college students, and young adults aged 21-32). The trend in binge drinking disapproval was practically identical across all three groups (multiple-R = .94). While this comparison excludes the trend for older age groups, there is no reason to doubt that older adults experienced a similar change in both binge drinking and DD disapproval given the apparent trend in DD-related public opinion as presented above based on anecdotal evidence.
3. MTF data on DD behavior and related attitudes are not publicly available yet. These data were obtained by specific request from Patrick M. O'Malley, who is with the University of Michigan's Institute for Social Research, following a published study that utilized some of these data (O'Malley & Johnston, 1999).
4. There is another alternative, of course, that pertains to the mediation of policy actions' impact on binge drinking disapproval via media coverage of policy actions. However, the fact that, when controlling for both the secular trend in binge drinking disapproval and media attention to the DD problem, the association between policy actions and binge drinking disapproval was still substantial and significant ( $r = .45$ ,  $N = 17$ ,  $p < .05$ ), speaks against this alternative.
5. As the estimation procedure requires that the researcher specify a certain date for which estimates be generated, April 15th of each year (1978-1995) was chosen because this date represents the middle of the spring (March-May) in which the MTF survey is administrated each year.



## CHAPTER 6

### EFFECTS OF MEDIA COVERAGE, POLICY RESPONSE, AND CHANGING SOCIAL NORMS ON DRUNK-DRIVING BEHAVIOR, 1978-1995

Did policy actions that were motivated by increased media attention to the DD problem at the beginning of the 1980s actually lead to changes in DD behavior over the past two decades? How about the decline in the social acceptability of this behavior to which DD-related media coverage may have contributed as well? Or was there a direct link from DD-related news coverage to DD behavior change? Finally, which groups of drivers were mostly affected by direct and indirect media effects? This chapter seeks to answer these questions and, in the process, complete the test of the proposed model of media effects on DD behavior change (see Figure 2.3).

#### **Complementary Paths of Media Effects on Drunk-Driving Behavior**

##### **Direct Media Effects on Drunk-Driving behavior**

There are several ways in which DD-related news stories may have influenced people's decision to quit DD directly. One is through people's capacity to learn from the media about the negative consequences that are associated with this behavior. In this framework, people change their attitudes and beliefs regarding personal involvement in this behavior following exposure to information in the media and continue to modify their behavior accordingly. This voluntary social control (or persuasion) approach adheres to the classic cognitive approach to health behavior change (Becker, 1974; Fishbein & Ajzen, 1975) but is unlikely to materialize for reasons of audiences' resistance. Specifically, as DD is a repeated behavior that many drivers perform, often, without encountering negative consequences (Robin, 1991), drivers' previous

experience with this behavior may inoculate them from being persuaded by media messages to change their behavior in order to escape DD-related death or injury. Moreover, those who have little or no previous experience with this behavior are likely to demonstrate an optimism bias or a belief that a particular hazard covered in the media presents high risk to many people in society but not to them personally (Culberston & Stempel, 1985; Tyler & Cook, 1984). The well-documented tendency among youth to underestimate risks associated with alcohol abuse and smoking compared to adults (Finn & Bragg, 1986) is one example of this tendency. Previous experience and optimism bias, therefore, may account for failures of many DD-related interventions to promote change in this behavior by increasing personal knowledge of the negative consequences of DD (DeJong & Hingson, 1998).

Notwithstanding, an approach claiming a direct media effect on change in DD behavior may still be viable if the underlying risk is conceptualized as the risk of being formally sanctioned for DD behavior. Studies have shown that deliberate interventions utilizing media outlets for publicizing rigorous enforcement initiatives were generally successful in reducing DD incidence (Barokas, 1995; Holder, 1994; Mercer, 1985; Ross, 1992). As argued above, the publicity of enforcement initiatives in the media acts to increase drivers' motivation to abstain from performing this behavior, at least until it is 'safe' to do so. One would therefore expect that when the visibility of policy actions in the media increases (rather than the visibility of the issue as a whole), involvement in DD behavior would decrease.

Still, this information cannot be assumed to universally affect all drivers' behavior. The threat of being pulled over by the police and sanctioned for DD particularly impinges on young drivers (aged 18-20), for whom consumption of alcohol

in any amount is illegal, as well as on the group of high-risk drivers (aged 21-34) that were heavily targeted by DD enforcement measures (DeJong & Hingson, 1998; Loch, 1994). Given the high stakes, drivers of these age groups are particularly motivated to pay attention and process information in the media concerning policy actions and, therefore, are likely to change their behavior. In contrast, older drivers (age 35+) who, to begin with, less frequently mix drinking and driving and are well aware of the low probability of being arrested for DD (Ross, 1991b), are likely to be less concerned with formal social sanctions and, therefore, are less likely to pay attention to related information in the media.

*Hypothesis 6.1: DD-related news coverage of policy actions between 1978 and 1995 will be negatively associated with the proportions of drivers who mix drinking and driving. This association will be greater for young and high-risk drivers in comparison to older drivers.*

Readers are reminded that the theoretical framework that guides the current study is pessimistic, for the most part, regarding the prospects of uncovering direct media effects on health behavior change in general and DD behavior change in particular. Therefore, while Hypotheses 6.1 claims direct media effects on DD behavior, the study's underlying expectation is that the null hypothesis of no media effects will be supported in this case.

## Effects of Media-Stimulated Institutional and Social Change on Drunk-Driving Behavior

Media attention to the DD problem may have also contributed to the decline in this behavior through its ability to set in motion mechanisms of formal and informal social control (i.e., institutional response to the problem and unfavorable social interaction around it). In this formulation, media representations affects directly others in a person's environment (e.g., policy-makers and peers) that, in the next step, act to constrain this person's involvement in DD by exerting formal or informal social control. Behavior change that involves media-stimulated processes of social influence within groups and social networks received considerable attention within communication research (see Weimann, 1994). On the other hand, communication scholars have seldom studied the impact of media-stimulated policy actions on actual behavior (Dearing & Rogers, 1996). For instance, the literature on DD prevention presents convincing evidence that policy actions (particularly deterrence measures) were successful in curbing this behavior (DeJong & Hingson, 1998), but no attempt was made to connect these changes to the degree of media attention this issue received.

One way to incorporate both media representations and policy actions into a single analytical framework is to suggest that whereas the media may have little persuasive power regarding a person's decision to drink and drive, they may still contribute to behavior change by motivating policy-makers to increase formal social control of drunk-drivers. Police sobriety checkpoints, prosecution and incarceration of first-time and repeat offenders, administrative license revocation, and impoundment of drunk-drivers' vehicles - are all measures that provide drivers with a strong incentive to avoid DD. Yet, the impact of this external incentive is likely to vary across drivers of different age groups. As alcohol occupies a central role in youth culture (Gusfield,

1985), it is unlikely that young drivers will willingly modify their alcohol use patterns to avoid DD. Rather, they are likely to avoid driving after drinking altogether by arranging for alternative transportation (e.g., designated drivers and public transportation) or attending nearby social events such as those held by students on college campuses. In contrast, cars are a central feature of adult life (Reinarman, 1988) and older drivers are less inclined to consider alternative forms of transportation. For this reason, DD-related policy actions will be less effective within this population of drivers.

*Hypothesis 6.2: DD-related policy actions between 1978 and 1995 will be negatively associated with the proportion of drivers who drink and drive. This association will be greater for young and high-risk drivers than for older drivers.*

Notice that the difference between Hypothesis 6.1 and 6.2 is that the former pertains to the impact of news coverage of policy actions on DD behavior whereas the latter relates to the impact of policy actions themselves. The results reported in Chapter 4 regarding the media-policy connection in the DD case show a strong impact of media coverage on DD-related policy. Therefore, if media effects on DD behavior are mediated through DD-related policy actions, the direct impact from news coverage to DD behavior should reduce to zero (or close to zero) when controlling for the effect of policy actions on DD behavior.

Finally, media effects are also possible in relation to the potential contribution of DD-related news coverage to the decline in the social acceptability of this behavior. As the normative ambiguity that surrounds this behavior was increasingly replaced by a

clear norm against it, drivers began to experience more frequently pressure from others in their environment to quit mixing drinking and driving. Still, unlike institutional response, change in social norms is typically slow and gradual and characterized by a lower degree of coercion. As a result, its impact on the decline in DD behavior is likely to be more moderate than that of policy actions. Young and high-risk drivers, who tend to conform to group norms that are sympathetic of excessive alcohol consumption and DD (Brown, 1998), are likely to resist a general social norm against DD that encourages others to place constraints on their behavior (e.g., raising the minimum legal drinking age). Their level of resistance to informal social control mechanisms is likely to be higher in comparison to formal social control measures because the potential negative outcomes of resisting (i.e., social isolation and stigma within their peer group) are not likely to materialize. In contrast, older drivers, who generally conform to social norms, have low resistance to informal social control measures and are likely to change their behavior accordingly.

*Hypothesis 6.3: The increase in the proportion of people who disapprove of DD between 1978 and 1995 will be associated with the reduction in the proportion of drivers who perform this behavior. This association will be greater for older drivers than for young and high-risk drivers.*

Here too, the expectation is that when controlling for social disapproval of DD, the main effect of DD-related news coverage on the proportion of people who engage in this behavior will be reduced to zero (or close to zero), while DD disapproval itself will have a significant main effect on DD behavior.

