THE IMPACT OF NEWS MEDIA FRAMES OF TYPE 2 DIABETES ON THE PUBLIC'S HEALTH POLICY OPINIONS

by

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For Ezra,
for everything

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ABSTRACT

Public opinion may be an important influence on policy development to improve population health and reduce disparities. Yet little is known about the public's opinions about the determinants of health or the impact of the news media on their opinions. Through two complementary studies, this dissertation addresses the media's role in shaping public understandings and policy preferences about type 2 diabetes, an illness for which racial disparities and social determinants are major concerns.

The first study evaluated coverage of diabetes in 698 articles appearing in 19 U.S. print newspapers in 2005 and 2006. Content analysis revealed that diabetes' behavioral causes and individualized remedies dominated coverage. Fewer than 15% of articles identified any social determinants, social policy interventions, or disparities; those that did appeared in a select subset of newspapers.

The second study assessed the effects of these media messages on participants' support for non-medical policy interventions. Study participants (N=2,490) completed a web-based survey in which they viewed a mock news article about diabetes featuring one of four randomly-assigned causal frames (genetic predisposition, behavioral choices, social determinants, or no causal language) and one of three photos (a black woman, a white woman, or a medical device). The experimental results challenge the conventional wisdom that increasing publicity of the social determinants of health will lead to greater public support for health policies. The social determinants framing of diabetes elicited a polarization of opinion, with Democrats more supportive and Republicans less supportive

of the policies, compared to those who viewed the frame without causal language. In the full sample, those who viewed the behavioral choices frame were significantly more likely to endorse negative stereotypes about people with diabetes, while blacks who viewed the social determinants frame were less likely to do so. Negative stereotypes predicted reduced support for spending on diabetes research. The race of the person pictured in the article did not influence these attitudes.

This research demonstrates that media messages about the causes of diabetes evoke morally- and politically-laden themes. Future research might assess how news media messages interact with political predispositions to shape public opinion about health policy topics.

CHAPTER 1

Introduction

MOTIVATION

Over the past several decades, researchers of social epidemiology, social demography, and medical sociology have documented the relationship between social factors—including socioeconomic status, social support, neighborhood environment, health behaviors, workplace conditions, and stress—and the distribution of health and illness in populations (House 2002). Public health scholars now take for granted that population health is determined more by social and behavioral factors than by genetics or medical care (Tarlov 1999). Despite this considerable body of academic research, it is not clear to what extent the public appreciates the social determinants of health or is even aware of the health disparities that exist across groups defined by race, ethnicity, or socioeconomic status (Lillie-Blanton et al. 2000). Williams (2005) stated, "a society that is largely unaware of a problem is unlikely to be highly motivated to address it" (p. 130).

As Williams suggests, public knowledge and support may be important for advancing a policy agenda to improve population health and reduce disparities by focusing on social factors. Public health researchers have identified numerous such policy strategies, ranging from reducing income inequalities through taxation and redistribution, improving public education, revitalizing urban neighborhoods, and reducing residential segregation (Adler and Newman 2002; Williams and Jackson 2005), but little progress has been made (Lurie 2002).

Despite the burgeoning scholarly attention to policy strategies to improve population health, there has been no research to date suggesting how the public's values, attitudes, and opinions might facilitate or hinder policy development in these areas. Nor has there been much research into the public's sources of information on these matters. Many questions remain to be answered, such as: Does giving people information about the social determinants of health make people more supportive, than they otherwise might be, of policies to promote a more equitable distribution of social resources? Do an individual's political or values-based predispositions make a difference in the degree to which they find information about social determinants of health compelling? This dissertation seeks to address these and other questions as it evaluates the roles of the media and public opinion in public health policy.

BACKGROUND ON PUBLIC OPINION AND THE MEDIA

Political science models of the policy process suggest an important role for public opinion, since policymakers are, at least to some extent, responsive to the public (Bartels 1991; Hutchings 2003; Jacobs and Shapiro 1994; Kingdon 2003; Stimson, MacKuen, and Erikson 1995). Numerous other factors also affect health policy-making, from the actions of advocacy and interest groups, the preferences of elected officials, and institutional and organizational constraints. Still, public opinion is likely a critical contributor to policy-making regarding public health.

One influence on the opinions of the public and policymakers alike is the news

media.[1] Indeed, Americans get much of their health-related information—including health policy topics—from news media (Brodie et al. 2003). Moreover, evidence demonstrates that the news media can shape the public's opinions about what issues, or aspects of issues, are important or salient (Gamson and Modigliani 1989; Price and Tewksbury 1997). Elites use the news media to frame issues in ways to motivate the public's support; journalists, in turn, aim to identify news narratives that appeal to audiences' values and interests. In addition, policymakers are responsive to news media messages. Policymakers consider media content to reflect their constituents' concerns, and they pay close attention to public opinion surveys, suggesting multiple routes through which the media influence policy (Baumgartner and Jones 1993; Herbst 1998; Kingdon 2003; Yanovitzky 2002).

What role, then, might the news media play within policy-making to address population health and health disparities? While few commentators have directly addressed the news media's role within public health policy, some researchers and advocates have implied that if the media publicized the social determinants of health, the public would become more aware of the sources of health inequalities and more supportive of policies to improve population health. Mechanic (2003), for example, suggests that policy progress in population health will "come in increments as research and its diffusion through the media and the educational process slowly change the way problems are thought about and conceptualized" and that "a great deal depends on how issues affecting social determinants are conceptualized and communicated" (pp. 438-

[1] This dissertation is restricted to an exploration of the *news* media. Other parts of the media, from the entertainment media (e.g., movies and television programs) to advertising (such as direct-to-consumer advertisements for pharmaceuticals) also influence the public's perceptions of public health problems and priorities. However, these aspects of the media are beyond the scope of this project.

439). In his discussion of public policy frameworks to improve population health, Tarlov (1999) states that "public policies are unlikely to be effective, or even adopted, unless there is in parallel an activation of multiple sectors," (p. 282) including the media. Tarlov describes a policy development framework that hinges upon improving public understanding and building public consensus before any political process can begin. He argues that the United States remains in the pre-political stage of policy development for population health because the public lacks knowledge of and consensus surrounding the relationship between social factors and health (Tarlov 1999). Finally, Wallack and colleagues (1993) propose that advocates use the media to "change the dominant understanding and perception of [health] problems from personal or life-style issues to social policy issues," (p. 5) and in turn, to advance social justice by "gaining greater control over the social and political environment in which decisions that affect health are made" (p. 24). These commentators suggest that greater media attention to the link between social factors and health will lead to greater public and political engagement surrounding population health and health disparities.

Without sufficient understanding of the nature and content of media messages or the impact of these messages on the public's attitudes, it may be short-sighted to assume this link between media attention and increased public support for policies to address health disparities. In fact, social science research within other social policy arenas, such as poverty, welfare, and crime, suggests that media attention might actually lead to a *reduction* in policy support, as a result of media portrayals activating the public's stereotypes and biases toward the targets of these policies (Gilens 1999; Gilliam and Iyengar 2000; Iyengar 1991; Peffley, Hurwitz, and Sniderman 1997). There has been no

research to date assessing the impact of news media coverage of health disparities, or of the determinants of health, on the U.S. public's opinions or attitudes. Yet it is possible that the social dynamics surrounding health disparities—evoking sensitive race-related issues and value-laden, morally-charged questions of responsibility for health—complicate the media's influence on policy to improve population health.

BACKGROUND ON TYPE 2 DIABETES

This dissertation research evaluates the media's role in shaping public understandings and policy preferences about one illness that is representative of U.S. health disparities—type 2 diabetes. Type 2 diabetes is the focus of this dissertation for several reasons. First, diabetes, of which more than 90 percent is type 2, is the sixth-leading cause of death in the United States, and 20.6 million adults have diabetes, amounting to upwards of 9.6 percent of the population aged 20 and above (CDC 2005). Type 2 diabetes has been increasing in incidence and prevalence over the last two decades. Thus, developing effective strategies to reduce its public health burden is an increasingly important goal for United States health policy.

Second, like most chronic illnesses, type 2 diabetes is distributed disproportionately among minorities and those with lower socio-economic status (SES) (Brown et al. 2004; Kanjilal et al. 2006). These racial, ethnic, and class associations with type 2 diabetes may play an important, if implicit, role in the policy process to address the epidemic. According to 2002 data from the National Health and Nutrition Examination Survey, the prevalence of diagnosed diabetes was three times higher among those in the lowest income quartile than in the highest income quartile, a prevalence gap

that has increased over the past 25 years (Kanjilal et al. 2006). While 8.7 percent of Caucasian, non-Hispanic white adults have diabetes, 13.3 percent of black adults, 9.5 percent of Hispanic or Latino adults, and 12.8 percent of American Indians or Alaskan Natives have diabetes (CDC 2005). Figures 1.1 and 1.2 show the increasing prevalence of diagnosed diabetes since 1980 and the racial differences in diabetes rates.

Figure 1.1: Prevalence of Diagnosed Diabetes, 1980-2004

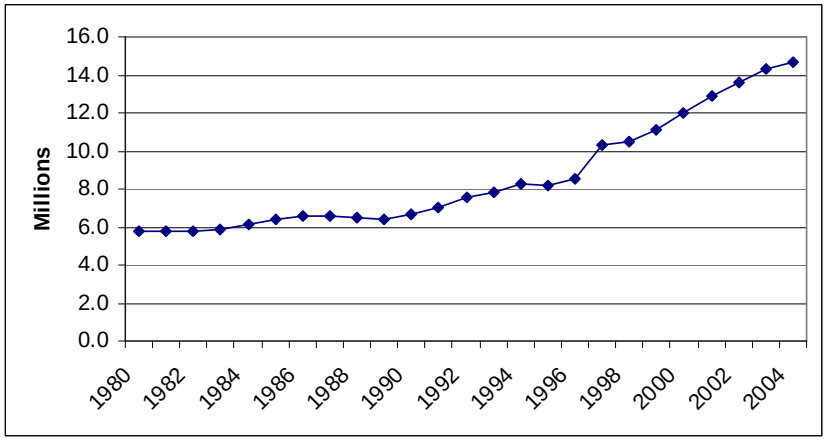
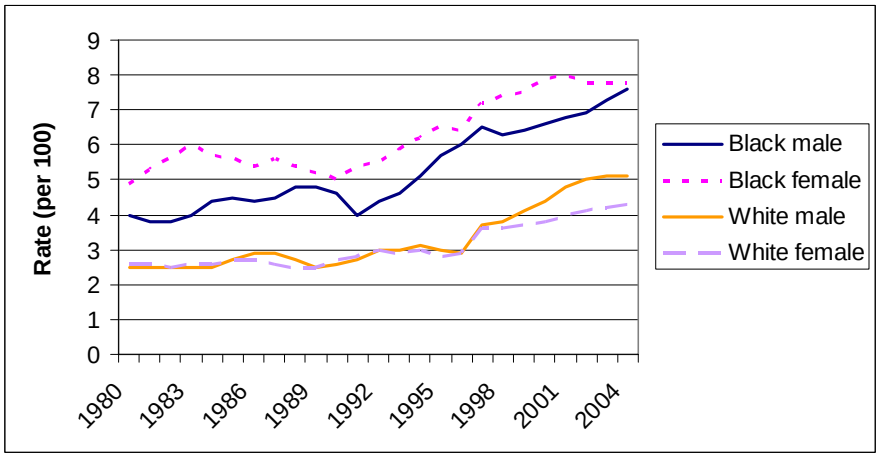


Figure 1.2: Age-Adjusted Prevalence of Diagnosed Diabetes by Race and Sex



Note: Source (for Figures 1.1 and 1.2): Centers for Disease Control and Prevention, National Center for Health Statistics, Division of Health Interview Statistics, data from the National Health Interview Survey. Available at Diabetes Data and Trends, http://apps.nccd.cdc.gov/ddtstrs/

Third, there is scientific uncertainty surrounding the causes of diabetes (Marx 2002). Genetic susceptibility, individual behaviors, and social and economic conditions each influence the population distribution of type 2 diabetes, suggesting multiple ways in which the determinants of diabetes can be portrayed in public discourse. Researchers have identified several candidate genes that increase susceptibility to type 2 diabetes. For example, a polymorphism in the transcription factor 7-like 2 (TCF7L2) gene increases the likelihood of type 2 diabetes by odds of about 1.5, a finding that has been replicated several times (Florez et al. 2006; Grant et al. 2006; O'Rahilly and Wareham 2006). Researchers have identified at least ten susceptibility genes, and more are expected as a result of the increasing number of genome-wide association studies (Scott et al. 2007; Zeggini et al. 2008). While acknowledging a role for genetics, researchers believe that the great increase in incidence of type 2 diabetes over the last two decades is primarily due to lifestyle (sedentary behaviors) and dietary behaviors (consuming fats and simple carbohydrates), and that prevention of diabetes hinges on changing these behaviors (Schulze and Hu 2005). Social and economic conditions influence the incidence of type 2 diabetes, as well as its morbidity and mortality, through the relationship between SES and health behaviors, availability and affordability of healthy food, leisure time for exercise, access to and quality of health care, and social support (Brown et al. 2004; Lutfey and Freese 2005). Researchers also posit direct biological effects of the stressors from low-status occupations and living in impoverished conditions on type 2 diabetes via the association between neuroendocrine processes, particularly elevated cortisol levels and inflammation, and insulin resistance (Abraham et al. 2007).

Finally, the social acceptance of diabetes is somewhat ambiguous, making it an interesting illness to study from a social scientific perspective. To adopt a term from the sociology of science and technology, there remains 'interpretive flexibility' surrounding this condition (Pinch and Bijker 1987). Whereas other conditions, such as obesity, sexually transmitted diseases, mental illness, or drug or alcohol abuse, have more obviously been constructed as socially undesirable or socially stigmatized (Freidson 1970; Link and Phelan 2001), diabetes may fall in a somewhat different category. Type 2 diabetes is closely linked to a sedentary lifestyle and poor dietary behavior, characteristics that may carry social stigma. From a medical sociological perspective, these characteristics would suggest that society would perceive type 2 diabetes as a less legitimate illness (see, e.g., Freidson 1970). Yet at the same time, as a serous and chronic illness, and one over which the medical profession has long claimed authority, diabetes may receive higher sympathy and support from the public than expected. There is little empirical evidence to suggest whether the public has positive or negative symbolic associations with diabetes.

This analysis focuses on type 2 diabetes as opposed to type 1 diabetes to the extent possible (although they are conflated frequently in public discourse, as the content analysis presented in Chapter 2 demonstrates) because the value judgments society associates with the sub-types are likely to be of different valence and intensity. Type 1 diabetes, resulting from an immune deficiency, occurs in children and attracts a great deal of advocacy and support. Type 2 diabetes, on the other hand, has an onset that is associated with lifestyle and occurs in adults (again, predominantly minority adults). These differences may explain the more generous research dollar allocation to type 1,

relative to its prevalence, compared to type 2 diabetes, despite the fact that the vast majority of diabetes cases are type 2 (Perez-Pena 2006).

RESEARCH QUESTION

This brief background suggests that media communication of type 2 diabetes' determinants and its social group associations may convey themes of potentially great relevance to the public's considerations regarding policy strategies to address diabetes. The overarching research questions motivating this dissertation are: *How do the United States news media describe the determinants of and groups who suffer from type 2 diabetes? How do these messages affect American public opinion about public health policy related to diabetes prevention?*[2] In this context, "public health policy" refers to decisions regarding allocating resources toward diabetes research or governmental policies that intervene on the behavioral, social, or economic determinants of diabetes.

To address this broad research question, this dissertation presents findings from two discrete but related studies. The first is a quantitative content analysis of the social construction of diabetes in 19 selected print news sources. The second is an Internet survey-based experiment, designed to isolate and identify the impact of media messages about diabetes' causes and racial associations on the public's perceptions of diabetes, their attitudes toward people with diabetes, and their opinions about policies to address its rising incidence. The results of these two complementary studies are presented in three distinct empirical papers: Chapter 2 presents the content analysis, and Chapters 3 and 4 present analyses of the experimental data.

[2] This research's findings and their interpretation apply exclusively to the United States, given this nation's particular cultural, political, and values orientation.

THEORETICAL ORIENTATION

This research is theoretically motivated by and responsive to disparate literatures within public health, medical sociology, ethics, communication studies, and political science. Bridging these areas of inquiry is critical to understand the dynamics of policy agenda-setting surrounding health disparities. Each of the three papers draws from several theoretical approaches, which are elaborated in detail in each of the associated chapters. It is useful, however, to lay out the general theoretical orientation that integrates each piece of the project.

Framing

Each of the papers relies heavily on the concept of media framing. In addition to publicizing some issues over others (a process known as the agenda-setting function of the media (Iyengar and Kinder 1987)), the media emphasize certain facets of particular issues. These facets, or "frames," are the central organizing ideas or symbols in the media's presentation of a social problem (Gamson et al. 1992; Gamson and Modigliani 1989). Scholars have employed the concept of frames in various ways across multiple disciplines, originating with Erving Goffman's definitional work (Goffman 1974). Goffman described frames as schemata of interpretation of some event that give that event meaning: "a primary framework is one that…render[s] what would otherwise be a meaningless aspect of the scene into something that is meaningful" (p. 21).

Since Goffman, the term framing in sociology can refer to both media presentations and strategic tactics to mobilize social movements (Benford and Snow 2000; Kolker 2004). This dissertation uses the definition of framing from the study of media effects in communication studies and political science. In this context, media

framing generally refers to the selection of certain aspects of issues to make these features more salient or meaningful to the reader or viewer (Entman 1993; Scheufele 1999). Journalists and their sources, including advocates or policymakers, utilize those frames which they expect will have maximum public and cultural resonance, in order to appeal to readers (Gamson and Modigliani 1989). Moreover, journalists' perceptions of news media values, including portraying conflict, drama, novelty, or a personalized perspective, influence the frames they select to present public problems (Price and Tewksbury 1997).

Other Social Scientific Theories

In addition to framing theory, this research incorporates other theoretical approaches in its empirical expectations and its interpretations of the findings. Chapter 2 most directly assumes a social constructionist perspective in its approach to the media. This chapter contends that political, institutional, and structural factors influence the media's coverage of issues; actors compete to construct a public definition of a social problem's causes and delineate who is responsible for its solution (Gusfield 1981; Hilgartner and Bosk 1988). Thus, media coverage of diabetes does not reflect objective facts about diabetes, but is the outcome of a social process.

Chapters 3 and 4 respond to a large body of United States public opinion research that suggests that many factors influence Americans' opinions regarding social policies, including their political and ideological predispositions, their values, self-interest, and perhaps most importantly, their attitudes about groups (Kinder and Sanders 1996; Sniderman 1993). This research highlights work by Kinder and others that suggests that members of the public rely on their attitudes about social groups, either their own group

membership (in-group) or some other group (out-group) as a simpler way of interpreting their opinions about otherwise complex policies (Gilens 1999; Green, Palmquist, and Schickler 2002; Kinder and Sanders 1996; Winter 2008). Social groups in this context refer to racial or ethnic groups, social classes, political parties, or immigrants. Chapter 4 incorporates and extends this literature, posing that attitudes toward groups perceived to be affected by a common health condition may also predict policy opinion.

Each of the chapters also incorporates theory from social psychology that suggests that public understandings of the causes of a social problem can influence perceptions of stigma, particularly whether an individual is deserving of assistance and/or policy attention. Weiner's work in social psychology, for instance, demonstrated that when people perceive that a disease's onset is controllable, they express less sympathetic attitudes toward people with that disease and are less likely to want to help them (Weiner, Perry, and Magnusson 1988). Research on mental illness stigma similarly finds connections between the causes of mental illness and helping behavior (Corrigan et al. 2003; Martin, Pescosolido, and Tuch 2000), with people having less favorable attitudes toward those for whom they perceive mental illness results from individual characteristics. While research has addressed the association between causal attributions and policy opinion with regard to obesity (Oliver and Lee 2005) and mental illness (McSween 2002), no previous research has explored these links for diabetes.

OUTLINE OF DISSERTATION

The first empirical paper (Chapter 2), entitled "Communicating Population Health: Features of Print News Media Coverage of Type 2 Diabetes," evaluates the ways

in which 698 articles about diabetes appearing in 19 national and regional newspapers from January 2005 to December 2006 describe the causes of diabetes, its policy solutions, and disparities. This analysis identifies great source-related and regional variability in the ways in which newspapers cover diabetes, particularly in the extent to which newspapers rely upon a population health perspective in their coverage. This paper seeks to generate hypotheses for why these differences in coverage might occur.

The second empirical paper (presented in Chapter 3), aims to identify the effects that common frames of the determinants of type 2 diabetes, as identified in Chapter 2, have on public opinion. Entitled "Preaching to the Choir or Falling on Deaf Ears? The Effect of Media Frames of the Determinants of Diabetes on Public Health Policy Opinion," this paper leverages an experimental research design to evaluate whether framing the determinants of diabetes in terms of social and economic factors, relative to frames that emphasize genetic susceptibility or lifestyle choices, influences study participants' opinions about the causes of diabetes and about several non-medical governmental policies to combat diabetes. This paper posits that political and racial symbols are embedded in a social determinants framing of diabetes, resulting in different reactions to the experimental stimuli depending on participants' racial group identification or political orientation.

The third paper (Chapter 4), entitled "Causal Frames, Group Associations, and Diabetes Resource Allocation Preferences," also relies on the experimental data. This paper evaluates whether the media frames of the causes of diabetes and/or the embedded racial prime (a photo of a black woman or a white woman) affects study participants' preferences regarding federal government allocation of money toward diabetes research.

This paper also evaluates whether stigma toward people with diabetes or attitudes about fault of diabetics mediate the frames' effects on participants' government spending preferences.

The final chapter (Chapter 5) integrates and discusses the findings of the three empirical papers and suggests directions for future research. This chapter also reflects on the research findings in light of current issues in health policy.

Considered as a whole, this dissertation, relying upon interdisciplinary methodological approaches and exploring a timely health policy issue, comes to some novel—and potentially controversial—conclusions about the political nature of framing public health policy. It identifies and explores the symbolic politics embedded in public health discourse (Edelman 1964). As Mechanic and colleagues (2005) emphasize in the introduction to their book *Policy Challenges in Modern Health Care*, significant debates in American health policy "inevitably involve questions of personal versus collective responsibility, government versus self-help, individual fault versus social causation, and a broader framing of populations as worthy and unworthy" (p. 2). This dissertation engages these broad themes, illuminating how each applies to public understandings of type 2 diabetes.

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CHAPTER 2

Communicating Population Health: Features of Print News Media Coverage of Type 2 Diabetes

INTRODUCTION

Americans get much of their health-related information, including information on health policy-related topics, from the news media (Brodie et al. 2003). The news media can shape the public's opinions about what issues are important as well as emphasize particular ways of thinking about a problem and its solutions (Gamson et al. 1992; Iyengar and Kinder 1987; Price and Tewksbury 1997). Thus, news media presentations of a public health problem—such as type 2 diabetes—can influence the public's perceptions about the importance of a problem and what should be done about it.

While mortality from many cancers, heart disease, and stroke has fallen over the past two decades, mortality from type 2 diabetes has increased, particularly among the poor, African Americans, Latinos, and Native Americans (McKinlay and Marceau 2000). Compared to whites, non-Hispanic blacks are 1.8 times as likely to have diabetes, Mexican Americans are 1.7 times as likely, and Native Americans are 2.2 times as likely to have diabetes (CDC 2005). The prevalence of diagnosed diabetes is three times higher among those in the lowest income quartile than in the highest income quartile, a prevalence gap that has increased over the past 25 years (Kanjilal et al. 2006). Because of the growing magnitude of the problem, effective and timely policy strategies are required to address the burden of type 2 diabetes on individuals, families, and whole

communities. However, little is known about the public's sources of information about diabetes and its possible solutions, so it is unclear which of many potential interventions the public might support. The goals of this paper are to analyze print news media presentations of type 2 diabetes from 2005-2006, focusing particularly on the extent to which articles employ a population health perspective in their coverage, and to discuss the implications of these patterns for public health policy.

Background and Theory

Social construction scholars argue that an issue becomes designated as a social problem through a public definitional or claims-making process, when some individual or group makes the normative judgment that a condition must be ameliorated, identifying its causes, assigning blame, and suggesting who is responsible (Blumer 1971; Gusfield 1981; Schneider 1985; Spector and Kitsuse 1977). The contest over a social problem's public definition occurs in multiple interactive arenas of public discourse, including the media (Hilgartner and Bosk 1988). Media coverage is not a simple reflection of important issues in society; rather, it is the product of a competitive process among multiple actors vying for finite amounts of attention and space. Scientists, politicians, advocates, journalists, and others compete to advance their sets of claims about a problem in the media. This competitive process means that some health problems will receive media exposure while others will not, with implications for which problems are on the public agenda. Indeed, prior research demonstrates that media attention to an issue is related to the public's evaluations of that issue's importance (Iyengar and Kinder 1987).

Previous empirical research supports the media's agenda-setting function in public health. United States print media attention to disease tends to be proportional to

disease mortality rates (Adelman and Verbrugge 2000). However, diseases that claim predominately black lives get less television and print media attention than diseases affecting primarily whites, even after controlling for overall mortality rates (Armstrong, Carpenter, and Hojnacki 2006). These findings suggest that the problem of racial health disparities—that is, that diseases like heart disease, stroke, and diabetes disproportionately affect black Americans—may not yet be high on the public's agenda. This conflicts with some commentators' recent arguments that addressing racial health disparities should be a major public health policy priority (Robinson 2008; Smedley 2008).

A closer examination of the ways in which the news media cover population health and racial health disparities is warranted, in light of the media's documented influences on the public. The media can help to set the public health agenda, as described above, and they can also frame health issues in particular ways. By selecting features to highlight in their coverage of an issue, such as emphasizing certain groups, identifying causal narratives, and assigning policy responsibility (Entman 1993), the news media shape the way the public thinks about that issue. Since policymakers are, at least to some extent, responsive to the public's opinions (Bartels 1991; Hutchings 2003; Jacobs and Shapiro 1994; Kingdon 2003; Stimson, MacKuen, and Erikson 1995), a supportive public could help enable policy-development to improve population health and reduce disparities (Tarlov 1999).

News Media Framing and Health Policy Issues

Scholars have argued that the public's attitudes about particular social groups are among the most powerful contributors to the public's opinions about policy (Kinder and

Sanders 1996; Nelson 1999; Nelson and Kinder 1996). The news media's depictions of groups can shape the public's perceptions of the groups who are the targets of a particular policy, such as the poor (Gilens 1996), the elderly (Winter 2006), or those with particular illnesses, such as AIDS (Pollock 1994) or diabetes.

An important policy-relevant question regarding the social construction of diabetes is the extent to which the news media identify specific subpopulations with higher diabetes prevalence or mortality, that is, whether the media epidemiology of diabetes matches its social epidemiology.[1] If social group disparities are missing from the public discourse surrounding diabetes, then agenda-setting theory would suggest the public would not perceive disparities in diabetes to be a problem worthy of policy attention or amelioration (McCombs and Shaw 1972). If the media does portray disparities in diabetes rates—depicting diabetes as a problem disproportionately affecting people of lower socioeconomic status and racial and ethnic minorities—such a depiction could motivate members of the public concerned about social justice to take action to address disparities. Social movements scholarship suggests that framing social problems in ways that emphasize injustice has mobilizing potential (Benford and Snow 2000; Gamson 1992).

Alternatively, media presentations of racial disparities in diabetes could have unintended, or negative, consequences. Gilens (1999), for instance, finds a relationship between the media's over-representation of black Americans among the poor and white Americans' negative attitudes about helping people in poverty through welfare programs. He suggests that white Americans' stereotypes about those in poverty, such as that they

[1] See Kempner 2006 for a discussion of the use "epidemiological mosaics" in pharmaceutical company representations of people with migraines.

are lazy, lead to their antipathy toward certain types of welfare programs. Thus, the extent to which the media does, or does not, emphasize disparities in diabetes status has important policy implications.

In addition to highlighting the groups affected by a social problem, media depictions of a health issue can also signal the problem's seriousness and the extent to which it is a threat to others. Research suggests that people's attitudes about groups may be more influential considerations in their evaluations of policies when they perceive a threat (Kinder and Sanders 1996; Stenner 2005; Winter 2006). In their recent articles about media framing of obesity, Saguy and colleagues note that the news media tend to describe obesity as an "epidemic," suggesting alarm, moral panic, and concerns about contagion, real or imagined (Saguy and Almeling 2008; Saguy, Elmen-Gruys, and Gong 2007). Articles that describe diabetes as an epidemic may signal that diabetes is particularly threatening for certain sub-groups or perhaps more pressing from a policy perspective.

A final important policy-relevant domain of news media coverage of diabetes concerns messages about diabetes' causes and, closely related, messages about responsibility and strategies for addressing the disease. Causal narratives, perceptions of who or what caused a problem, can affect the public's attributions of responsibility for the problem as well as the range and scope of policy interventions that policymakers and the public consider appropriate (Gusfield 1981; Iyengar 1991; Stone 1989; Tesh 1994). Theory suggests that when people identify individual behaviors as the cause of some disease, they would attribute responsibility to address the disease to the individual, whereas when they identify structural or environmental factors as causal factors, they

would more likely support social or governmental responsibility or interventions "upstream" from the individual (McKinlay 2005; McKinlay and Marceau 2000; Tesh 1994).[2] Perceptions of who, or what, causes health disparities—and by extension, who or what is responsible to ameliorate them—may be particularly important factors leading to the acceptance of policy strategies to address health disparities.

Evidence supports these theoretical connections between causal narratives and policy support. Blendon and colleagues observed that people who believed that patient circumstance (such as living in areas where they do not have access to care) were the causes of disparities in health care were more likely to support federal responsibility for ameliorating health care disparities than those who believed that patients' behaviors caused the inequalities (as cited in Taylor-Clark et al. 2007). Reutter and colleagues (2002) found that Canadians who believed in structural explanations for health inequalities were more supportive of social policies to address poverty than those who endorsed behavioral or medical explanations (Reutter, Harrison, and Neufeld 2002). Similarly, the media's coverage of the causes of particular diseases, such as genetics, behaviors, the social environment, or some other causal factor, may influence the public's perceptions of policy responsibility for disparities in those diseases.

News Media Framing and Responsibility for Health

Previous research suggests that the media tend to privilege the "downstream" individualized biological or behavioral determinants of chronic disease over the "upstream" environmental or social structural determinants (Brown et al. 2001; Conrad

[2] Throughout this paper, following McKinlay's (1974/2005) original use of the term, "upstream" strategies refer to interventions to address diabetes at the macro-social or economic level, that is, targeting diabetes' social or economic determinants (like poverty, the urban environment, availability of affordable food, etc.)

1997; Horwitz 2005; Lantz and Booth 1998). Accordingly, news articles emphasize individual actions as both causes of and means of prevention of chronic disease. For instance, articles about breast cancer rarely identified its environmental or social causes, and most implicated women's personal behaviors (e.g., diet, use of contraceptives, smoking, alcohol, and delayed childbearing) as causes of rising breast cancer rates (Brown et al. 2001; Lantz and Booth 1998). Similarly, in the only published content analysis of articles about diabetes, Rock found that lifestyle and behavioral factors dominated the discussion of the determinants of diabetes in articles appearing in four U.S. and Canadian print news sources from 1998-2000 (Rock 2005). She also reported that remedies for reducing the incidence of type 2 diabetes focused upon behavioral and clinical interventions, even when articles identified societal factors as causes.

Several studies about media framing of obesity also found that news articles emphasized behavioral causes over structural, environmental, or genetic factors, and also emphasized individually-oriented solutions (Kim and Willis 2007; Lawrence 2004; Saguy and Almeling 2008; Saguy, Elmen-Gruys, and Gong 2007). Saguy and Almeling (2008) found that news articles were even more likely to frame obesity as a problem of personal behaviors (e.g., poor food choices or sedentary lifestyles) when the articles mentioned the poor, African Americans, or Latinos. Using a longitudinal approach, Lawrence (2004) identified the emergence of a framing contest between individual behaviors as the cause of obesity (stressing personal responsibility) and the social environment (stressing social or corporate responsibility), with socio-environmental frames becoming increasingly featured in the early 2000s. Authors of a more recent longitudinal content analysis of obesity, using both print and television media from 1995-

2004, observed that personal causes (i.e., unhealthy diet and sedentary lifestyle) and personal solutions for obesity (i.e., healthy diet, physical activity, and medical treatment) far outnumbered societal attributions of cause or responsibility (although societal causes and solutions increased in the later part of the time period) (Kim and Willis 2007). Kim and Willis, among others, attribute the American ethos of personal responsibility as a driver of this individualistic frame (Dorfman, Wallack, and Woodruff 2005; Wikler 2002).

The emphasis on behaviors in the news media is at odds with the conclusions of some public health researchers. While lifestyle and behavioral factors, such as poor diet, lack of exercise, and smoking are indeed associated strongly with health outcomes (McGinnis and Foege 1993), these behaviors are themselves influenced by socio-economic resources and environmental factors and they do not explain all of the variance in observed socioeconomic disparities in mortality (Lantz et al. 1998; Link and Phelan 1995). Other commentators have argued that an overemphasis on individualized causes of chronic disease (including genetics) could obscure recognition of a social responsibility to address the disease (Conrad 1997; Horwitz 2005).