## **Methodology**

### **Data**

Several ongoing national data collection projects offer access to longitudinal aggregated data on DD behavior incidence. These include the Behavioral Risk Factor Surveillance System (BRFSS) that is administered by the Centers for Disease Control and Prevention (CDC), the MTF project (from which data were used in the previous chapter), and NHTSA's Fatal Accident Reporting System (FARS). The BRFSS provides monthly nationwide estimates of self-reported DD based on interviews with a representative sample of adults. Unfortunately, these data are not available for the period between 1978 and 1983. The MTF project provides annual measures of DD prevalence beginning in 1984 and is also limited to data on a single age group (i.e., high school seniors). Of these three databases, FARS is the most appropriate for testing this chapter's hypotheses. FARS is a census of all fatal traffic accidents in the United States beginning in 1975. In order to consistently track the involvement of alcohol in traffic accidents over time, NHTSA developed a statistical imputation method for estimating the BAC levels of drivers nationwide from data on drivers with known BAC (see Rubin, Schafer, & Subramanian, 1998). This method employs three-level linear discriminant models to estimate the probability that a particular driver has a BAC in grams per deciliter (g/dl) of 0.00 (no alcohol), 0.01-0.09 (some alcohol) or 0.10 and greater (generally considered legally intoxicated in most states). These probabilities, in conjunction with known alcohol test results, are then used to produce monthly estimates of BAC levels for drivers of different demographic groups. These estimates have been routinely used before in studies that examined changes in alcohol-related

traffic crash fatalities over time as well as studies that used these estimates in conjunction with other national-level datasets (e.g., Kennedy, Isaac, & Graham, 1996; Margolis, Foss, & Tolbert, 2000).

To validate the use of BAC estimates of .10 and above as a measure of the national trend in DD behavior between 1978 and 1995, a comparison was made to self-reported measures of DD from the two other databases (that is, BRFSS and MTF). As data from the BRFSS and MTF are only available from 1984 onward, the comparison was limited to the period between 1984 and 1995 and was based on annual estimates. As Figure 6.1 shows, the BAC measure was closely associated to the BRFSS self-reported measure ( $r = .92$ ,  $N = 12$ ,  $p < .001$ ) but less so with the MTF self-reported measure ( $r = .72$ ,  $N = 12$ ,  $p < .05$ ). The reason for the relatively low compatibility between these two measures is that the MTF measure represents the trend in this behavior among high school seniors rather than within the overall population. As one may expect, this particular measure was strongly associated ( $r = .95$ ,  $p < .001$ ) with that generated from BAC estimates for the group of 18-20 year-olds (that is plotted in Figure 6.2).

## Variables

Involvement in DD behavior was defined as the estimated proportion of drivers in each month that operated a motor vehicle with BAC level of .10 or above. This measure of DD behavior was widely used in previous studies (e.g., Blomberg, 1992; Cox, Quillian, Gressard, Westerman, & et al., 1995; Klein, 1989; Stewart & Voas, 1994; Yanovitzky & Bennett, 1999) and is also strongly and significantly correlated with the decline in alcohol-related traffic crash fatalities that is described in Figure 2.1 ( $r = .94$ ,  $N$



= 216 months,  $p < .001$ ). Following this chapter's hypotheses, this measure was taken separately for the entire population of drivers and for three distinct age groups: young drivers (18-20), drivers at high-risk of DD (21-34), and older drivers (35+).

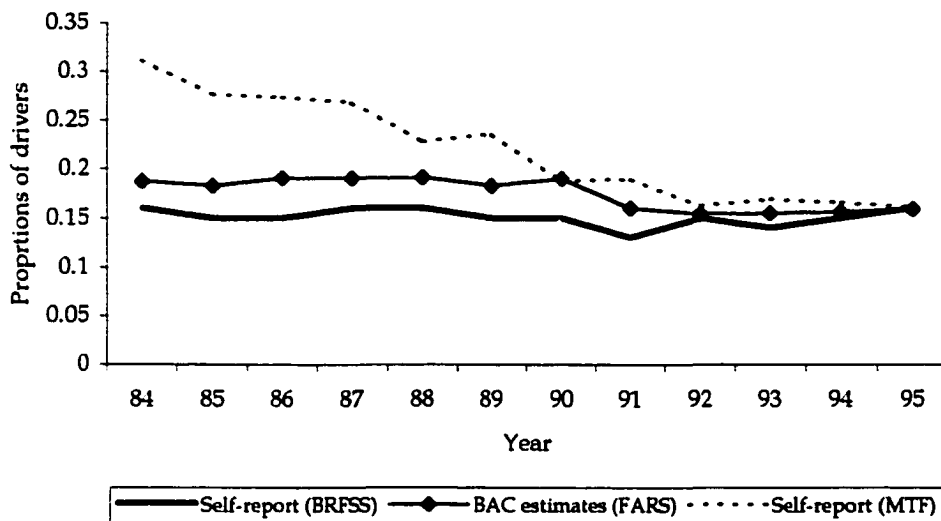


Figure 6.1: A comparison of trends in estimates of drunk-driving behavior in three different national databases, United States, 1984-1995 (N = 12 years)

## Results

Figure 6.2 describes trends in DD behavior for drivers of different age groups between 1978 and 1995. A decreasing trend in the proportions of individuals who drink and drive is apparent for all groups of drivers but was greater among young drivers (18-20 year-olds) and high-risk drivers (aged 21-34). The percentages of high-risk drivers who were involved in this behavior dropped by about two-thirds during this period while those for young drivers dropped by half. In contrast, not much change in

DD behavior is apparent for the group of older drivers (35+ year-olds). In comparison to other age groups of drivers, older drivers' involvement in this behavior was low (about 10%) and stable over time. In fact, the trend in this sub-population (that includes the majority of drivers) is probably responsible for the apparent stability in the prevalence of DD behavior within the entire population of drivers. These observed trends are similar to those reported elsewhere (NHTSA, 1998) and demonstrate, as suggested by Hypotheses 6.1-6.3, that the potential of DD behavior change in response to social control efforts was greater for young and high-risk drivers than for older drivers.

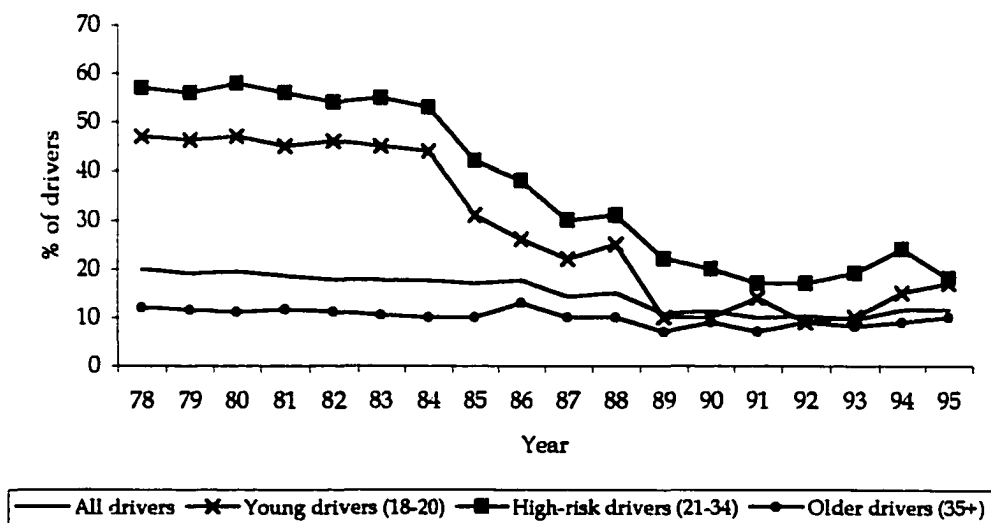


Figure 6.2: Drivers' past-month involvement in drunk-driving by age group, United States, 1978-1995 (N = 18 years)

## Direct Media Effects on Drunk-Driving Behavior

Hypothesis 6.1 postulates that news coverage of DD-related policy actions between 1978 and 1995 will be negatively associated with drivers' involvement in DD behavior and that this association will be greater for young and high-risk drivers than for older drivers. This prediction implies three separate tests. The first is whether or not a direct association exists between DD behavior and news coverage of policy actions. The second, assuming that an association exists, is whether or not this association varies across drivers of different age groups. The third test pertains to the possibility that while there may not be an apparent association of DD behavior with news coverage of policy actions, DD behavior may still be directly associated with the overall media attention to this issue. That is, it may be that a different cognitive component (such as the perceived harmfulness of DD or its perceived social acceptability) accounts for the media-behavior link.

Table 6.1 summarizes the results of the time-series regression models that address these tests based on data from 216 consecutive months. Given this substantial sample size, estimates of media impact on DD behavior are likely to be stable and asymptotically efficient (i.e., converge to the true estimates of the association between media coverage and the outcomes of interest). Therefore, the presentation of these estimates here follows their standard OLS regression interpretation. In addition, as indicated by the results of the serial correlation, multicollinearity, and heteroscedasticity tests, no violations of OLS regression assumptions were detected.

Table 6.1: Time-series regression of drunk-driving (DD) behavior by all DD-related news stories and stories on policy actions among drivers of different age groups, United States, 1978-1995 (N = 215 months)

	B (SE)	adjusted-R <sup>2</sup>	ΔR <sup>2</sup>	DW	T	ARCH
<u>All Drivers</u>						
DD behavior <sub>t-1</sub>	.88 (.103)**					
Policy-related news <sub>t-1</sub>	-.0002 (.007)	.844	.004	2.28	.89	1.92
DD behavior <sub>t-1</sub>	.83 (.116)**					
All DD-related news <sub>t-1</sub>	-.0013 (.001)	.85	.01	2.28	.73	1.72
<u>Young Drivers (18-20)</u>						
DD behavior <sub>t-1</sub>	.93 (.084)**					
Policy-related news <sub>t-1</sub>	-.003 (.002)	.898	.016	2.26	.86	1.88
DD behavior <sub>t-1</sub>	.874 (.069)**					
All DD-related news <sub>t-1</sub>	-.006 (.001)*	.95	.02*	2.4	.70	1.69
<u>High-risk Drivers (21-34)</u>						
DD behavior <sub>t-1</sub>	.98 (.064)**					
Policy-related news <sub>t-1</sub>	-.0002 (.001)	.94	.01	2.27	.86	1.92
DD behavior <sub>t-1</sub>	.804 (.091)**					
All DD-related news <sub>t-1</sub>	-.008 (.003)*	.91	.08*	2.34	.71	1.73
<u>Older Drivers (35+)</u>						
DD behavior <sub>t-1</sub>	.48 (.22)*					
Policy-related news <sub>t-1</sub>	-.0003 (.001)	.262	.01	2.42	.89	1.95
DD behavior <sub>t-1</sub>	.34 (.24)					
All DD-related news <sub>t-1</sub>	-.0012 (.001)	.326	.066	2.35	.74	1.72

Note: The dependent series is the proportion of drivers involved in DD in each month.

ΔR<sup>2</sup> = R-square change due to the contribution of media attention.

DW = Durbin-Watson test of serial correlation.

T = Tolerance (test of multicollinearity).

ARCH = Auto Regressive Conditional Heteroscedasticity.

\*  $p < .05$ . \*\*  $p < .001$ .

Table 6.1 includes a set of two time-series regression tests for drivers of different age groups. The first of the two models in each set tests Hypothesis 6.1 directly

(namely, test the proposition that news coverage of policy actions influenced DD behavior directly over and above the secular trend in this variable). The second model tests for the possibility that the overall news coverage of DD in the media (and not simply reports on policy actions) was associated with the change in this behavior. In relation to the general population of drivers, the results show no evidence of direct media effects on DD behavior. Both measures of media attention (i.e., the previous month's news coverage of DD-related policy actions and overall DD-related news coverage) did not have an independent contribution to the variance in DD behavior over time within this population.

This finding is consistent with Hypothesis 6.1 according to which the association between media attention and DD behavior should be particularly visible for young and high-risk drivers but less so for older drivers. In contrast to the Hypothesis 6.1 expectation, however, the time-series regression analysis suggests no independent direct impact of news coverage of DD-related policy actions on the decline in DD behavior among young and high-risk drivers. Yet, the subsequent analysis demonstrates a statistically significant contribution of overall DD-related media attention to the variance in DD behavior within these groups. Specifically, each additional DD-related news story in the previous month resulted in a 0.6% reduction in current DD incidence among young drivers and a 0.8% decrease among high-risk drivers. As Figure 6.3 shows, similar results were obtained using the ideodynamic model to predict the trend in DD behavior among different groups from the overall media attention to the DD problem between 1978 and 1995.

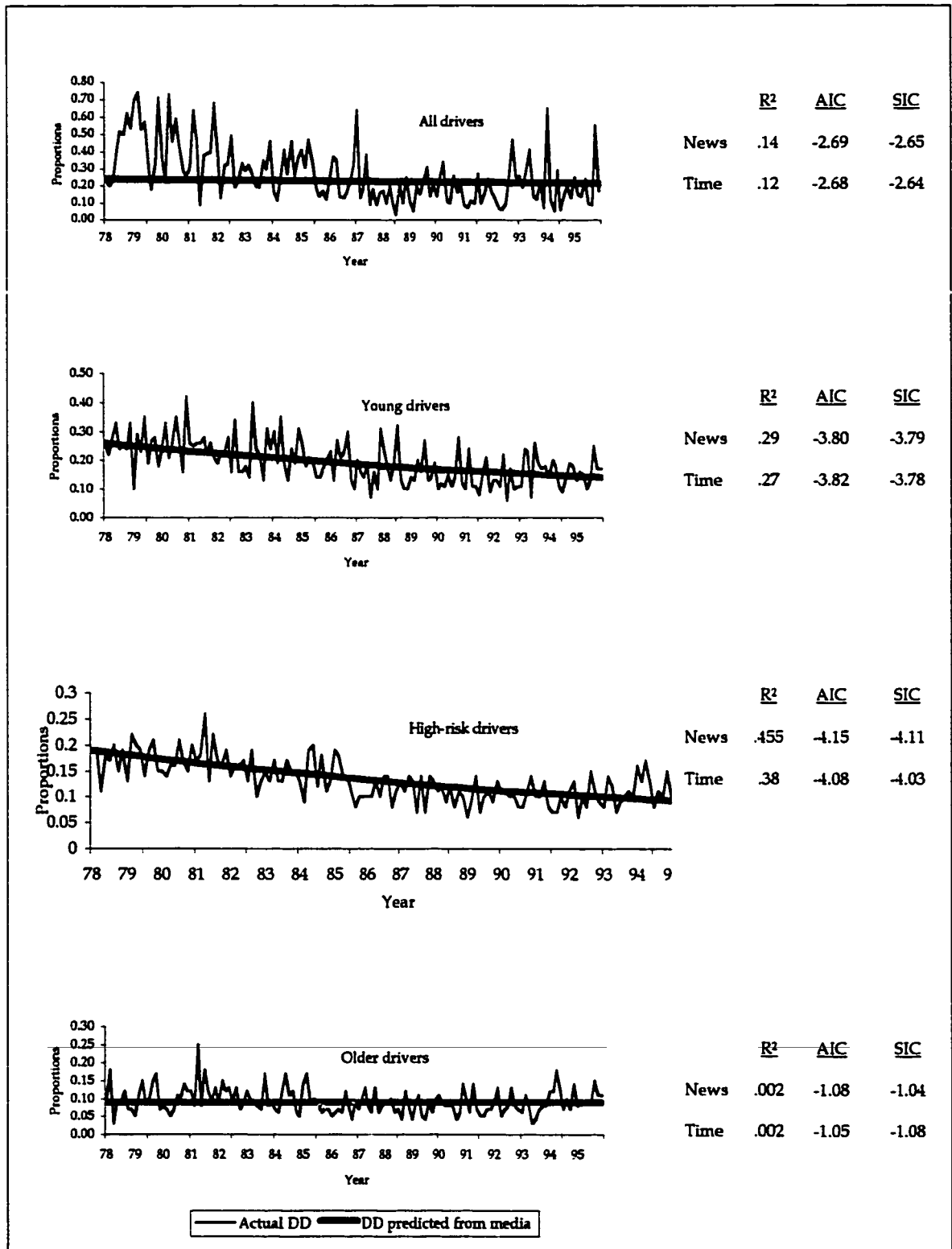


Figure 6.3: Predictions of drunk-driving (DD) behavior from DD-related media coverage by age group using the ideodynamic model, 1978-1995 (N = 216 months)

The ideodynamic predictions of DD behavior from media coverage suggest that the impact of DD-related media coverage on DD behavior was relatively small or negligible in comparison to the secular trend in this behavior (estimated by fitting a line that represents DD behavior as a linear function of time). The only significant contribution of news coverage to the trend in DD behavior was for the group of high-risk drivers. While this impact is in the hypothesized direction (i.e., negative), the findings of both analyses seem to imply that a different cognitive mechanism than the one initially hypothesized (i.e., media influencing the perceived risk of being sanctioned for DD) may have been operating on DD behavior. As noted above, changes in the perceived harmfulness of DD behavior or its perceived social acceptability following exposure to the social images of DD in the media, are possible alternatives that cannot be examined here in the absence of comparable data. Still, It is worth noting that the literature concerning media effects on DD behavior has consistently demonstrated that while information in the media is likely to increase awareness to the negative consequences of DD, it has little efficacy in actually leading to change in DD practices (DeJong & Hingson, 1998). Moreover, this literature points out that DD-related social expectations are primarily learned through social interaction (Brown, 1998). This body of knowledge seems to undermine these potential alternatives but it cannot deny the evidence of direct media effects here.

#### Effects of Media-Stimulated Institutional and Social Change on Drunk-Driving Behavior

Hypothesis 6.2 predicts that DD-related policy actions will be negatively associated with DD behavior between 1978 and 1995 and that this association will be greater for young and high-risk drivers than for older drivers. As this hypothesis also

pertains to indirect media effects, it implies that when policy actions are controlled for in a model predicting DD behavior from media attention to the problem, the direct impact the media seems to have on DD behavior will no longer be significant.

This hypothesis was tested with annual data ( $N = 18$  years) in a series of 16 time-series regression models in which current DD behavior for each group of drivers (4 groups) was predicted from the previous values of this behavior (to control for the secular trend), the level of media attention in the previous year, and only one of four measures of policy actions (to avoid the problem of multicollinearity). In this respect, this analysis provides 16 independent tests of Hypothesis 6.3. Due to the limited number of observations available for this analysis, a standard interpretation of the regression coefficients is not particularly meaningful (especially, when the time lag of effect is limited to 1 year). Rather, this analysis is aimed at uncovering a pattern of findings that is consistent with the hypothesis tested (i.e., a significant negative main effect of policy actions on DD behavior and a non-significant effect of news coverage). As before, tests of serial correlation, multicollinearity, and heteroscedasticity were employed to ascertain the validity of this analysis. The values of the Durbin-Watson test of serial correlation were within the acceptable level (2.03 - 2.25), as were the results of the ARCH test (1.54 - 1.77). Tolerance tests suggested (as expected) an association between news coverage and policy actions as predictors, but tolerance values were acceptable (.62 - .66) given the size of the sample (see Hamilton, 1992). Notice that this analysis builds of the finding of the previous section (see Table 6.1) according to which independent media effects on DD behavior was observed only for the young and high-risk drivers.