In sum, then, there is growing social scientific literature on causal attributions and responsibility framing in the media, and several previous studies have aimed to identify the causal and treatment messages in news articles about public health issues. The majority of these previous studies find that individualized messages predominate in the media. In reaction to the dominance of individualized frames of health in the media and in public discourse more generally, advocates seek to reframe public health problems to encompass social and economic conditions and inequalities (Dorfman and Wallack 2007;

Wallack et al. 1993). Dorfman and Wallack (2007), for instance, argue that advocates should reframe the issue of nutrition to include the social, economic, and political context surrounding obesity and diet. There has been little extant research to suggest to what extent these advocates have been successful in getting their population health message into the media.

Research Goal and Analytic Approach

The goal of the present research is to evaluate quantitatively the construction of type 2 diabetes in the print news media, focusing particularly on the extent to which the print news media in 2005 and 2006 took a "population health" approach in their depictions. This use of this term, after Kindig and colleagues (Kindig and Stoddart 2003; Niederdeppe et al. 2008) connotes a particular style of media presentation of health issues that emphasizes social, economic, and population-level causes and solutions and also depicts health disparities as a social problem.

In order to achieve this goal, the content analytical approach consists of five specific tasks. The first task is to catalog basic descriptive information, including the number of articles about diabetes appearing in each newspaper and how often articles about diabetes mentioned its "epidemic" nature or featured references to scientific studies, advocacy groups, or pharmaceutical companies. The second task is to describe the extent to which articles about type 2 diabetes (N=698) appearing in 2005 and 2006 depicted the causes of diabetes, particularly the balance of individually-oriented causes and social-oriented causes. The third task is to describe how news articles described policies or strategies for prevention, treatment, or management of diabetes, particularly the extent to which articles mentioned policies that target social and economic

determinants and individual-level determinants. The fourth task is to evaluate media presentations of who gets diabetes and how often disparities in diabetes prevalence are identified. Finally, integrating the aforementioned content areas, the last task is to identify the article-level characteristics that are associated with taking a population health approach to coverage. These findings would inform the efforts of those advocates who seek greater discussion of social determinants of health, health disparities, and population health perspectives in the media (e.g., Wallack et al. 1993). Rather than posing hypotheses a priori, this research generates hypotheses for future study.

This research has several strengths that differentiate it from previous content analyses of health-related topics. Conceptually, it is among the first studies to analyze media construction of type 2 diabetes, an illness which is one of the most pressing public health issues facing the United States (see Rock 2005 for an earlier study, based on 1998-2000 news content). This study, while a chronological update of this earlier study, goes well beyond Rock's in its methodology, by relying on data collected across 19 geographically diverse print news sources. As a result, this research can assess whether there are any source-related or regional differences in coverage of diabetes. Often, researchers conduct content analyses of just one or two major news sources (such as the *Washington Post* or the *New York Times*), assuming these presentations are representative of all news media coverage of the issue, and ignoring any potential differences across sources. This assumption is problematic, given the diversity of newspapers' audience demographics, political orientations, and the resources of the publication—all factors that shape news content (Benson 2004; Gans 1979; Schudson 1989). In addition, the present research relies upon a very large sample of articles, facilitating quantitative analyses,

including multivariate approaches, not possible in smaller samples. Finally, this work is one of the first to assess systematically the extent to which mentions of socioeconomic and racial disparities in health status (i.e., diabetes status), and not just in health care disparities, are featured in the U.S. news media.

DATA AND METHODS

Data

Articles were collected from 19 national and local print newspapers, all of which contained full coverage in the LexisNexis database. Three of the newspapers (*The New York Times, USA Today,* and the *Washington Post)* can be considered national papers or papers of record. The other 16 papers comprise the top-circulation papers (having daily circulation of at least 250,000) that are contained in the LexisNexis "Major U.S. Newspapers" category in each of four Census regions: Northeast (*Boston Globe, New York Daily News, New York Post*); Midwest (*St. Louis Post-Dispatch, Chicago Sun-Times, Minneapolis Star Tribune, Cleveland Plan Dealer)*; South (*Houston Chronicle, St. Petersburg Times, Atlanta Journal and Constitution, New Orleans Times Picayune)*; and West (*Sacramento Bee, San Francisco Chronicle, San Diego Union-Tribune, Denver Post, Portland Oregonian).* See Table 2.1 for a list of all print newspapers included in the study and their daily circulation rates.

To identify articles about diabetes, the LexisNexis database was searched by selecting the Index Term "diabetes" and indicating that only articles wherein diabetes is a "major" term (most relevant) should be identified. Searches were restricted to articles

published between January 1, 2005 and December 31, 2006 from the above sources, and also restricted to all articles that were at least 150 words and not an obituary (i.e., including the search criteria that the articles should not appear in the "Deaths and Obituaries" section of the paper). These searches yielded 590 articles in 2006 and 592 articles in 2005, for a total of 1,182 articles. As described in greater detail below, this search strategy produced a mix of articles about type 1 diabetes, type 2 diabetes, gestational diabetes, and combinations therein; thus, manual coding was required to focus the analysis only on those articles that were mostly or partly about type 2 diabetes.

Coding Strategy

A quantitative coding scheme was developed after a sub-sample of 60 articles was coded. All articles that met the following criteria were excluded by hand: any articles less than 150 words that LexisNexis did not exclude automatically (i.e., short news briefs within a larger summary of articles, in which the brief about diabetes was less than 150 words); obituaries, letters to the editor, calendar or events reports, articles about diabetes in animals, duplicate articles from the same publication, and articles that mentioned diabetes only in passing. This latter category was quite rare, given that that the search criteria specified that the article should include "diabetes" as a major term (which LexisNexis defines as a term which describes the majority of the content as determined by a percent relevance score).

Key Variables

Each of the 1,182 articles was assigned a unique ID, and the publication, title, date, page number, section, number of words, and type of article (i.e., news, editorial,

sports, etc.) were recorded for all articles. If the articles met any of the exclusion criteria, this was noted and coders were instructed to stop coding. In total, 323 articles (27.3%) of the 1,182 articles identified were excluded based on these criteria, leaving 859 articles.

The main descriptive variables in the quantitative coding scheme included: type of diabetes (type 1 implicit or explicit, type 2 implicit or explicit, both types, unknown, or gestational diabetes); scientific study mentioned (1 if yes, 0 otherwise); advocacy group mentioned (1 or 0); pharmaceutical company mentioned (1 or 0); differences in type 2 diabetes morbidity or mortality among social groups mentioned (1 or 0 for each category of black/African American, Hispanic/Latino, Asian, Native American, minority, those in poverty, or increasing prevalence among children); number of identifiable individuals with type 2 diabetes described in the narrative, and when discernable, their race/ethnicity, gender, age, socio-economic status; and, number of photos accompanying the article. In addition, text word searches of the full sample of articles identified every article in which the word "epidemic" appeared in the title or text (coded 1 if epidemic appeared, 0 otherwise). See Appendix E and F for the coding sheet and code book with definitions.

For those articles which coders could determine were exclusively about type 1 diabetes, this was noted on the coding sheet and coders were instructed not to code the remainder of the variables for these articles. Such articles discussed exclusively "type 1", "juvenile" or "insulin-dependent" diabetes. Any articles that discussed type 1 diabetes but also included any content about type 2 diabetes (however brief) were coded in their entirety. Any articles that were exclusively about gestational diabetes (of which there were only two) were not coded beyond the descriptive article-level information. Overall, out of the 859 articles which were included in the sample, 158 (18.4%) were about

exclusively type 1 diabetes, 374 (43.6%) were about exclusively type 2 diabetes, 131 (15.3%) were about both types, 177 (20.7%) discussed "diabetes" in general, without providing enough information with which to infer a type, two (0.23%) dealt exclusively with gestational diabetes, and 16 (1.9%) discussed gestational diabetes as well as type 2 diabetes. Since the goal of this research was to describe the social construction of type 2 diabetes, any article that was only about type 1 diabetes or gestational diabetes was excluded from the analytical sample, leaving 698 to analyze fully.

The two major variables that comprised the bulk of the coding were the causes of type 2 diabetes mentioned and the proposals or policies mentioned to treat, prevent, or manage type 2 diabetes. Each was treated as a binary variable, so that for every possible cause of diabetes (e.g., genetics, diet, obesity, lack of exercise, biological factors, SES, healthy food availability, etc.) the coder indicated either "present" or "absent" (1 or 0). Cause variables were coded 1 or 0 regardless of how many times that causal factor was mentioned. The list of causes included on the original coding sheet was based on which causes appeared most frequently in the pilot sub-sample of 60 articles as well as the causes of type 2 diabetes that are most often cited in the epidemiological and social epidemiological literature, ranging from a biological explanation of insulin insufficiency to the social structural factors that influence the prevalence of diabetes (Abraham et al. 2007; Brown et al. 2004; Grant et al. 2006; Schulze and Hu 2005). A cause of diabetes was defined as any factor explicitly noted in the news article as a cause (or putative cause), a risk factor (or putative risk factor), or any other factor contributing to the prevalence of type 2 diabetes. An "other" cause category was also included, with the option to specify any other causes the article cited. After completing the content analysis

for each year's sample, these qualitative "other" causes were re-coded, either into already established categories appearing on the code sheet or into new categories.

Similarly, for the policy proposals variables, the code sheet included a list of potential proposals to treat, manage, or prevent diabetes that appeared in the pilot sub-sample of articles or that are often cited in scholarly articles about treatments and policies to address type 2 diabetes (Colagiuri et al. 2006; Gostin 2007; McKinlay and Marceau 2000; Schulze and Hu 2005). Just as for the cause variables, each of these was treated as a binary variable, so that for every possible strategy to address diabetes (e.g., drugs or pharmaceuticals, taxes on junk food, health management programs, exercise, dietary changes, losing weight, etc.) the coder indicated yes or no (1 or 0) that this was mentioned in the article. An "other" strategies category was also included, with the option to specify any other causes of type 2 diabetes the article cited; these qualitative responses were coded and categorized by the author.

Reliability

Two MPH students were trained to conduct the coding in addition to the author. When they were learning the coding scheme, each of the three coders coded a random selection of 40 articles appearing in 2006, discussing all variables for every article until coming to agreement. Then, each full year set of articles was divided up among the coders, with each coder responsible for approximately one-third of the articles but with some double- or triple-coding, so that about 20 percent of the articles had some overlap. Coders met regularly to discuss all of the overlapping articles, deliberating about all variables for which there was uncertainty or disagreement until consensus was reached. To determine the reliability of the coding scheme, a random sample of 38 articles in 2005

and 40 articles in 2006 was selected, for a total random sample of 78 articles (11% of the 698) that did not meet any of the exclusion criteria and were not about type 1 diabetes exclusively. All three coders coded this sub-sample, and kappa statistics were computed for three raters for each coded variable prior to any discussion of the results, using Stata 9.0 (Fleiss 1981; Landis and Koch 1977). The kappa statistic measures inter-rater reliability for categorical data and adjusts for any coder agreement expected by chance alone. The inter-coder reliability of the data was good; the mean κ for all cause variables was 0.76 and the mean κ for all strategies variables was 0.74. See Table 2.A1, in the Chapter 2 appendix, for the calculated kappa statistics for every variable collected from the code sheet.

Data Analysis

The coders entered all data into Excel software with every article appearing on a unique row headed by the article ID. When more than one coder coded an article (i.e., for the reliability sample), one of the three coders' work was randomly selected to be included in the final data set. Data were merged for the years 2005 and 2006 and the dataset was transferred to Stata 9.0 for analysis. Descriptive statistics (cross-tabs) were performed to display the data, and multivariate logistic regressions were conducted to identify associations between presentations of diabetes and article characteristics, such as length, newspaper source, mentions of pharmaceutical companies, or year of publishing, while controlling for potentially confounding characteristics.

RESULTS

A total of 698 articles were identified for the analytic sample, as per the coding decisions above, that appeared in 19 newspapers between January 1, 2005 and December 31, 2006. Table 2.1 shows the distribution of articles across the 19 newspapers.

Table 2.1: Number and Length of Articles about Type 2 Diabetes, by Newspaper

Newspaper (Daily Circulation[1])	N of articles	% of total	Mean Length (no. of words)	95% Confidence Interval of Length	
				Lower bound	Upper bound
New York Times (1,126,190)	97	13.9	1284.9	1046.9	1522.9
Washington Post (678,779)	76	10.9	830.8	657.7	1004.0
St. Louis Post-Dispatch (271,386)	76	10.9	605.6	524.2	687.0
Houston Chronicle (521,419)	60	8.6	549.0	472.4	625.7
USA Today (2,222,745)	55	7.9	636.5	552.6	720.5
Boston Globe (414,225)	48	6.9	705.2	593.0	817.4
San Diego Union-Tribune (314,279)	47	6.7	750.1	628.0	872.1
Chicago Sun Times (382,796)	41	5.9	462.9	367.3	558.4
Atlanta Journal Constitution (351,999)	34	4.9	669.2	592.3	746.0
St. Petersburg Times (319,349)	21	3.0	730.4	524.5	936.2
Plain Dealer (339,055)	20	2.9	660.4	493.5	827.3
Oregonian (333,515)	19	2.7	862.7	642.3	1083.1
Denver Post (264,301)	18	2.6	591.5	505.1	677.9
NY Daily News (688,584)	18	2.6	538.9	348.8	729.0
Sacramento Bee (290,553)	17	2.4	780.9	546.4	1015.5
San Francisco Chronicle (419,358)	16	2.3	656.2	518.0	794.4
Times Picayune (261,573)	16	2.3	504.2	373.9	634.5
Minneapolis Star Tribune (374,528)	13	1.9	563.9	423.4	704.4
New York Post (662,681)	6	0.9	518.7	266.5	770.8
Total	698				

Note: 1—These are daily (not Sunday) circulation rates from September 30, 2005 as listed in the 2006 *Editors & Publishers Yearbook.*

About 35 percent of all the articles appeared in three sources: the *New York Times* (n=97), the *St. Louis Post-Dispatch* (n=76), and the *Washington Post* (n=76). The mean number of words in these articles ranged from 462 words in articles appearing in *The*

Chicago Sun-Times to 1,284 words in *The New York Times*. The articles appearing in *The New York Times* were significantly ($p<0.05$) longer than articles in any other source, as demonstrated by the 95 percent confidence intervals of article length.[3]

Figure 2.1: Number of Print News Articles about Type 2 Diabetes in 19 Newspapers, per Month for 2005-2006

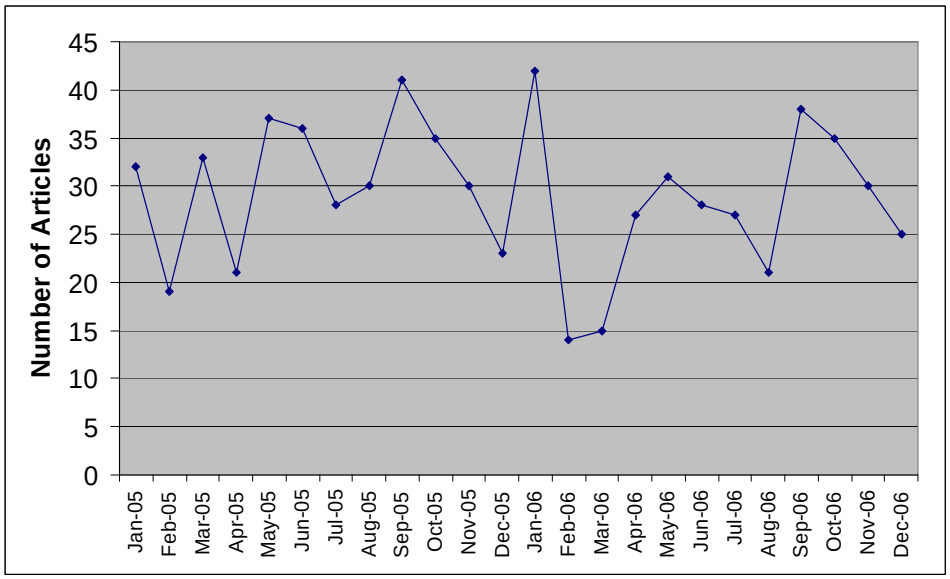


Figure 2.1 displays the number of articles (of the total analytic sample of 698) about type 2 diabetes that appeared in each month from January 2005 to December 2006. Article publishing was highly variable, with no upward trend in publishing, despite the fact that the number of Americans diagnosed with diabetes increased by 14 percent between 2004 and 2006 (ADA 2006). The largest number of articles appeared in September 2005, January 2006, and September 2006. These publishing trends can be explained, at least in part, by the fact that Exubera (inhalable insulin) was recommended

[3]Of note, from January 9-12, 2006, the *New York Times* published a series of 4 particularly comprehensive articles about diabetes in New York City, called "Bad Blood" (mean length of these 4 articles was 5,984 words). After excluding these outlier articles, the mean length of *New York Times* articles was 1,086 words (95% CI: 938.0-1235.0), still significantly longer than every source except the *Washington Post*.

for FDA approval in September 2005 and received FDA approval in January 2006. There was no evidence of publishing more articles about diabetes during November, National Diabetes Month.

A small proportion (88, or 12.6%) of the total sample of articles about type 2 diabetes included a mention of the word "epidemic" in either the title or article body, more in 2006 (50 articles) than in 2005 (38 articles). Just under half (295, or 42.3%) of the articles reported on a scientific study (a published study, conference proceedings, or other scientific report). About a third of the articles (218, or 31.2%) mentioned an advocacy group in the article body or as a source of content, most frequently the American Diabetes Association. A substantial minority (147, or 21.1%) of articles mentioned a pharmaceutical or biotechnology company. Many of these articles, often financial reports, described new drug initiatives, biomedical research, or regulatory activities of the Food and Drug Administration.

News Media Depictions of Diabetes' Causes

More than half of the 698 articles (405, or 58.0%) mentioned at least one causal claim about type 2 diabetes (see Table 2.2). The most frequently mentioned single cause of type 2 diabetes was obesity or weight gain, attributed in 69.6 percent of all articles that mentioned at least one cause. Behavioral factors (including obesity) comprised the majority (79.0%) of causal messages about diabetes.[4] Genetic factors were mentioned in 11.6 percent of articles, while somewhat more (15.3%) mentioned family history.

[4] Obesity/weight gain is categorized here as a "behavioral factor", since this was its emphasis in the media, although it could be classified as a biological or medical factor.

Table 2.2: Causes of Type 2 Diabetes Mentioned in 2005-2006 News Articles

	N	%
No causes mentioned	293	42.0
At least 1 cause mentioned	405	58.0
Causes of T2 diabetes cited, of those articles with at least 1 cause mentioned:		
Genetics or Family History	**95**	**23.5**
Family history	62	15.3
Genetics	47	11.6
Biology	**203**	**50.1**
Biological factors	173	42.7
Aging	44	10.9
Gestational diabetes	12	3.0
Metabolic syndrome	9	2.2
Mental illness (e.g., schizophrenia)	7	1.7
Medical Care	**26**	**6.4**
Pharmaceuticals	15	3.7
Medical treatments (e.g., lithotripsy)	6	1.5
Lack of health insurance	6	1.5
Behaviors or Lifestyle	**320**	**79.0**
Obesity or weight gain	282	69.6
Diet	107	26.4
Lack of exercise	102	25.2
"Lifestyle" factors	34	8.4
Smoking	6	1.5
Lack of sleep	3	0.7
Not breast feeding	1	0.3
Socio-economic or Neighborhood Factors	**47**	**11.6**
Social or neighborhood environment	27	6.7
Food availability or affordability	24	5.9
Socioeconomic status or poverty	20	4.9
Advertisements or marketing	7	1.7
School environment (e.g., vending machines)	4	1.0
Any Socio-economic, Racial/Ethnic, Psychosocial, or Macro Factors	**63**	**15.6**
Category includes the above socio-economic or neighborhood factors, plus:	47	11.6
Race and/or ethnicity	12	3.0
Psychosocial factors (e.g., stress)	9	2.2
Macro trends in lifestyle and diet	8	2.0
Cultural shifts or trends	6	1.5
Agricultural changes	1	0.3
Other environmental factors	1	0.3

Note: Bold-face terms indicate an aggregated causal category comprising the union of all the specific causes listed below. Percentages listed are the proportion, out of all articles that mentioned at least one cause, that mentioned a cause from that category. Percentages do not add up to 100 because causes are not mutually exclusive.

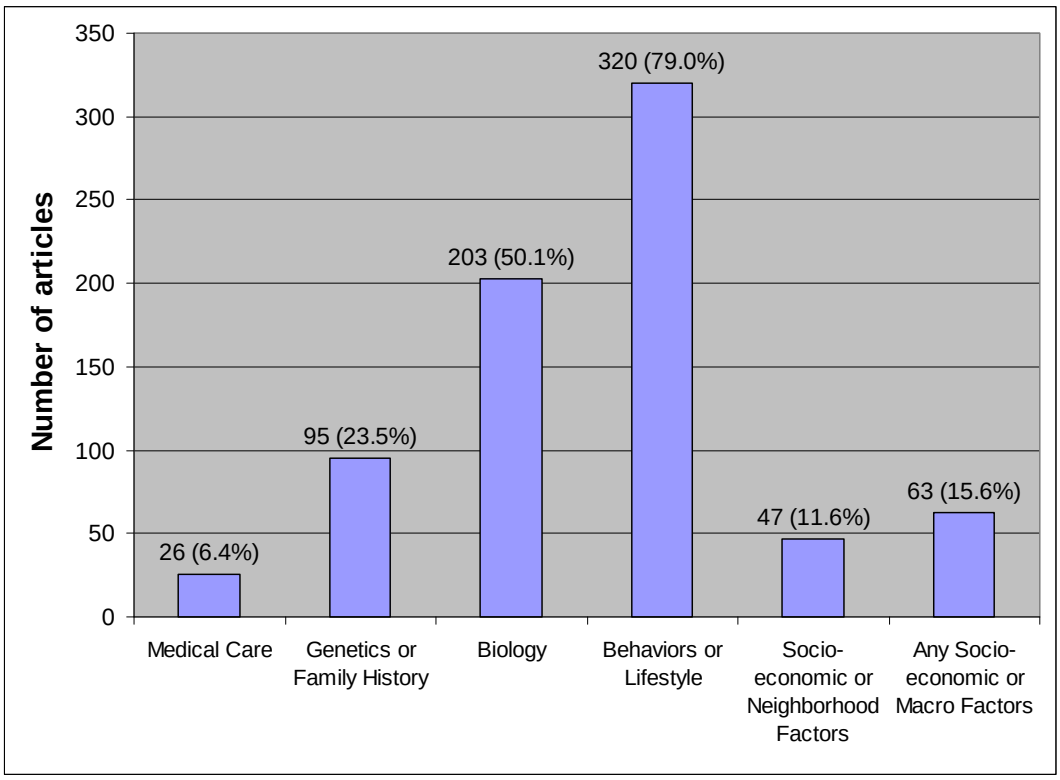
Biological explanations for type 2 diabetes were quite common, mentioned in 50 percent of all articles that mentioned any cause, and included explanations such as that type 2 diabetes is caused by biological malfunctions of insulin processing, aging, or metabolic syndrome. Six percent of articles identified causes associated with medical care, such as not having insurance coverage or side effects of psychotropic drugs.

The same proportion of articles that mentioned genetics (11.6%) mentioned any social or environmental determinants of diabetes, including socioeconomic status, food access or affordability, the neighborhood environment, advertising or marketing of unhealthy food, or the school environment (such as vending machine options). More articles (n=28) mentioned social or environmental determinants of diabetes in 2006 than in 2005 (n=19), a difference which was statistically significant at $p<0.10$ ($\chi^2=2.84$, df=1, p=0.09). Considering social causes even more broadly, 15.6 percent of articles mentioned any of the aforementioned socioeconomic, neighborhood, or environmental factors or identified psychosocial causal factors (such as stress), race or ethnicity, or other macro-level changes in diet, exercise, or cultural preferences. Figure 2.2 demonstrates the dominance of behavioral factors over other levels of causation of type 2 diabetes presented in the news media.

Of the 405 articles that described any causes of type 2 diabetes, just under half (n=195, 48.1%) described causes exclusively within one cause category (i.e., just behavioral factors, or just genetics) while the other half (n=210, 51.9%) described multiple causal categories of diabetes. Of the 195 articles mentioning causes from just one causal category, 25.0 percent were biological, 5.1 percent were genetic, and 69.2 percent were behavioral (none described just medical care-related causes). Just one

article (0.5%) described the social determinants of type 2 diabetes without mentioning any other causal explanation, meaning that the social determinants cause category essentially always co-occurred with other causal explanations for diabetes (usually behavioral explanations).

Figure 2.2: Number and Type of Causes of Type 2 Diabetes in 2005-2006 News Articles Which Mention at Least 1 Cause (N=405)



News Media Depictions of Diabetes' Solutions

Just as behavioral factors were the most common causal explanation of type 2 diabetes in news articles, so too were behavioral changes the most commonly indicated way to address the disease (see Table 2.3). Of the 551 (70%) of the 698 articles that

mentioned any treatments or preventive strategies, 58 percent mentioned individual-level behavior changes, mainly diet (46.2%), exercise (38.1%), and weight loss (23.2%). Identifying pharmaceuticals or biotechnological products as ways to address diabetes was also common, mentioned in 53.9 percent of all articles. Other than pharmaceuticals, health-care oriented programs or strategies were mentioned in 34.9 percent of articles. These included health management programs, employer-based programs, insurance coverage incentives, provider incentives for diabetes treatment, and screening, both among the un-diagnosed and blood glucose screening and management among diabetics.

About 17 percent of articles described health education strategies to deal with diabetes, such as organized campaigns, books (often self-help or diet books), health fairs, or cooking classes. A very small number (2%) of articles described individual-level psychosocial strategies for managing diabetes, like stress management, faith, and personal commitment.

Table 2.3: Proposals Mentioned to Treat, Manage, or Prevent Type 2 Diabetes in 2005-2006 News Articles (N=698)

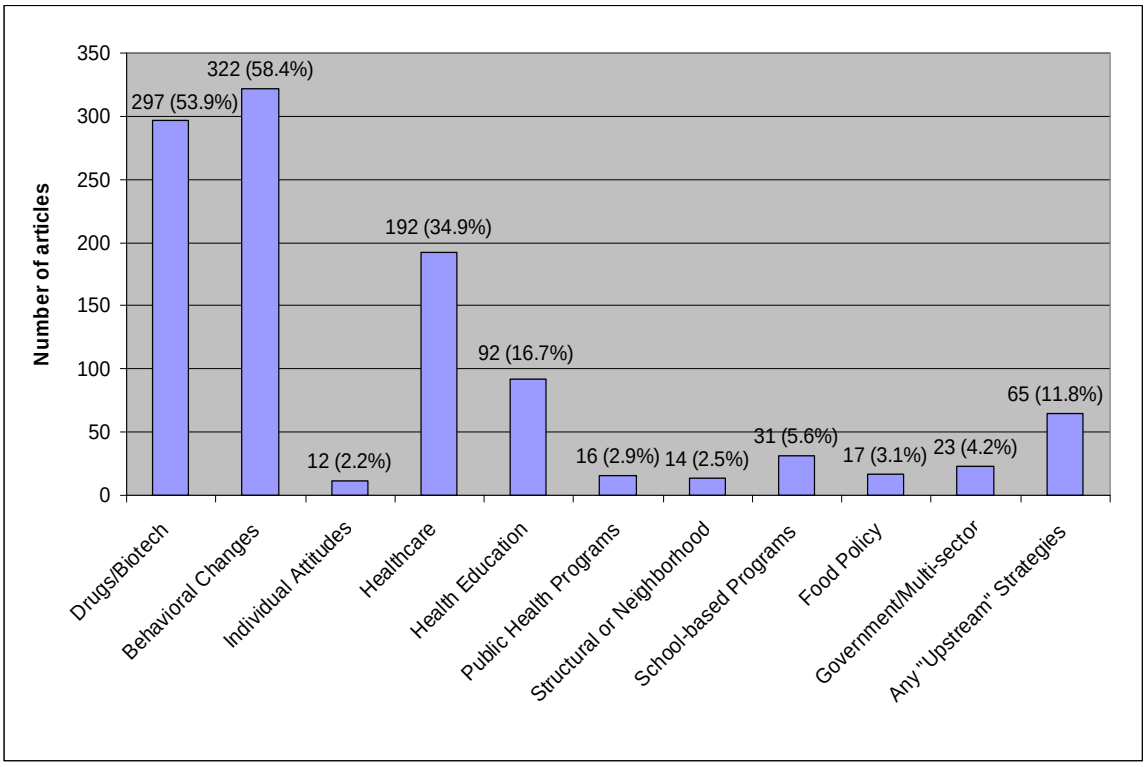
	N	%
No proposals mentioned	147	21.1
At least 1 proposal mentioned	551	78.9
Proposals to deal with T2 diabetes cited, of those articles with at least 1 proposal mentioned:		
Drugs and Biotechnology	**297**	**53.9**
Pharmaceuticals	277	50.3
Biotechnology	46	8.4
Behavioral Changes	**322**	**58.4**
Dietary changes	255	46.3
Lifestyle or exercise	210	38.1
Weight loss or weight management	128	23.2
Breast-feeding	6	1.1
Quitting smoking	5	0.9
Parental behaviors or role models	2	0.4
Individual Attitudes or Coping	**12**	**2.2**
Stress management	9	1.6
Personal faith, religion, or philosophy	4	0.7

Food Policy	**17**	**3.1**
Food industry regulations	8	1.5
Food labeling	4	0.7
Advertising or marketing regulations	4	0.7
Taxes on junk/snack food	2	0.4
Trans fat bans or regulations	2	0.4
Subsidies on healthy food	1	0.2
Changes to WIC formulary	1	0.2
Healthcare-oriented Programs	**192**	**34.9**
Blood glucose monitoring or management	66	12.0
Medical treatment for complications	49	8.9
Health management programs	41	7.4
Access to health care or insurance	37	6.7
Screening among undiagnosed	33	6.0
Surgery (e.g., bariatric surgery)	11	2.0
Provider programs (e.g., pay for performance)	15	2.7
Insurance incentives	5	0.9
Employer-based programs	4	0.7
Specialty diabetes clinics	3	0.5
Genetic testing	2	0.4
Alternative medicine	1	0.2
Electronic medical records	1	0.2
Education and Counseling	**92**	**16.7**
Health education, dietary counseling, or cooking classes	94	17.1
Social support (e.g., support groups)	10	1.8
Public Health Programs	**16**	**2.9**
Registry/surveillance (e.g., NYC registry)	13	2.4
Community-based public health (e.g., outreach programs)	3	0.5
Structural or Neighborhood Programs/Policies	**14**	**2.5**
Addressing poverty (e.g., charity or welfare)	7	1.3
Urban planning (e.g., building parks)	3	0.5
Grocery stores (e.g., access or food availability)	3	0.5
Housing programs	1	0.2
Other environmental changes	1	0.2
School-based Programs (e.g., physical activity, cafeteria choices, vending)	**31**	**5.6**
Government or Multi-sector Responsibility	**23**	**4.2**
Government programs (e.g., Healthy Ohio)	9	1.6
Multi-sector strategy (e.g., media, schools, and food industry)	7	1.3
Addressing norms	4	0.7
Addressing culture	3	0.5
Any Upstream Strategy	**65**	**11.8**

Note: Bold-face terms indicate an aggregated strategies category comprising the union of all the specific strategies listed below. Percentages listed are the proportion, out of all articles that mentioned at least one strategy, that mentioned a strategy from that causal category. Percentages do not add up to 100 because strategies are not mutually exclusive.

Figure 2.3 displays the strategies that articles described for dealing with type 2 diabetes, arranged from individually-oriented strategies (behavior changes, medical care, coping, etc.) on the left to strategies with a more population-oriented impact on the right (food policy, school programs, etc.). Population-based strategies were much less frequently mentioned relative to strategies that were directed at individuals' behaviors or oriented around medical care. One type of population-based strategy included formal public health programs, like a New York City Department of Health and Mental Hygiene program to create a surveillance registry of diabetics' hemoglobin A1C laboratory values (Steinbrook 2006). Thirteen articles, 6 in 2005 and 7 in 2006, referenced this program, which took effect on January 15, 2006. Policies to address socio-economic disadvantage (e.g., aid to the poor through charity or welfare programs) or the neighborhood environment (e.g., building parks, improving access to grocery stores) were rare, appearing in 14 (2.5%) articles about diabetes. Discussion of programs to change the school-level environment to prevent diabetes among children, such as physical education requirements, enhancing healthy vending machine options, or eliminating fast food from school cafeterias, occurred in 31 (5.6%) articles.

Figure 2.3: Number and Type of Strategies Mentioned to Prevent or Treat Type 2 Diabetes, in 2005-2006 News Articles Which Mention at Least 1 Such Strategy (N=551)



Only 17 (3.1%) articles described food policy strategies, despite their prominence in academic articles describing ways to reduce overweight, obesity, and type 2 diabetes (Boehmer et al. 2007; Kim and Kawachi 2006; Schwartz and Brownell 2007). Such strategies included taxing junk food, food labeling, trans fats regulations, voluntary food industry changes, and advertising and marketing regulations for unhealthy food. Broad statements about social, governmental, or industry responsibility were more common than were mentions of specific food policy strategies, occurring in 23 (4.2%) of articles. These articles made explicit reference to the idea that reducing diabetes requires changes beyond the level of the individual, including state government responsibility for initiatives, multi-sector strategies involving the media, food industry, governments, and

schools, and macro-level changes in norms and culture to facilitate health behavior changes. Considered collectively, 65 articles, or about 12 percent of all those that mentioned any strategies, discussed any "upstream" strategies to address type 2 diabetes, defined as encompassing social structural programs, neighborhood changes, food policies, school-level programs, or broad statements about government or multi-sector responsibility for the problem.

Next, multivariate logistic regressions were estimated to assess whether there were any significant associations between the ways articles described the causes of diabetes and whether they depicted any upstream policy approaches. This analysis should help determine if media discussion of certain types of causes predict discussion of certain types of solutions. Table 2.4 displays logistic regression models of mentions of upstream policy approaches regressed on each causal category in separate models. (Due to the significant collinearity between causal mentions, all the causes were not included together in a single model.) Each of these four models also control for the length of the articles, given that longer articles have a higher risk of describing policy strategies more comprehensively, as well as mentions of pharmaceutical companies, to adjust for the correlation between reporting on FDA approval of new drugs or devices and focusing on biological causes and medical treatments. Controlling for articles' length and their pharmaceutical company content, Table 2.4 reveals a strong association between depictions of causes and upstream policy strategies. Articles that mentioned social causes of diabetes were significantly (odds ratio $OR=8.56$, $p<0.001$) more likely to discuss upstream policy strategies, as were articles that described behavioral causes of diabetes ($OR=6.77$, $p<0.001$). Articles that mentioned biological causes of diabetes were

less likely to mention any upstream policy strategies (OR=0.57, p=.08). There were no significant associations between mentioning genetic causes of diabetes or medical care-related causes and mentioning upstream policy strategies.

Table 2.4: Multivariate Logistic Regression Models of Mentioning Upstream Strategies for Diabetes on Mentions of Diabetes' Causes

	Odds Ratio (95% CI)
Any social cause	8.56 (4.57-16.06)***
Behavioral cause	6.77 (3.37-13.60)***
Genetic/family history cause	1.46 (0.74-2.90)
Biological cause	0.57 (0.30-1.07)†
Medical care cause	0.29 (0.03-2.36)

Note: N=698. Each row shows the results of separate regression models; each model also controls for length and whether the article mentioned pharmaceutical companies.
†<0.10, *<0.05, **<0.01, ***<0.001

News Media Depictions of Diabetes Disparities

A small proportion of articles about type 2 diabetes discussed social disparities in its incidence or prevalence. Twelve percent of all articles (n=84) mentioned at least one type of racial or ethnic difference in diabetes rates. Fifty-six (8.0%) articles mentioned higher rates among blacks/African Americans, 48 (6.9%) mentioned higher rates among Latinos, 31 (4.4%) mentioned higher rates among Native Americans or Alaskan Natives, and 18 (2.6%) mentioned higher rates among Asians or Pacific Islanders. Eleven articles (1.6%) made only general reference to minority populations having higher rates of type 2 diabetes. Twenty-one (3.0%) articles identified the fact that poorer people tend to have higher rates of type 2 diabetes, while 11 (1.6%) articles mentioned differences in diabetes prevalence across people living in various geographical areas. In total, 95 (13.6%) articles made any mention of social disparities in diabetes rates, including racial or

ethnic-, class-, or neighborhood-related disparities. Seventy-three (10.5%) articles mentioned type 2 diabetes' increasing prevalence among children and young adults.

There were strong associations between mentioning disparities, discussing social determinants, and mentioning upstream policy strategies, suggesting these features of population health-oriented coverage tended to be communicated in the news media together. Controlling for length and pharmaceutical company mentions (full models not shown), articles that mentioned any disparities were also significantly more likely to discuss social determinants (OR=11.5, $p<0.001$) and mention upstream policy strategies (OR=3.16, $p<0.001$). Including the same controls, articles identifying diabetes as an "epidemic" were also more likely to use a population health orientation in their coverage; these articles were more likely to mention disparities in diabetes rates (OR=4.23, $p<0.001$), social determinants of diabetes (OR=5.43, $p<0.001$), and upstream policy strategies (OR=4.08, $p<0.001$).

Article-level Factors Predicting a Population Health Orientation

Certain news outlets may be more or less likely to cover the social determinants of diabetes, upstream policy approaches to diabetes, or disparities in diabetes rates. Table 2.5 displays the distribution of newspapers covering these features of diabetes. This table demonstrates that a large proportion of the coverage of these population-health oriented features of diabetes appeared in just two sources, *The New York Times* and *The Boston Globe*. For instance, 21 of the 47 articles that mentioned social determinants appeared in these two sources exclusively. In addition, these two sources produced 22 of the 65 articles that mentioned upstream policy approaches and 32 of the 95 articles that mentioned any social disparities. Many newspapers (including the *Atlanta Journal-*

Constitution, *Denver Post*, *New York Post, San Francisco Chronicle, St. Petersburg Times,* and *Times Picayune*) did not contribute a single article that discussed any social determinants of diabetes.

Of course, since the *Boston Globe* and the *New York Times* contributed a higher proportion of the total volume of coverage, they would likely contribute a proportionally greater volume of coverage using a population health perspective. To adjust for this, the third column under each heading in Table 2.5 shows the proportion of each source's total coverage that mentions the outcome (social determinants causes, given any causes mentioned; upstream strategies, given any strategies mentioned; and any disparities). This provides a different perspective on sources' contributions to the discourse surrounding diabetes. For instance, 38 percent of *New York Daily News* coverage of the causes of diabetes mentioned its social determinants, much higher than the sample average of 11.6 percent. Similarly, 22 percent of *New York Daily News* coverage mentioned disparities, also higher than the sample average of 13.6 percent. Newspapers that devoted at least 20 percent of their coverage of diabetes' causes to mentions of social determinants included the *Boston Globe, New York Daily News, New York Times, Oregonian, Plain Dealer, Sacramento Bee,* and *Minneapolis Star Tribune.* Newspapers that devoted at least 20 percent of their coverage of treatments or policy strategies to "upstream" policies included the *Boston Globe, New York Post, Plain Dealer, San Francisco Chronicle,* and *Minneapolis Star Tribune.* Finally, newspapers that devoted at least 20 percent of their coverage to diabetes' disparities included the *Atlanta Journal Constitution, Boston Globe, New York Daily News, Oregonian,* and *Sacramento Bee.* The *Times Picayune* mentioned disparities in 19 percent of its coverage.

Table 2.5: Print Newspaper Coverage of Social Determinants, "Upstream" Policy Approaches, and Disparities in Type 2 Diabetes

	Social Determinants			Upstream Policy Approaches			Disparities in T2 Diabetes		
	N of articles	% of total	% of source[1]	N	% of total	% of source[2]	N	% of total	% of source[3]
Atlanta Journal Constitution	0	0	0	3	4.6	10.3	9	9.5	26.5
Boston Globe	7	14.9	20.0	8	12.3	20.5	15	15.8	31.3
Chicago Sun Times	2	4.3	9.5	3	4.6	9.4	6	6.3	14.6
Denver Post	0	0	0.0	1	1.5	10.0	1	1.1	5.6
Houston Chronicle	1	2.1	2.5	4	6.2	9.8	3	3.2	5.0
NY Daily News	3	6.4	37.5	2	3.1	13.3	4	4.2	22.2
New York Post	0	0	0	1	1.5	25.0	0	0	0
New York Times	14	29.8	22.2	14	21.5	16.3	17	17.9	17.5
Oregonian	3	6.4	37.5	3	4.6	18.8	4	4.2	21.1
Plain Dealer	3	6.4	33.3	3	4.6	20.0	2	2.1	10.0
Sacramento Bee	2	4.3	25.0	2	3.1	14.3	4	4.2	23.5
San Diego Union-Tribune	2	4.3	9.5	5	7.7	12.5	3	3.2	6.4
San Francisco Chronicle	0	0	0	3	4.6	25.0	2	2.1	12.5
St. Louis Post-Dispatch	3	6.4	6.3	2	3.1	3.4	5	5.3	6.6
St. Petersburg Times	0	0	0	0	0	0	3	3.2	14.3
Minneapolis Star Tribune	1	2.1	20.0	2	3.1	20.0	2	2.1	15.4
Times Picayune	0	0	0	1	1.5	7.7	3	3.2	18.8
USA Today	4	8.5	10.8	7	10.8	14.9	5	5.3	9.1
Washington Post	2	4.3	4.5	1	1.5	1.9	7	7.4	9.3
Total (or mean % of sample)	47		(11.6)	65		(11.8)	95		(13.6)

Notes: 1—Proportion mentioning social determinants, of each newspaper's articles mentioning at least 1 cause
2—Proportion mentioning upstream strategies, of each newspaper's articles mentioning at least 1 strategy for prevention/treatment
3—Proportion mentioning any racial/ethnic, socioeconomic, or neighborhood-level disparities, of newspaper's total article

Some news sources had particularly low coverage of social determinants, upstream policies, or disparities by either metric shown in Table 2.5. These included the *Houston Chronicle*, the *Denver Post*, the *St. Petersburg Times*, the *St. Louis Post-Dispatch,* the *Times Picayune* (for social determinants of health or upstream strategies) and the *Washington Post.*

Understanding the newspaper-specific differences in diabetes coverage requires a multivariate approach. For instance, some newspapers may simply tend to publish longer articles and thus are more likely to mention certain aspects of diabetes than newspapers that publish shorter articles. Adjusting for article length in a multivariate model can clarify whether some newspapers are different beyond their tendency to feature longer articles. Table 2.6 presents the results of a multivariate logistic regression model of characteristics associated with taking a *population health* orientation in coverage, defined as 1 if the articles mentioned any social determinants, any upstream strategies, or any disparities in diabetes, and 0 otherwise. (The proportion of news articles taking this orientation ranged from 10.5 percent in the *Washington Post* to 39.6 percent in *The Boston Globe*, with a mean proportion for the full sample of 20.8 percent.) This model includes dummy variables for each newspaper source, with *USA Today* excluded as the reference source (which had a mean proportion of population health coverage of 20.0%, close to the sample mean). These results indicate that longer articles were significantly more likely to use a population health orientation ($p=0.001$), while articles that mentioned pharmaceutical companies were significantly less likely to take such an orientation ($p<0.001$). Controlling for these characteristics, relative to *USA Today,* the *Boston Globe* was significantly more likely to use a population health orientation ($p<0.05$), while the

Washington Post and the *St. Louis Post Dispatch* were less likely (p<0.10). Articles that cited advocacy groups were more likely to use a population health orientation, while articles reporting on scientific studies were less likely to do so, but neither of these differences were significant at p<.10.

Table 2.6: Multivariate Logistic Regression Model Predicting Use of Population Health Features in Newspaper Coverage of Diabetes

	OR (95% CI)
Advocacy group mentioned	1.32 (0.86-2.03)
Scientific study mentioned	0.70 (0.45-1.09)
Length[1]	1.00 (1.00-1.001)**
Pharmaceutical company mentioned	0.15 (0.07-0.32)***
Atlanta Journal Constitution	1.33 (0.49-3.66)
Boston Globe	2.77 (1.10-6.99)*
Chicago Sun Times	0.69 (0.22-2.16)
Denver Post	0.36 (0.07-1.85)
Houston Chronicle	0.45 (0.15-1.30)
NY Daily News	1.63 (0.45-5.94)
New York Post	0.64 (0.07-6.12)
New York Times	1.14 (0.46-2.78)
Oregonian	1.01 (0.28-3.61)
Plain Dealer	1.21 (0.35-4.10)
Sacramento Bee	1.26 (0.37-4.34)
San Diego Union-Tribune	0.87 (0.30-2.53)
San Francisco Chronicle	1.48 (0.40-5.50)
St. Louis Post-Dispatch	0.43 (0.16-1.15)†
St. Petersburg Times	0.48 (0.11-2.02)
Minneapolis Star Tribune	1.20 (0.26-5.43)
Times Picayune	1.07 (0.27-4.17)
Washington Post	0.40 (0.14-1.15)†
N=698	
Pseudo R-squared=0.13	

Notes: 1—Length is number of words. Reference category for newspapers is *USA Today*. †<0.10, *<0.05, **<0.01, ***<0.001

DISCUSSION

This study quantitatively evaluated news coverage of type 2 diabetes in 19 newspapers in 2005 and 2006, presenting the most comprehensive evaluation of diabetes in the mass media to date. As researchers have observed in news coverage of other chronic conditions (Kim and Willis 2007; Lantz and Booth 1998), behavioral causes of diabetes dominated the discussion in the media, comprising 79 percent of all discussion about causes. About 15 percent of articles recognized at least some of the socioeconomic, neighborhood, racial/ethnic, psychosocial, or macro-level factors shaping the incidence of diabetes. Messages about ways to address diabetes focused on behavioral changes, pharmaceutical interventions, and health-care and health-insurance oriented strategies, rather than social policy-oriented strategies that intervene on diabetes at levels "upstream" from the individual, such as neighborhood revitalization programs, programs to address social structural inequalities, school-based programs to change nutrition access among children, or food-related policies like marketing or advertising junk food. Articles that discussed biological causes of diabetes were less likely to mention these upstream policies, while articles that discussed social determinants were much more likely to describe upstream solutions.

Interestingly, while news media discussion of diabetes' biological causes was quite common, discussion of genetics in particular was not that prevalent. This is surprising in light of academic concerns surrounding "geno-hype", the perception of the news media's inflated expectations of genetics, and "geneticization," the observation of increasing attribution of genetic causes to medical and social conditions (Bubela and Caulfield 2004; Hedgecoe 2002; Lippman 1991). Just 47 articles of the 405 that

mentioned any causes explicitly identified genetic factors as causes or putative causes of type 2 diabetes, despite the fact that a major susceptibility gene (TCFL2, or transcription factor 7 like-2) for type 2 diabetes was identified during the time period of this study (Florez et al. 2006). Saguy and Almeling (2008) also noted a surprising lack of discussion of genetic contributors to obesity in the media. Some commentators have suggested that media discussion of genetics and diabetes may have troubling consequences on public perceptions, including promoting fatalism among the public about risk of disease (Senior, Marteau, and Peters 1999), individualizing the problem and neglecting the social factors that shape diabetes' incidence (Conrad 1997; Horwitz 2005; McDermott 1998), or fostering essentialist understandings of genetics and race (Condit and Bates 2005; McDermott 1998). Yet, these findings suggest that the volume of genetics-oriented coverage of type 2 diabetes is not overwhelming, and is not a major media message relative to the lifestyle and behavioral risk factors.

A small minority of articles about diabetes mentioned any racial, ethnic, neighborhood, or social class-related disparities in its incidence, prevalence, morbidity, or mortality. This finding suggests that the public may not be aware about diabetes disparities and may not consider the issue important for health policy or public policy to address, supporting others' observations about the news media agenda (Armstrong, Carpenter, and Hojnacki 2006). This contrasts with the case of media representation of poverty, wherein research has found that the media tends to *over-represent* blacks in media coverage of poverty, potentially depressing the white public's willingness to help the poor through charity or welfare programs (Gilens 1999; Hannah and Cafferty 2006). Given the relatively infrequent media discussion of the high rates of diabetes among

blacks, similar concerns that negative attitudes about racial groups may become activated by coverage about health disparities in diabetes are either not valid or premature. The present analysis is limited in its conclusions about the social construction of people with diabetes, since it only analyzed text-based references to the race and social class of people with diabetes, and was not able to do so reliably.[5] But based on the relatively small prevalence of mentions of diabetes disparities, these data are suggestive that media messages about diabetes are largely neutral on the race of those the disease affects, not over-representing one group over another in media coverage.

Implications of Diabetes Coverage

This dominant emphasis on lifestyle, behaviors, and individualized medical causal factors in the print news media might leave an impression among the public that the responsibility for addressing rising rates of diabetes should fall to the individual and the medical system, as Kim and Willis (2007) observed is the case for obesity. Rarely did articles mention government, industry, or school systems as actors that might have roles and responsibilities regarding diabetes.[6]

From a health communication perspective, the news media consistently disseminate the message that individuals should manage their weight and eat a healthy diet as a way to prevent type 2 diabetes or its complications, which could have positive influences on the health behaviors of the public. (Although, nearly as many articles

[5] Analysis of the social characteristics of the 172 individuals identified in the text of the 698 articles was difficult and produced much missing data. For instance, race/ethnicity of the identifiable individual described in the text was coded for only 35% of the cases, and those were disproportionately classified as Hispanic/Latino given the ease of identifying surnames of Hispanic origin.

[6] A notable exception to this trend was a series of news articles appearing in 2005 about former President Clinton's and then-governor Huckabee's childhood obesity initiatives, which often identified the promise of a multi-sector approach to dealing with obesity and diabetes.

mentioned pharmaceutical strategies for diabetes as mentioned lifestyle or behavioral strategies, despite the effectiveness of lifestyle changes alone in reducing diabetes risk (Knowler et al. 2002)). Yet many people at risk for diabetes face great social and economic barriers to improving their diet, engaging in physical activity, or adhering to treatment regimens (Lutfey and Freese 2005). Moreover, those with more education and other social and economic resources have greater capacity to respond to information in the media and to change their behavior (Viswanath and Bond 2007).

From a policy perspective, the small amount of aggregate media coverage focused on social determinants or social policy solutions observed in this study overall would not convey information to the public about social, governmental, or industry levels of responsibility for addressing diabetes (see also Taylor-Clark 2007). Social movement theory, which emphasizes the mobilizing potential of "injustice frames" (see e.g., Gamson 1992), suggests that the dominant way that diabetes is framed in the media would be unlikely to mobilize public interest or activism around strategies that could prove quite effective at reducing rates of diabetes. Moreover, given that public awareness of social determinants may be associated with the public's support for social policies to influence the non-medical determinants of health (Reutter, Harrison, and Neufeld 2002), the small proportion of media discussion on social determinants may explain the lack of public engagement in the U.S. surrounding population-health oriented policies.

Other commentators have also observed a paucity of consideration of social determinants in health communications (Viswanath and Emmons 2006) and the news media (Hayes et al. 2007). This trend may not be particularly surprising in the United

States, where an ethos of personal responsibility for health dominates the discourse (Dorfman, Wallack, and Woodruff 2005). Moreover, the limited policy action surrounding health disparities in the U.S. has mainly focused on health care disparities (Stone 2006), and not health status disparities, in which social determinants would likely have a more prominent role in the public debate. Yet even in Canada, which has been much more active than the United States in developing national policy surrounding population health and its determinants, media discussion of social determinants is nearly non-existent. One study of 4,732 health articles appearing in Canadian newspapers found that mentions of the social determinants of health comprised only 0.2 percent of the sampled stories from 1993-2001 (Hayes et al. 2007). These authors concluded that newspapers in Canada "do not find the central observation [i.e., social determinants of health] driving the population health perspective in public policy newsworthy" (p. 1950).

Variability in Coverage

Concluding that the U.S. news media do not consider the social determinants of diabetes or population-health oriented coverage newsworthy, however, does not tell the whole story. In fact, the present findings suggest there is a great deal of variability in the tendency of certain newspapers to discuss diabetes from a population health perspective. Two northeastern newspapers, the *New York Times* and the *Boston Globe* (which are owned by the same company), contributed a large portion of the total volume of coverage of social determinants; the latter was significantly more likely than the average newspaper to cover type 2 diabetes from a population health perspective even after controlling for factors like length and the number of articles about the pharmaceutical

industry. On the other hand, these findings suggest that vast regions of the country do not receive print news media information (at least from the high-circulation newspapers included in this study) about the social determinants of diabetes. In fact, only one article out of the 131 articles from the four sampled newspapers from the southern United States (*Houston Chronicle, Times Picayune, Atlanta Journal-Constitution*, *St. Petersburg Times)* mentioned any social, economic, or neighborhood determinants of diabetes. The *Washington Post,* controlling for article length and other features of coverage, used a population health perspective in its discussion of diabetes significantly less often. Thus, the population health perspective—promoting social determinants, policy approaches targeted at populations, and racial and ethnic disparities in diabetes—was virtually absent in the news source likely most frequently read by Washington area policy-makers, lobbyists, and advocates.

Some news sources that may reach an ethnically and socio-economically diverse population, like the *New York Daily News* and Cleveland's *Plain Dealer* tended to discuss diabetes relatively infrequently, but when they did, they were more likely to mention diabetes' social determinants or disparities. This suggests these news outlets may have recognized the newsworthiness of these features of diabetes to their readership. However, these messages were infrequent in volume, particularly relative to those of the *New York Times* and the *Boston Globe.* Research suggests that heavy exposure of a message is critical for its effective communication: increasing the likelihood that the audience is ready to receive it, making the message seem more credible, increasing the diffusion of that message through social networks, and giving the impression to policymakers that the message is of great public interest (Hornik and Kelly 2007).

Why, then, do certain news sources discuss social determinants and other aspects of a population health-oriented coverage more than others? At the article level, longer articles were more likely to discuss social determinants (which is unsurprising, given the difficulty communicating the complexity of the concept, see Niederdeppe and colleagues 2008). Longer and more complex articles are probably more likely to be produced by those newspapers that have multiple dedicated health reporters. Articles about diabetes that mentioned the pharmaceutical industry (such as reports of Food and Drug Administration approvals) were less likely to mention social determinants, and such articles may well be the type of health policy or financial brief that is more readily disseminated from a news wire, rather than created de novo by staff journalists.

A thorough discussion of the political, social, and institutional factors shaping the coverage of the 19 newspapers included in the study is beyond the scope of the present analysis and the data collected in this study (see, e.g., Benson 2004; Schudson 1995; Tuchman 1978). However, several tentative explanations can be hypothesized for future study. Regarding institutional or organizational factors, each newspaper has a varying budget that it can spend on health-related news reporting as well as a different number of dedicated health reporters. These factors likely influence whether newspapers rely more heavily on national news wires such as the Associated Press or develop health stories themselves. These factors may be related to the newspapers' likelihood of reporting on the social determinants of health. In addition, reporters often rely on certain regular sources in their articles, perhaps those with whom they have an established personal relationship or with whom they are in close proximity, which influences the content of articles (Gans 1979). Some sources, like academic public health scholars, may put a

greater emphasis on a population health perspective than others in their discussions of diabetes. Moreover, individual differences among reporters may also play a role; some individual journalists may more easily grasp a contextualized social structural framing of diabetes than others.

The norms to which journalists aspire to adhere may also explain news articles' tendency to discuss the individualized factors that influence health. Gans (1979) proposes that journalists adhere to a particular set of values in their reporting, such as altruistic democracy, responsible capitalism, and individualism. He argues that as a result of dedication to these values, journalists rarely discuss economic or structural barriers to individuals' achievement or the fact that capitalism can lead to structural inequalities. In addition, journalists place highest priority on a story's newsworthiness. An emphasis on conflict, drama, or novelty can enhance a particular story's perceived newsworthiness (Price and Tewksbury 1997), qualities that may be difficult to highlight in discussions of the enduring socioeconomic influences on health. Moreover, news coverage tends to be episodic, focusing on events, and less likely to emphasize the broader social context that a discussion of the social determinants of diabetes would require (Iyengar 1991; Niederdeppe et al. 2008).

A final contextual factor which may play some role in the patterns observed is *politics*—whether of the audiences or of the media outlet itself. It is well known that Democrats are more likely than Republicans to agree with the idea that social structural factors, and not just individual or behavioral factors, are responsible for inequalities in social status (Kluegel and Smith 1986). This suggests there may be political differences in the population in the degree of accepting the idea of social determinants of health and

health inequalities. In fact, survey-based experimental work indicates that educated, liberal Democrats are more likely to agree with a social determinants explanation for diabetes (see Chapter 3). Whether this public opinion finding is a cause, or a consequence, of the coverage choices by publications like the *New York Times* and the *Boston Globe* is yet unclear.

Limitations

This research has several limitations. First, the data only include print news articles, not television, and more Americans get their news from television (and particularly local television) than from print news (Pew 2006).[7] However, it is unlikely that television covers the complexity of social pathways of disease, given the tendency of TV coverage and local TV coverage in particular to provide over-simplified health content (Pribble et al. 2006). Kim and Willis (2007) found that television coverage was not significantly different from print coverage in representations of obesity's causes, but tended to emphasize personal solutions to obesity even more so than print. This suggests that the findings from the present analysis, only observing print news, may actually over-estimate the prevalence of population health-oriented depictions of diabetes in the media.

The greatest advantage of including television news in this sample would have been to code the images in order to understand better the social construction of who gets diabetes. Images of people can provide an easily recognizable signal of the social group with diabetes. Researchers have shown that images can serve as framing devices to

[7] I actually did gain access to and watch 10 news clips about diabetes from Pribble's and colleagues' (2005) nationally representative sample of evening local health news from 2002. My qualitative assessment from this small sample was that these articles tended to focus exclusively on individual causes (particularly behaviors and biological factors) and solutions (particularly diet, exercise, and pharmaceuticals) of type 2 diabetes, in the "news you can use" tradition.

identify a target social group (Nelson and Kinder 1996) and can convey information about what group is at risk for a particular disease, even in the absence of textual cues (Gibson and Zillman 2000). This analysis did code for whether are not there was an accompanying photograph for each article in the sample of 698 articles, so a future research effort could find and clip these photographs in order to code social demographic information about each of the people pictured with type 2 diabetes.

In addition to not including television news, the sample did not include ethnic media sources. Research has identified significant differences in the health communication messages contained in ethnic media versus major news media (Stryker, Emmons, and Viswanath 2007). Not only would ethnic media reach an audience at higher risk for diabetes and may serve as an important source of health information for that audience, but it could also mobilize members of communities who are more likely to be affected by health disparities to take local, grassroots, actions.

Another limitation of the analysis is that data were not collected on the specific sources cited for the claims articles made, such as CDC staff, policymakers, or academic scientists. The source of the message may have a significant influence on the perceived credibility of the information, and thus the extent to which any framing effects might occur (Druckman 2001). The specific reporter or wire service that created the article was also not recorded, so it is not possible to assess whether observed variation is a result of differences among reporters.

Finally, this analysis only focused on one condition, so it is not clear whether the findings of patterns of coverage of diabetes can be generalized for other diseases which

have similar epidemiological features (such as cardiovascular disease) and which are similar contributors to health disparities in the United States.

Conclusions and Future Directions

News articles about diabetes from 2005 and 2006 tended to emphasize behavioral causes of diabetes and individualized approaches to dealing with diabetes far more than they mentioned social determinants or social policy approaches. Survey-based and/or experimental research (see, e.g., Chapters 3 and 4) would be necessary to identify any impact of these causal explanations, particularly the social determinants explanation, on the public's opinions regarding policies and programs to prevent or treat diabetes. Yet findings from this content analysis indicate that frames of the determinants of diabetes do not occur in isolation in a news article. Rather, news media presentations about the causes of diabetes often occur in packages, with a discussion of one type of health determinant occurring with discussion of another. Future experimental research might explore how multiple frames of the determinants of health in a single news article compete for the public's attention, identify which frames are most salient to a reader or viewer, and assess what factors mediate how competing news media messages influence the public's values and policy opinions (Chong and Druckman 2007; Shah et al. 2004). In addition, future research might collect more comprehensive data on the institutional resources of news outlets and other community-level factors, which would be required to advance explanations for differences in coverage across media markets.[8]

[8] Preliminary analyses, for instance, found weak positive or negative correlations between a metropolitan region's diabetes mortality rates and its newspaper's overall number of articles about diabetes or number of articles with population health coverage features.

Overall, the key finding from this chapter is that the social determinants or population health perspective, a small proportion of coverage in the aggregate, was not equally distributed across newspapers. Content analysis findings from a single news source, such as the *New York Times,* will not generalize to the media discourse as a whole, since there is such great variability across media outlets. This finding of news media variability suggests there could be a wide continuum of public understanding, and acceptance, of the notion that social, economic, and environmental factors can influence health. Such a continuum of understanding has implications for the public's likelihood of supporting interventions to reduce the population health burden of type 2 diabetes, as subsequent chapters investigate.

CHAPTER 2 APPENDIX

Table 2.A1: Kappa Statistics for 3 Raters for all Nominal Variables on Code Sheet (N=78 articles)

Causes	Kappa	**Strategies (cont.)**	Kappa
Genetics	1.000	Biotechnology	0.5913
Dietary factors	0.8553	Lifestyle or exercise	0.9072
Lifestyle	0.7689	Food labeling	1.000
Social environment	0.6579	Provider programs	1.000
Drugs/pharmaceuticals	0.8706	Health education	0.9071
Family history	0.8954	School-based programs	1.000
Obesity/weight gain	0.8860	Addressing SES[2]	0.0086
Lack of exercise	0.6556	Weight loss	0.5029
Socioeconomic status	0.8527	Other[1]	0.5422
Biological factors	0.6349	*Mean κ for all strategies*	*0.7434*
Food availability	0.5582	**Descriptive information**	
Aging	0.7721	Mention of scientific study	0.7767
Other[1]	0.5079	Mention of advocacy group	0.6332
Mean κ for all causes	*0.7627*	Mention of pharm. company	0.9049
Strategies		**Disparities**[3]	
Drugs	0.8587	African Americans	0.8527
Dietary changes	0.8805	Hispanics/Latinos	1.000
Transfat regulations	1.000	Native Americans	1.000
Health management programs	0.7136	Kids have higher rates	0.8658
Health insurance incentives	0.4957	*Mean κ for all disparities*	*0.9296*

Notes: For all variables but "addressing SES", the p-value of the kappa statistic was <0.001.

1. Each specified item identified under “Other” causes and “Other” strategies were each re-coded and re-classified by the main author.
2. In this sample, there were only 2 putative instances of the "addressing SES" category. In each instance only 1 of 3 coders identified this, resulting in the low inter-rater reliability. Given the low frequency of this variable in general, all instances in the data set where a coder suggested this code were discussed until consensus was reached.
3. None of the other disparities categories were identified in this inter-coder reliability sample of 78 articles.

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CHAPTER 3

Preaching to the Choir or Falling on Deaf Ears? The Effect of Media Frames of the Determinants of Diabetes on Public Health Policy Opinion

INTRODUCTION

Public health research demonstrates that social factors—such as socioeconomic status, experience of racial discrimination, social support, stress, or neighborhood conditions—are important contributors to racial, ethnic, and socioeconomic disparities in chronic diseases such as diabetes (House 2002; Lantz et al. 1998). Some researchers characterize social and economic resources as the "fundamental causes" of health disparities, for these factors both shape health behaviors and influence health directly (Link and Phelan 1995). As a result, scholars suggest that policies to reduce disparities and improve overall population health will be most effective if they target the social determinants of health, through reducing residential segregation, improving education, alleviating poverty, and revitalizing urban neighborhoods (Adler and Newman 2002; Lantz, Lichtenstein, and Pollack 2007; Williams and Jackson 2005). Some argue that attention to these types of strategies will require a concerted effort to "expand the frame" of understanding of health disparities to focus on social and economic systems, not solely health care and health behaviors (Smedley 2006). However, the implementation of U.S. policy to address the non-medical determinants of health and health disparities has been slow (Lurie 2002).

One reason for the lack of policy attention may be that the public and policymakers alike are unaware of the social determinants of health, considering chronic illnesses to be the result of and responsibility of individual behaviors and medical care. The news media may reinforce this presentation, emphasizing individual-level and medical factors over other causal narratives (Kim and Willis 2007), as Chapter 2 demonstrated. Commentators in public health have argued that if the media publicized the social determinants of health more actively, the public may become more supportive of a public health policy agenda to improve population health and reduce health disparities. Mechanic, for example, suggests that policy progress will "come in increments as research and its diffusion through the media and the educational process slowly change the way problems are thought about and conceptualized" (Mechanic 2003, p. 438-439). Similarly, Tarlov argues that the United States remains in the pre-political stage of policy development for population health because the public lacks knowledge of and consensus surrounding the relationship between social factors and health (Tarlov 1999). Wallack and colleagues contend that advocates should use the media to "change the dominant understanding and perception of [health] problems from personal or life-style issues to social policy issues" (Wallack et al. 1993, p. 5). These scholars each suggest that greater media attention to the link between social factors and health would lead to greater public support and/or political engagement surrounding population health.

However, the claim that publicity of the social determinants of health will lead to increased public support for health policy interventions to prevent chronic disease and/or reduce disparities has received little systematic empirical scrutiny.[1] The goal of this

[1] See Niederdeppe and colleagues (2008, forthcoming) for a conceptual discussion of communications strategies regarding social determinants of health.

paper is to analyze how news media portrayals of the social determinants of type 2 diabetes—compared with coverage that emphasizes genetic factors, behavioral choices, or no particular causal explanation—influence the public's support for non-medical public health policy strategies to prevent diabetes.

Background and Theory

Diabetes, of which more than 90 percent is type 2, is the sixth-leading cause of mortality in the United States. As is the case with most chronic diseases, huge racial, ethnic, and class-related disparities abound in its incidence, morbidity, and mortality (CDC 2005; Kanjilal et al. 2006). Genetic susceptibility, individual behaviors, and social and economic conditions each influence the population distribution of type 2 diabetes. Social and economic conditions shape one's experience of stress and opportunities for diet and exercise, thus influencing the onset of diabetes through both direct (via biological links between stress and insulin insufficiency) and indirect (via health behaviors) processes (Abraham et al. 2007; Brown et al. 2004; Lutfey and Freese 2005; Schulze and Hu 2005; Scott et al. 2007).