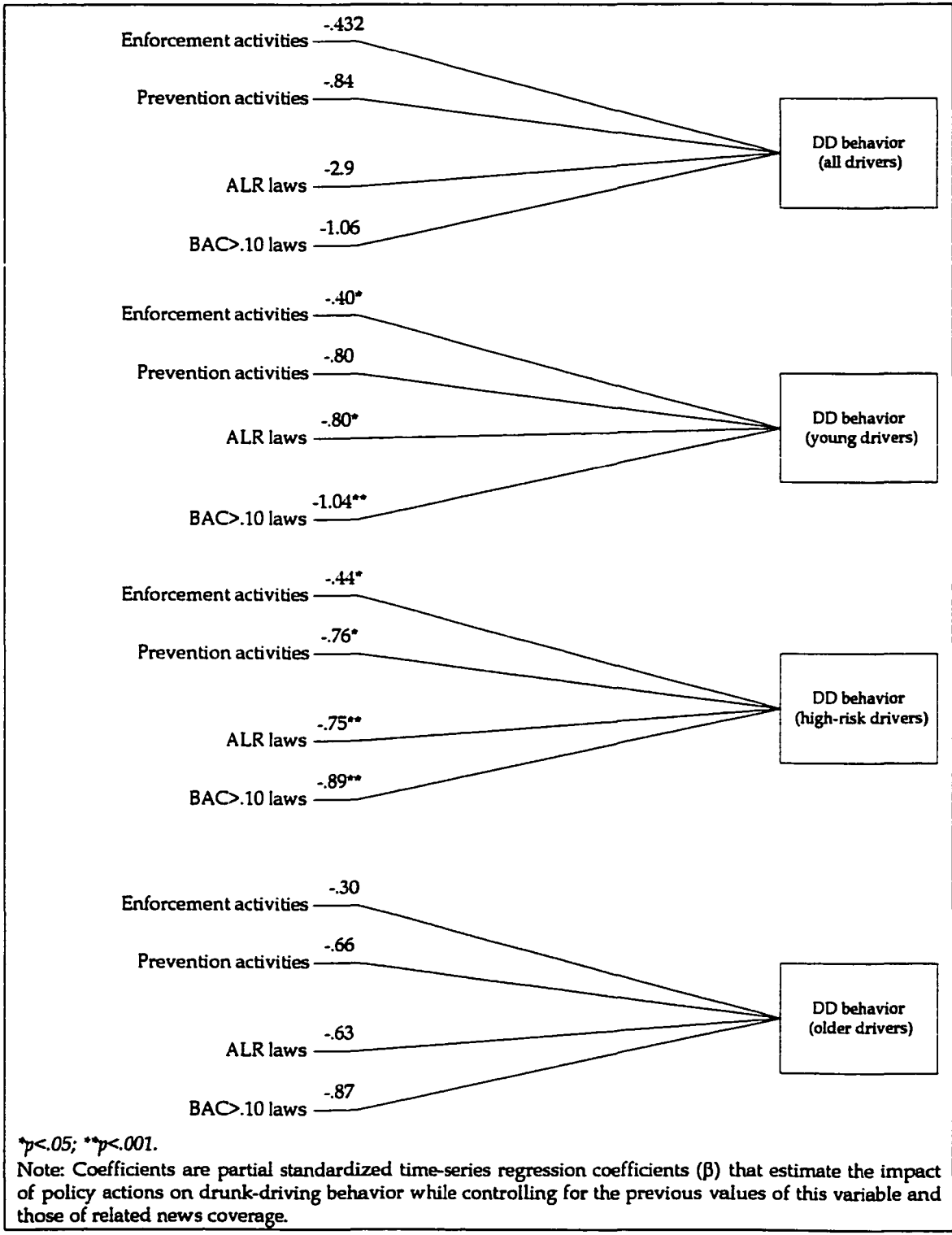


Figure 6.4: Predictions of drunk-driving (DD) behavior from DD-related policy actions for drivers of different age groups, United States, 1978-1995 (N = 17 years)

The pattern of findings in Figure 6.4 seems to be consistent with Hypothesis 6.2. First, as expected, there was no evidence of effect from DD-related policy actions to DD behavior among older drivers (the bottom box in Figure 6.4). As previously noted, this particular group demonstrated a relatively low and stable level of DD incidence over the research period and, therefore, is not expected to change in response to either media coverage of DD or related policy actions that were primarily aimed at younger drivers (Stewart & Voas, 1994). Since this specific group includes the majority of drivers, no effect of policy actions is apparent for the population of drivers in general (the top box in Figure 6.4).

On the other hand, as expected, there is evidence that policy actions contributed to the decreasing trend in DD behavior among young and high-risk drivers (the two middle boxes in Figure 6.4). First, we note that all coefficients of the effect from policy actions to DD behavior are in the hypothesized direction (that is, negative). Next, the independent effect of news coverage on DD behavior (not shown in Figure 6.4), that was found in the previous analysis (Table 6.1), was no longer significant once each of the four measures of policy actions entered the time-series regression model as an additional predictor. Moreover, the regression coefficient from news coverage to DD behavior reduced to a very small number (.00001 - .00003) in all eight regression models for young and high-risk drivers. Finally, whereas the standardized regression coefficients that were generated by this analysis may not be an accurate estimation of the true effect of policy actions on DD behavior among young and high-risk drivers (and, moreover, may not be significantly different from one another), some interesting insight can still be gained by comparing these coefficients across policy measures and groups of drivers. Thus, we learn that the volume of enforcement activities (as

measured by annual federal appropriation aimed at increasing DD enforcement) and particularly the enactment of per se ( $BAC < .10$ ) and administrative license revocation (ALR) laws were instrumental in contributing to the decline in DD behavior among young drivers. As suggested above, prevention activities (measured by annual federal appropriation for DD-related prevention programs) are not likely to result in gains regarding this particular group as its members tend to strongly resist messages that contradict the group's own set of norms (youth culture) regarding DD and alcohol consumption. Resistance to prevention efforts is less common among high-risk drivers who are closer to being well-socialized adults. For this reason, they seem to be responsive to all types of policy actions against DD. These findings are consistent with the general pattern of findings from other studies that examined this association (for a review see DeJong & Hingson, 1998).

The final hypothesis (Hypothesis 6.3) proposes that the decline in DD behavior will be also associated with the increase in social disapproval of DD over the research period and that older drivers are expected to change the most in response. As social disapproval increases, much of the normative ambiguity that surrounds DD is removed, and drivers are expected to conform to the norm against performing this behavior. Young and high-risk drivers are likely to use their group membership to resist this informal mechanism of social control (for example, defy their parents' demand to avoid DD). Therefore, this change is not likely to influence their behavior. In contrast, older drivers, who are well-socialized adults that conform to social norms in general, are expected to change their behavior accordingly.

Table 6.2 summarizes the results of the time-series regression models that were employed to test this proposition. Each of the four models examines the independent

contribution of the increasing trend in DD disapproval from 1978 to 1995 to the decline in DD behavior among drivers of different age groups while controlling for the secular trend in this behavior and DD-related media attention. Results in support of Hypothesis 6.3 are those demonstrating (1) a negative association between DD disapproval and DD behavior and (2) a significant impact of DD disapproval on DD behavior that exists only for older drivers when controlling for DD-related news coverage. As the results of the linear regression assumptions tests indicate, no potential problems of serial correlation, multicollinearity, or heteroscedasticity were detected in any of these models.

Notice that as was previously the case (see analysis in Chapter 5), the measure of self-reported disapproval of binge drinking behavior from the MTF data was used as a surrogate of DD disapproval. Here too, two assumptions are made in this regard. The first is that binge drinking disapproval provides an adequate representation of DD disapproval given that both behaviors were continuously found to be strongly associated (Duncan, 1997) and the strong association over time (1984-1995) between measures of the two within the MTF data ( $r = .91$ ,  $N = 12$  years,  $p < .001$ ). The second assumption is that the measure of binge drinking disapproval that was taken from a population of high school seniors is still representative of the trend in this variable within the population at large. As noted in the previous chapter, this assumption received some support when the cohort component in MTF was used to demonstrate that the trend in binge drinking disapproval among high school seniors is comparable to that among college students and young adults.<sup>1</sup> Still, some degree of caution in interpreting the results of the following analysis is advisable in light of the non-traditional use of this variable here and the fact that the analysis reported in Chapter 5

could not clearly indicate whether disapproval of binge drinking was linked directly or indirectly to DD-related media coverage.

Table 6.2: Time-series regression of drunk-driving (DD) behavior by DD-related news coverage and DD disapproval among drivers of different age groups, United States, 1978-1995 (N = 17 years)

	B (SE)	adjusted-R <sup>2</sup>	ΔR <sup>2</sup>	DW	T	ARCH
<u>All Drivers</u>						
DD behavior <sub>t-1</sub>	.83 (.11)**	.844			.69	
DD-related news <sub>t-1</sub>	-.0004 (.001)	.853	.009		.73	
DD Disapproval <sub>t-1</sub>	-.524 (.17)*	.913	.06*	2.3	.69	1.84
<u>Young Drivers (18-20)</u>						
DD behavior <sub>t-1</sub>	.874 (.07)**	.934			.69	
DD-related news <sub>t-1</sub>	-.006 (.002)*	.953	.02*		.71	
DD Disapproval <sub>t-1</sub>	-.06 (.72)	.953	0	2.03	.69	1.75
<u>High-risk Drivers (20-34)</u>						
DD behavior <sub>t-1</sub>	.804 (.09)**	.874			.69	
DD-related news <sub>t-1</sub>	-.007 (.004)*	.90	.03*		.71	
DD Disapproval <sub>t-1</sub>	-1.03 (.775)	.905	.005	1.98	.69	1.77
<u>Older Drivers (35+)</u>						
DD behavior <sub>t-1</sub>	.345 (.242)	.212			.69	
DD-related news <sub>t-1</sub>	-.0004 (.001)	.230	.065		.72	
DD Disapproval <sub>t-1</sub>	-.255 (.085)*	.513	.278*	1.78	.69	1.85

Note: The dependent series is the proportion of drivers involved in DD in each month. The first two entries in the 'adjusted R-square' column were estimated from regression models that included a single or two predictors respectively (i.e., a stepwise model). ΔR<sup>2</sup> = R-square change following the inclusion of an additional predictor. DW = Durbin-Watson test of serial correlation. T = Tolerance (test of multicollinearity). ARCH = Auto Regressive Conditional Heteroscedasticity. \*  $p < .05$ . \*\*  $p < .001$ .