Given the availability of these alternative causal narratives, journalists can frame the determinants of diabetes in several ways—describing genetic, behavioral, and/or social structural levels of causation. Journalists select frames in their depictions of social problems to make certain aspects of an issue more salient, often aspects related to causal attribution and policy responsibility (Entman 1993; Gamson et al. 1992; Gamson and Modigliani 1989; Nelson, Clawson, and Oxley 1997; Scheufele 1999). According to Zaller's (1992) model of opinion formation, media frames convey key considerations that people draw from when forming their evaluations of policies. Causal depictions of

diabetes likely influence the public's opinions through a two-step process: first, causal frames in news articles influence the public's own assessment of diabetes' causes, which in turn become salient considerations in their evaluations of public health policies. Scholars have suggested that both causal attributions and attitudes toward groups are important contributors to social policy opinion (see, e.g., Nelson 1999). Causal attributions of diabetes affect the public's policy opinions by influencing their attitudes about the target population, people with diabetes (in particular, whether they are deserving), and/or by influencing their attributions of responsibility (whether individuals, government, or society should be responsible for addressing diabetes). The theory supporting each proposition is presented below.

Causal Attributions and Attitudes About Groups

Empirical research across multiple disciplines has shown that causal attributions for public health problems influence the public's attitudes about those affected by those problems. When people perceive that a disease's onset is controllable, that is, caused by one's own behaviors, they express less empathetic attitudes toward people with that disease and are less likely to want to help them than when they perceive the disease to be out of the individual's control (Corrigan et al. 2003; Ubel et al. 2001; Weiner, Perry, and Magnusson 1988). Similarly, when people attribute mental illness to genetics (in contrast to "bad character"), they hold less stigmatizing attitudes toward people with mental disorders (Martin, Pescosolido, and Tuch 2000). Those who accept genetic explanations for obesity are more likely to agree that the obese deserve anti-discrimination protections (Oliver and Lee 2005).

Causal Attributions and Policy Responsibility

In addition to influencing attitudes about group deservingness, causal narratives delineate the range and scope of policy interventions that policymakers and the public alike consider appropriate (Stone 1989; Tesh 1994). Theory suggests that when people identify behaviors as the cause of diseases, they would attribute responsibility to the individual, whereas when they identify structural or environmental factors, they would more likely support social or governmental responsibility (Tesh 1994). Accordingly, Oliver and Lee (2005) find that those who believe that obesity is caused by the availability of nutrient-poor food in the environment are more likely to support advertising regulations, taxes on snack foods, and banning junk foods in schools, compared to those who believe that obesity results from individuals' lack of willpower.

For diabetes, as for obesity, prevention strategies may be targeted at several levels of intervention, including macro-level policies (such as improving the standard of living of the poor), meso-level policies (such as improving neighborhood access to healthy food), and micro-behavioral level policies (such as providing incentives to change individuals' dietary choices) (Schulz and Northridge 2004). Depending on one's understanding of the causes of diabetes, one might support very different policy actions. As McKinlay and Marceau (2000: 758) suggest in their review of diabetes prevention, "profoundly different [policy] actions are required depending upon which level of explanation one focuses." For instance, if one believes that diabetes is largely the result of individuals' bad behavioral choices, one may perceive neither improving the standard of living of the poor nor improving access to healthy food as effective or appropriate

strategies. Instead, one would hold those at risk personally responsible for making better lifestyle choices.

While existing literature can support connections among genetic or behavioral causal beliefs and the public's opinions about policy, there has been little United States research assessing public opinions about social structural explanations for health or health disparities—despite the prominence of such explanations in the public health literature. Most of the limited research on the public's perceptions of the causes of health inequalities has taken place in the United Kingdom, and has suggested mixed evidence about the prominence of understanding or acceptance of the social determinants of health among the public (Blaxter 1997; Davidson, Kitzinger, and Hunt 2006). In one study relating causal beliefs to policy support, Reutter and colleagues found that Canadians who believed in structural explanations for health inequalities were more supportive of social policies to address poverty than those who endorsed other explanations (Reutter, Harrison, and Neufeld 2002). While this finding lends support to public health advocates' claims about the desirability of publicizing the structural determinants of health, it has questionable applicability to the United States, where poverty-related policy is often politically- and racially-charged.

Poverty Policy in the United States

Americans' perceptions of the causes of poverty as well as whom they perceive to be poor are important predictors of their support for welfare and related social policies (Gilens 1999). When white Americans explain inequality via arguments about individual behaviors (such as laziness or motivation) instead of social structure (such as employment discrimination), they also tend to express more opposition to government

assistance for blacks and the poor (Kluegel and Smith 1986). A large body of research demonstrates that the public's opinions about policy are shaped by their attitudes about the particular groups affected by the policies, particularly whether they are deserving of aid (Cook and Barrett 1992; Nelson and Kinder 1996; Schneider and Ingram 1993; Kinder and Sanders 1996).

The news media have an important role in depicting groups' deservingness. Gans (1995) claims that the news media describe the "undeserving poor" or the "underclass" in ways that blame the poor and emphasize their deviation from middle-class American values. Iyengar (1991) finds that those who view news stories that focus on individuals rather than the social context are more likely to attribute poverty to individuals' character flaws, such as laziness, and assign responsibility for the treatment of poverty to individuals rather than to the government or society. Finally, Gilens (1999) demonstrates that racialized and stereotypical depictions of poverty in the news media contribute to the public's low support for welfare policy.

Research Aims and Empirical Expectations

The present research assesses whether health policy support also may hinge upon attitudes evoked by news media depictions of poverty and other social determinants of health. The specific aim of this study is to evaluate experimentally how media depictions of the causes of diabetes influence the public's support for policies to address diabetes. By randomly distributing which causal frame of diabetes—genetics, behavioral choices, socio-economic environment, or no causal language—appears in a mock news article that study participants view in an Internet-based survey, the impact of the media stimuli on

participants' causal attributions and on their support for non-medical public health policies can be identified.

Considering the theoretical literatures on causal attribution, responsibility, and U.S. poverty policy together suggests several hypotheses regarding the effects of these media portrayals of diabetes' determinants. First, assuming that genetic attribution tends to absolve individuals of blame, when people perceive genetic causes of diabetes they would have favorable attitudes toward those with diabetes, consider them deserving, and support policies to help them (Phelan 2005). However, belief in genetic causation of disease may obscure recognition of a societal responsibility for health (Conrad 1997; Horwitz 2005). Thus, Hypothesis 1 is that people exposed to the genetic frame of diabetes will be less likely to infer individual fault, yet they will be no more likely than those exposed to a frame without causal language to support policies to address diabetes' social determinants.

Second, since the public holds negative opinions of those perceived to be responsible for their plight, people would consider those with diabetes unfavorably when the disease is portrayed as the result of personal choices (Weiner, Perry, and Magnusson 1988). Accordingly, Hypothesis 2 is that those exposed to a behavioral frame of diabetes will be less likely to support macro-social level or neighborhood-level policies, because they will either believe diabetics are undeserving of such aid, or that these interventions would be ineffective for those whose illness is behavioral.

The effects of a social determinants framing of diabetes, linking diabetes to conditions of poverty and the neighborhood environment, are less straightforward to predict. Hypothesis 3 is that on average, people exposed to this frame will be less likely

to infer individual fault for people with diabetes, and will be more supportive of policies to address the social determinants. Yet levels of support would vary depending on individual differences of study participants, particularly participants' attitudes about the poor—their causal beliefs about poverty and their attribution of responsibility for the poor. Individuals' party affiliation and race are two characteristics that could serve as a proxy for these predisposing attitudes. While it is unlikely that policy issues specific to diabetes have been already overtly politicized (given its recent emergence as a policy problem, see Oliver and Lee 2005), other broader public health policy approaches with relevance to diabetes—such as taxation, government interventions on lifestyle, and responsibility for addressing poverty—are imbued with partisan cues that the public can identify (Rahn 1993). Moreover, the notion that social and economic factors influence one's health status likely has both political, and racial, meaning. Specifically, Democrats and African Americans historically have been more likely to accept that poverty results from social and economic circumstances beyond the individual's control. In contrast, whites and Republicans are less likely to agree with this worldview, believing more strongly in personal responsibility for poverty (Cook and Barrett 1992; Gilens 1999; Kluegel and Smith 1986). Thus, Democrats and African Americans also may be more likely to consider it plausible that one's social and economic conditions, and not simply one's own biology or behaviors, structure one's health status. Therefore, Hypothesis 4 is that participants' race and party identification will moderate the effects of the social determinants frame of diabetes (but not necessarily the other causal frames) on participants' policy opinions.

In sum, this research stands apart from previous research, both conceptually and methodologically. It is the first study to evaluate experimentally whether presenting the social determinants of a chronic illness affects the public's opinions regarding public health policy. Moreover, multiple social science disciplines inform the study's empirical expectations of both average and heterogeneous effects of the causal frames on the public's causal beliefs and policy opinions.

DATA AND METHODS

Sample

The study sample consisted of members of a panel of more than one million ethnically-diverse adults who agreed to take Internet-based surveys for research purposes, maintained by Survey Sampling International (SSI). Given the opt-in nature of this panel, the study participants are not representative of U.S. adults as a whole (see Appendix A, Table A1, for a comparison of the SSI sample with nationally representative descriptive statistics). SSI recruited a sample of at least 2,000 panel members to meet the following quotas: 60% white, 25% black, 12% Hispanic, and 3% Asian. Within each racial or ethnic stratum, SSI drew three age-group samples of 37.5% aged 18-39, 37.5% aged 40-59, and 25% aged 60+ (to approximate the U.S. age distribution). SSI adjusted the number of email invitations to participate in the study in each demographic sub-sample until they achieved the specified quotas.

A total of 2,838 people were enrolled in the study, and 2,490 (87.7%) completed the section of the survey that included the diabetes news article and diabetes-related

dependent variables in late April 2007.[2] Participants completing the survey were entered into a drawing administered by SSI for cash prizes. The survey was completely anonymous, and SSI handled all correspondences with participants, identifying each individual only with a study ID. The study received an exemption from human subjects review by the Medical Institutional Review Board at the University of Michigan, since no personally identifying or sensitive information about study participants was collected.[3]

Experimental Design

Every study participant was randomly assigned to view one of four mock news articles, which appeared at the start of the web-based survey. The articles were designed to resemble an article from an online news source and were modeled after existing news stories and a press release from the American Diabetes Association. The articles described lobbying activities in Washington and the increasing prevalence of type 2 diabetes. Articles were identical except for which one of four causal frames (genetics, behavioral choices, socio-economic environment, or no causal language) was embedded in the text. See Appendix B for the full text of the articles. Images accompanying the article were also randomly assigned, such that every article was associated with one of three images: a black woman, a white woman, or a glucose testing device. Hypotheses regarding these images, however, are beyond the scope of the present analysis and are not assessed here. All analyses presented in this chapter are pooled across the images. (See Chapter 4 for an analysis that incorporates the image experimental treatments.)

[2] Appendix Table A2 demonstrates some significant differences between the panel members who completed the diabetes news section of the survey and those who did not. Those study participants who terminated the survey early were more likely ($p<.05$) to be black, Hispanic, and younger, but there were no significant differences by gender or education.

[3] This survey was administered along with an unrelated survey about avian flu and breast cancer. All statistics presented in this analysis are restricted to those 2,490 participants who completed the diabetes part of the survey.

Measures

Treatment Variables

The key treatment variables are the randomly assigned causal frames. Randomization ensures that any differences between the groups can be attributed to the experimental manipulation. Each of the four experimental groups was compared based on demographic characteristics (age, gender, race/ethnicity, income, partisanship, ideological identification, education, diabetes status, and family or friends with diabetes) using F-tests and chi-squared tests. There were no significant ($p<.05$) differences across groups, suggesting successful randomization (see Table 3.1). Dummy variables were constructed for each frame (genetic, behavioral choices, and social environment) with 1 indicating that the participant was exposed to that causal frame, 0 otherwise. The "no causal language" (or "control") condition serves as the reference group for all analyses.

Dependent Variables

To test the first step in the two-step conceptual model, whether the causal frames in the news articles did, in fact, influence causal attributions, participants were asked the extent to which they agreed, ranging from 1 (strongly disagree) to 5 (strongly agree) with four statements: "People with diabetes brought their illness upon themselves", "People with diabetes got their illness through no fault of their own", "People with diabetes got their illness from the genes they inherited from their parents", and "People with diabetes got their illness because of the social and economic conditions in which they live."

The main dependent variables are participants' opinions about nine non-medical governmental policies to prevent diabetes, organized by level of intervention. The

macro-social level policy variable, targeting diabetes' social structural determinants, was an item assessing participants' support for governmental versus individual responsibility for improving the standard of living of the poor. This question, from the General Social Survey, was measured on a 5-point Likert scale ranging from 1 (strongly agree it is a government responsibility) to 5 (strongly agree it is a personal responsibility).[4] The *meso- or neighborhood-level policies*, targeting the environmental or neighborhood factors that contribute to diabetes, included five questions assessing participants' support for public school bans on junk food concessions, government providing financial incentives for stores carrying healthy food to locate in areas where there are few such stores, local governments placing bans on trans fats in restaurants, government investing in parks and other places to exercise, and regulating advertisements for junk food. The three *micro-behavioral policies*, targeting individuals' dietary behaviors, included participants' support for government imposing taxes on unhealthy foods, providing subsidies to make healthy foods more affordable, and their agreement that more health education is needed to teach people how to eat right. Each of these opinions was measured with 5-point Likert scales, ranging from 1 (strongly disagree) to 5 (strongly agree). These public health policy questions were adapted from recent articles about policy and legislation for obesity and diabetes (Boehmer et al. 2007; Colagiuri et al. 2006; Gostin 2007; Kim and Kawachi 2006; McKinlay and Marceau 2000; Oliver and Lee 2005; Schwartz and Brownell 2007). The sample distribution and text of all dependent variables are displayed in Table 3.2.

[4] The survey also included a statement to which participants could agree (5-pt Likert scale): "The government should provide more assistance to poor Americans." Given the high correlation between this variable and the GSS variable (r=-.56) and the fact that the results of the models were essentially identical, only the GSS outcome is reported since it is more widely used and validated in other populations.

Finally, an omnibus measure of participants' support for non-medical public health policies was created by calculating the mean of participants' responses to all nine variables (reversing the values for the GSS variable) and deleting any cases for which there was missing data for any of the nine variables. The reliability of this nine item scale was high (Cronbach's alpha=0.826), suggesting consistency in participants' opinions toward public health policies. The new variable had mean 2.68 ± 0.83 and ranged from 0.33 to 4.33. (See Figure 3.A1 for a histogram of its distribution.)

Moderators

Race/ethnicity was measured by self-report, and mutually exclusive categories were constructed for white (non-Hispanic), black/African American (non-Hispanic) and all other racial/ethnic identities. All analyses assessing the role of race as a moderator were conducted with the sample restricted to those identifying as white or black, given the saliency of U.S. poverty policy to these racial groups. Political party identification was measured with a seven-point Likert scale ranging from 1 (Strong Democrat) to 7 (Strong Republican). For the analyses of party identification as a moderator, party identification was collapsed into three categories: Democrats, Independents, and Republicans.[5]

Statistical Analysis

To test whether the experimental manipulation influenced participants' beliefs in the causes of diabetes, the four categorical causal belief variables were regressed on the dummy variables for the three causal frames. Given the ordinal form of most of the

[5] For these analyses, the group Independents included those participants who indicated they were Independents as well as those who identified as Independents but "leaned" toward Democrats or Republicans. Analyses including the leaners with the partisan groups made the group differences weaker.

dependent variables in these analyses, ordered probit regression models were estimated. (Analyses using the omnibus variable created from responses to all 9 policies used ordinary least squares regression given this variable's near-normal distribution across more than 30 discrete categories.) Following Long's and Freese's (2006) discussion of ordered models, the parallel regression assumption was tested using a likelihood ratio test of the equality of coefficients across the five response categories, for each dependent variable (regressed on the three causal frame dummy variables). These tests yielded no evidence that any of the dependent variables presented in this chapter violated this assumption.[6]

In the next step, models were estimated regressing causal beliefs on the three causal frames, dummy variables for party identification, and interaction terms between party identification and frames. These models test whether party identification moderates the frames' effects on causal beliefs. Similar models were estimated to test race as a moderator.

Next, the policy opinions variables (the questions assessing participants' support for policies shown in Table 3.2) were regressed on dummy variables representing the three causal frames, to assess whether the causal frames influenced policy support for the full sample. Just as for the causal belief dependent variables, to assess the role of party identification as a moderator of the frames' effects on policy opinions, models were estimated with dummy variables for the three frames, dummy variables for Republican and Independent party identification, and interactions between each of the frames and

[6] Other model estimation strategies were also assessed, including ordinary least squares (OLS), probit (comparing "agree" to "neutral or disagree") and multinomial logit (comparing "agree", "neutral", and "disagree"). Results with ordered probit were largely identical to those estimated with OLS. Reducing the dependent variable to fewer categories resulted in weaker results of the frames' effects on opinions.

Republican and Independent status. Democrats represent the omitted category, with the expectation that Democrats are more likely to support the public health policies, with Republicans diverging from them and Independents falling in the middle. For each of these models, Wald tests of the set of frame*party identification interactions (testing the null hypothesis that the coefficients on the interaction terms are jointly equal to zero) were performed. An identical process was used to test the role of racial group identification as a moderator of the frames' effects on opinions for all dependent variables.

To interpret the ordered probit regression models, the predicted probabilities of each response category were calculated for every frame and political orientation combination; these values (summing the proportion of those who agree and strongly agree) were plotted on graphs displaying the probability of agreeing with the given policy on the y-axis.

All analyses were performed using Stata 9.0 and utilizing Long and Freese's SPost programs for interpreting outcomes from categorical regression models in Stata (Long and Freese 2006). While there were no significant differences across experimental groups in demographic characteristics (see Table 3.1), to assess the sensitivity of the coefficient estimates, the models were also estimated including controls for random variation across groups in ideological identification, age, gender, race, income, education, and diabetes status (party identification and race were only included as controls in those models in which those variables were not tested as potential moderators). The results of one such model, the demographic and political predictors of agreeing with social determinants of diabetes, are reported in this chapter (see Table 3.5). The coefficients on

the key variables generally do not differ substantively when these control variables are excluded, so the models including only treatment variables and the hypothesized moderators are presented in this chapter.

Additional Analyses: Test of Alternative Moderators and Sensitivity Analyses

The theory presented above suggests that party identification and race are strong candidates to moderate the frames' effects, given that the social determinants frame is likely to convey different symbolic meaning in these groups. However, it could be that any observed interactions between the media frames and party identification or race are confounded by some other characteristic that may moderate the effect of the frames and correlates with party or race. For instance, Republicans in the sample have higher incomes, on average. Having a higher income could lead to greater opposition to public health policies for this group based on considerations of self-interest, because the social determinants frame (associating poverty with diabetes) would signal that people with higher incomes would be less likely to benefit from the proposed policies.

To address these alternative hypotheses, several additional models were estimated. Support for non-medical public health policies was regressed on the causal frames, controlling for the race and party interactions described as above, and also simultaneously controlling for interactions with the causal frames and income, education, and diabetes status, each factors which may be associated with party identification and also with policy opinions. These analyses can assess whether the party*frame interactions are still significant after accounting for possible confounders.

RESULTS

Table 3.1 displays the descriptive statistics for the entire sample and for each of the four treatment groups. While study participants were not recruited to be representative of the entire U.S. population, these statistics illustrate that the sample is diverse in terms of race/ethnicity, age, income, education, and political orientation. (See Appendix A, Table A1, for a comparison of the sample statistics to statistics for the U.S. population.) Fourteen percent indicated that a physician had ever told them they had diabetes, and 64 percent indicated that a family or friend has diabetes. This diabetes prevalence is higher than the national average, based upon the national population rate of diagnosed diabetes of 7.8 percent of all adults aged 18 years or older and 11.9 percent among non-Hispanic blacks (CDC 2007).

Table 3.2 shows the mean and distribution of the main dependent variables. Among the non-medical policies, study participants exhibited the highest support for public schools eliminating their fast food concessions, government investing in parks, subsidizing healthy food, and more health education. Study participants expressed the least support for taxes on junk food.

Table 3.1: Descriptive Characteristics of Sample

	Full Sample %	Treatment Groups			
		Control	Genetics	Behavior Choices	Social Environ-ment
N	2,490	588	615	592	695
Female	50.9	50.6	48.0	51.9	52.9
Race/Ethnicity					
White (non-Hispanic)	58.6	56.4	58.7	61.7	57.9
Black (non-Hispanic)	22.9	23.2	25.3	21.7	21.5
Other race/ethnicity	18.5	20.5	16.0	16.6	20.6
Age [mean], ranges from 18-98	46.5	46.2	45.5	47.0	47.1
Age 18-29	21.1	20.3	24.5	20.4	19.2
Age 30-49	30.4	31.8	27.8	30.6	31.2
Age 50-69	42.9	43.0	43.9	41.6	43.1
Age 70 +	5.7	4.9	3.8	7.3	6.5
Highest level of education completed					
Some high school	2.3	2.5	1.7	2.7	2.1
High school	16.9	16.9	18.1	15.2	17.3
Some college	37.1	36.9	35.4	37.9	38.3
College	21.8	21.8	19.0	24.0	22.5
More than college	11.7	10.3	11.3	11.9	13.1
Annual household income					
<$30,000	25.9	28.3	24.6	25.2	25.6
$30,000-49,999	26.9	26.5	30.5	25.2	25.6
$50,000-69,999	18.0	17.7	17.3	19.0	18.0
$70,000-89,999	11.6	12.2	9.7	12.6	11.9
$90,000 or more	17.6	15.3	18.0	17.9	19.0
Political party identification					
Democrat (strong or moderate)	35.0	32.3	36.7	33.5	37.2
Independent (+ "leaning")	41.6	44.2	38.7	44.7	39.4
Republican (strong or moderate)	23.3	23.5	24.7	21.8	23.4
Political ideology					
Liberal	19.8	20.1	20.7	20.4	18.0
Moderate	57.6	58.9	55.9	59.4	56.4
Conservative	22.7	21.0	23.4	20.2	25.6
Diabetes prevalence	14.1	14.6	13.5	12.8	15.1
Family or friends have diabetes	64.4	67.6	63.1	62.6	64.4

Note: None of the differences between treatment groups were significant at ($p<.05$) except for one: there was a significant difference in the proportion over 70 years of age, because of very small sample sizes in this group. However, the F-test for differences in mean age across groups was not significant.

Table 3.2: Full Sample Distribution of Policy Opinions and Causal Beliefs (N=2,490)

	% Strongly Disagree (1)	% Disagree (2)	% Neutral (3)	% Agree (4)	% Strongly Agree (5)	Mean	Std dev
Policy Opinions							
Macro-social policy support							
Government should improve the standard of living for the poor[1] (N=2,409)	19.1	10.5	37.7	16.6	16.2	3.0	1.3
Meso-neighborhood policy support							
Public schools should eliminate their fast food concessions (N=2,472)	6.2	7.5	22.7	24.3	39.2	3.8	1.2
The government should provide financial incentives to encourage grocery stores to locate in areas where there are few (N=2,463)	12.9	11.2	27.8	24.3	23.8	3.4	1.3
Local governments should ban restaurants from cooking with trans fats (N=2,465)	21.0	14.2	23.3	19.0	22.6	3.1	1.4
The government should invest in parks and safe places to exercise in urban areas (N=2,470)	6.3	6.7	24.1	30.0	32.9	3.8	1.2
The government should regulate advertisements for junk food like it does for cigarettes and alcohol (N=2,475)	22.8	13.5	23.1	20.7	20.1	3.0	1.4
Micro-behavioral policy support							
The government should impose higher taxes on food high in calories and fat, like it does for cigarettes (N=2,478)	39.1	16.0	22.8	13.7	8.4	2.4	1.3

The government should use some of its tax revenue to make healthy food (like fruits and vegetables) more affordable (N=2,462)	10.0	7.5	20.7	25.8	36.1	3.7	1.3
More health education is needed to teach people how to eat right (N=2,464)	2.9	4.9	19.9	32.7	39.5	4.0	1.0
Causal Beliefs							
People with diabetes brought their illness upon themselves (N=2,477)	49.1	22.3	21.1	5.9	1.7	1.9	1.0
People with diabetes got their illness through no fault of their own (N=2,477)	5.1	16.3	40.2	21.2	17.3	3.3	1.1
People with diabetes got their illness because of the genes they inherited from their parents (N=2,476)	5.4	8.7	41.3	31.8	12.8	3.4	1.0
People with diabetes got their illness because of the social and economic conditions in which they live (N=2,470)	24.7	17.8	37.9	15.0	4.7	2.6	1.1

Note: 1—Response choices for this item were (1=SA the government should improve living standards, 3=Agree both answers, 5=SA people should take care of themselves)

Frames' Effects on Causal Beliefs

Table 3.3 presents the results assessing whether the causal frames to which participants were exposed influenced participants' causal beliefs and their attitudes about fault. For the full sample, those who were exposed to the behavioral frame were more likely to agree that people with diabetes brought their illness upon themselves (p=.026).

Those who were exposed to the genetic frame were more likely to agree that diabetes is not the fault of the individual (p=.002). Those who were exposed to the genetic frame were also more likely to agree that diabetes is caused by genes (p=.001). Finally, those who were exposed to the behavioral frame (p=.003) and the social determinants frame (p<0.001) were more likely to agree that people with diabetes got their illness as a result of social and economic conditions.

Table 3.3: Effect of Media Frames on Causal Beliefs

DV coded from 1 (strongly disagree) to 5 (strongly agree)	People with diabetes brought their illness upon themselves (N=2477)	People with diabetes got their illness through no fault of their own (N=2477)	People with diabetes got their illness because of the genes they inherited from their parents (N=2476)	People with diabetes got their illness because of the social or economic circumstances in which they live (N=2470)
	Coeff (SE)	Coeff (SE)	Coeff (SE)	Coeff (SE)
Genetic frame	-0.08 (0.07)	0.19 (0.06)**	0.20 (0.06)**	-0.08 (0.06)
Behavior frame	0.14 (0.07)*	-0.01 (0.06)	0.08 (0.06)	0.18 (0.06)**
Socioenv frame	-0.02 (0.06)	0.04 (0.06)	-0.06 (0.06)	0.27 (0.06)***
cut1	-0.01 (0.05)	-1.59 (0.06)	-1.57 (0.06)	-0.59 (0.05)
cut2	0.58 (0.05)	-0.74 (0.05)	-1.03 (0.05)	-0.09 (0.05)
cut3	1.45 (0.06)	0.35 (0.05)	0.19 (0.05)	0.96 (0.05)
cut4	2.15 (0.07)	1.00 (0.06)	1.19 (0.05)	1.79 (0.06)

Note: Table entries are ordered probit coefficients and standard errors in parentheses; *p<.05, **p<.01, ***p<.001

These causal frames may have influenced some participants' causal beliefs more or less than others. Regression models of causal attributions fitted with interaction terms between frame and individuals' party identification and frame and their race indicate that neither of these characteristics moderated the impact of the stimuli on attitudes about individual fault or genetic causation (models not shown). However, the test of the joint effect of the set of the frame*party interactions indicates a moderating effect (χ^2=11.94,

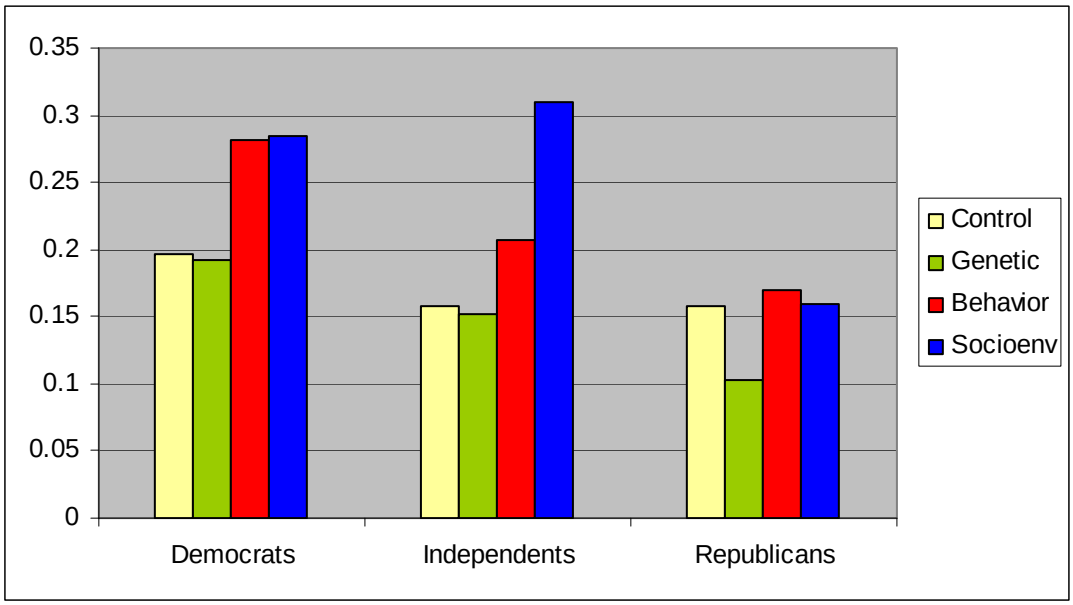
df=6, p=0.06) of party identification on the frames' impact on beliefs about social and economic causation of diabetes (see Table 3.4, column 1). This test indicates that the causal frames influenced Democrats, Independents, and Republicans differently in their beliefs about social determinants of diabetes. There were no differences by race in the effect of the frames on beliefs about social and economic causation of diabetes.

Table 3.4: Test of Race and Party Identification as Moderators of Agreeing with Social Determinants of Diabetes

DV coded from 1 (strongly disagree) to 5 (strongly agree)	People with diabetes got their illness because of the social or economic circumstances in which they live	
	Interactions with party ID (N=2033)	Interactions with race (just blacks and whites, N=1855)
	Coeff (SE)	Coeff (SE)
Genetic frame	-0.01 (0.11)	-0.06 (0.13)
Behavior frame	0.28 (0.12)*	0.30 (0.13)*
Socioenv frame	0.28 (0.11)*	0.38 (0.13)**
Independent	-0.15 (0.11)	
Republican	-0.15 (0.13)	
Genetic x Independent	-0.01 (0.16)	
Behavior x Independent	-0.09 (0.16)	
Socioenv x Independent	0.22 (0.15)	
Genetic x Republican	-0.25 (0.18)	
Behavior x Republican	-0.23 (0.18)	
Socioenv x Republican	-0.28 (0.18)	
White		-0.10 (0.11)
Genetic x White		0.01 (0.15)
Behavior x White		-0.06 (0.16)
Socioenv x White		-0.02 (0.15)
cut1	-0.69 (0.09)	-0.59 (0.10)
cut2	-0.18 (0.09)	-0.08 (0.10)
cut3	0.86 (0.09)	0.97 (0.10)
cut4	1.73 (0.09)	1.83 (0.10)
Wald test of all party x frame interactions	X^2=11.94, df=6 p=0.06	
Wald test of all race x frame interactions		χ^2=0.25, df=3 p=0.97

Note: Table entries are ordered probit coefficients and standard errors in parentheses; *p<.05, **p<.01, ***p<.001

Figure 3.1: Probability of Agreeing with Social Determinants of Diabetes, by Frame Viewed and Political Party Identification



Note: For each group, bars show the proportion agreeing for those who viewed (from left to right) the control ("no cause") frame, the genetic frame, the behavioral frame, and the social environment frame.

To demonstrate these differences visually, Figure 3.1 displays the probability of agreeing with social determinants explanations for diabetes for each of the treatment conditions separately for Democrats, Republicans, and Independents. Republicans exposed to the social determinants frame were no more likely to agree that social and economic conditions cause diabetes than those who viewed the frame that lacked any causal language. In fact, their agreement with social determinants was consistently low across each of the frames. Democrats, on the other hand, who were exposed to the social determinants frame were more likely to agree with this statement than those who viewed the frame that lacked causal language, but they were no more likely to agree than those exposed to the behavioral frame. In contrast, 15.8 percent of Independents who viewed the frame without causal language agreed that social and economic conditions cause

diabetes, while 31 percent of those Independents who viewed the social determinants frame agreed. Participants who identified as Independents showed the greatest difference in their agreement with social determinants between those who viewed the frame without causal language and those who viewed the frame that emphasized the social environment.

Predictors of Agreeing with Social Determinants

To explore further the political and demographic predictors of agreeing with a social determinants model of diabetes causation, Table 3.5 presents the model of agreeing with social determinants regressed on a variety of covariates, controlling for the frame each participant viewed. This model demonstrates that older people, women, Republicans, political Conservatives, and those with a high school education or less were all significantly ($p<.05$) less likely to agree that people with diabetes got their illness because of the social or economic circumstances in which they live, regardless of the causal frame they viewed. Comparing the magnitude of the coefficients, the strongest predictor of agreeing with a social determinants model of causation was political party identification.

Table 3.5: Sociodemographic Predictors of Agreeing with Social Determinants Model of Diabetes, Controlling for Frame Viewed

DV coded from 1 (strongly disagree) to 5 (strongly agree)	People with diabetes got their illness because of the social or economic circumstances in which they live (N=1734)
	Coeff (SE)
Genetic frame	-0.08 (0.07)
Behavioral frame	0.19 (0.07)**
Socioenv frame	0.34 (0.07)***
Age	-0.004 (0.00)*
Female	-0.11 (0.05)*
Party identification[1]	-0.40 (0.10)***
Ideological identification[2]	-0.26 (0.13)*
Has diabetes	0.01 (0.08)
Family or friends have diabetes	0.00 (0.05)
Income[3]	-0.04 (0.08)
High school or less education	-0.16 (0.07)*
Black (ref=White)	0.00 (0.07)
Other race (ref=White)	0.11 (0.07)
cut1	-1.20 (0.12)
cut2	-0.66 (0.12)
cut3	0.39 (0.12)
cut4	1.28 (0.13)

Note: Table entries are ordered probit coefficients and standard errors in parentheses; *p<.05, **p<.01, ***p<.001

[1] Party identification is coded from 0=Strong Democrat to 1=Strong Republican

[2] Ideological identification is coded from 0=Very Liberal to 1=Very Conservative

[3] Income is coded in 10-point increments from 0=<$10,000/year and 1=>$100,000/year

Frames' Effects on Attitudes Regarding Addressing Poverty

In the next stage of the analysis, models were estimated to assess whether the causal frames influenced opinions about public policies, and whether race or party identification moderated these effects. Table 3.6 displays participants' attitudes about responsibility for improving the standard of living of the poor, regressed on the causal frames (column 1), interactions between frame and party identification (column 2), and interactions between frame and race (column 3). For the full sample, the causal frame the

participant viewed was not significantly associated with these attitudes. Relative to Democrats, Independents and Republicans who viewed the control condition were more likely to agree that improving the standard of living of the poor is a personal responsibility. There were no significant interactions between frame and party identification, suggesting no evidence of partisan differences in the effect of the causal frames on attitudes about improving the standard of living. However, Column 3 reveals evidence of racial differences in the effects of the frames. Relative to blacks, whites who viewed the frame without causal language were more likely to agree with personal responsibility for improving standard of living. Moreover, the significant positive interaction between white race and the social determinants frame suggests that the effect of the frame was significantly different in whites than in blacks. For blacks, the reference group, the effect of the social determinants frame was small and negative (β=-.26). Comparing this coefficient to the magnitude of the interaction term (β=0.47) suggests that, relative to those who viewed the frame without causal language, those whites who viewed the social determinants frame were more likely to agree that improving standard of living is a personal responsibility.

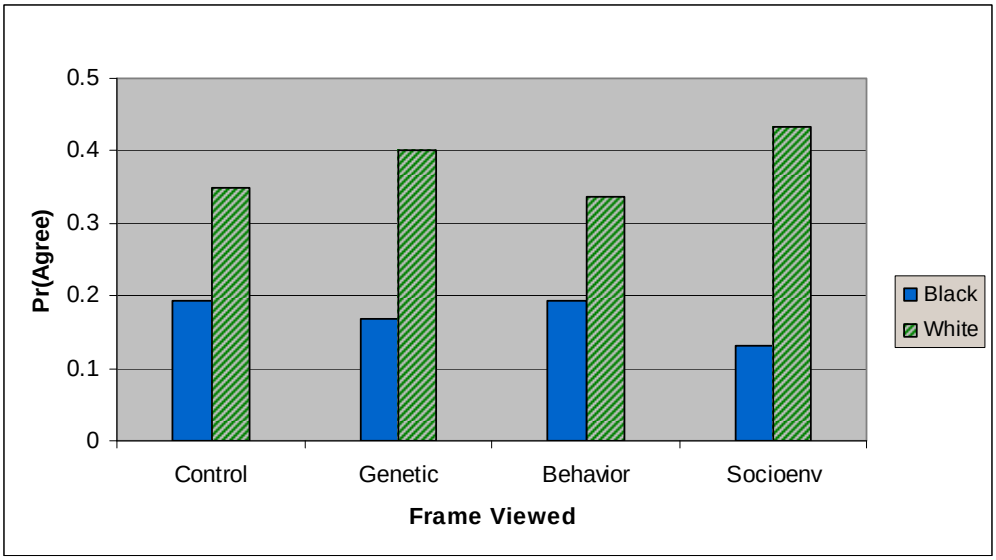
These racial differences are displayed in Figure 3.2, showing a divergence in attitudes between blacks and whites exposed to the social determinants frame. Blacks who viewed this frame expressed less support for the notion that people should take care of themselves, relative to those who viewed the control condition, while whites who viewed this frame expressed higher levels of support for the idea that people should take care of themselves.

Table 3.6: Test of Race and Party Identification as Moderator of Causal Frames' Effects on Responsibility for Poverty (Higher values=Individual Responsibility)

	Government should improve the standard of living for the poor *(1=SA the government should improve living standards, 3=Agree both answers, 5=SA people should take care of themselves)*		
	Full sample framing effects (N=2,409)	Interactions with party ID (N=2,033)	Interactions with race (just blacks and whites, N=1,855)
	Coeff (SE)	Coeff (SE)	Coeff (SE)
Genetic frame	0.04 (0.06)	0.11 (0.12)	-0.09 (0.13)
Behavior frame	0.02 (0.06)	0.11 (0.12)	0.00 (0.14)
Socioenv frame	0.10 (0.06)	0.07 (0.11)	-0.26 (0.13)
Independent		0.52 (0.11)***	
Republican		1.12 (0.13)***	
Genetic x Independent		-0.03 (0.16)	
Behavior x Independent		-0.04 (0.16)	
Socioenv x Independent		0.13 (0.15)	
Genetic x Republican		0.01 (0.18)	
Behavior x Republican		-0.10 (0.19)	
Socioenv x Republican		0.10 (0.18)	
White			0.48 (0.11)***
Genetic x White			0.23 (0.16)
Behavior x White			-0.03 (0.16)
Socioenv x White			0.47 (0.16)**
cut1	-0.83 (0.05)	-0.38 (0.09)	-0.53 (0.10)
cut2	-0.50 (0.05)	-0.03 (0.09)	-0.18 (0.10)
cut3	0.49 (0.05)	1.02 (0.09)	0.86 (0.10)
cut4	1.03 (0.05)	1.61 (0.09)	1.45 (0.10)
Wald test of all party x frame interactions		χ^2=2.29, df=6 p=0.89	
Wald test of all race x frame interactions			χ^2=13.4, df=3 p=0.004

Note: Table entries are ordered probit coefficients and standard errors in parentheses; *p<.05, **p<.01, ***p<.001

Figure 3.2: Probability of Agreeing that People Should Take Care of Themselves, by Frame Viewed and Participants' Race



Frames' Effects on Environment-level Public Health Policy Opinions

Table 3.7 displays regression models of opinions about public policies that affect the environmental or neighborhood determinants of diabetes (including building parks and stores in neighborhoods, banning school concessions, and banning trans fats in restaurants). There was no evidence that participants' racial identity moderated the frames' effects on their opinions for any of these policies (i.e., the test of the hypothesis that the coefficients on the interaction terms with race were equal to zero was not rejected). Table 3.7 displays only the models of policy opinions regressed on the causal frames and on the interactions between frames and party identification. The causal frames did not significantly affect participants' opinions about regulating advertisements for junk food, nor did the models indicate any moderating effect of race or party identification on their opinions about advertisement regulation. Thus, models of opinions about regulating advertisements are not shown.

Table 3.7: Test of Party Identification as Moderator of Causal Frames' Effects on Support for Neighborhood-level Public Health Policies

	Local restaurants should ban trans fats		**Schools should eliminate fast food concessions**		**Government should provide financial incentives for parks**		**Government should provide incentives for grocery stores**	
	Full sample (N=2,465)	Interactions with party (N=2,061)	Full sample (N=2,472)	Interactions with party (N=2,067)	Full sample (N=2,470)	Interactions with party (N=2,066)	Full sample (N=2,463)	Interactions with party (N=2,061)
	Coeff (SE)	Coeff (SE)	Coeff (SE)	Coeff (SE)	Coeff (SE)	Coeff (SE)	Coeff (SE)	Coeff (SE)
Genetic	0.09 (0.06)	0.06 (0.12)	-0.06(0.06)	-0.01 (0.12)	-0.02 (0.06)	0.00 (0.12)	-0.01 (0.06)	0.04 (0.11)
Behavior	0.05 (0.06)	-0.02 (0.12)	0.06(0.06)	0.10 (0.12)	-0.06 (0.06)	0.05 (0.12)	-0.03 (0.06)	0.13 (0.12)
Socioenv	0.13 (0.06)*	0.23 (0.11)*	0.07(0.06)	0.16 (0.11)	0.01 (0.06)	0.17 (0.12)	0.08 (0.06)	0.25 (0.11)*
Independent		-0.25 (0.11)*		0.02 (0.11)		-0.21 (0.11)		-0.12 (0.11)
Republican		-0.33 (0.13)*		0.09 (0.13)		-0.40 (0.13)**		-0.36 (0.13)**
Genetic x Ind		0.05 (0.16)		-0.03 (0.16)		-0.03 (0.16)		-0.16 (0.16)
Behavior x Ind		-0.02 (0.16)		-0.02 (0.16)		-0.18 (0.16)		-0.27 (0.16)
Socioenv x Ind		-0.13 (0.15)		0.05 (0.15)		-0.20 (0.15)		-0.20 (0.15)
Genetic x Rep		-0.04 (0.18)		-0.09 (0.18)		-0.02 (0.18)		0.02 (0.18)
Behavior x Rep		0.09 (0.19)		-0.11 (0.19)		-0.24 (0.19)		-0.27 (0.18)
Socioenv x Rep		-0.28 (0.18)		-0.35 (0.18)*		-0.32 (0.18)†		-0.45 (0.18)**
cut1	-0.74 (0.05)	-0.93 (0.09)	-1.52(0.06)	-1.49 (0.09)	-1.55 (0.06)	-1.73 (0.09)	-1.12 (0.05)	-1.23 (0.09)
cut2	-0.31 (0.05)	-0.49 (0.09)	-1.08(0.05)	-1.03 (0.09)	-1.14 (0.05)	-1.31 (0.09)	-0.69 (0.05)	-0.79 (0.09)
cut3	0.28 (0.05)	0.07 (0.09)	-0.33(0.05)	-0.33 (0.09)	-0.35 (0.05)	-0.54 (0.09)	0.06 (0.05)	-0.07 (0.09)
cut4	0.82 (0.05)	0.61 (0.09)	0.29(0.05)	0.30 (0.09)	0.43 (0.05)	0.25 (0.09)	0.73 (0.05)	0.61 (0.09)
Wald test of all party x frame interactions		χ^2=5.92, df=6 p=0.43		χ^2=6.79, df=6 p=0.34		χ^2=5.37, df=6 p=0.50		χ^2=12.8, df=6 p=0.04

Note: Table entries are ordered probit coefficients and standard errors in parentheses; †p<0.10, *p<.05, **p<.01, ***p<.001

The first column under each policy opinion heading shows the opinions regressed on just the causal frames. The only policy opinion for which there was an effect of the causal frames for the full sample (i.e., without stratifying into political party sub-samples) was opinion regarding trans fats bans (Table 3.7, column 1). Participants who saw the social determinants frame were significantly ($p=0.03$) more likely to support local government bans on trans fats in restaurants, and the effect of this frame did not vary by political party subgroup.

In contrast, Column 8 shows that political party identification moderated the effects of the frames on participants' attitudes about government incentives for grocery stores to locate in areas where there are few, as indicated by the significant Wald test that the set of party*frame interactions jointly affect policy opinions. For Democrats (the reference category), the effect of the social determinants frame relative to the control condition was positive and significant ($\beta=0.25$), indicating that exposure to this frame led to increased support for grocery store incentives in this group. The significant coefficient on the interaction between the social determinants frame and Republican party identification ($\beta=-0.45$) indicates there was a significant difference in the effect of the social determinants frame for Republicans and Democrats. Considering the two coefficients in combination suggests that the overall effect of the social determinants frame on Republicans was negative, depressing Republicans' support for grocery store incentives. Thus, the difference in opinions about grocery stores between Republicans and Democrats who were exposed to the social determinants experimental frame was significantly greater than their difference among those exposed to the frame without causal language, demonstrating a polarization effect.

The models for school concessions and parks in urban areas exhibit a similar pattern as that for opinions about grocery stores. For policy opinions regarding school concessions, there is a negative interaction (β=-.35, p=0.05) between exposure to the social determinants frame and having a Republican party identification, indicating a significant difference between that frame's effect on Democrats (the reference) and Republicans. The effect of the frame on building parks in urban areas was also significantly different for Democrats and Republicans, as indicated by the interaction between Republican party identification and the social determinants frame, which was negative and significant at $p<0.10$ (β=-.32, p=0.07).

Frames' Effects on Micro-Level (Behavioral) Public Health Policy Opinions

Table 3.8 shows participants' opinions about snack taxes, fruit and vegetable subsidies, and health education, regressed on the causal frames and interactions with causal frames and party identification. (As with the neighborhood-level policies, there were no significant interactions between the causal frames and participants' race, so these models are not reported.) Similar to opinions regarding stores, Table 3.8 (columns 2 and 4) demonstrates significant negative interactions between Republican party identification and the social determinants frame for both the snack taxes and the food subsidies variables, suggesting that Republican partisanship moderates the impact of this causal frame on these policy opinions. These significant interactions indicate that the effect of the social determinants frame was significantly different for Republicans and Democrats; the difference in opinions between Republicans and Democrats who were exposed to the social determinants experimental frame was significantly greater than their difference among those exposed to the frame without causal language. In each case, the effect of

the social determinants frame on Democrats is significant and positive, and the coefficient on the social determinants*Republican interaction term is negative and of a greater magnitude, indicating that the overall effect of the social determinants frame on Republicans' policy opinions is negative.

In addition, the coefficient on the Republican*behavioral frame interaction is also negative and significant ($p=0.01$) for the snack taxes variable. Considering the magnitude of this interaction ($\beta=-0.49$) combined with the magnitude of the effect of the behavioral frame for Democrats (the reference category) ($\beta =0.19$) indicates that the overall effect of the behavioral frame on Republicans is also negative. Moreover, for each of these variables, the Wald tests show that the set of all party*frame interactions jointly affect policy opinions, providing additional evidence that party identification moderates the causal frames' effects on these policy opinions.

Table 3.8 (column 6) identifies slight differences in health education opinions by political identification and some evidence of an interaction between the social determinants frame and Republican status, but the Wald test provided no evidence that party identification had an impact on the frames' effects on health education opinions.

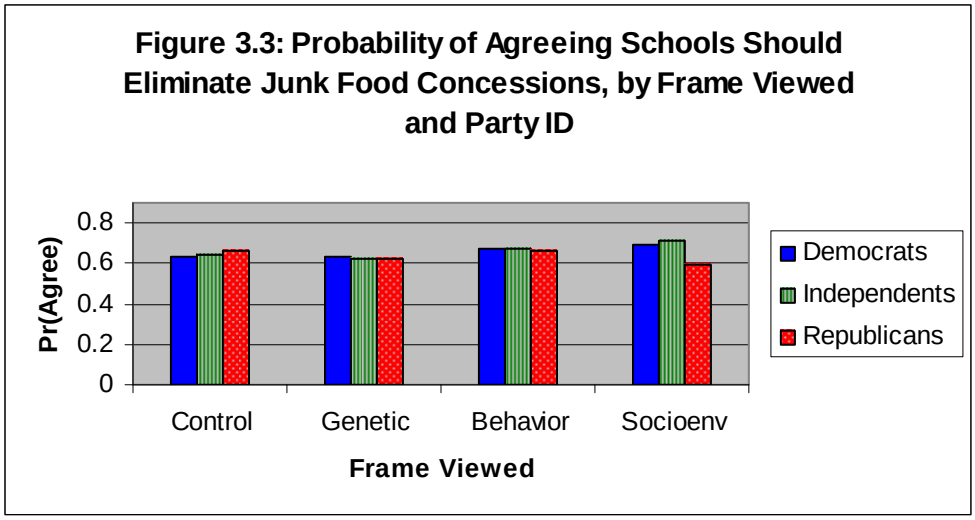
Figures 3.3 through 3.8 illustrate the differences in the frames' effects by party identification, demonstrating the polarization described above. Figure 3.3 shows only small differences between political partisans' support for eliminating school concessions, regardless of frame. Figure 3.4 shows the same relative difference between political groups in their support for building parks across each of the four causal frames.

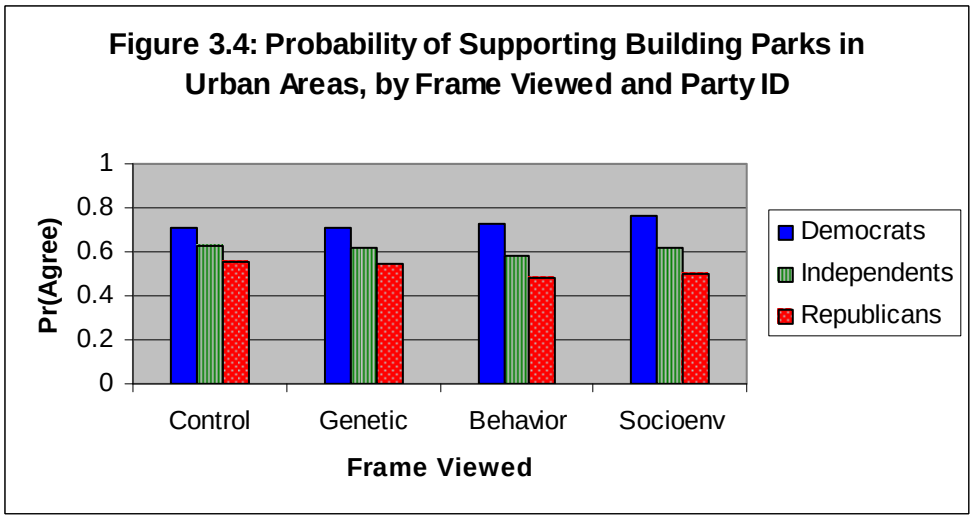
Table 3.8: Test of Party Identification as Moderator of Causal Frames' Effects on Support for Individual-level Behavioral Public Health Policies

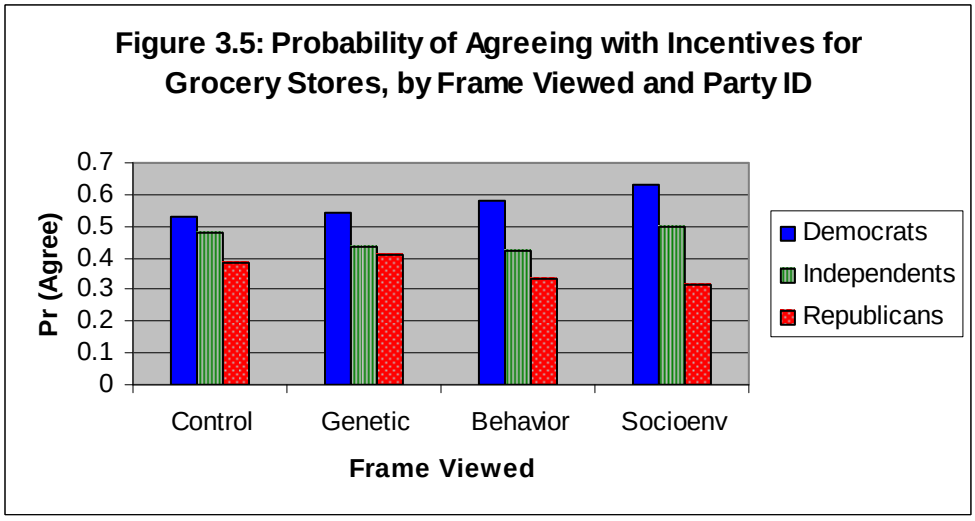
	Taxes on Junk Food		Subsidies to Make Healthy Food Cheaper		More Health Education	
	Full sample (N=2,478)	Interactions with party (N=2,072)	Full sample (N=2,462)	Interactions with party (N=2,058)	Full sample (N=2,464)	Interactions with party (N=1,060)
	Coeff (SE)	Coeff (SE)	Coeff (SE)	Coeff (SE)	Coeff (SE)	Coeff (SE)
Genetic frame	-0.01 (0.06)	0.01 (0.12)	-0.02 (0.06)	0.08 (0.12)	-0.01 (0.06)	0.13 (0.12)
Behavior frame	0.00 (0.06)	0.19 (0.12)	-0.06 (0.06)	-0.03 (0.12)	0.05 (0.06)	0.23 (0.12) †
Socioenv frame	0.10 (0.06)	0.23 (0.11)*	0.03 (0.06)	0.23 (0.12)*	0.03 (0.06)	0.22 (0.12)†
Independent		-0.01 (0.11)		-0.27 (0.11)*		-0.14 (0.12)†
Republican		-0.05 (0.13)		-0.35 (0.13)**		-0.26 (0.13)
Genetic x Independent		0.01 (0.16)		-0.17 (0.16)		-0.07 (0.16)
Behavior x Independent		-0.30 (0.16)		-0.04 (0.16)		-0.27 (0.16)†
Socioenv x Independent		-0.06 (0.15)		-0.14 (0.16)		-0.13 (0.16)
Genetic x Republican		-0.05 (0.18)		-0.24 (0.18)		-0.18 (0.18)
Behavior x Republican		-0.49 (0.19)**		-0.18 (0.19)		-0.14 (0.19)
Socioenv x Republican		-0.42 (0.18)**		-0.60 (0.18)***		-0.30 (0.18)†
cut1	-0.25 (0.05)	-0.27 (0.09)	-1.30 (0.05)		-1.87 (0.06)	-1.97 (0.10)
cut2	0.15 (0.05)	0.15 (0.09)	-0.95 (0.05)		-1.40 (0.05)	-1.50 (0.09)
cut3	0.80 (0.05)	0.76 (0.09)	-0.32 (0.05)		-0.57 (0.05)	-0.71 (0.09)
cut4	1.41 (0.05)	1.39 (0.09)	0.34 (0.05)		0.28 (0.05)	0.18 (0.09)
Wald test of all party x frame interactions		χ^2=13.76, df=6 p=0.03		χ^2=13.84, df=6 p=0.03		χ^2=6.51, df=6 p=0.37

Note: Table entries are ordered probit coefficients and standard errors in parentheses; †p<0.1 *p<.05, **p<.01, ***p<.001

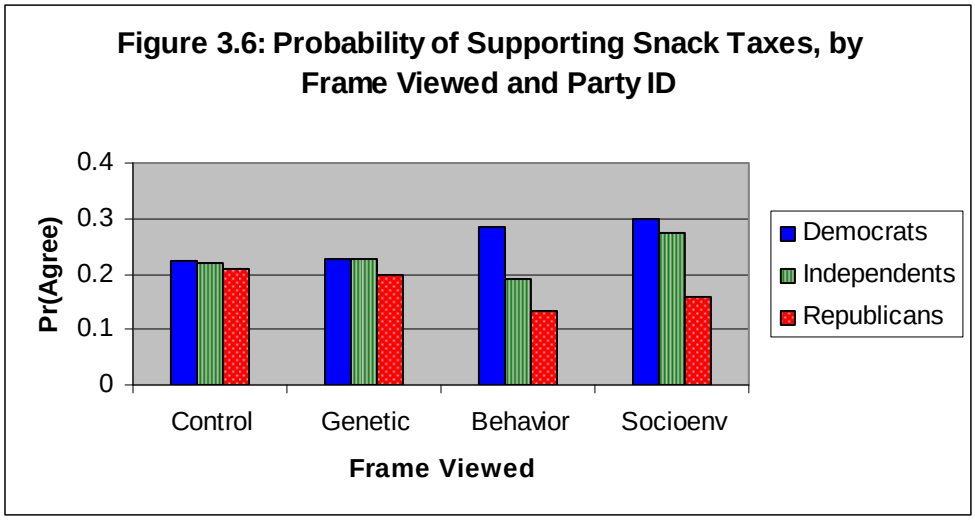
Figures 3.3-3.5: Variation in Causal Frames' Effects on Support for Public Health Policies by Party Identification

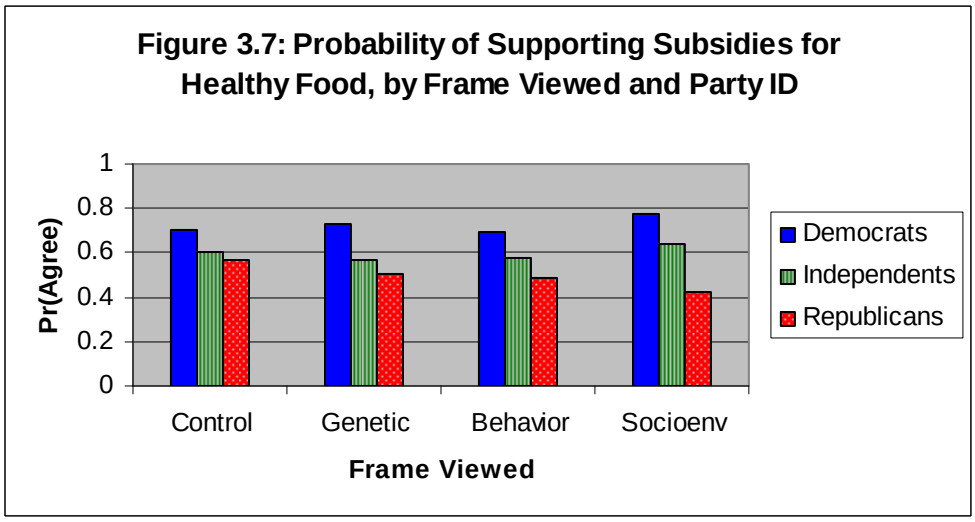






Figures 3.6-3.7: Variation in Causal Frames' Effects on Support for Public Health Policies by Party Identification (continued from previous page)





In contrast, each of the other figures shows a divergence between the partisan groups when comparing the control condition to the social determinants condition, as suggested by the significant Republican*social determinants interaction terms in the regression models. Figures 3.5 to 3.7 show that the difference between Republicans and Democrats in their support for grocery store incentives, snack taxes, and healthy food subsidies is

significantly greater under the social determinants treatment condition, relative to their difference within the control condition.

Differences in Patterns Across Types of Policy Interventions

The above figures, and their associated regression models, demonstrate some clear differences in opinion across various policies. For instance, there was no statistically significant partisan polarization in the frames' effects on attitudes regarding eliminating school concessions. Part of the reason for these differences may be that support for school concessions was quite high in the aggregate (the mean level of support was 3.8 out of 5, among the highest support of all the policies), so there may have been a ceiling on the extent of divergence between the parties that was possible. The same is true for support for building parks, another policy that participants supported highly across political orientations. Moreover, eliminating junk food from school concessions, if applied universally, helps all children, whereas some of the other policies, like bringing grocery stores into areas where there are few such stores, signal assistance to only a particular group—the impoverished.

Tests of Moderators of Causal Frames' Effects and Alternative Hypotheses

As a final test of the overall strength and consistency of the observed party identification moderator, OLS models were estimated to identify the causal frames' effects on participants' global attitudes regarding non-medical public health policies (models shown in Table 3.9). Similar to several of the models of opinions regarding specific policies, these models also reveal strong evidence of an interaction between the social determinants frame and Republican party identification, indicating that the effect

of the frame is significantly different among Republicans than among Democrats. Comparing the magnitude of the effect of the social determinants frame among Democrats (β=0.20), with the magnitude of the interaction term (β=-0.43), suggests that Republicans exposed to the social determinants frame expressed significantly less support for these non-medical, public health policies, relative to Democrats.

The models also demonstrate evidence that race moderated the effect of the frame, as there was a negative and significant coefficient on the interaction between the social determinants frame and a dummy variable representing whites. Whereas blacks who viewed the social determinants frame were more supportive of the policies (as indicated by β=0.27), the effect of the frame on whites was significantly more negative (β=-0.25). Considering the coefficients in combination suggests that the social determinants frame had little effect on whites alone.

Table 3.9: Test of Race and Party Identification as Moderators of Causal Frames' Effects on Participants' Overall Support for Non-Medical Public Health Policies (OLS model)

	Full sample framing effects (N=2,335)	Interactions with party (N=1,972)	Interactions with race (just blacks and whites, N=1,796)
	Coeff (SE)	Coeff (SE)	Coeff (SE)
Genetic frame	-0.01 (0.05)	0.01 (0.09)	0.05 (0.10)
Behavior frame	0.00 (0.05)	0.11 (0.09)	0.10 (0.11)
Socioenv frame	0.06 (0.05)	0.20 (0.09)*	0.27 (0.11)*
Independent		-0.23 (0.09)**	
Republican		-0.40 (0.10)***	
Genetic x Independent		-0.02 (0.12)	
Behavior x Independent		-0.18 (0.12)	
Socioenv x Independent		-0.13 (0.12)	
Genetic x Republican		-0.08 (0.14)	
Behavior x Republican		-0.22 (0.14)	
Socioenv x Republican		-0.43 (0.14)**	
White			-0.24 (0.09)**
Genetic x White			-0.09 (0.12)
Behavior x White			-0.09 (0.13)
Socioenv x White			-0.25 (0.12)*
Constant	2.67 (0.04)***	2.86 (0.07)***	2.82 (0.08)***
F-test of all party x frame interactions		$F_{(6, 1960)}$=2.26, p=0.03	
F-test of all race x frame interactions			$F_{(3, 1788)}$=1.48, p=0.22

Note: Table entries are OLS coefficients and standard errors in parentheses; *p<.05, **p<.01, ***p<.001

Table 3.10: Tests of Alternative Moderators of Causal Frames' Effects on Support for Public Health Policies, Controlling for Frame x Party Interactions and Socio-Demographic Variables (OLS models)

DV is support for public health policies; ranges from 0.33-4.33, mean = 2.68	*Model 1* Interactions with **Education** (High school or less) (N=1661)	*Model 2* Interactions with **Income** (10-pt scale) (N=1661)	*Model 3* Interactions with **Diabetes** status (1=has diabetes) (N=1661)
	Coeff (SE)	Coeff (SE)	Coeff (SE)
Genetic frame	0.05 (0.10)	0.05 (0.13)	0.04 (0.10)
Behavior frame	0.16 (0.10)	0.24 (0.14)	0.13 (0.10)
Socioenv frame	0.26 (0.10)**	0.33 (0.13)*	0.23 (0.10)*
Independent	-0.06 (0.09)	-0.07 (0.09)	-0.07 (0.09)
Republican	-0.09 (0.12)	-0.11 (0.12)	-0.09 (0.12)
Genetic x Independent	-0.08 (0.13)	-0.08 (0.13)	-0.08 (0.13)
Behavior x Independent	-0.19 (0.13)	-0.18 (0.13)	-0.18 (0.13)
Socioenv x Independent	-0.17 (0.13)	-0.15 (0.13)	-0.16 (0.13)
Genetic x Republican	-0.01 (0.15)	0.01 (0.15)	0.00 (0.15)
Behavior x Republican	-0.21 (0.15)	-0.17 (0.15)	-0.20 (0.15)
Socioenv x Republican	-0.40 (0.14)**	-0.35 (0.15)*	-0.39 (0.14)**
Genetic x [Column head]	-0.09 (0.16)	0.00 (0.02)	-0.05 (0.15)
Behavior x [Column head]	-0.17 (0.16)	-0.02 (0.02)	0.05 (0.15)
Socioenv x [Column head]	-0.21 (0.16)	-0.02 (0.02)	-0.01 (0.15)
Age	0.002 (0.00)*	0.00 (0.00)	0.00 (0.00)
Female	0.15 (0.04)***	0.15 (0.04)***	0.15 (0.04)***
Ideological identification[1]	-0.55 (0.09)***	-0.55 (0.09)***	-0.55 (0.09)***
High school or less education	0.05 (0.12)	-0.07 (0.06)	-0.07 (0.06)
Income (10-pt scale)[2]	-0.24 (0.06)***	-0.13 (0.13)	-0.25 (0.06)***
Diabetes status	-0.04 (0.06)	-0.04 (0.06)	-0.04 (0.11)
Family or friends have diabetes	0.12 (0.04)**	0.13 (0.04)**	0.12 (0.04)**
Black race (ref=White)	0.24 (0.05)***	0.24 (0.05)***	0.24 (0.05)***
Other race (ref=White)	0.21 (0.05)***	0.21 (0.05)***	0.21 (0.15)***
Constant	2.97 (0.11)***	2.93 (0.12)***	2.98 (0.11)***
F-test of all Republican x frame interactions	$F_{(3, 1637)}$=3.70, p=0.01	$F_{(3, 1637)}$=2.92, p=0.03	$F_{(3, 1637)}$=3.47, p=0.02

Note: Table entries are OLS coefficients and standard errors in parentheses; *p<.05, **p<.01, ***p<.001.
1-Ideological identification is coded from 0=Very Liberal to 1=Very Conservative
2- Income is coded in 10-point increments from 0=<$10,000/year and 1=>$100,000/year

Tests of Alternative Hypotheses

Table 3.10 presents the results of support for public health policies (the nine-item omnibus scale) regressed simultaneously on the interactions between the causal frames

and political party and the interactions between the causal frames and characteristics that may be alternative moderators of the framing effects, while controlling for a host of demographic and political variables. In all three of the models, there remains a strong significant negative interaction between the social determinants frame and Republican party identification, demonstrating significant polarization in opinion between Republicans and Democrats in the social determinants condition compared to the control condition. Neither education, income, nor diabetes status confound this relationship. In addition, the test of the joint effect of the Republican*frame interactions adds to the evidence already presented that political party identification moderates the effects of the causal frames on policy opinion.

DISCUSSION

In this experimental study, causal frames of diabetes embedded in a mock news article affected study participants' causal attributions of diabetes and their opinions regarding several public health policies. As expected, people who were exposed to the behavioral choices causal frame were more likely to blame people with diabetes, while those who were exposed to the genetic susceptibility frame were less likely to attribute fault to those with diabetes. People who were exposed to either the behavioral frame or the social determinants frame, relative to the news article with no causal narrative, were each more likely to agree that social or economic circumstances play a role in diabetes, suggesting some recognition among the public that social and environmental factors shape individuals' health behaviors. Interestingly, though, the results suggest that study

participants' understanding of the social determinants of diabetes is politically-, and to a lesser extent, racially-, patterned.