The results of all four models clearly support the expectation of a negative association between DD disapproval and DD behavior. Whereas the accuracy of the regression coefficients may be questionable given the small number of observations in

the analysis (N = 17), a comparison of coefficients across the models is both valid and instructive. As expected, a significant independent contribution of the trend in DD disapproval to the decline in DD behavior is only apparent for the group of older drivers (and, consequently, among the group of all drivers). Consistent with the results of the previous analyses in this chapter, there was no evidence of an independent impact of DD-related media attention on older drivers' DD behavior (or that of the secular trend in this behavior, for that matter). Although the variance over time in DD behavior among members of this group was small and incremental, the contribution of DD disapproval to this variance was statistically significant ( $p = .01$ ) even with such a small sample size. Results for young and high-risk drivers are also consistent with both Hypothesis 6.3 prediction and the previous analyses. As expected, the multiple regression analysis shows no significant contribution of DD disapproval to DD behavior among young and high-risk drivers. In contrast, there is evidence of an independent contribution of DD-related media coverage to the trend in DD behavior within these groups of drivers. This finding is consistent with the analysis in Table 6.1 that focused on direct media effects on DD behavior.

### **Summary**

The results of this chapter provide some compelling evidence of effects of media-stimulated institutional and social change on DD behavior and some ambiguous findings regarding direct media effects. The analysis shows that direct media effects were small and primarily limited to young (18-20 year-olds) and high-risk drivers (aged 21-34). However, the cognitive mechanism that is responsible for this association is unclear. The findings seem to reject the proposition that drivers of these age groups

responded to media coverage of policy actions that were primarily aimed at deterring them from performing this behavior. On the other hand, there was a significant independent impact of the overall media coverage on DD behavior. While this finding may suggest that a different cognitive mechanism accounts for this association, the results of the subsequent analysis that examined this association while controlling for actual policy actions showed that the direct impact of DD-related media coverage on DD behavior among young and high-risk drivers reduced to zero and was no longer significant.

The results reported here are less ambiguous about the validity of claims about the ability of the media to contribute to health behavior change by stimulating institutional and social change regarding DD behavior. As expected, there was evidence of a strong negative impact of policy actions (particularly deterrence measures) on DD behavior among young and high-risk drivers that was independent of the secular trend in this behavior and media attention to the DD problem. Older drivers (aged 35+) were not influenced by policy actions but, as hypothesized, changed their behavior in response to the decline in the social acceptability of this behavior.

#### **Notes**

1. Notice that this assumption does not contradict the expectation that groups would differ in their level of behavior change (Hypothesis 6.3) as behavior change is conceptualized as a function of differential levels of resistance to explicit social norms and not as a function of different norms. In other words, conceptually, there is a difference between sharing or acknowledging a social norm against a certain behavior and accepting this norm as a guideline of personal behavior.

## CHAPTER 7

### MASS MEDIA, SOCIAL CONTROL, AND HEALTH BEHAVIOR CHANGE: CONCLUSION AND DISCUSSION

The main goal of the current research project was to broaden the conceptual framework within which media effects on health behavior are typically studied by examining the plausibility of mediated paths of media effects on health behavior change. The study's main proposition is that by focusing on uncovering a direct association between exposure to health information in the media and health behavior change, health communication researchers may be underestimating the potential of mass communication channels to contribute to this process. Specifically, the media's ability to shape personal health decisions by stimulating processes of social control and social change, has long been a neglected aspect of research in this field.

To test the validity of this approach, the present study examined the case of change in drunk-driving (DD) behavior between 1978 and 1995. It was hypothesized that, whereas past evaluations of interventions in DD behavior led researchers to the conclusion that mass communication channels are largely ineffective in promoting change in this behavior, the media's contribution to DD behavior change over the past two decades was largely mediated through their impact on other social structures. Specifically, increased media attention to the DD problem in the early 1980s helped to set in motion mechanisms of formal and informal social control by stimulating related policy actions and reinforcing the social norm against this behavior. These measures, in turn, resulted in substantial DD behavior change at the population-level.



## **A Summary of the Study's Main Findings**

This study tested five general hypotheses. The first was that grassroots activism in the early 1980s helped to attract media attention to DD behavior and shape the media's characterization of the problem. The second postulated that in response to the volume of media attention to the DD problem, policy-makers came under pressure to produce short-term solutions to the problem (i.e., deterrence measures) that mirrored those promoted in the media. The third suggested that in addition to promoting institutional response (i.e., increased formal social control), media attention to the DD problem promoted social change in the norm surrounding this behavior and that this contribution was mediated by processes of social interaction. The fourth hypothesis raised the possibility that DD behavior was influenced directly by media coverage of DD either through perceptions of risk or social learning. The last hypothesis argued for effects of policy actions and informal social control (i.e., social disapproval of DD) on the decline in DD behavior but conditioned them on group membership (drivers of different age groups) as a basis for resisting certain mechanisms of social control. Beginning with Chapter 3, each chapter tested one of these hypotheses.

Chapter 3 tested hypotheses regarding the nature of media attention to the DD problem and the social forces that helped to shape it. The findings supported the argument that grassroots activism was particularly instrumental in setting the media agenda for the DD problem, but contrary to the popular view, suggested that the role of activists was limited to that of a social catalyst of media attention to problems that were previously identified and constructed by others (particularly, policy-makers). In addition, the results of the content analysis demonstrated a strong link between interests of powerful social actors and the dominant frames used by the media to

describe and discuss the DD problem. Most notably, DD was frequently defined in the media as a crime committed by drunk-drivers who have callous disregard for others and, therefore, is best curbed by tougher formal social control measures. Both grassroots activists and policy-makers advocated these solutions in the media, calling for increased legal penalties for drunk-drivers, continued efforts to limit alcohol availability to youth (minimum drinking age laws), and strict enforcement of these measures.

Chapter 4 tested the proposition that media attention to the DD problem helped to set in motion processes of formal social control by stimulating institutional response to the problem. Consistent with this hypothesis, the findings presented in this chapter demonstrated that increased media attention to the problem in the beginning of the 1980s attracted a considerable degree of policy attention to a problem that was previously low on policy-makers' agenda. DD-related news stories were particularly instrumental in creating a sense of urgency among policy-makers to generate immediate, short-term solutions to the problem. Following the solutions advocated in the media, policy actions focused on direct deterrence of drunk-drivers and efforts to intervene in this behavior indirectly by limiting alcohol availability to young drivers. The impact of DD-related news stories on policy-makers' attention and behavior was primarily manifested, therefore, in their ability to provoke periods of intensive policy-making, particularly in the early 1980s. This impact, however, seems to have waned over time as the DD problem became increasingly institutionalized and the role played by the media shifted from mobilization to maintenance of current policy.

Chapter 5 examined the proposition that media coverage of the DD problem contributed to the decrease in the social acceptability of DD behavior over the research

period. Following the current study's rationale, it was hypothesized that DD-related news coverage galvanized public concern with the problem and, subsequently, set the tone for the informal social interaction that surrounded this behavior. Social disapproval of DD increased gradually from 1978 to 1995 and was positively associated with both media attention to the problem and policy actions that were inspired by it. A subsequent analysis that employed the ideodynamic approach suggested an independent contribution of the mass media to the increased social disapproval of DD behavior beyond the secular trend in this variable, but could not convincingly distinguish between a direct effect (through social learning) and a mediated effect (through social interaction).

Finally, Chapter 6 tested the plausibility of direct and mediated effects of DD-related news coverage on DD behavior change and the role played by group membership in shaping the response of different groups of drivers to these social control efforts. In the absence of data on behavioral expectancies, hypotheses were tested directly regarding actual behavior. The results of this chapter provide some compelling evidence of effects of media-stimulated institutional and social change on DD behavior and some ambiguous findings regarding direct media effects. The analysis showed that direct media effects were small and primarily limited to young (18-20 year-olds) and high-risk drivers (aged 21-34), but the cognitive mechanism that may have produced this association was unclear (particularly since this impact disappeared when controlling for policy actions). The results were less ambiguous about the validity of claims about mediated media effects. As expected, there was evidence of a strong negative impact of policy actions (particularly deterrence measures) on DD behavior among young and high-risk drivers that was independent of the secular trend in this

behavior and media attention to the DD problem. Older drivers (aged 35+) were not influenced by policy actions but, as hypothesized, changed their behavior in response to the decline in the social acceptability of this behavior.

Overall, the results of this study support the proposed model of media effects on health behavior change that was presented in Chapter 1. Consistent with findings in the literature on DD behavior change (DeJong & Hingson, 1998; Vingilis & Coultres, 1990), this study found a small and inconclusive direct impact of media messages on DD behavior. However, in contrast to the common conclusion that mass communication channels are relatively ineffective in promoting change in DD behavior (Vingilis & Coultres, 1990), the findings indicate that alternative routes of media effects were instrumental in promoting change in this behavior. Thus, it seems that past research on the contribution of mass communication channels to change in DD behavior have underestimated this impact by focusing only on direct media effects.

### **The Study's Limitations**

#### **The Question of Cross-Level Inference**

The current study is not free of some important limitations. Like other studies that utilize secondary data, the quality of available data impinges on the researcher's ability to adequately test the research hypotheses. In the context of the current study, the lack of appropriate data on public disapproval of DD behavior and related processes of social influence within social networks did not allow for a complete and adequate test of hypotheses regarding media effects on DD behavior that are mediated by changes in social acceptability. Similarly, the reliance of many analyses on annual estimates of variables made it difficult to accurately estimate associations of interest.

Still, the study limitations need to be primarily examined in relation to the inferences that may be drawn from the available data rather than from those that could have been drawn if all variables of interest were perfectly measured.

Perhaps the most important of these limitations is the use of aggregated data to test hypotheses that are derived from processes at the individual-level. Without appropriate individual-level data, these hypothesized relationships cannot be directly confirmed. Still, providing that certain conditions are met, cross-level inference from aggregated data to individual-level processes is valid (Price et al., 1991). Pan and McLeod (1991) prescribe that cross-level inference is valid as long as individuals are implicated in all communication processes and individual-level constructs and processes can be analytically extended to represent similar notions regarding group or societal processes. This can be done to the extent that the group of people from which individual-level data were aggregated is (or presumed to be) homogeneous. As argued above, journalists, policy-makers, and drivers of different age groups certainly meet this criterion.

Moreover, the measures of aggregated-level constructs used in the analysis were sensitive, for the most part, to important distinctions between cognitive and behavioral processes. The distinction between policy attention (cognitive) and action (behavior) is one example of that. Another is the distinction between the amount of news stories produced (behavior) and the frames used to describe the issue (a cognitive aspect). Where the available data did not permit to make substantive distinctions (such as in the case of media effects on the social acceptability of DD behavior), results were compared against those of other substantive models that assume different individual-level processes (e.g., diffusion of information through interpersonal communication).

As an additional precaution against the ecological fallacy, data were disaggregated in instances where an aggregated measure was likely to lead to misleading results. A good example is the comparison of media effects between all drivers and younger drivers. Without disaggregation, the inevitable (and misleading) conclusion would be that media had no effect on DD behavior. Instead, by disaggregating the data to represent homogeneous groups of drivers, different types of indirect media effects were uncovered for both young and older drivers.

Finally, when using aggregated data, confounding effects are always of concern as they may bias the interpretation of results. For example, the influence of social actors other than the media on the policy agenda is one source of such a bias. This potential problem was addressed in this study by controlling for confounding influences rather than specifying them. This was done statistically by employing tests of causal direction that test for the significant contribution of X to the variance in Y over and above the contribution of previous values of Y to this variance. Hence, given that potential threats to cross-level inference were appropriately addressed in this study, the validity of the claims made here regarding media effects on individual behavior at the aggregate may be deemed valid. Moreover, as many of the processes of change that were studied here are essentially aggregated-level processes, an aggregate-level analysis is likely to provide a close approximation of the relationship between these processes in reality.

#### The Question of Generalizability

Assuming that the findings of this study are valid, can one generalize them to other health behaviors? As previously noted, DD shares many features that are typical of other risky lifestyle behaviors (e.g., smoking, consumption of high-fat foods, etc.).

This behavior is learned and acquired through interactions with others in a person's social environment, it holds important social and individual benefits to individuals, and increasing personal knowledge of the health risks associated with this behavior is often insufficient to promote change in it.

Beyond these shared characteristics, there is also a considerable similarity between the life cycle of DD on the social agenda and those of other public health problems. First, a certain innovation (e.g., cigarettes, drugs, automobiles, processed foods, etc.) is introduced and presented as a socially desirable practice for individuals to pursue. The new practice quickly diffuses and many in society begin to perform it habitually. A few years (or decades) down the road, information about the dire health consequences of this behavior emerges, but people are still reluctant to give it up either due to a physical addiction or simply because old habits are hard to change. As the problem grows in severity, it is officially recognized (e.g., by the President or the Surgeon General) as a major public health problem that needs to be addressed by social measures. In the next stage, social resources are allocated for curbing the problem and the behavior is repeatedly presented to the public as socially undesirable. Gradually, people are persuaded to change their behavior and quit this practice. This has been the case for smoking (Dearing & Rogers, 1996), unsafe sex that put individuals at risk of HIV/AIDS (Rogers et al., 1991), binge drinking (Yanovitzky & Stryker, 2000), and illegal drugs (Gonzenbach, 1996; Shoemaker, 1989). In all cases, the problem was first identified by policy-makers or scientists and only later on made its way to the media agenda when victims of the problem gained voice and personalized it for the first time.

In this respect, then, the model of health behavior change that guides the current study is applicable to changes in other risky lifestyle behaviors. In fact, voluntary

(persuasion) and formal mechanisms of social control as conceptualized by this model are the cornerstone of most deliberate interventions in risky health behaviors. What cannot be generalized, however, are the particular circumstances under which substantial change in health behavior is likely to occur. In this respect, the case of DD may be considered unique because different mechanisms of social control happened to operate on this behavior with great intensity due to the one-sided nature of the issue. The result was a substantial behavior change, but could have been different if the problem was debated (see the case of smoking and gun control, for example). Therefore, the particular nature and circumstances of a behavior are important regarding the potential outcomes of social control efforts. For easy behaviors, persuasion will suffice. For more complex (lifestyle) behaviors, persuasion efforts would probably have to be complemented by formal and informal social control efforts for a change in behavior to occur.

## **The Study's Implications**

### **Theoretical Implications**

The main theoretical contribution of the current study is placing the process of health behavior change within the context of social change and social control. The model of media effects used here accepts the basic premise of health communication research that, at the individual-level, behavior change involves change in behavioral attitudes and beliefs, but contests the convention that these cognitive components can only (or primarily) be influenced by persuasive information. Rather, it is argued that processes of social change are more likely to influence behavioral expectancies of behaviors that are deeply embedded in social and cultural conventions. In this spirit,



the model introduces the continuum between high- and low-intensity mechanisms of social control as a useful conceptual tool for organizing and analyzing efforts to intervene in risky health behaviors. In this framework, the specific circumstances of each risky behavior will determine the extent and the intensity of social efforts to control it, which, in turn, are predictive of people's motivation to change. Therefore, future research should be directed at mapping the particular circumstances and behavioral dimensions that are associated with different levels of social control in order to reach generalizations regarding their effectiveness in promoting health behavior change. This should be done in relation to each of the proposed model's link. For instance, it is important to identify the particular circumstances under which media effects on behavior-related policy is likely to be optimal. Following the results of the current study, these circumstances may be contingent upon the extent to which policy-makers already share the definition of the problem and its potential solutions as presented in the media. Others may include the scope of public support to certain policy measures (one-sided vs. controversial issues) and the nature and scope of the competition between policy issues on the policy agenda and the different actors who seek to influence it. These theoretical dimensions can only be determined through empirical research that will employ the model used here to other behaviors that are surrounded by different circumstances.

Beyond that, the current study proposes that future research efforts to uncover media effects on health behavior change may also (or even particularly) benefit from considering the impact of mass media on the social and cultural environment that surrounds people and influences their behavior. It may be argued that the main challenge that health communication researchers face at present is bridging across

highly valid and influential theories of health behavior change such as the Theory of Reasoned Action (Fishbein & Ajzen, 1975), the Health Belief Model (Becker, 1974), and Social Cognitive Theory (Bandura, 1986), that guide many interventions in risky health behaviors and theories of mass communication effects. Thus far, these attempts have focused primarily on using the mass media as an instrument of persuasion, with few fruitful results. The results of this study suggest that considering mediated media effects in addition may be a more promising venue for facing this challenge.

Finally, the current study continues to highlight the important role of social norms and group membership to processes of behavior change. By extending Fishbein and Ajzen's (1975) measure of social norms from the perception of important referents' expectations to the perceived expectations of others in general, this construct seems to gain more power in relation to the prospects of health behavior change. As noted above, recent studies that adopted this approach (see Terry et al., 2000) found that perceptions of social norms (what others in general think about my behavior) were more predictive of behavioral intentions than the measure of subjective norm. Group norms, in turn, are presented here as a powerful 'social filter' that shapes the response of group members to various mechanisms of social control. The interaction between group conventions and social control efforts proved useful in uncovering direct and indirect media effects on DD behavior. Thus, these two concepts (social norms and group membership) should be further explored in the context of health behavior change.

#### Methodological Implications

Most theoretical accounts of health behavior change typically refer to a process. Still, the majority of studies that examine health behavior change utilize methodologies

(typically, survey and cross-sectional analysis) that are appropriate for studying static phenomena. As a result, valuable information about the nature of this process is lost including the ability to test hypotheses about causality, separate effects of interventions from secular trends in outcomes, specify the optimal time-lag of effect between variables, and gain further insight into the dynamics of a process. These, on the other hand, were the main advantages of utilizing a longitudinal research design in this study.

This, in turn, brings us to the discussion of the data analysis techniques used. Recent advancements in modeling non-linear associations between media coverage and some outcomes, and particularly the ideodynamic model (Fan, 1988), proved to be a useful supplement to traditional time-series regression models. While regression models are still valuable for testing hypotheses regarding the causal direction between variables, more advanced estimation methods allow researchers greater flexibility in modeling and testing association between variables over time with greater precision. Greater flexibility, however, comes at the price of an intuitive interpretation of results (such as that of the ideodynamic recruitment coefficients). Hence, it is important to set some standards for the use of these methods (i.e., when is the use of these techniques appropriate or not) as well as set alternative substantive communication models (diffusion, for example) as appropriate benchmarks against which to compare media effects on certain outcomes (such as attitudes and behaviors).