In particular, the social determinants framing of diabetes—emphasizing causal links between type 2 diabetes and one's socioeconomic status and the social and economic conditions in one's neighborhood—elicited a polarization of support between whites and blacks and political partisans toward several public health policies. The social determinants frame depressed whites' support for government's responsibility for improving the standard of living of the poor. (Interestingly, for none of the other opinions about specific public policies did the effects of the causal frames differ by race; race only moderated the effects when poverty was mentioned explicitly in the survey question.) The social determinants frame caused Republicans to be especially less likely to support financial incentives for grocery stores, taxes on junk food, and subsidies to make healthy food cheaper. In fact, Republicans who viewed the social determinants frame were less likely to support all public health policies, when considered collectively. These findings beg the question of why a social determinants framing should provoke such consistently diverging reactions.

Part of the answer may well be found in Figure 3.1. More participants overall disagreed than agreed that diabetes is caused by social and economic conditions, but higher levels of agreement were found among Democrats than among Republicans or Independents. Indeed, when controlling for the frame viewed and a host of demographic characteristics, the strongest predictor of agreeing with a social determinants model of diabetes was political orientation, with Democrats much more likely to agree. When exposed to the mock media article highlighting social causation of diabetes, Democrats

expressed more agreement than those exposed to the frame lacking causal language, but were no more likely to agree with social or economic causation than those exposed to the behavioral frame of diabetes. For Democrats, the behavioral frame already implied social or economic influences on diabetes risk factors; the social determinants media message amounted to "preaching to the choir" of already-believers. Republicans, on the other hand, appeared to resist the message, perhaps because it was inconsistent with their political predispositions and worldview (Zaller 1992). Their low levels of agreement with social causation of diabetes were consistent regardless of which causal frame they viewed. Thus, the media message of social determinants "fell on [their] deaf ears." Only non-partisans appeared responsive to the social determinants message, as self-identified Independents were significantly more likely to agree with social causation once exposed to the social determinants message.

The policy opinion findings indicate that Republican study participants not only resisted the social determinants message, but they also reacted against it—responding more negatively and expressing less support toward each public health policy when they were exposed to the social determinants frame. Correlations between Republican party identification and education, income, or diabetes status do not explain these polarization reactions. There are several possible explanations for the results.

First, the social determinants media frame may have presumed a liberal worldview to which the Republican study participants disagreed or found factually erroneous. Faced with such a challenge to their attitudes about disease causation, they may have counter-argued the frame, reacting even more vehemently than they might otherwise would against government intervention in health and personal behavior

(Niederdeppe et al. 2008). Moreover, media consumption is becoming increasingly polarized by party identification (Pew 2004), and a large proportion of the public tends to perceive that the media is biased against their own worldview (Eveland and Shah 2003). The social determinants frame, with its liberal assumptions, may have appeared especially biased, or hostile, to partisan Republicans (Gunther and Liebhart 2006).[7] Republicans' reactions suggest they perceived two partisan cues that compounded one another: a media article which they deemed either not credible or hostile to their view, followed by survey questions framed to emphasize government intervention, with which they are predisposed to disagree.

Alternatively, or in addition, the social determinants frame may have primed some study participants' stereotypical attitudes toward the diabetics living in poverty who were highlighted in the news article (see, e.g., Valentino et al. 2002). These stereotypical attitudes may have become newly salient considerations in their evaluations of the policies. If one associates poverty with the so-called "underclass," those undeserving of support and responsible for their situation, one would not view the social determinants model of diabetes positively. Instead, a social determinants frame of diabetes would elicit similarly negative reactions as those in the behavioral frame—that is, that poor people with diabetes suffer their condition as the result of personal moral failures. Thus, negative attitudes about the poor with diabetes, primed by the media frame, may have depressed whites' and Republicans' support for policy strategies that would help these "undeserving" targets (Gilens 1999).

[7] The "hostile media effect" (see Gunther and Liebhart 2006) is an experimentally observed phenomenon wherein ideological partisans each claim that media coverage is biased against their view.

Participants' party identification and race may be proxies for some unmeasured characteristic, such as values held regarding personal versus social responsibility for health. This could explain why these factors were activated in the social determinants condition, a media narrative which may have implied a social responsibility for health improvement. The social determinants frame was also likely the most salient, or striking, among the four experimental treatments. Given the prominence of genetic and lifestyle explanations—but not social structural explanations—for diabetes in the media (see Chapter 2 and Rock 2005) and among patients' causal beliefs (Broom and Whittaker 2004), the social determinants frame was likely highly unfamiliar relative to the other frames.

Findings from this study suggest several implications for communicating population health research and for health policy in general. Consistent with an empirical tradition of finding only nuanced media effects (McGuire 1986), this study identified little evidence of persuasion effects for the full sample. That is, when exposed to social determinants frames of diabetes, study participants as a whole did not become much more supportive of the public health policy intervention in question. Some public health researchers and advocates make the assumption that the public *ought* to respond in this way to information about social determinants of health and health disparities. However, these results suggest there may be unintended consequences of publicizing social determinants frames of chronic diseases, at least in the short-term, given the negative and divergent opinions the frame elicited among partisans.

While future research is necessary to examine the potential mechanisms of these reactions, repeated in representative samples of Americans, this study suggests that

public health advocates should use cautious, or targeted, communication strategies. If one's short-term goal is to increase public support for social and economic policies that improve population health, one might tailor communications to non-partisans—neither the already believers nor those with deaf ears—who may tend to respond with a more open mind to public health messages. Indeed, other research has demonstrated greater responsiveness among political Independents than partisans to strategic frames in elite debate over health policy issues (Jerit 2008). Alternatively, the social determinants message might be paired with a discussion of individual causal factors, implying a need for shared responsibility. Such a strategy might avoid eliciting resistance among members of the population predisposed to disagree with a social determinants narrative (Niederdeppe et al. 2008). It remains to be seen whether a gradual diffusion of the social determinants message could, over a sufficient time period, increase public support for health policies—regardless of individuals' political predispositions—if the message becomes more integrated into the public's worldview.

Limitations

The study results must be interpreted in light of several limitations. The goal of this type of experiment is not representativeness, but an assessment of causal inference. However, these findings may not necessarily be generalized to the full population of Americans. Future research using population-based samples is needed to determine whether these findings are representative of Americans' opinions. Second, given their experience with surveys for research, the study participants may have been sufficiently savvy to intuit the purpose of the experimental manipulation and respond accordingly. However, while demand characteristics may explain the expected associations between

the causal frames and the causal attributions (in other words, these questions served simply as a manipulation check), they cannot reasonably explain the sub-sample divergence in reactions between Republicans and Democrats and whites and blacks.

Third, one cannot necessarily extrapolate the reactions observed in this experimental study to the public's reactions to mass media coverage of diabetes one might obtain outside the experimental setting, particularly given the multiple and competing mass media messages about diabetes occurring simultaneously and over time. Yet, the news articles participants viewed were designed to resemble web-based news, and the reading level and general content were matched to articles about diabetes in the popular news media. Moreover, the experimental manipulation was quite subtle, adding just a few key phrases within a news article, and elicited reactions even among a sample with significant personal experience with diabetes.

Future Directions

While these findings are provocative, suggesting that communicating about the social determinants of health can polarize opinion, several avenues of future research would clarify the impact of these communications on the public's policy opinions. First, as suggested above, study participants (particularly Republicans) may not have found the media source credible. Future experimental analyses might manipulate the perceived credibility of the information source, by identifying a particular news outlet (such as *The New York Times* or *The Wall Street Journal)* or opinion leader (such as a prominent politician or scientist) to assess whether reactions to the determinants of health depend on the perceived credibility of the source of public health information (Druckman 2001).

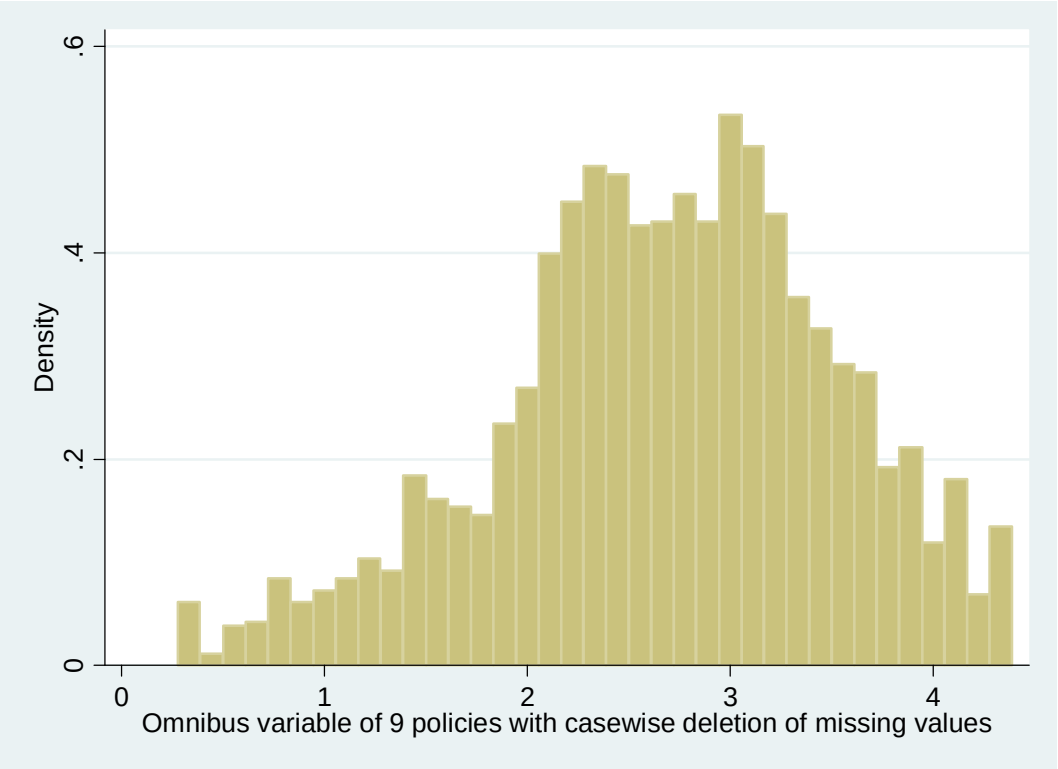
Such an analysis could indicate whether a message is more or less politically symbolic if it comes from a politician rather than a scientist.

Second, these results cannot disentangle which aspects of the social determinants frame elicited the reactions observed. The frame purposefully mixed social structural-level (i.e., identifying "the poor") and neighborhood-level (i.e., advertisements, places to exercise, and food outlets) explanations for diabetes. A future experiment that tests the impact of these explanations separately would be informative to understand whether associations with poverty in particular or the social environment more broadly lead to polarization in the public's policy support for public health strategies.

Third, the survey questions might be tweaked in a future experiment to emphasize not only government interventions (which may signal a partisan cue) but also voluntary policy strategies, like employer-initiated programs. Fourth, and finally, while carefully controlled experiments designed to isolate the effects of a single media message are valuable for building theory, particularly in a new arena, future work should also assess how the public responds to multiple, competing frames of health issues, such as a genetic *and* an environmental explanation for disease, to understand how frames work in combination (Chong and Druckman 2007; Shah et al. 2004). In sum, these findings represent a novel, yet still preliminary step, toward understanding the political and communications implications of framing public health problems.

CHAPTER 3 APPENDIX

Figure 3.A1: Histogram of Omnibus Variable of Opinions About Nine Public Health Policies



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CHAPTER 4

Causal Frames, Group Associations, and Diabetes Resource Allocation Preferences

INTRODUCTION

Over the last several decades, the incidence and prevalence of type 2 diabetes have increased rapidly in the United States and throughout the world. Type 2 diabetes leads to expensive and burdensome complications, ranging from high blood pressure and cardiovascular disease to blindness, kidney failure, and amputations. The American Diabetes Association estimates that treatment for and lost productivity from diabetes costs the United States $132 billion per year (ADA 2006). A key challenge for the future, therefore, will be identifying new ways to prevent and treat diabetes and reduce its human and economic costs. Reducing the impact of diabetes will demand major societal resources for treatment and research.

Despite its status as the sixth-leading cause of mortality in the United States, diabetes receives relatively limited resources compared with other conditions. The National Institutes of Health (NIH) 2008 estimate for funding for diabetes research is $1.031 billion, a decrease of $24 million since 2005. In contrast, the NIH estimates it will spend $2.905 billion on heart disease, $5.534 billion on cancer, $3.085 billion on infectious diseases (not including HIV/AIDS) and $1.723 billion on bio-defense in 2008 (NIH 2007). While the prevalence of diabetes increased during the 1990s, the proportion of the total NIH budget devoted to diabetes declined during those years (Davidson 1998).

More than 90 percent of all diabetes cases are type 2 diabetes, the type that usually emerges in adulthood and is associated with obesity. Yet about one-third of total diabetes research funds go toward research for type 1 diabetes, known as juvenile diabetes (Urbina 2006). Figures from the late 1990s suggested that approximately 20 percent of the NIH research budget went to type 2 diabetes, with about the same amount (17%) devoted to type 1; the remainder was devoted to basic glucose science and diabetes' complications (Davidson 1998). While both sub-types involve problems with insulin function, they differ dramatically in their etiology, risk factors, and treatment approaches, so it is unclear how readily research findings from one type can be applied to the other.

One possible explanation for these discrepancies, both in total diabetes spending and in spending devoted to the most dominant sub-type, revolves around differences in public support for treating or preventing type 2 diabetes compared to type 1 diabetes. The public may, for example, believe that type 2 diabetes is a less important health priority based on their perceptions of who suffers from the disease (i.e., obese non-white adults). These perceptions may be shaped by the media. The goal of this paper is to identify the impact of media frames of type 2 diabetes on the public's support for resource allocation toward diabetes.

Background and Theory

In their coverage of social problems, the news media emphasize certain facets of issues over others. These facets, or "frames," are the central organizing ideas or symbols in the media's presentation of an issue (Gamson and Modigliani 1989). Journalists and their sources—including health advocates, researchers, and policymakers—pick frames

to highlight certain dimensions of an issue. Framing refers to the deliberate selection of certain aspects of issues to make these features more salient or meaningful to the reader or viewer (Entman 1993; Scheufele 1999).

In the case of diabetes, as with any social or health-related issue, there are multiple frames the media may employ. One potential frame highlights the causes of the problem. Identifying the causes and distribution of illness in the population is the central goal of epidemiology and much medical research (Gordis 2000). Moreover, patients seek explanatory accounts for illness as a way to cope with and gain control over illness (Kleinman 1988). Given their expected cultural resonance with expert sources and the public alike, then, causal explanations for diabetes should be prominent in media accounts of diabetes.

Genetic susceptibility, individuals' behavioral choices, and social and economic conditions each influence the population distribution of type 2 diabetes, suggesting multiple ways in which the causes of diabetes might be portrayed in the media. Researchers have identified several candidate genes that increase susceptibility to type 2 diabetes, with particular genetic variants increasing the likelihood of type 2 diabetes by odds of about 1.5 (Florez et al. 2006; Grant et al. 2006; Scott et al. 2007). While acknowledging a role for genetics, researchers believe that the great increase in incidence of diabetes since 1980 is primarily due to lifestyle (i.e., sedentary behaviors) and dietary behaviors (i.e., consuming fats and simple carbohydrates). Such lifestyle-related causes might be framed as individualistic factors, people choosing to engage in unhealthy behaviors, or as broad societal shifts, macro-social changes in energy intake and expenditures. Health researchers regard type 2 diabetes as an exemplary demonstration

of the social determinants of health, for social and economic conditions influence its incidence, morbidity, and mortality (Brown et al. 2004; Lutfey and Freese 2005). Socioeconomic status is strongly associated with type 2 diabetes, via links between poverty and the increased cost and decreased availability of healthy food, increased stress, reduced leisure time for exercise, unhealthy neighborhood conditions, decreased access to and lower quality of health care, and less social support (Lutfey and Freese 2005). As a result, the prevalence of diagnosed diabetes is three times higher among those in the lowest income quartile than in the highest income quartile, a gap that has increased over the last 25 years (Kanjilal et al. 2006).

Like most chronic illnesses, type 2 diabetes is distributed disproportionately among racial and ethnic minorities. While 8.7 percent of non-Hispanic white adults have diabetes, 13.3 percent of black adults, 9.5 percent of Hispanic or Latino adults, and 12.8 percent of American Indian or Alaskan Natives have diabetes, with the proportion of undiagnosed diabetics even higher among racial and ethnic minority groups (CDC 2005).

Based upon these epidemiological characteristics of diabetes, one would expect its causal explanations and racial group associations to be featured in news articles describing diabetes' impact and increasing prevalence. Three related classes of literature offer theoretical support for linking these media frames of diabetes—its causes and its racial group associations—with opinions regarding resource allocation: causal attributions, group associations, and racial schema.

Causal Attributions

Social psychological literature on causal attributions demonstrates that the public's perceptions of the cause of a condition relate to their attitudes about blame,

stigma, and deservingness of public policy attention. In general, when people believe that a disease's onset is controllable, they express less pity, convey less empathetic attitudes toward people with that disease, and are less likely to want to help people with that disease than when they believe the disease is outside of the individual's control (Corrigan et al. 2003; Weiner, Perry, and Magnusson 1988). Weiner and colleagues (1988) found that people were less likely to support charitable giving for a condition they thought was controllable than for an uncontrollable condition. Similarly, Ubel and colleagues found that people preferred to allocate scarce organs to patients perceived to have not caused their own illnesses (Ubel et al. 2001). Kluegel and Smith (1986) found that whites who believed that racial and class differences were the result of individual factors (such as laziness or motivation) instead of social structure (such as employment discrimination) expressed more opposition to government assistance for blacks and the poor. Taken together, these findings suggest that when people perceive the causes of diabetes to be under individuals' control (such as individuals choosing to eat unhealthily or failing to exercise), they would be less likely to support increased funding for diabetes research as compared to when people perceive genetic or structural causes of diabetes.

Several recent studies have applied causal attributions theory to mental illness, focusing particularly on the relationship between causal attributions and perceptions of stigma. Martin, Pescosolido, and Tuch (2000) found that when people attributed mental illness to genetics or stress, rather than individualistic causes (i.e., "bad character"), they held less stigmatizing attitudes (as defined by a measure of social distance) toward those with mental illness. Phelan (2005) also aimed to identify whether attributing mental illness to genetics would lead to higher or lower levels of stigma. Causal attribution

theory would suggest the optimistic view; that is, that genetic attribution would lead to reduced blame and more positive inclinations toward helping people with mental illness. In contrast, Phelan found little evidence to support the notion that genetic explanations reduce stigma; instead, she found that genetic explanations led to study participants' increased perceptions of the seriousness of mental illness and its risk to other family members (Phelan 2005).

Applying these concepts to policy preferences, McSween (2002) found that higher levels of stigma (measured as social distance) were modestly associated with preferences toward decreased spending for mental health. She found that the strongest predictors of spending preferences were participants' personal experiences with mental illness and their political party and ideological identification (McSween 2002) Overall, then, this literature demonstrates two sets of relevant links—first, causal attributions are associated with stigma-related attitudes, and second, stigma-related attitudes appear to be associated with resource allocation preferences.

Group Associations and Racial Schema

Preferences for resource allocation for diabetes likely hinge not only on the perceived causes of diabetes but also on the public's perceptions of which social groups are affected by diabetes. Research demonstrates that the public's policy opinions are shaped by their attitudes about the targets of policies and whether they are deserving of help (Gilens 1999; Kinder and Sanders 1996; Nelson and Kinder 1996; Pollock 1994; Schneider and Ingram 1993). Nelson and Kinder (1996) showed that the public's perceptions of groups shape their opinions about government spending. When frames in survey questions emphasized the homosexual beneficiaries of AIDS policies, for

example, negative attitudes about gays had a stronger impact on opinions regarding government spending on AIDS than when frames did not mention the policies' targets. Thus, citizens appear to reduce what would be a complex consideration of a policy into a simpler question of how they feel about a particular group (Kinder and Sanders 1996). Media frames of social policy issues tend to illuminate specific morally-charged characteristics of groups, particularly whether or not they are responsible for their plight (Iyengar 1991).

Given the social epidemiology of diabetes, with its highest rates among African Americans, attitudes toward blacks may be important predictors of opinions regarding diabetes, to the extent that the media identify these racial disparities in their coverage. Rather than leading to increased support for diabetes, however, media coverage that identifies the disproportionate incidence of diabetes among blacks may potentially dampen the public's policy support. Gilens identified a relationship between whites' generally low support for spending on welfare programs and their racially stereotypical associations with blacks. In particular, whites' perceptions that blacks are lazy were strong negative predictors of their support for welfare, which Gilens associates with media depictions that tend to over-emphasize negative portrayals of blacks in their coverage of welfare programs (Gilens 1999). In another study, both whites and blacks who saw television news clips depicting the poor as predominantly white were more likely to say that too little is being spent on programs to help the poor than when news portrayals depicted the poor as predominantly black (Hannah and Cafferty 2006). Peffley and colleagues (1997) found that whites who held negative stereotypes of blacks (such as

that they are lazy or violent) were more likely to oppose welfare payments and support tough policies on crime.

Racial attitudes may influence opinions even regarding policy arenas beyond those that the public typically associates with black Americans, like welfare and crime. Winter argues that Americans will use a racial schema to interpret policy issues that are ostensibly unrelated to race when media coverage of those policy issues emphasizes particular racialized attributes (Winter 2008). Certain frames in public discourse will lead people to interpret a policy issue via an analogy they construct with the racial schema they hold. For instance, media frames of Social Security tend to emphasize benefits for hard-working, motivated, Americans—attributes Winter argues the public implicitly associates with whites. As a result of this group implication, the white public's attitudes toward whites strongly predicted their attitudes toward federal spending on Social Security (Winter 2006).

If racial schema can indeed be implicitly evoked by media presentations, there could be a potentially very powerful interactive effect between causal explanations of an illness and racial group associations. A media frame that emphasizes behavioral choices as the cause of diabetes would highlight individuals' laziness, risky choices, and lack of motivation to exercise, perceptions that causal attributions theory suggest lead to lower levels of support for diabetes spending. Moreover, such an account of diabetes that privileges its behavioral attributes would also implicitly highlight historically stereotypical attributes of blacks violating the American work ethic—being lazy or not dependable (Peffley, Hurwitz, and Sniderman 1997). Thus, when the news media link poor health behaviors and black Americans to diabetes, one would expect to find a

compounding of two negative sets of stereotypes. Under such circumstances, racialized behavioral attributes would become linked to racial associations with diabetes, bearing potentially negative consequences for support for diabetes funding. This theory finds support from previous empirical research, in which powerful racial group effects on policy opinions have been detected when media images implicitly suggest blacks are undeserving (Valentino, Hutchings, and White 2002).

Empirical Expectations

In sum, the literature reviewed above suggests that news articles which feature frames that emphasize the causes of diabetes (genetics, behaviors, or the social environment) and highlight a particular racial group (blacks or whites) will activate a survey participant's causal attributions, group associations, and racial schema. Following Zaller's model of opinion formation, these verbal and visual frames of diabetes will influence opinions by altering the salience of these sets of considerations to the issue of government spending on diabetes, with both independent and interactive effects possible (Zaller 1992). Several hypotheses can be advanced about the frames' potential effects.

Hypothesis 1 is that people who see a media article that identifies genetic causal frames of diabetes will be more supportive of government spending on diabetes, since they would consider diabetes to be outside of individuals' control and thus that people with diabetes (or those at-risk for diabetes) are deserving of increased spending. Hypothesis 2 is that people who see a media article that frames diabetes as the result of individuals' behavioral choices will be less supportive of government spending on diabetes, since they would infer blame and responsibility for those with diabetes or those at-risk of diabetes.

Hypothesis 3 is that people who see a media article that frames diabetes as the result of social structural factors will be more supportive of government spending on diabetes, because they would be more likely to consider diabetes outside of the individual's control and be less likely to infer responsibility for individuals.

Experimental research demonstrates that when people view photos accompanying a news article, they are more likely to believe that the particular racial or ethnic group pictured has an elevated risk for the health condition described in the article, even in the absence of an explicit text-based reference (Gibson and Zillman 2000). Other research on the phenomenon known as priming demonstrates that implicit racial cues in the media, particularly images, can lead whites to incorporate racial group attitudes in their evaluations of policies or candidates (Mendelberg 2001; Valentino, Hutchings, and White 2002). Thus, Hypothesis 4 is that when articles are accompanied by a photo of a black woman, whites' negative stereotypical associations with blacks will become primed, and whites will be less supportive of government spending on diabetes.

Hypothesis 5 predicts an interactive effect of associating diabetes with behavioral choices and with black Americans. The least supportive attitudes toward government spending on diabetes would be observed among whites exposed to frames of diabetes that emphasize the behavioral choices that cause the disease and also identify a racial group association between blacks and diabetes.

The literature on stigma and causal attributions suggests a potential mechanism for the proposed framing effects. This literature posits that frames of the causes of a social problem influence one's opinions about resource allocation because these frames activate one's stereotypical attitudes—that is, perceptions of individuals' or groups'

laziness or blameworthiness. These negative attitudes mediate the relationship between causal attributions and opinions regarding spending. Thus, Hypothesis 6 predicts that the public's stereotypical attitudes about people with diabetes and their attitudes about fault for people with diabetes will mediate the impact of media frames of diabetes on opinions regarding governmental spending.

STUDY DESIGN AND METHODOLOGY

Sample

These hypotheses were tested with an experimental survey that was administered to members of a panel, maintained by Survey Sampling International (SSI), of more than one million ethnically-diverse adults who have agreed to take Internet-based surveys for research purposes. The study participants are not representative of U.S. adults as a whole (see Appendix Table A1 for a comparison of the SSI sample with nationally representative descriptive statistics). SSI recruited a sample of at least 2,000 panel members from the U.S. to meet the following quotas: 60% white, 25% black, 12% Hispanic, and 3% Asian. Within each racial or ethnic stratum, SSI drew three age-group samples of 37.5% aged 18-39, 37.5% aged 40-59, and 25% aged 60+ (to approximate the U.S. age distribution). SSI adjusted the number of email invitations to participate in the study in each demographic sub-sample until the specified quotas were achieved.

To meet the demographic quotas, 2,838 people were enrolled in the study, and 2,490 (87.7%) completed the section of the survey that included the diabetes news article and diabetes-related variables in late April, 2007. This survey was administered back-to-back with an unrelated survey about avian flu and breast cancer conducted by the

University of Michigan Center for Behavioral and Decision Sciences in Medicine. Participants completing the survey were entered into a drawing administered by SSI for cash prizes. The survey was completely anonymous, and SSI handled all correspondences with participants, identifying each individual only with a study ID. The study received an exemption from human subjects review by the Medical Institutional Review Board at the University of Michigan, since no personally identifying or sensitive information about study participants was collected.

Experimental Design

Every study participant was randomly assigned to view one of four mock news articles about diabetes, designed to resemble an article from an online news source, which appeared at the start of the web-based survey. The articles, modeled after existing news articles and a press release from the American Diabetes Association, described lobbying activities in Washington and the increasing prevalence of type 2 diabetes. Articles were identical except for which one of four causal frames (genetics, behavior, socio-economic environment, or no causal language) was embedded in the text. See Appendix B for the full text of the articles. Images accompanying the article were also randomly assigned, such that every article was accompanied by one of three images: a black woman, a white woman, or a glucose testing device. Thus, the study design included 12 total possible treatments: one of four causal frames and one of three photos.

If only two photos were used as the treatments (one of a white woman and one of a black woman), some non-racial characteristic of one of the photos could influence participants' opinions, yet any observed effect would be interpreted as a race effect. To help guard against this, each participant who was assigned to receive a photo of a woman

was first randomly assigned to one of two photo sets (pairs of racially discordant seated women or standing women, each matched as much as possible for observable characteristics, including age, expression, and body mass index). Then, each participant was randomly assigned to view either the black or the white woman within that set. See Appendix C for all of the possible photos accompanying the articles, and Appendix D for a sample screen shot of what a study participant would have viewed.

For all analyses presented in this paper, the sample is restricted to the two-thirds of the respondents who saw a photo of a woman, so that comparisons can be made between the effect of the black woman and the white woman, rather than comparing the effects of seeing a personalized article relative to one featuring the glucose-testing device.[1]

Measures

Treatment Variables

The key treatment variables are: 1) the randomly assigned causal frames; and, 2) whether the participant saw the photo of a black woman or a white woman. Dummy variables were constructed for each frame (genetic, behavioral, socio-economic environment, and no causal language) with 1 indicating that the participant was exposed to that frame, 0 otherwise. A dummy variable represented that the participant viewed a photo of a black woman. The "no causal language" (or "control") condition and the photo of a white woman serve as the reference groups for all analyses.

[1] Analyses suggest that participants who saw a personalized article, compared to those who saw the picture of the glucose-testing device, were significantly more likely to stereotype people with diabetes and were less likely to agree that people with diabetes got their illness through no fault of their own. No significant effects of a personalized article on resource allocation preferences were observed.

Dependent Variables

The main dependent variables are participants' preferences for allocating federal dollars toward research for diabetes treatment or prevention. Participants were asked: "Please indicate whether the government should spend more or less on research about new treatments for diabetes" and "Please indicate whether the government should spend more or less on research about ways to prevent diabetes." Response categories were: 1=Spend much less, 2=Spend less; 3=Spend about the same; 4=Spend more; 5=Spend much more. Pollock (1994), Nelson and Kinder (1996), and McSween (2002), among others, have used similar survey items to assess opinions about federal spending on health-related issues (AIDS and mental illness). Table 4.1 shows the distributions and means of these variables. The correlation between the two variables was 0.75, suggesting participants' preferences for spending on prevention or treatment were highly correlated. Thus, for these analyses, the dependent variable is participants' overall preferences for research spending on diabetes prevention and treatment, by creating an average of the two spending variables. The variable was re-scaled from 0-1, and the mean was 0.756, indicating high overall support for spending on diabetes.

Table 4.1: Distribution of Spending Preferences on Diabetes Research (N=2,485)

Please indicate whether the government should spend more or less on…	Research about new treatments for diabetes (%)	Research about new ways to prevent diabetes (%)
Spend Much Less	1.6	1.5
Spend Less	2.4	2.1
Spend about the Same	20.3	16.8
Spend More	48.3	47.0
Spend Much More	27.4	32.6
Mean on 5-pt scale (95% CI)	3.98 (3.94-4.01)	4.07 (4.04-4.10)
Correlation=0.747		

Mediators

The mediators assessed in these analyses are stigmatizing attitudes toward people with diabetes. A key component of stigma, according to Link and Phelan (2001), is labeling negative or undesirable characteristics to a group or individual. Participants were asked on a scale from 1-7 how intelligent (1=not at all intelligent, 7=extremely intelligent), lazy (1=not at all lazy, 7=extremely lazy) and dependable (1=not at all dependable, 7=extremely dependable) people with diabetes are. This measurement strategy is known as the semantic differential technique, which researchers assert provides a reliable measure of stereotyping (Link et al. 2004). These particular characteristics were chosen to capture negative stereotypical attitudes toward people with diabetes, particularly if diabetes is perceived to result from poor health behaviors. Each of these stereotypes also captures attributes that have been racialized in the United States, by their implicit association with black Americans (Winter 2006). A scale of stereotypical attitudes was created by reversing the values for intelligent and dependable and creating an average of all three characteristics (Cronbach's α=0.72). This variable was re-scaled to run from 0 (low stereotypical attitudes) to 1 (high stereotypical attitudes). The mean level of stereotypical attitudes in the sample is 0.282, indicating low mean levels of stereotypical attitudes toward people with diabetes.

Causal attributions literature suggests that attitudes about fault will be evoked by representations of the cause of a social problem. Like stereotypical attitudes, attitudes about fault might mediate the impact of the frames of diabetes on resource allocation preferences. Participants were asked on a scale from 1-5 how much they agree (1=strongly disagree, 5=strongly agree) that "People with diabetes got their illness

through no fault of their own" and "People with diabetes brought their illness upon themselves." These variables were re-scaled from 0-1, and the mean level of agreement that diabetes is not the fault of the individual was 0.573, while the mean level of agreement that people with diabetes brought their illness upon themselves was 0.221. Results presented in the previous paper (Chapter 3), demonstrated that the randomly-assigned causal frames of diabetes significantly influenced participants' attitudes about fault. Study participants who saw the genetics frame were significantly ($p<.01$) more likely to agree that people with diabetes got their illness through no fault of their own, compared to those who saw the frame without causal language. Participants who saw the behavioral frame were significantly ($p<.05$) more likely to agree that people with diabetes brought their illness upon themselves, compared to those who saw the frame without causal language. These findings suggest that the causal frames manipulated in this experiment did, in fact, affect study participants' causal attributions of diabetes.

Control Variables

Each of the four experimental groups was compared based on demographic characteristics (age, gender, race/ethnicity, income, partisanship, ideological identification, education, diabetes status, whether family or friends have diabetes, and body mass index) using F-tests and chi-squared tests; see Table 4.2. Due to random sampling variation, there was one significant ($p<.05$) difference across the 8 groups (4 causal frames x 2 photos), in ideological self-identification.