More importantly, though, this study demonstrates the importance of selecting process-oriented measures of variables and disaggregating data for testing hypotheses with aggregated data. As noted above, the selection of measures for the purposes of this study was informed by the notion that they describe a process of change over time. For

example, if a true representation of the process of media effects on policy-making is one that involves a cognitive response (i.e., attention) first and only then actions (behavioral change), this relationship should be tested accordingly if valid inference is sought. Similarly, if people are more likely to be exposed to health information in the news media than to information in public service announcements (PSAs), the potential of uncovering media effects is greater for studies that utilize news coverage as a measure of relevant media messages. Hence, researchers should favor aggregated measures that approximate the true hypothesized process as closely as possible.

Finally, beyond its theoretical merit, disaggregation of measures is empirically justified by the need to avoid the ecological fallacy and test more elaborated hypotheses about the nature of the relationships between variables. It is important to note that disaggregation is not limited to outcomes (e.g., attitudes and behaviors that are aggregated for distinct groups according to demographic and psychological attributes) but may also be employed with equal utility to the content of media representations as an independent variable. Linking specific media frames to specific actions and judgments was particularly instrumental in uncovering media effects in this study (for example, by demonstrating that policy-makers were particularly responsive to news stories that advocated increased deterrence as a solution to the DD problem).

### Practical Implications

Making practical recommendation based on the results of a single study is never a sensible practice. The theoretical model that guided this study should be tested regarding other behaviors and circumstances before such recommendations can be made. Still, the results of this study tie directly to a number of important debates in the

literature on public health communication. Hence, some observations are made here with the mere intention of further contributing to these ongoing debates.

First is the question of reaching audiences with health messages. By referring to news and entertainment media, the model of media effects used in this study attaches considerable weight to media advocacy strategies (Wallack et al., 1993). There is little hope that even a lavishly funded deliberate media campaign would generate the same level of exposure and attention to a public health problem, as well as considerable impact on policy and public opinion, as would the content of news and entertainment media. Rather, it is the strategic use of these media that will allow campaign managers to draw attention to a certain problem behavior and reframe its causes and solutions.

Besides reasoning with different theoretical formulations of the media's agenda-building process (Barker-Plummer, 1995; Baumgartner & Jones, 1993; Gandy, 1982; Montgomery, 1989), this contention is increasingly supported by empirical findings from evaluations of such programs (Holder & Treno, 1997; Marshall & Oleson, 1994; Montgomery, 1993; Singhal & Rogers, 1999; Wallack, 1990a; Yanovitzky & Bennett, 1999). In the context of this study, the findings also suggest that the prospects of successful media advocacy are contingent upon the support of policy-makers to claims made by advocacy groups. It is clear that without this support, MADD would not have had the same impact on media attention to the issue. This suggests that developing working relationships with federal and state functionaries should receive more attention from researchers and advocates alike.

The findings also suggest (though not unequivocally) that a norm-reinforcement approach (Yanovitzky & Stryker, 2000) may be a valuable and promising communication model of health behavior change. Perhaps, the most obvious way to

employ the norm reinforcement approach in health promotion efforts is through deliberate public health communication campaigns (Barokas, 1995; DeJong & Atkin, 1995). Messages designed to correct people's perception of social norms may follow several strategies. One is to convince people that the behavior advocated in the campaigns is already the norm (Barokas, 1995). Another is to provide information that corrects misperceptions about the prevalence of and support to this behavior among peers, parents, and members of the community at large (Barnett et al., 1996; Brown, 1998; Far, 1998). The third is to try and attach a social stigma to risky lifestyle behaviors by presenting those who perform them as individuals with poor self-discipline who have callous disregard for others (DeJong & Atkin, 1995). It is hard to imagine, however, that such efforts would be able to escape the same pitfalls of public health communication campaigns in general. Besides securing sufficient exposure, such campaigns will be forced to produce a different set of messages for different sub-populations (e.g., youth and adults) as well as compete (unsuccessfully) with the massive presence of commercial information in the media that push audiences to adopt or maintain unhealthy practices. Once again, media advocacy strategies may prove to be more effective in this respect.

Finally, the study raises legitimate concerns about the process through which certain health behaviors (but not others) are identified as public health problems and treated as such. Similar to other studies (Gandy, 1982; Gonzenbach, 1996; Montgomery, 1989; Rogers et al., 1991), the results of this study show that this process is open to manipulations from powerful actors and is rarely motivated by real-world indicators of morbidity and mortality. Too often, the results of this process are allocation of public resources to certain behaviors at the expense of others. More importantly, social efforts

to reduce the incidence of one risky behavior may result in an undesirable increase in the incidence of a related risk. For example, if following public health communication efforts DD is perceived by audiences as the only reason to avoid binge drinking, reductions in DD incidence may further exacerbate the prevalence of binge drinking because individuals do not connect this behavior to health risks other than DD. Researchers should, therefore, be critical of the process through which public health problems are constructed and consider all aspects of intervening in them.

**APPENDIX A:**

**CONTENT ANALYSIS INSTRUMENT**



## News Story Information

- (1) Date: \_\_\_\_\_  
MM/DD/YY
- (2) Source (AP, NYT, or WPOST): \_\_\_\_\_
- (3) Length (# of words): \_\_\_\_\_
- (4) Section (A, B, C, D, E, or F): \_\_\_\_\_
- (5) Page #: \_\_\_\_\_
- 

## Who is Mentioned in the News Story?

- | (6) Does the news story mention:                                          | YES | NO  |
|---------------------------------------------------------------------------|-----|-----|
| (a) Grassroots organizations (e.g., MADD, SADD, RID) or members           | ___ | ___ |
| (b) Scientists or scientific work (e.g., a study, a report)               | ___ | ___ |
| (c) Policy-makers or a policy initiative (bills, laws, regulations, etc.) | ___ | ___ |
| (d) Law enforcement efforts (police activities) or representatives        | ___ | ___ |
| (e) Alcohol industry representatives (CEOs, PR people, lobbyists)         | ___ | ___ |
| (f) Insurance industry representatives (CEOs, PR people, lobbyists)       | ___ | ___ |
| (g) Car industry representatives (CEOs, PR people, lobbyists)             | ___ | ___ |
- 

## News Story Framing

- | (7) Does the news story describe DD as: | YES | NO  |
|-----------------------------------------|-----|-----|
| (a) A Crime or a criminal activity      | ___ | ___ |
| (b) An Alcohol problem                  | ___ | ___ |
| (c) A traffic safety problem            | ___ | ___ |
| (d) A public health problem             | ___ | ___ |
| (e) A normative problem                 | ___ | ___ |
| (f) Other: _____                        | ___ | ___ |

- |                                                                                                        | YES | NO |
|--------------------------------------------------------------------------------------------------------|-----|----|
| (8) Does the news story identify DD as a problem created by:                                           |     |    |
| (a) Individual drunk-drivers                                                                           | —   | —  |
| (b) Young drivers (e.g., ages 16-25)                                                                   | —   | —  |
| (9) Does the news story mention a possible solution to the DD problem:                                 |     |    |
| (a) Tougher DD laws                                                                                    | —   | —  |
| (b) Stiffer punishments to drunk drivers (jail, fines, license revocation)                             | —   | —  |
| (c) Strict enforcement efforts (more activities, more resources)                                       | —   | —  |
| (d) Treatment of DD offenders (e.g., alcohol treatment, safer drivers)                                 | —   | —  |
| (e) Public awareness and education-prevention programs                                                 | —   | —  |
| (f) Passive safety measures (e.g., safer cars, safer highways)                                         | —   | —  |
| (g) Other: _____                                                                                       | —   | —  |
| (10) Does the news story:                                                                              |     |    |
| (a) Report on a specific DD incident (e.g., an accident, arrest, trial)                                | —   | —  |
| (b) Report national- or state-level DD-related statistics (cost, injury, mortality, incidence, trends) | —   | —  |
- 

### News Story Valence

- |                                                                                                                               | YES | NO |
|-------------------------------------------------------------------------------------------------------------------------------|-----|----|
| (11) Does the news story <u>report</u> the opinion of those who <b>favor</b> all or some type of social measures against DD?  | —   | —  |
| (12) Does the news story <u>report</u> the opinion of those who <b>oppose</b> all or some type of social measures against DD? | —   | —  |

**APPENDIX B:**

**CODING INSTRUCTIONS FOR DRUNK-DRIVING-RELATED NEWS STORIES**

## CODING INSTRUCTIONS FOR DD-RELATED NEWS STORIES

Please take a few minutes of your time to review carefully the following coding instructions. For your convenience, an example of the coding instrument is attached to this document. Please note that the coding instrument consists of 4 separate parts: *News story information* (p. 1), *who or what is mentioned in the news story* (p. 1), *news story framing* (pp. 1-2), and *news story normative stance* (p. 3). The questions included in each part are discussed in more detail below.

Your task is to first read an entire newspaper story related to the issue of drunk driving (DD) and then answer all the questions in the coding instrument (or the coding sheet). The questions address the news story as a whole and require you (with the exception of the questions in part 1) to check either the "YES" or "NO" box on the right-hand side of each question. **Please use a separate coding sheet for each newspaper story you read.**

### Part 1: News Story Information

The questions included in this section simply require you to indicate:

1. The DATE on which the news story appeared.
2. The SOURCE (i.e., the newspaper or the wire service) in which the news story appeared ("A P", for the *Associated Press*, "N Y T" for the *New York Times*, or "W P O S T" for the *Washington Post*).
3. The LENGTH of the news story (i.e., the number of words).
4. The SECTION of the newspaper in which the news story appeared (ranging from "A" to "F"). Notice that for some news stories, the section may be denoted by a number (e.g., 1, 2, and so on) instead of letters. In these cases, please replace the numbers with the corresponding letters of the alphabet (e.g., "1" with "A", "2" with "B", etc.).
5. The PAGE NUMBER on which the news story begins. In some cases, the page number will accompany the alphabet letter that indicates the newspaper section (e.g., "B10" means section B, page 10).