McSween (2002) found that experience with mental illness, party identification, and ideological identification were the strongest predictors of preferences for government spending on mental health. To control for the effects across the experimental groups of

sampling variation in these characteristics, as well as to control for the effects of participants' race (given the race-related experimental manipulation), all analyses were conducted including the following control variables: experience with diabetes (whether the participant indicates that he or she had ever been told by a physician that he or she had diabetes or whether the participant indicates he or she has a close friend or family with diabetes), ideological identification (a 7-point scale ranging from 1=Liberal to 7=Conservative, and recoded to range between 0-1), political party identification (a 7-point scale ranging from 1=Strong Democrat to 7=Strong Republican and recoded to range between 0-1), black race, other race (neither black nor white) and photo set version (whether the individual viewed the standing or the seated person). Including a dummy variable for photo set in the analyses allows for an identification of the effect of the race of the target in the photo, regardless of which of the two photo sets the participant viewed. Finally, race control variables were only included in analyses conducted on the full sample, not in samples stratified by race.

Table 4.2: Descriptive Statistics of the Eight Experimental Groups

	Control + white photo	Genetic + white photo	Behavior + white photo	SocioEnv + white photo	Control + black photo	Genetic + black photo	Behavior + black photo	SocioEnv + black photo	Test of Association	P
N	***228***	***201***	***242***	***276***	***227***	***230***	***241***	***265***		
Age (mean)	45.6	46.9	45.9	46.6	47.9	44.6	46.8	48.0	$F_{7, 1573}$ =0.92	0.49
Female (%)	47.6	51.8	49.5	54.3	52.7	50.0	50.8	51.9	$\chi^2_{(7)}$=2.42	0.93
Party Identification (7pt scale)	3.69	3.91	3.40	3.59	3.80	3.35	3.73	3.55	$\chi^2_{(42)}$ =32.97	0.84
Ideological Identification (7pt)	4.02	4.18	3.76	4.17	4.31	3.92	4.04	4.27	$\chi^2_{(42)}$ =63.64	0.02
White (%)	55.4	62.8	62.6	57.9	58.4	58.8	61.2	63.0	$\chi^2_{(7)}$ =4.40	0.73
Black (%)	23.8	20.9	20.5	20.6	23.2	25.4	20.9	20.4	$\chi^2_{(7)}$ =2.85	0.90
Other/ mixed race (%)	20.7	16.3	16.9	21.4	18.4	15.8	17.8	16.7	$\chi^2_{(7)}$ =4.17	0.76
Has diabetes (%)	14.8	12.4	10.9	13.7	15.0	16.6	13.0	17.7	$\chi^2_{(7)}$ =5.44	0.61
Family or friends have diabetes (%)	64.8	67.9	58.3	61.6	70.9	66.9	64.7	70.0	$\chi^2_{(7)}$ =10.42	0.17
Body Mass Index (mean)	30.0	29.5	28.2	29.1	29.3	29.6	28.9	29.8	$F_{7, 1503}$=1.15	0.33
Income (10pt scale)	4.87	4.95	4.93	5.03	4.62	4.60	4.93	5.22	$\chi^2_{(63)}$ =61.52	0.53
High school educ or less (%)	16.3	19.9	14.3	15.0	21.5	22.6	20.1	22.1	$\chi^2_{(7)}$ =10.03	0.19

Empirical Approach

The empirical model underlying participants' opinions about government spending is: Support for Government Spending for Diabetes = $\beta_0 + \beta_1$(GeneticFrame) + β_2(BehavioralFrame) + β_3(SocialEnvFrame) + β_4 (BlackPhoto) + β_5(GeneticFrame x BlackPhoto) + β_6(BehavioralFrame x BlackPhoto) + β_7(SocialFrame x BlackPhoto) + $\beta_{8\text{-}13}$(Controls) + ε.

This model was estimated using ordinary least squares (OLS) regression, first without including the interaction terms and then including the interaction terms. Based upon the hypotheses outlined above, the coefficients on B_1 and B_3 would be positive (meaning higher support for diabetes research for those exposed to the genetic and social environment frames) and the coefficient on B_2 would be negative (meaning less support for diabetes research for those exposed to the behavioral frame). For whites only, the coefficient on B_4 would be negative (meaning less support for those exposed to a photo of a black woman), and the coefficient on B_6, the interaction between the behavioral frame and the photo of the black woman, would also be negative and significant.

Since the theory presented above suggests that the causal frames and images influence participants' stereotypical attitudes about people with diabetes, the same model as above was estimated but with stereotypical attitudes as the dependent variable. The hypotheses suggest that the signs on the coefficients in this model would be opposite those in the first model, such that the behavioral frame is associated with higher levels of stereotyping, while the genetic and social environment frame would be associated with lower stereotyping; for whites, seeing a photo of a black woman would be associated with higher stereotyping.

Finally, to assess the hypothesis that stereotypical attitudes and attitudes about fault mediate the impact of the frames and photos on government spending opinions, equation 1 was re-estimated including stereotypes and attitudes about fault as covariates. If stereotypical attitudes and attitudes about fault indeed mediate the relationship between the frames and opinions about government spending, the coefficients on the causal frames and photo variables should become significantly closer to zero when the models include these mediating variables (Baron and Kenny 1986).

RESULTS

Frames' Effects on Spending

Table 4.3 shows the results of the regression model of government spending on diabetes research, displaying the main effects of the causal frame and the photo treatments in Model 1 and the interactive effects in Model 2. The table presents the regression results for the full sample (first two columns), for white study participants (third and fourth columns), and for black study participants (fifth and sixth columns). (Tables displaying the coefficients on the control covariates are included in the Chapter 4 Appendix.) In the full sample, exposure to the genetic frame and the social environmental frame boosts support for spending on diabetes research, relative to exposure to the frame that included no causal language about diabetes. However, there was no evidence of significant effects of any of the causal frames on spending preferences among whites alone. Blacks who were exposed to the social environmental frame of diabetes were more likely to support increased spending on diabetes research.

To test whether the impact of the social environmental frame was statistically significantly different in blacks and whites, Model 1 was re-estimated for the sample of blacks and whites pooled (N=1,015) and fitted with interaction terms between each experimental treatment (the three causes and the photo) and participants' black race (see appendix Table 4.A4, column 1). There were no significant coefficients on any of the interaction terms (nor was the F-test of the joint effect of the interaction terms significant), meaning the apparent differences in the effect of the frames stratified by racial group in Table 4.3 were not statistically significant.

Table 4.3: Effect of Frames and Photo on Support for Diabetes Research Spending

Higher value of DV is more support for spending	Full Sample (N=1227)		Whites Only (N=761)		Blacks Only (N=254)	
	Model 1 Coeff (SE)	*Model 2* Coeff (SE)	*Model 1* Coeff (SE)	*Model 2* Coeff (SE)	*Model 1* Coeff (SE)	*Model 2* Coeff (SE)
Genetic Frame	0.03† (0.02)	0.01 (0.02)	0.03 (0.02)	-0.01 (0.03)	0.04 (0.03)	0.07† (0.04)
Behavioral Frame	0.01 (0.02)	-0.01 (0.02)	0.02 (0.02)	-0.004 (0.03)	0.01 (0.03)	0.02 (0.04)
SocioEnv Frame	0.03* (0.01)	0.04† (0.02)	0.03 (0.02)	0.03 (0.03)	0.06* (0.02)	0.07* (0.04)
BlackPhoto	0.01 (0.01)	-0.01 (0.02)	0.01 (0.04)	-0.03 (0.03)	0.001 (0.02)	0.030 (0.04)
Genetic x BlackPhoto		0.03 (0.03)		0.07† (0.04)		-0.06 (0.06)
Behavior x BlackPhoto		0.04 (0.03)		0.05 (0.04)		-0.03 (0.06)
SocialEnv x BlackPhoto		-0.01 (0.03)		0.01 (0.04)		-0.02 (0.05)
F-test that interaction terms=0		$F_{3, 1213}$ =1.33 p=0.262		$F_{3, 749}$ =1.40 p=0.212		$F_{3, 242}$ =0.46 p=0.711

Note: Table entries are OLS coefficients and standard errors; †p<.1, *p<.05, **p<.01. Models control for party identification, ideological identification, diabetes experience (whether respondent or close family or friend has diabetes), black race, other race (only for full sample models), and which photo set the respondent viewed. See Table 4.A1 for full model coefficients.

There was no statistically significant effect of seeing a photo of a black woman with diabetes, relative to a photo of a white woman, on opinions regarding spending on diabetes, for the full sample, for just whites, or for just blacks. Moreover, contrary to expectations, the results in Table 4.3 showed little evidence of any significant interactions between the causal frame and the photo viewed. Whites who viewed the genetic frame and also saw a photo of a black woman were more likely to support increased spending on diabetes research (p=0.086). Yet, the test of the joint effect of the photo x frame interaction terms indicated that these interactions did not add to the predictive power of the model of spending preferences.

Frames' Effects on Stereotypes

Table 4.4 shows the effect of the causal frames and the racial stimulus on stereotypical attitudes toward people with diabetes. As expected, in the full sample, participants exposed to the behavioral choices frame of diabetes were significantly more likely to report negative stereotypical attitudes about people with diabetes, relative to those who viewed the frame without causal language. None of the causal frames had statistically significant effects on stereotypes for whites only, but blacks were significantly less likely to report negative stereotypical attitudes toward people with diabetes when they viewed the social environmental causal frame of diabetes as compared to those viewing the frame without any causal language.

As above, to test whether or not these apparent racial differences were statistically significant, Model 1 of stereotypes was re-estimated on the pooled sample of black or white participants (N=1,013), with interaction terms included between each causal frame and black race as well as an interaction term between black race and the photo of the

black woman (see appendix Table 4.A4, column 2). There was a negative coefficient on the interaction term between the social environmental frame and black participants' race (β=-.10, p=0.011), indicating that the effect of the social environment frame on blacks' likelihood of stereotyping people with diabetes was significantly different more negative than its effect on whites. The F-test of whether all the causal frame*race interactions were jointly equal to 0 was also significant ($F_{3,999}$=3.62, p=0.013), indicating the causal frames had a differential impact on stereotyping for blacks and for whites.

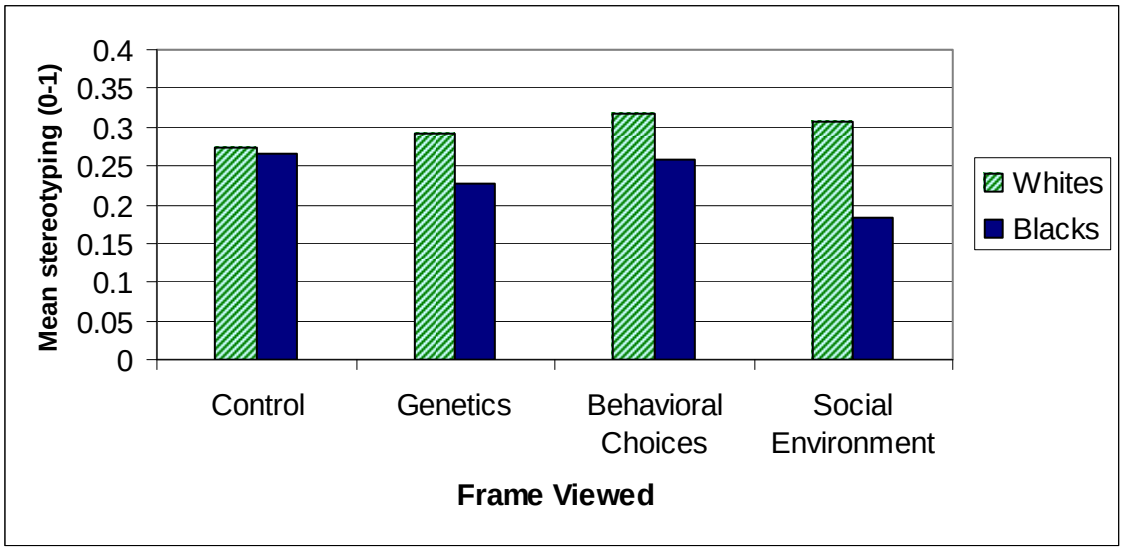
Table 4.4: Effect of Frames and Photo on Negative Stereotypical Attitudes Toward People with Diabetes

Higher value of DV is more negative stereotyping	Full Sample (N=1223)		Whites Only (N=758)		Blacks Only (N=255)	
	Model 1 Coeff (SE)	*Model 2* Coeff (SE)	*Model 1* Coeff (SE)	*Model 2* Coeff (SE)	*Model 1* Coeff (SE)	*Model 2* Coeff (SE)
Genetic	0.001	0.01	0.01	0.00	-0.01	0.02
	(0.02)	(0.02)	(0.02)	(0.03)	(0.03)	(0.05)
Behavior	0.03*	0.04*	0.03	0.04	0.05	0.06
	(0.02)	(0.02)	(0.02)	(0.03)	(0.03)	(0.05)
Social	0.000	0.001	0.02	0.02	-0.07*	-0.04
Environment	(0.02)	(0.02)	(0.02)	(0.03)	(0.03)	(0.05)
BlackPhoto	-0.02†	-0.01	-0.03*	-0.03	0.01	0.05
	(0.01)	(0.02)	(0.01)	(0.03)	(0.02)	(0.05)
Genetic x		-0.01		0.02		-0.06
BlackPhoto		(0.03)		(0.04)		(0.07)
Behavior x		-0.02		-0.02		-0.02
BlackPhoto		(0.03)		(0.04)		(0.07)
SocialEnv x		-0.002		-0.01		-0.07
BlackPhoto		(0.03)		(0.04)		(0.07)
F-test that interaction terms=0		$F_{3, 1209}$ =0.26 p=0.854		$F_{3,746}$ =0.43 p=0.734		$F_{3, 243}$= 0.48 p=0.694

Note: Table entries are OLS coefficients and standard errors; †p<.1, *p<.05, **p<.01 Models control for party identification, ideological identification, diabetes experience (whether respondent or close family or friend has diabetes), black race, other race (only for full sample models), and which photo set the respondent viewed. See table 4.A2 for full model coefficients.

Figure 4.1 shows blacks' and whites' divergent responses to the causal frames. Whereas whites expressed more negative stereotypes toward people with diabetes upon viewing the social determinants frame (relative to the frame without causal language), blacks who viewed this frame exhibited significantly less negative stereotyping.

Figure 4.1: Levels of Stereotyping for Blacks and Whites, by Causal Frame Viewed



For the full sample, exposure to a photo of a black woman, relative to seeing a photo of a white woman, was actually associated with *less* stereotyping (p=0.09) (see Table 4.4, column 1). This effect appeared driven by whites, as whites who viewed the photo of a black woman were significantly (p=0.03) less likely to report negative stereotypes toward people with diabetes (Table 4.4, column 3), in contrast to Hypothesis 4. However, the pooled model fitted with interaction terms (appendix Table 4.A4 column 2) demonstrated no statistically significant interaction between participants' black race and viewing the photo (β=0.03, p=0.20), indicating that the effect of the photo on stereotyping was not statistically significantly different in whites and in blacks (see

appendix Table 4.A4, column 2). As in the model of resource allocation preferences, Table 4.4 shows there were no significant interactive effects of the causal frame and photos on stereotyping.

Stigma as a Mediator of Frames' Effects on Spending

Next, models of diabetes spending opinion were estimated with stereotypes and attitudes about fault included as covariates. Table 4.5 demonstrates that negative stereotypes of people with diabetes were strong predictors of opinions on government spending on diabetes research.[2] In the full sample, an increase in stereotyping from the lowest to highest possible levels was associated with a decrease in spending preferences of nearly 0.3 units on the 0-1 scale. In fact, negative stereotyping was the largest independent predictor of opposition to spending more on diabetes research, larger even than conservative political ideology (see appendix Table 4.A3). The magnitude of the effect of negative stereotypes on resource allocation preferences was larger for whites than for blacks, although it was statistically significant in both groups.

Attitudes about fault were also associated with resource allocation preferences, albeit less strongly. The regression results showed no evidence that participants' attitudes that diabetes is not the individual's fault were related to their opinions regarding spending. However, people who agreed with the contrary, that people with diabetes brought their illness upon themselves, were significantly less likely to support government spending on diabetes, for the full sample and for whites.

[2] Given the lack of support for interactive effects between the photos and the causal frame treatments, the models in Table 5 were estimated for the independent, or main, effects only.

Table 4.5: Effect of Frames and Race of Photo on Support for Diabetes Research Spending, Assessing Stereotypes (Model 1) and Attitudes about Fault (Model 2) as Mediators

Higher value of DV is more support for spending	Full Sample		Whites Only		Blacks Only	
	Model 1 (N=1221) Coeff (SE)	*Model 2* (N=1218) Coeff (SE)	*Model 1* (N=757) Coeff (SE)	*Model 2* (N=755) Coeff (SE)	*Model 1* (N=254) Coeff (SE)	*Model 2* (N=253) Coeff (SE)
Genetic	0.03†	0.03†	0.03	0.03	0.04	0.04
	(0.01)	(0.01)	(0.02)	(0.02)	(0.03)	(0.03)
Behavior	0.02	0.02	0.03†	0.03†	0.01	0.01
	(0.01)	(0.01)	(0.02)	(0.02)	(0.03)	(0.03)
SocioEnv	0.03*	0.03*	0.04†	0.03†	0.05†	0.05†
	(0.01)	(0.01)	(0.02)	(0.02)	(0.03)	(0.03)
BlackPhoto	0.002	0.004	-0.004	-0.005	0.003	0.005
	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)	(0.02)
Stereotypes	-0.29**	-0.26**	-0.34**	-0.31**	-0.18**	-0.15**
	(0.03)	(0.03)	(0.04)	(0.04)	(0.05)	(0.05)
Not fault		0.02		-0.02		0.05
		(0.02)		(0.03)		(0.04)
Individual fault		-0.04*		-0.06*		-0.01
		(0.02)		(0.03)		(0.04)

Note: Table entries are OLS coefficients and standard errors; †p<.1, *p<.05, **p<.01 Models control for party identification, ideological identification, diabetes experience (whether respondent or close family or friend has diabetes), black race, other race (only for full sample models), and which photo set the respondent viewed. See Table 4.A3 for full model coefficients.

Table 4.5 offers little evidence to support the hypothesis that the effects of the genetic and social environmental causal frames on spending preferences are mediated through participants' negative stereotypical attitudes about people with diabetes. For the full sample (Model 1), including stereotypical attitudes in the model left the magnitude of the coefficients on the genetic frame and the social determinants frame virtually unchanged from their magnitude in Model 1 of Table 4.3. For whites, controlling for stereotypes in the model actually increased the magnitude of the coefficients on each of the causal frames. The coefficients on the behavioral frame and the social environmental

frame became significant at the 0.1 level, suggesting that participants who viewed either of these frames were more likely to support spending on diabetes, once their negative stereotypical attitudes toward people with diabetes were accounted for. Among blacks, the hypothesis of mediation via stereotypical attitudes was somewhat supported, as the coefficient on the social environmental frame decreased from .064 to .051 (a decrease of 20%) when stereotypical attitudes were included in the model, and the coefficient no longer reached significance at the .05 level.[3] This means that for blacks, some of the positive effect of the social environmental frame on support for diabetes spending can be explained by their (relatively lower) levels of stereotyping of people with diabetes.

When attitudes about fault were included in the model of government spending for the full sample (Table 4.5, Model 2), the magnitudes of the coefficients on the genetic frame and social environment frame decreased somewhat more than when just stereotypes were included, suggesting some mediation. The same is true for models of whites only and blacks only, although in no cases did the magnitudes of the coefficients on the causal frames decrease to a level that is not statistically different from zero once both stereotypical attitudes and attitudes about fault were included in the models.

DISCUSSION

These results demonstrate that a relatively subtle manipulation in a media message about diabetes—identifying the determinants of diabetes as genetic susceptibility, behavioral choices, or the social environment—influences the public's

[3] Evidence from the Sobel test that the effect of the social environmental frame on resource allocation attitudes is mediated through stereotypes supports these findings (Baron and Kenny 1986). The test neared statistical significance for blacks, but not for whites or for the full sample. (Sobel coefficient for the full sample = .00004, p=0.99; for whites only, coeff= -.007, p=.35; for blacks only, coeff = .013, p=.06)

preferences toward governmental spending on diabetes research. Within the full sample, study participants who were exposed to a media frame that suggested that diabetes has a genetic origin, or that diabetes results from living in an impoverished neighborhood, were more likely to support increased spending on diabetes research. This is suggestive that, in the aggregate, participants considered those whose diabetes results from a genetic predisposition or from economic or social conditions more deserving. Moreover, participants who were exposed to a news article that framed the causes of diabetes in terms of individuals' behavioral choices were more likely to hold negative stereotypes of people with diabetes, stereotypes that proved to be robust predictors of participants' support for spending on diabetes research.

These findings are consistent with previous studies on causal attributions and mental illness stigma, which found that people are less likely to hold stigmatizing attitudes toward those whose health conditions they perceive are not their fault, whether due to genetics or external factors like stressful life circumstances (Martin, Pescosolido, and Tuch 2000; Weiner, Perry, and Magnusson 1988). Moreover, the robust relationship between negative stereotypes of people with diabetes and opposition to spending on diabetes research provides additional evidence that policy opinions are group-centric, hinging upon attitudes about the social groups that are the policy targets, in this case, people with diabetes (Nelson and Kinder 1996).

Contrary to the theoretical expectations, these results do not support the hypothesis that associating diabetes with a particular racial group, by accompanying a news article with a photo of a black woman or a white woman, had any impact on participants' spending preferences. These findings also fail to support the hypothesis that

a racial image will interact with the behavioral causal frame to produce a stronger impact on attitudes about diabetes spending or on negative stereotypes. Whites who saw an article that visually suggested diabetes was associated with blacks were not less likely to support spending on diabetes than those who saw a photo of a white person, nor were they more likely to endorse negative and stereotypical attitudes about people with diabetes.

In fact, the results provide some evidence that whites who saw a photo of a black woman were *less* likely to endorse stereotypical traits about people with diabetes. These findings contrast with research on media frames of welfare policy, which find strong negative effects of racial imagery on whites' support for welfare and other anti-poverty policy (Gilens 1999; Hannah and Cafferty 2006). This finding may mean that whites have more positive views of blacks suffering from significant health issues, in contrast to their associations with blacks in poverty. It may also be possible that whites may have identified the race manipulation and the racialized content of the attribute scales (e.g, lazy, unintelligent). If so, they may have rated people with diabetes higher than they would otherwise on the stereotypes scales, in order not to violate the norm of equality and the norm against reporting racially stereotypical opinions (Mendelberg 2001). This is very unlikely, however, given that the photo stimulus was relatively subtle according to Mendelberg, since there was no textual reference to race of diabetics.

Similar to the findings presented here, Peffley and colleagues (1997) found little evidence that the race of the target described in their experimental narratives affected whites' support for policies. They suggested that whites in their study responded in opposite directions to the stimuli; some whites reacted negatively, as expected, while a

substantial group of whites, those predisposed to reject negative stereotypes of blacks, reacted more positively, thus canceling out any effects. In their experimental study of charitable giving after Hurricane Katrina, Fong and Luttmer (2007) found no effect of the race of the victims pictured on the amount of charitable giving participants would themselves provide, but they did find that white respondents were less likely to support governmental spending on public assistance for Katrina victims when they were exposed to an image of black victims. Like Peffley and colleagues, they found heterogeneity among the groups, such that whites who more strongly identified with their racial group were more biased against blacks. These two complementary studies suggest that the lack of racial effects observed in the present study could mask significant heterogeneity in whites' racial predispositions; that is, whites' opinions regarding spending and stereotypes may have moved in opposite directions in response to the photo stimuli.

Thus, while there was no observable evidence that average levels of spending opinion were significantly associated with the photo treatment, the photo manipulations may have changed the underlying determinants of spending opinion (see, e.g., Mendelberg 2001). Neither racial resentment nor participants' feelings about members of particular racial groups were measured in this study. Had these been measured, it might have been possible to observe that the determinants of opinion differed depending on whether study participants saw a photo of a black person and/or whether they saw the behavioral causal frame. For racial liberals, for instance, predisposing sympathetic attitudes about blacks may have become more important predictors of their attitudes about government spending on diabetes when they were exposed to a picture of a black woman with diabetes (and the same may be true for a racially conservative individual's

negative attitudes about blacks). Future research might replicate this experiment and include measures of racial group affect or racial predispositions to assess whether these factors become stronger predictors of diabetes funding opinion when the news media associate diabetes with racialized attributes or racial images.

Despite finding little overall effects of the race-related manipulation, this analysis did identify some important differences between blacks and whites in the effects of the causal frames of diabetes on opinions. First, while independent positive effects of the genetics and social determinants causal frames on spending preferences were identified for the full sample, these effects were not statistically different from zero among whites alone. These findings suggest that the full sample framing effects were driven by non-whites. In particular, the results reveal that blacks who were exposed to the social determinants frame were more likely to support spending on diabetes. Blacks who were exposed to the social environmental frame of diabetes were significantly less likely to endorse negative stereotypes of people with diabetes. Previous research has suggested that blacks are more likely to endorse social structural explanations for poverty, compared to whites (Kluegel and Smith 1986). Blacks are also less likely than whites to agree with genetic or family upbringing explanations for mental illness (Schnittker, Freese, and Powell 2000), findings that Schnittker and colleagues speculate may reflect blacks' skepticism of these politically-loaded causal arguments for blacks' social status. The current research extends this work, suggesting that blacks have more sympathetic attitudes than whites toward people with diabetes whose condition results from the social and economic conditions in which they live.

These racial differences in the effects of the media frames suggest that the current focus in health policy discourse of publicizing the social and economic determinants of illness (Smedley 2006) could have differential effects on the policy opinions of blacks and whites. In particular, blacks may be more likely than whites to consider individuals with a chronic illness that is caused by the social environment (such as conditions of poverty, lack of access to healthy food or places to exercise, or unsafe neighborhoods) to be especially deserving of policy attention.

Finally, these results offer only limited evidence that the effects of the causal frames on participants' spending opinions were mediated through stereotypical attitudes or attitudes about fault of people with diabetes. The proposed mediating variables, including ranking people with diabetes as lazy, may have been measured with significant error, which would lead to an underestimate of the mediators' effects (Baron and Kenny 1986). The "true" mediator of the causal effects on policy opinions may actually be an emotional or affective reaction to people with diabetes, which may not have been measured reliably by the cognitive ranking task.

Limitations

The study results must be interpreted in light of several limitations. This study was designed first and foremost to test a causal hypothesis, not to be representative of a broader population. These findings cannot necessarily be generalized to the full population of Americans. In particular, the members of the study sample were more highly educated than the general public and the sample over-represented blacks (see Appendix A, Table A1), but in other regards, such as political orientation and income, they were similar to the general population.

Second, the task of reading a mock news article and responding to survey questions can be considered somewhat artificial. It is an empirical question whether or not the reactions observed in this study can be extrapolated to the public's reactions to mass media coverage of diabetes one might obtain outside the experimental setting (Berkowitz and Donnerstein 1982). The news articles were designed to resemble web-based news, and the reading level and content were matched to articles about diabetes in the popular news media. Moreover, the experimental manipulation was quite subtle, just the addition of a few key phrases and a photo within a news article. These manipulations elicited reactions even among people with significant personal experience with diabetes.

Conclusions and Future Directions

Morone (2005) argues that fundamental issues in public health policy can be interpreted as debates revolving around Americans' moral judgments of "us" versus "them." He states that "the politics of social policy always turns on the mental images we create of the beneficiaries" (p. 18). This paper supports Morone's argument, providing new evidence that media framing of a seemingly neutral health problem, diabetes, to emphasize its behavioral attributes increases negative stereotypes toward people with that disease—stereotypes that are large predictors of support for federal spending on diabetes. Morone suggests the first major historical public health "sins" were alcoholism and drugs, followed by sexually transmitted diseases conveyed through promiscuity (Morone 1997). Contemporary sins responsible for public health and economic burdens are eating unhealthily and not exercising, attributes of groups that likely also carry social stigma.

A key question for future health policy is, under what conditions will group-centric attitudes become more important predictors of the public's health policy opinions? The findings presented here provide little evidence that diabetes has become racialized, at least at the present time. This contrasts to social problems like crime and welfare that social scientists argue have become linked to race via unflattering media coverage over the last several decades (Gilens 1999; Gilliam and Iyengar 2000). If future media coverage tends to emphasize racial disparities in diabetes, however, the public's mental images of people with diabetes may indeed include their race.

Research suggests that use of the group lens to interpret one's policy opinions becomes more likely when the in-group perceives a threat (Kinder and Sanders 1996; Stenner 2005; Winter 2006). In public health, immigration restrictions and eugenic sterilization laws in the 20th century can be interpreted as ethnocentric reactions to perceived threats from foreigners (Markel and Stern 2002; Stern 2005). Such regulations resulted because of inflated concerns about foreigners spreading infectious disease or genetic deficiencies throughout the population. Moreover, policy opinions about AIDS in the early stages of the epidemic were shaped by similar ethnocentric-based attitudes toward gays, those most likely at that historical moment to harbor the infection (Nelson and Kinder 1996). Thus, the public's interpretation of public heath policy issues via their perceptions of groups may become heightened in the face of perceived threats of infection.

In their recent articles about media framing of obesity, Saguy and colleagues note that the news media tend to depict an "epidemic" of obesity, suggesting alarm and moral panic (Saguy and Almeling 2008). Print news articles describing the increasing

prevalence of type 2 diabetes also frequently use the language of an epidemic (see Chapter 2). Thus, public discourse increasingly depicts both obesity and type 2 diabetes, conditions that are not actually infectious, using language that implies an epidemic, with the prevalence spreading most rapidly within minority groups. This trend suggests that group-centric attitudes may become more significant determinants of the public's attitudes about obesity and diabetes, and health disparities more generally, in the future — bearing potentially negative consequences for the public's support for increasing societal resources to combat these disparities.

Table 4.A1: Effect of Frames and Race of Photo on Support for Diabetes Research Spending (including control covariates)

	Full Sample (N=1227)		Whites Only (N=761)		Blacks Only (N=254)	
	Model 1 Coeff (SE)	*Model 2* Coeff (SE)	*Model 1* Coeff (SE)	*Model 2* Coeff (SE)	*Model 1* Coeff (SE)	*Model 2* Coeff (SE)
Genetic Frame	0.03† (0.02)	0.01 (0.02)	0.03 (0.02)	-0.01 (0.03)	0.04 (0.03)	0.07† (0.04)
Behavioral Frame	0.01 (0.02)	-0.01 (0.02)	0.02 (0.02)	-0.004 (0.03)	0.01 (0.03)	0.02 (0.04)
SocioEnv Frame	0.03* (0.01)	0.04† (0.02)	0.03 (0.02)	0.03 (0.03)	0.06* (0.02)	0.07* (0.04)
BlackPhoto	0.01 (0.01)	-0.01 (0.02)	0.01 (0.04)	-0.03 (0.03)	0.001 (0.02)	0.030 (0.04)
Genetic x BlackPhoto		0.03 (0.03)		0.07† (0.04)		-0.06 (0.06)
Behavior x BlackPhoto		0.04 (0.03)		0.05 (0.04)		-0.03 (0.06)
SocialEnv x BlackPhoto		-0.01 (0.03)		0.01 (0.04)		-0.02 (0.05)
Party ident.	-0.06** (0.02)	-0.06** (0.02)	-0.04 (0.03)	-0.04 (0.03)	-0.002 (0.04)	-0.001 (0.04)
Ideological ident.	-0.10** (0.03)	-0.02** (0.004)	-0.13** (0.04)	-0.12** (0.04)	-0.03 (0.05)	-0.03 (0.05)
Diabetes experience	0.06** (0.01)	0.06** (0.01)	0.07** (0.01)	0.07** (0.01)	0.08** (0.02)	0.08** (0.02)
Black race (ref=White)	0.06** (0.01)	0.06** (0.01)				
Other race (ref=White)	0.05** (0.01)	0.05** (0.01)				
PhotoSet #1	-0.01 (0.01)	-0.01 (0.01)	-0.02 (0.01)	-0.02 (0.01)	0.03 (0.02)	0.03 (0.02)
Constant	0.76** (0.02)	0.78** (0.02)	0.77** (0.03)	0.78** (0.03)	0.74** (0.03)	0.72** (0.04)
Adj. R^2	0.108	0.109	0.074	0.076	0.061	0.055
F-test that interaction terms=0		$F_{3, 1213}$ =1.33 p=0.262		$F_{3, 749}$ =1.40 p=0.212		$F_{3, 242}$ =0.46 p=0.711

Note: Table entries are OLS coefficients and standard errors; †p<.1, *p<.05, **p<.01. Party identification is coded as a 7-pt scale where 0=Strong Democrat and 1=Strong Republican; ideological identification is coded as a 7-pt scale where 0=Very Liberal and 1=Very Conservative; Diabetes experience is coded such that 1=Participant or family/friend has diabetes, 0 otherwise.