All the information you need in order to answer these five questions is conveniently located at the top of each news story. If a question cannot be answered due to missing or partial information, please leave the relevant boxes blank.

## Part 2: Who is Mentioned in the News Story?

The second part of the coding sheet (*Question 6*) includes questions about individuals, groups, or/and organizations that are mentioned (or not) in the news story. "Mentioned," means individuals, groups or organizations that the journalist reports on, interviews, or cites. Stories written by these individuals, groups or organizations, such as letters to the editor, also fall under this category.

- a) ***Grassroots Organizations.*** There are many grassroots organizations (or citizens action groups) that try to fight drunk driving. The most known are Mothers Against Drunk Driving (MADD), Students Against Drunk Driving (SADD), and Remove Intoxicated Drivers (RID). These three are very likely to be mentioned in news stories. Also qualify as grassroots organizations are local or national non-governmental organizations that fight or condemn drunk driving. Examples are the coalition of football players against drunk driving (FADD) and the National Restaurant Association who promotes responsible beverage service among its members. Excluded are organizations or individuals that are affiliated with the alcohol industry (see more details below).
- b) ***Scientists or Scientific Work.*** Some DD-related news stories cite scientists or report on a scientific work regarding drunk driving. Scientists interviewed or cited may be easily spotted in the text by their titles (Dr., Professor, Ph.D., M.D., etc.) or affiliation (a university, a research institute, etc.). Scientists who are affiliated with governmental agencies (e.g., Centers for Disease Control and Prevention (CDC), National Highway Traffic Safety Administration (NHTSA), etc.) are also included in this category. Scientific work is almost always presented as "study" or "research" and reported in reference to the scientist(s) or the research institution that conducted the study.
- c) ***Policy-Makers or Policy Initiatives.*** Policy-makers are any of the following: The president, the vice president, ministers (secretaries) or other governmental officials, legislators (members of congress, senators, state legislators), governors and mayors. The institutions in which these individuals or groups operate (e.g., the Congress, the Senate, the Department of Transportation, NHTSA, etc.) should also be coded as a reference to policy-makers. Policy initiatives include bills, laws, regulations, appropriations (funding), executive orders, and the appointment of a task force or committees. These policy actions may directly address drunk driving behavior or may be aimed at reducing this behavior through limiting alcohol accessibility to drivers. "Zero tolerance" laws, "dram shop" laws, and "minimum drinking age of 21" laws are all examples of limiting alcohol accessibility to drivers.
- d) ***Law Enforcement Efforts or Representatives.*** Law enforcement efforts include police roadblocks, sobriety checkpoints, breath tests (Breathalyzer), arrests and incarceration of drunk drivers, and administrative penalties such as fines, license suspension or revocation. Law enforcement representatives include police officers, prosecutors, district attorneys, and judges.

- e) *(also f and g, for that matter) Industry Representatives.* Alcohol industry representatives are individuals or organizations that are affiliated with alcohol (beer, wine, and hard liquor) manufacturers. These include CEOs and managers of alcohol companies, public relation (PR) officers who work for these companies, representatives of alcohol consumers associations, and professional lobbyists for the alcohol industry. The same logic applies for representatives of the car and car insurance industry.

### **Part 3: News Story Framing**

**Question 7** pertains to the way or ways the problem of DD is defined in the news story.

- a) Check 'Yes' if DD is referred to as a crime or offense or if persons accused of DD are described as criminals, offenders, killers or murderers.
- b) Check 'Yes' if the problem is described as part of larger set of problems associated with alcohol abuse or drunkenness.
- c) Select 'Yes' if the DD problem is referred to as a traffic or highway safety problem, including expressions such as "alcohol-related traffic fatalities and injuries."
- d) Select 'Yes' if DD is referred to as a public health problem (using these exact phrase).
- e) Choose 'Yes' if DD is presented as a problem of ambiguous social norms or social pressure to drink and drive.
- f) If the DD problem is described in a way other than the ways listed above, use the OTHER category while specifying the definition used.

**Question 8** requires you to indicate how are drunk drivers characterized in the news story.

- a) Check 'Yes' if the news story suggests that drunk-drivers themselves are responsible for the problem because they make a conscious decision to drink and then drive.
- b) Check 'Yes' if the news story suggests that the DD problem is particularly a problem of young drivers (youth, teenagers, college students, ages 16-25).

**Question 9** concerns solution(s) to the DD problem that are proposed or advocated

in the news story. The options are tougher laws (a), stiffer punishments (b), strict enforcement of DD laws (c), alcohol treatment for drunk drivers (d), public education and prevention programs (e), or passive safety measures in cars such as ignition lock devices that operate when alcohol is detected in the driver's breath (e). If you choose OTHER, please specify what other potential solution is mentioned.

*Question 10* requires you to indicate (a) if the news story is a report on a specific DD incident, and (b) if the article makes any reference to national statistics about DD-related outcomes (e.g., accidents, fatalities, injuries, estimated cost of damages, etc.).

#### **Part 4: News Story valence**

The two last questions (*Questions 11-12*) ask you to indicate whether or not the news story makes reference to (a) opinions that are favorable of social actions against DD (i.e., legislation, enforcement, treatment, prevention, etc.), whether specific to the one covered in the news story or social actions in general; and (b) opinions that are unfavorable toward specific or general social actions against DD.

**APPENDIX C:**  
**SEMANTIC VALIDATION OF COMPUTER-ASSISTED FRAME ANALYSIS**



## SEMANTIC VALIDATION OF COMPUTER-ASSISTED FRAME ANALYSIS

### Procedure

A representative sample of DD-related news stories (N = 1,058) was generated by retrieving all DD related news stories from randomly selected 75 months of news coverage between 1978 and 1995. To be able to code for the presence or absence of certain frames, a unique syntactical rule was developed to capture each content category (24 content categories altogether). Each of these had the following structure:

(Basic DD search phrase) + (distance in words) + (frame-related keywords)

The basic DD search phrase was (Atleast2(drunk! or drink! or intoxicated) w/1 driv!). The optimal window of words between this basic search phrase and the phrase representing a particular frame was determined empirically by first reviewing relevant news stories to estimate the size of a window, then experimenting with different windows of words and selecting the one that maximized recall and precision. Recall addresses the concern that the search phrase used does not adequately capture the entire universe of relevant content items. Precision, on the other hand, addresses the concern that the search phrase used captures a substantial number of non-relevant content items. To estimate recall, the window of words component was replaced by the Boolean 'AND' that captured all relevant news stories that included a particular content category. The results of this procedure are summarized below and were used for retrieving a census of particular content categories.

## 6. References to Stakeholders

### *Grassroots Activists*

AND (MADD or SADD or RID or against drunk driving)

Recall = 1  
Precision = .98

### *Scientists*

W/100 (Scien! or study or research! or expert!)

Recall = .91  
Precision = .95

### *Policy-makers*

W/50 (president or congressman or congresswoman or senator or Democrat or Republican or Rep. or Governor or NHTSA or National Highway Traffic Safety)

Recall = .95  
Precision = .98

### *Policy actions*

W/30 (congress or senate or bill or law or legislat!)

Recall = .96  
Precision = .99

### *Law enforcement representatives*

W/20 (police or police officer or detective or judge or prosecutor)

Recall = .97  
Precision = .96

*Law enforcement actions*

W/10 (arrested or prosecuted or charged or accused or roadblock or patrols or sobriety or checkpoint or breath!)

Recall = .96  
Precision = .99

*Alcohol industry*

AND (liquor industry or wine industry or beer industry or wine institute or brewers or alcoholic beverage industry or beer companies or National Beer Wholesalers Association or distillers)

Recall = 1  
Precision = .98

**7. News Item Framing**

*DD is a crime*

W/20 (crime or offense)

Recall = .98  
Precision = 1

*DD is an alcohol problem*

W/100 (alcohol problems or alcohol-related problems or alcohol-related diseases or alcohol abuse)

Recall = 1  
Precision = .93

*DD is a traffic safety problem*

W/100 (highway safety or traffic safety or traffic problem or traffic-related)

Recall = 1  
Precision = .84

*DD is a public health problem*

W/100 (health or health problem)

Recall = .95  
Precision = .89

*DD is cultural problem*

W/100 (norms or social values or social acceptability or social drinking or social problem or social pressure or social behavior)

Recall = .97  
Precision = .91

## **8. Who is Responsible?**

*DD is a problem of young drivers*

W/50 (youth or young people or young drivers or young males or teenagers or 19 or 16 or 21)

Recall = .97  
Precision = 1

## **9. Advocated Solutions**

*Stiffer Laws*

W/100 (stiff! or tough!) w/5 (law or legislation or sanctions) but not (law enforcement)

Recall = .94  
Precision = .99

### *Enforcement*

W/50 (strict or stiff! or great! or more) w/5 (enforce! or crack! or arrest or prosecute)

Recall = .92

Precision = .97

### *Stiffer Punishments*

W/50 (punish! or penal! or jail sentence or revoc! or fines) but not fine

Recall = .95

Precision = .94

### *Treatment of DD*

W/50 treat! W/5 (alcohol! or rehab!)

Recall = .97

Precision = .98

### *Education and Prevention*

W/50 (educ! or awareness)

Recall = .98

Precision = 1

### *Passive Safety Measures*

W/50 (device or ignition lock!)

Recall = 1

Precision = 1

*Statistics*

W/30 (fatalities or injuries or deaths) w/10 (statistics or percent)

Recall = .96

Precision = .98

**10. News Stories Valence**

*Negative Stance*

W/100 (prohibition! or big brother or (disproportionate w/1 punishment)

Recall = .97

Precision = .89

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