Table 4.A2: Effect of Frames and Race of Photo on Stereotypical Attitudes Toward People with Diabetes (including control covariates)

	Full Sample (N=1223)		Whites Only (N=758)		Blacks Only (N=255)	
	Model 1 Coeff (SE)	*Model 2* Coeff (SE)	*Model 1* Coeff (SE)	*Model 2* Coeff (SE)	*Model 1* Coeff (SE)	*Model 2* Coeff (SE)
Genetic	0.001	0.01	0.01	0.00	-0.01	0.02
	(0.02)	(0.02)	(0.02)	(0.03)	(0.03)	(0.05)
Behavior	0.03*	0.04*	0.03	0.04	0.05	0.06
	(0.02)	(0.02)	(0.02)	(0.03)	(0.03)	(0.05)
Social	0.000	0.001	0.02	0.02	-0.07*	-0.04
Environment	(0.02)	(0.02)	(0.02)	(0.03)	(0.03)	(0.05)
BlackPhoto	-0.02†	-0.01	-0.03*	-0.03	0.01	0.05
	(0.01)	(0.02)	(0.01)	(0.03)	(0.02)	(0.05)
Genetic x		-0.01		0.02		-0.06
BlackPhoto		(0.03)		(0.04)		(0.07)
Behavior x		-0.02		-0.02		-0.02
BlackPhoto		(0.03)		(0.04)		(0.07)
SocialEnv x		-0.002		-0.01		-0.07
BlackPhoto		(0.03)		(0.04)		(0.07)
Party ident.	0.10**	0.10**	0.08**	0.08**	0.10†	0.10†
	(0.02)	(0.02)	(0.03)	(0.03)	(0.05)	(0.05)
Ideological	-0.04	-0.04	-0.02	-0.02	-0.04	-0.03
ident.	(0.03)	(0.03)	(0.04)	(0.04)	(0.06)	(0.06)
Diabetes	-0.05**	-0.05**	-0.05**	-0.05**	-0.10**	-0.10**
experience	(0.01)	(0.01)	(0.01)	(0.01)	(0.03)	(0.03)
Black race	-0.03†	-0.03†				
(ref=White)	(0.02)	(0.02)				
Other race	-0.02	-0.02				
(ref=White)	(0.02)	(0.02)				
PhotoSet #1	0.02†	0.02†	0.03*	0.03*	0.02	0.02
	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)	(0.02)
Constant	0.30**	0.30**	0.30**	0.30**	0.32**	0.29**
	(0.02)	(0.02)	(0.02)	(0.03)	(0.04)	(0.05)
Adj. R^2	0.056	0.054	0.040	0.038	0.105	0.099
F-test that interaction terms=0		$F_{3, 1209}$ =0.26 p=0.854		$F_{3,746}$ =0.43 p=0.734		$F_{3, 243}$= 0.48 p=0.694

Note: Table entries are OLS coefficients and standard errors; †p<.1, *p<.05, **p<.01. Party identification is coded as a 7-pt scale where 0=Strong Democrat and 1=Strong Republican; ideological identification is coded as a 7-pt scale where 0=Very Liberal and 1=Very Conservative; Diabetes experience is coded such that 1=Participant or family/friend has diabetes, 0 otherwise.

Table 4.A3: Effect of Frames and Race of Photo on Support for Diabetes Research Spending, Assessing Stereotypes (Model 1) and Attitudes about Fault (Model 2) as Mediators (including control covariates)

	Full Sample		Whites Only		Blacks Only	
	Model 1 (N=1221) Coeff (SE)	*Model 2* (N=1218) Coeff (SE)	*Model 1* (N=757) Coeff (SE)	*Model 2* (N=755) Coeff (SE)	*Model 1* (N=254) Coeff (SE)	*Model 2* (N=253) Coeff (SE)
Genetic	0.03†	0.03†	0.03	0.03	0.04	0.04
	(0.01)	(0.01)	(0.02)	(0.02)	(0.03)	(0.03)
Behavior	0.02	0.02	0.03†	0.03†	0.01	0.01
	(0.01)	(0.01)	(0.02)	(0.02)	(0.03)	(0.03)
SocioEnv	0.03*	0.03*	0.04†	0.03†	0.05†	0.05†
	(0.01)	(0.01)	(0.02)	(0.02)	(0.03)	(0.03)
BlackPhoto	0.002	0.004	-0.004	-0.005	0.003	0.005
	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)	(0.02)
Stereotypes	-.29**	-0.26**	-0.34**	-0.31**	-0.18**	-0.15**
	(0.03)	(0.03)	(0.04)	(0.04)	(0.05)	(0.05)
Not fault		0.02		-0.02		0.05
		(0.02)		(0.03)		(0.04)
Individual fault		-0.04*		-0.06*		-0.01
		(0.02)		(0.03)		(0.04)
Party ident.	-0.03	-0.02	-0.01	-0.01	0.02	0.025
	(0.02)	(0.02)	(0.03)	(0.03)	(0.04)	(0.04)
Ideological ident.	-0.11**	-0.11**	-0.14**	-0.14**	-0.04	-0.05
	(0.03)	(0.03)	(0.04)	(0.04)	(0.05)	(0.05)
Diabetes experience	0.05**	0.05**	0.05**	0.05**	0.06**	0.06**
	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)	(0.02)
Black race (ref=White)	0.05**	0.05**				
	(0.01)	(0.01)				
Other race (ref=White)	0.04**	0.04**				
	(0.01)	(0.01)				
PhotoSet 1	-0.01	-0.01	-0.01	-0.01	0.03	0.03
	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)	(0.02)
Constant	0.85**	0.83**	0.87**	0.89**	0.79**	0.76**
	(0.02)	(0.03)	(0.03)	(0.03)	(0.04)	(0.04)
Adj. R^2	0.191	0.195	0.174	0.179	0.101	0.109

Note: Table entries are OLS coefficients and standard errors; †p<.1, *p<.05, **p<.01. Party identification is coded as a 7-pt scale where 0=Strong Democrat and 1=Strong Republican; ideological identification is coded as a 7-pt scale where 0=Very Liberal and 1=Very Conservative; Diabetes experience is coded such that 1=Participant or family/friend has diabetes, 0 otherwise.

Table 4.A4: Testing Whether the Causal Frames' Effects on Spending Preferences (Model 1) or Stereotypes (Model 2) Differ for Black and White Participants

	Model 1 **Spending on Diabetes Research**	*Model 2* **Stereotypical Attitudes Toward People with Diabetes**
	N=1015 (just whites and blacks)	N=1013 (just whites and blacks)
Genetic	0.03	0.01
	(0.02)	(0.02)
Behavior	0.02	0.03
	(0.02)	(0.02)
SocioEnv	0.03	0.02
	(0.02)	(0.02)
BlackPhoto	0.01	-0.03*
	(0.01)	(0.01)
Genetic x Black race	0.02	-0.02
	(0.04)	(0.04)
Behavior x Black race	-0.02	0.02
	(0.04)	(0.04)
SocioEnv x Black race	0.04	-.10*
	(0.04)	(0.04)
BlackPhoto x Black race	0.001	0.03
	(0.03)	(0.03)
Black race (ref=White)	0.05†	-.02
	(0.03)	(0.03)
Party identification	-0.04†	0.08***
	(0.02)	(0.02)
Ideological ident.	-0.11***	-0.03
	(0.03)	(0.03)
Diabetes experience	0.07***	-0.06***
	(0.01)	(0.02)
PhotoSet 1	-0.01	0.03*
	(0.01)	(0.01)
Constant	0.75***	0.31**
	(0.03)	(0.02)
Adj. R^2	0.110	0.101
F-test of causal frames x participants' race interactions	$F_{(3, 1001)}$=0.84 p=0.47	$F_{(3, 999)}$=3.62, p=0.01

Note: Table entries are OLS coefficients and standard errors; †p<.1, *p<.05, **p<.01, ***p<0.001. Party identification is coded as a 7-pt scale where 0=Strong Democrat and 1=Strong Republican; ideological identification is coded as a 7-pt scale where 0=Very Liberal and 1=Very Conservative; Diabetes experience is coded such that 1=Participant or family/friend has diabetes, 0 otherwise.

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CHAPTER 5

Conclusions

This dissertation draws from multiple disciplines, including sociology, communication studies, health policy, and political science, to evaluate the policy implications of media coverage of type 2 diabetes, a question of great public health policy importance that has not been addressed previously in the literature. The project's distinct contribution lies not only with how it incorporates literatures across multiple disciplines, but in its multi-methodological approach, combining a content analysis of the social construction of a health problem with experimental methods to identify causal relationships of media messages on policy opinions. Integrating the findings across each of the pieces is critical both to extend the validity of the experimental results and to situate the findings from the content analysis in terms of their likely effect on public opinion. The goals of this final chapter are to: 1) summarize, in brief, the results across each of the three papers; 2) draw some broader conclusions about media coverage of type 2 diabetes and related public health problems within the context of current health policy debates; 3) discuss future research which would either clarify or expand upon these findings; and, 4) conclude with a discussion of the work's contributions.

SUMMARY OF FINDINGS ACROSS THREE PAPERS

The experimental results presented in Chapters 3 and 4 demonstrate that media frames of the causes of diabetes influenced a variety of outcomes, including the public's understanding of the causes of diabetes, their attitudes about fault, support for public health policy strategies, and support for federal spending on diabetes research. (In contrast, the experiment yielded little evidence that visual racial cues in an article affects these opinions or attitudes.) In the aggregate, study participants who viewed a media article that emphasized genetic causation were more likely to agree that diabetes is not the individual's fault, compared to those who viewed the article with no causal language. These participants were also more likely to support increased research spending on diabetes. However, the content analysis revealed that only a small proportion of actual news articles in 2005 and 2006 identified genetic associations with diabetes.

Instead, the predominant message in print news stories about diabetes, mentioned in three-quarters of all articles that identified any causal language or risk factors, focused upon its behavioral attributes. Study participants who viewed an article of this type, identifying behavioral choices as the cause of type 2 diabetes, were most likely to express stereotypical attitudes about people with diabetes. They were also more likely to agree that people with diabetes got their illness because of some fault of their own. One result of the high volume of media messages about the link between diabetes and "undisciplined" behaviors may be that the public could begin to cultivate negative impressions of people with diabetes. This could lead to lower public support for diabetes, as negative stereotypes about people with diabetes were strong predictors of study participants' lower support for diabetes research funding.

Out of all the news articles about diabetes included in the content analysis sample that mentioned any causes, a small portion—only about 15 percent—described social, economic, or environmental factors that influence diabetes. Those articles that did mention social determinants were longer and less likely to discuss the pharmaceutical industry. Moreover, the *New York Times* and the *Boston Globe* produced the most articles that mentioned social determinants, the latter significantly more so once controlling for article length and frequency. Several newspapers, including nearly all of those within the sample of newspapers from the southern United States, did not identify any social determinants of diabetes in their coverage.

Considering these content analysis findings in light of the experimental results regarding the effects of the social determinants frame is intriguing. In the aggregate, all study participants who viewed this frame were significantly more likely to support diabetes research funding. Dividing the sample by race, blacks who viewed the social determinants frame of diabetes were more likely to support diabetes research funding and less likely to endorse negative stereotypes of diabetics. All study participants who viewed this frame were also more likely to support trans fats bans in restaurants, presumably because they were able to see the value of such a prohibition to minimize the risk for those who live in health-damaging social environments. Yet Chapter 3 demonstrated that the social determinants frame of diabetes had starkly different symbolic meaning to Democrats and Republicans. Republicans resisted the message and reacted against it, expressing lower levels of support for nearly every public health policy after they had viewed this frame. Democrats, on the other hand, reacted positively—endorsing public health policies to a greater degree than expected after they viewed this

frame. (And Independents, in general, tended to look more like Democrats after exposure to this frame.) After controlling for the particular experimental frame that study participants viewed, Democrats were much more accepting of the idea that social factors can determine who gets type 2 diabetes.

Several possible social processes could explain these findings. It is difficult to distinguish whether Republicans in the study found the social determinants message to be not credible, or alternatively, hostile to their world view. The former could be explained by the fact that few newspapers publicize this perspective on diabetes. If the message is not believable simply because it is not well-known, one might optimistically suggest that with greater publicity of the social determinants of health, more people would come to accept this explanation, and in turn, come to support policy strategies to intervene on these determinants. If, on the other hand, people find the message hostile to their values and world-view, greater publicity of the message could lead to more polarization if subsets of the public are always predisposed to disagree.

SITUATING FINDINGS WITHIN CURRENT HEALTH POLICY DEBATES

Responsibility for Health

The challenges of communicating about social determinants and disparities are not unique to diabetes. Indeed, the findings from this dissertation suggest that the issues surrounding the social construction of diabetes fit within a broader morally- and politically-charged debate in health policy, that over responsibility for health. Personal responsibility is a powerful and poignant ideology within American politics generally and within public health policy in particular (Guttman and Ressler 2001; Knowles 1977;

Morone 1997; Morone 2005; Oliver 2006). Study participants' deeply divided views on the question of who should be responsible for health in the United States may explain the observed partisan polarization in policy opinions after receiving the social determinants message about diabetes. Indeed, demonstrating major partisan differences in attitudes toward responsibility for health, Blendon and colleagues (2008) found that 45 percent of Republicans believed that individuals (instead of government) should be responsible for health insurance, while only 13 percent of Democrats believed that.

The normative question of where responsibility for health should lie, whether with individuals, the government, or society more broadly, has growing health policy significance (Wikler 2002). For example, the West Virginia Medicaid program has recently implemented changes to its benefit structure which would reduce benefits overall but would provide enhanced benefits (including diabetes health maintenance and mental health services) exclusively for those enrollees who sign a "Medicaid Member Agreement." The Agreement states that signatories must keep medical appointments, arrive on time, receive regular health screenings, use the emergency room only for emergencies, and "do [their] best to stay healthy" – or risk losing their enhanced benefit package (Steinbrook 2006). High-deductible health savings accounts, which are also heavily promoted policy tools, similarly shift responsibility for health to individuals, in contrast to a traditional social insurance model. On the other hand, advocates for improving population health and reducing health disparities argue there should be greater social and governmental responsibility for health, shifting away from an emphasis on health care to one of social and economic policy (Lantz, Lichtenstein, and Pollack 2007;

Smedley 2006). These policy debates will only become more intense in the future, as each side competes to position its claim of responsibility for health in the news media.

Communicating Population Health

At the time of this writing, the public health community is paying new attention to media communication of population health issues. In a forthcoming article in *Milbank Quarterly*, Niederdeppe and colleagues describe the conceptual challenges related to communicating population health, many of which this dissertation evokes. In particular, they argue that communicating the social determinants of health is difficult because of the dominant U.S. ideology of personal responsibility, the emphasis on individual behaviors and medical care in traditional public health and health communication, and the journalistic norm to discuss individual attributions for health (Niederdeppe et al. 2008). They suggest that promising communication strategies should emphasize *both* individual and structural factors, to reduce the potential for resistance; to use narratives and exemplars; and to evoke modest guilt among audiences to spur action.

Niederdeppe's and colleagues' conceptual analysis is especially relevant in light of recent events. A PBS documentary series, "Unnatural Causes", which explains and discusses the links among health and income inequality, discrimination, and neighborhood quality, aired in March and April 2008. The overarching message of the documentary is that inequalities affect all of us, not just the very poor or racial minorities, through relative inequalities at all levels. The first episode in particular discussed the Whitehall studies, which support these claims (Marmot et al. 1991). This message seemed purposefully targeted to avoid identifying one specific group (thus activating group-centric thinking), emphasizing instead the point that everyone's interests are at

stake as a result of systematic inequalities. The documentary especially stressed the injustice of health disparities, a potentially effective strategy for mobilizing activism (Gamson 1992). Moreover, it contextualized health behaviors in terms of their social and economic influences in order to avoid leaving viewers with the stereotypical impression that health inequalities result simply from people who should know better behaving badly.

It is unknown what consequences these messages—emphasizing the injustice of health inequalities and the idea that "inequalities affect everyone"—might have on public opinion. Having been aired on public broadcasting, the program could be criticized as "preaching to the choir", as Chapter 3 discusses. Viewers prone to make charges of media bias may perceive the series as yet another example of the liberal media publicizing messages hostile to the conservative viewpoint (Eveland and Shah 2003). Yet, the documentary itself likely spurred reviews and/or discussion of the content across multiple media outlets, thus reaching broader audiences. A slow diffusion of the social determinants message, over a long period of time and across multiple types of media, may be required to bring understanding, and ultimately public support and mobilization, around these issues. As Mechanic (2003) stated in a commentary on population health:

> "Progress often comes in increments as research and its diffusion through the media and the educational process slowly change the way problems are thought about and conceptualized. The field of population health is unlikely to build a powerful political base in either universities or government. More likely, it will diffuse slowly by modifying the health paradigm as media, pundits, policy makers, and the general public think about and attempt to tackle seemingly intractable health problems." (p. 438)

While we wait, however, for such incremental change to occur, United States social and economic policies continue to foster inequities in income, education, occupation, and housing. Such inequities in turn result in widening inequalities in mortality between the wealthy and the poorest poor, leading to the first generation that can expect lower life expectancies than their parents (Ezzati et al. 2008).

FUTURE RESEARCH

Secondary Data Analyses

Experimental Data

The experimental data collected for this study are rich, provoking interesting questions that have yet to be answered. While this dissertation focused on *non-medical* policy approaches for addressing diabetes, responsibility for health care insurance is a hot health policy topic, as discussed above. Media frames of disease could influence one's attribution of responsibility for health care. The survey included a question from the General Social Survey asking participants to rank their support for government sponsored health care insurance, ranging from strongly believing that it is a government responsibility to strongly believing that it is a personal responsibility. It would be interesting to discover whether the experimentally-imposed media frames of diabetes causation influence the public's attitudes on this topic, and whether individual differences (including whether or not the individual has health insurance or his or her political ideology and party identification) make a difference.

In addition, the West Virginia Medicaid program described above heralds an era of increased personal responsibility for health care embedded in the design of health care

benefits. Responsive to this trend, the experimental survey included questions asking participants to identify their support for the idea that people with diabetes (as well as the overweight, and people who do not exercise consistently) should pay higher health insurance premiums. Frames of the causes of diabetes may influence study participants' considerations of whether people should be held accountable for their behaviors.

News Content Data

The content analysis study also suggests some fruitful avenues for additional research employing the data already collected. Chapter 2 focused exclusively on articles about type 2 diabetes, but 158 articles collected concerned type 1 diabetes only. Preliminary qualitative analyses of the type 1 articles suggest some interesting differences between these and the articles about type 2 diabetes. Articles about type 1 diabetes seemed to coalesce around several general themes. They were more likely than those about type 2 diabetes to feature profiles of particular people with diabetes, most often children or athletes. Both of these types of profiles emphasized the heroic qualities of people with type 1 diabetes who defy the odds to become professional athletes, compete on their high school's athletic team, or perform at the top of their class academically, all while conscientiously managing their blood glucose levels. Another set of these type 1 articles focused on the power of science, discussing with reverence new scientific discoveries or a new drug. A third set of articles focused on "super-parents", parents of children with type 1 diabetes who are active fund-raisers for juvenile diabetes foundations. Each of these main themes would likely foster more sympathy and support from the public toward people with type 1 diabetes than do articles about type 2 diabetes. Exploring the differences between media portrayals of the two diabetes types could be

telling in light of the disproportionate funding type 1 diabetes receives relative to type 2 (Davidson 1998; Perez-Pena 2006).

New Study Designs

As briefly discussed within the conclusions of Chapters 3 and 4, the results from the experiment suggest many additional experimental manipulations which could inform our understanding of media communication of the determinants of type 2 diabetes. There are at least two categories of new potential experimental manipulations: the content of the message itself, and the sender of the message.

Regarding the first, there are multiple potential ways the *content* of the message might be manipulated to yield novel insights. First, the news media rarely described the causes of diabetes as unitary. Rather, in the articles coded for this study, it was just as common for articles to introduce causes from multiple categories (such as health behaviors and genetics) than it was for articles to describe exclusively one type of cause of diabetes. This causal plurality is true not only for diabetes but for most chronic conditions, in which the social environment shapes health behaviors and biological or genetic explanations increase disease risk as well. It is unclear how the public responds to multiple causal attributions received simultaneously. Political communications researchers have argued recently for scholars to study competing frames in political discourse (Chong and Druckman 2007). The same research agenda is needed in the health context, in which causal frames are no less competitive—or contentious—than explanations for political problems. By manipulating multiple causal frames in one media article (such as comparing the effects of an article that describes a genetic causal explanation *and* a social environmental explanation to one that describes just a genetic

causal frame), a researcher can test whether one causal explanation dominates another in its influence on the public's policy opinions and, importantly, what characteristics moderate this process. For instance, the present research found that Democrats react positively to the social determinants frame of diabetes. It would be interesting to evaluate Democrats' reactions to a message that was paired with another competing message, compared to one that used an exclusive social determinants frame.

Another content-related issue that demands additional experimental research involves parsing out the social determinants message. In this experiment, the frame introduced multiple concepts in a single message: poverty, neighborhood environment, food advertising, and food access or affordability. Thus, it is unclear which aspect of the message elicited the political polarization observed. Future research might distinguish these domains, so that, for instance, one experimental media frame identifies the relationship between poverty and poor health, while another focuses on the links between the neighborhood environment and poor health. Or, alternatively, taking a cue from the "Unnatural Causes" documentary, another potential causal frame might avoid discussion of material conditions entirely, discussing instead the health disadvantages yielded by relative inequality across the socioeconomic spectrum.

A final content-related message manipulation might increase the intensity of the content about threat and racial groups. It would be interesting to evaluate if people are more likely to view diabetes policy through a group-centric lens if they are told that diabetes is a major epidemic, increasing dramatically in prevalence, and particularly among a particular racial/ethnic group. Such a frame could activate more influential

ethnocentric considerations in their policy opinions, if people have a stronger sense that the policies in question will help some "other" group.

Manipulations about the *sender* of the message—regardless of content—would also be informative. In this experiment, the message sender for each treatment group was the anonymous "Dr. Howard Smith." Research suggests that the credibility or status of the message sender, as either a respected member of an in-group or someone in an out-group not to be trusted, influences the degree to which persuasion occurs (Druckman 2001). Were the source of the social determinants message a politician, rather than a physician, the political polarization may have been even more pronounced. A related manipulation might identify the newspaper outlet by name (thus varying whether the newspaper source was the *New York Times*, for instance, versus the *Wall Street Journal*), in an effort to understand what role, if any, perceptions of media bias play in causal frames' influence on policy opinions.

CONTRIBUTIONS AND CONCLUSIONS

Overall, the empirical findings presented in Chapters 2 through 4 suggest that advocates' strategy of publicizing the social determinants of health will not uniformly increase the public's support for public health policies that target these determinants. In contrast, this dissertation provides evidence that such a strategy could antagonize those who may be predisposed to find this message hostile or not credible. Moreover, the public is not equally prepared to receive the message. For some select audiences (such as the readership of the *Boston Globe*), the news media fairly regularly describe the social determinants of diabetes and the problem of racial health disparities. For other

audiences, however, these messages are foreign, and their news outlets tend to describe diabetes mainly in individualistic terms, rarely mentioning racial or socioeconomic differences across groups. This variability in message exposure is important for advocates and policymakers to consider as they seek to mobilize the public around population health issues. Given the degree to which members of the public self-select their media sources (Pew 2004), and assuming that the observed differences in coverage patterns across news outlets remain relatively stable across time, the population of those familiar with social determinants ("the choir") and those who are unfamiliar ("deaf ears") may continue to diverge. This would make it difficult to build the public consensus for action on the non-medical determinants of health, as Tarlov argues is required: "an evident desire must develop at a high enough priority among a sufficient proportion of the population to create a national agenda" (Tarlov 1999) (p. 286).

Contributions

This research contributes to health policy, as discussed above, by highlighting the important roles of public opinion—and particularly the public's political orientations regarding responsibility for health—within current public health discussions. The research also contributes some key theoretical observations to the three major social science disciplines from which it drew inspiration.

One key contribution for sociology, particularly for social construction scholars, is the finding of news media variability. Hilgartner and Bosk (1988) described the competitive process that lead some issues to be on the public agenda (i.e., the plight of laboratory animals for research) and others not (i.e., the plight of indigenous South Africans). They argued that the news media, with only finite space or "carrying

capacity" are constrained in the number of social problems they can describe; moreover, the intense competition for space means that only certain topics will be selected, particularly those that are dramatic and/or new. They also argued that journalist-level, institutional, and organizational-level factors influence news outlets' coverage (Hilgartner and Bosk 1988). Yet, in their treatment of "the media" as just one of many "arenas" that contribute to the "public agenda", their model may inadvertently lead the impression that the news media are a unitary actor. In fact, this research identified great variability across news outlets, suggesting that the news have multiple (and competing) agendas. Future research on the media construction of social problems would benefit from using multiple print (and television) sources in the analyses so as to identify these multiple media agendas.

This research also adds to prior scholarship within the sociology of the mass media that identifies the important role of the audience in receiving and processing media messages (McQuail 1985). Rather than passively receiving a message, the audience actively participates in meaning-making. For example, Radway (1983) and Shively (1992) argued that the meaning of romance novels and Westerns, respectively, must be interpreted through an evaluation of the context the audience ascribes to the content. The social significance of these narratives, particularly the function that they serve, depends on the degree to which the messages resonate within the readers' or viewers' social context. Similarly, it is clear from the experimental findings that the effect of the social determinants media message was conditional on the degree to which it resonated with the audience. For Democrats, the message was persuasive because it resonated with their predisposing attitudes regarding the social influences on individuals' status. For

Republicans, on the other hand, the message likely did not resonate with their worldviews. As Radway (1983) suggested, an interpretation of a text in isolation may be inaccurate, if it does not consider the interaction between the text and its audience. In other words, an analysis of the social determinants message in isolation, without addressing the active process of meaning-making with which its viewers engaged, could have led to a misinterpretation of the impact of the message.

For political science, the public opinion results contribute new evidence of the extent of partisan polarization in the United States. Scholars argue that Democrats and Republicans have become increasingly divided in their opinions on a variety of issues since the 1980s (see, e.g., Abramowitz and Saunders 1998). For instance, Bartels' newest research demonstrates dramatic partisan and ideological differences in attitudes toward inequalities, with the widest gap among those who pay the closest attention to politics (Bartels 2008). Partisan differences regarding health care policy may also be increasing. In fact, the most recent public opinion results from Blendon and colleagues (2008) demonstrate huge differences between Republicans and Democrats in their attitudes about health care. They found that 94 percent of Democrats agreed that lacking health insurance is a very serious problem, versus only 55 percent of Republicans; a similar 38 percentage point gulf existed between Republicans' and Democrats' assessment of the quality of U.S. health care (Blendon et al. 2008). These dissertation findings similarly show partisan polarization in attitudes toward health policy. More importantly, however, they demonstrate *how* partisan differences might be created, since significant polarization occurred after each group was confronted with a narrative that

suggests that health problems are caused by social factors (thus implying social responsibility to address health).

Finally, with regard to communication studies, this dissertation contributes additional evidence of the power, but also the limits, of framing. As discussed earlier, it identifies that frames interact with audience predispositions to produce effects. To be sure, abundant communications research has demonstrated framing effects across a variety of issues (see, e.g., Scheufele 1999). As with previous framing experiments, the effect of the diabetes frames observed in the study may be exaggerated relative to what one might expect to find in the "real" world. In the study, all participants presumably attended to the news article. In contrast, outside of the experimental context, the public may be inattentive to articles about diabetes. If they do happen to be attentive, they select their own news sources rather than have one message imposed upon them (Kinder 2007). However, this dissertation aimed to alleviate this concern by also sampling a contemporaneous selection of news articles about diabetes. The content analysis demonstrated the relative frequency across 19 newspapers of the types of articles matching the main experimental treatments, enhancing the external validity of the experiment. This two-study design, complementing an experiment with a comprehensive content analysis, provides a model methodology for future communications research.

In sum, this dissertation explored the role of media coverage of type 2 diabetes in public opinion toward public health policy. In so doing, politics became elevated from an important contextual consideration to a key variable of interest, both as a moderator of media messages' effects and as a potential, albeit tentative, explanation of variability in print news media coverage throughout the United States. This research complements

commentators' recent arguments that public health is an inherently political enterprise (Mechanic et al. 2005; Oliver 2006). Future research should be mindful of the ways that the framing of public health problems can interact with political predispositions to facilitate—or hinder—policy progress to improve population health.

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APPENDICES

APPENDIX A—SURVEY SAMPLING INTERNATIONAL SAMPLE DETAILS

Table A1: Comparison of Survey Sampling International Sample and Nationally Representative Data

	SSI Sample	National
	%	%
Male	49.1	49.1
Female	50.9	50.9
White	58.7	75.1
Black or African American	22.9	12.3
American Indian and Alaska Native	0.1	0.9
Asian	3.7	3.6
Native Hawaiian and Other Pacific Islander	--	0.1
Some other race	1.5	5.5
Two or more races	2.4	2.4
Hispanic or Latino	11.0	12.5
Not Hispanic or Latino	89.0	87.5
Age		
20-29	21.1	19.1
30-49	30.4	42.7
50-69	42.9	25.6
70+	5.7	12.7
Education		
Less than high school	2.3	19.6
High school	16.9	28.6
Some college	32.0	21.1
Associate degree	15.3	6.3
Bachelor's degree	21.8	15.5
Professional or Master's degree	9.1	7.9
Doctoral degree	2.7	1.0

Income		
Less than $10K	5.5	9.5
10 to 29K	20.4	25.6
30-39K	15.4	12.3
40-49K	11.5	10.7
50-59K	10.1	9.0
60-99K	24.4	20.6
100+	12.7	12.3
Strong Democrat	19.2	16.5
Democrat	11.7	15.5
Independent, Leans Democrat	13.3	17.4
Independent	14.8	9.7
Independent, Leans Republican	8.6	11.7
Republican	10.2	12.4
Strong Republican	10.4	16.5
Don't know, haven't thought	11.8	0.3
Very Liberal	3.1	2.1
Liberal	13.4	8.6
Slightly liberal	10.0	11.5
Moderate	26.4	25.7
Slightly conservative	11.7	13.3
Conservative	15.5	15.9
Very Conservative	3.4	2.6
Don't know, haven't thought	16.5	20.2
Has diabetes	14.1	7.8
Obese (BMI 30+)	35.7	32.1
Overweight (BMI 25-25.9)	33.1	33.9
Normal weight (BMI 18.5-24.9)	29.3	32.2
Underweight (BMI <18.5)	1.9	1.8

Note: All demographic data are from the Census 2000 Briefs, available at http://www.census.gov/population/www/cen2000/briefs.html. All nationally representative political variables are from the 2004 National Election Survey. The health status variables are from the CDC's 2006 National Health Interview Survey (physician diagnosed diabetes) and the document *Health United States* 2007 (obesity rates from NHANES).

Table A2: Comparison of SSI Respondents Who Began Diabetes Survey and Those Who Reached the Final Page (Total N=2,838)

	Completed Diabetes News Section (N=2,490)	Did Not Complete Section (N=348)	Test of Association
White (%)	64.2	54.3	χ^2(df 1)=12.9***
Black (%)	26.0	37.4	χ^2(df 1)=19.9***
Hispanic (%)	12.9	14.4	χ^2(df 1)=0.62
Asian (%)	5.1	3.2	χ^2(df 1)=2.48
Female (%)	50.8	54.9	χ^2(df 1)=2.00
Education			χ^2(df 6)=7.02
Completed some high school (%)	2.2	3.2	
High school graduate (%)	19.8	17.6	
Completed some college (%)	40.4	41.6	
College degree (%)	21.7	24.6	
Completed some graduate (%)	5.0	4.1	
Master's degree (%)	8.1	7.8	
Doctorate, law/professional (%)	2.8	1.2	
Mean age	48.0	44.6	t=-3.47 (df 2,836)***

Note: These data rely on Survey Sampling International's basic data on panel members, not on participants' self-report. Thus, these numbers may appear somewhat different from those presented in Chapter 2 and 3 and in Table A1. ***p<.001

APPENDIX B—FULL TEXT OF ARTICLES IN EXPERIMENT

Mock News Articles about Diabetes

Control ("No Frame") Group

"People with Diabetes Lobby Congress This Week"

Washington, March 28 – About 1000 patients with type 2 diabetes (also commonly known as adult-onset or non-insulin-dependent diabetes) have converged here as advocates for the American Diabetes Association (ADA). They will be meeting with their members of Congress to discuss their condition and advocate for federal policies to address their disease. In addition, they will hold a rally on Thursday of this week on the National Monument grounds, to attract popular attention to their disease.

According to the Centers for Disease Control and Prevention, nearly 21 million Americans have diabetes, but one-third of these people do not yet know they have the disease. More than 90% of people with diabetes have type 2 diabetes, a form of diabetes which typically emerges when people are adults but which may develop during childhood. The number of people diagnosed with type 2 diabetes has been increasing every year. There were over 1 million new cases of diabetes diagnosed in 2005 among adults. ***[Insert Causal Claim #1 here.]***

People with type 2 diabetes develop a problem with the way their body secretes or responds to insulin, a hormone that regulates blood glucose levels. As a result, they have elevated blood sugar levels, which they must check multiple times per day and monitor their food intake.

Researchers are working hard to understand more about what causes type 2 diabetes. ***[Insert Causal Claim #2 here.]***

If left untreated, people with diabetes can become blind, have kidney damage, lose their limbs, or die. Physicians, health plans, employers, and policymakers are considering new ways to prevent diabetes, help patients manage their diabetes, and reduce this deadly epidemic. It is expected that the U.S. Senate Committee on Health, Education, and Labor will consider several bills about diabetes in the upcoming session of Congress.

Caption (for control article): Shirley Jackson, 42, has diabetes. She has to check her blood sugar several times a day.

Each of the treatment group articles were identical to the above but included the addition of the following phrases in article text and captions:

	Genetic Frame	**Behavior/Lifestyle Frame**	**Socio-economic Environment Frame**
Causal Claim #1	Researchers believe that certain genes increase the chances of getting type 2 diabetes.	Researchers believe that the way people behave increases their chances of getting type 2 diabetes.	Researchers believe that the conditions in the neighborhoods where people live increase their chances of getting type 2 diabetes. Rates of diabetes are highest among people living in poor neighborhoods.
Causal Claim #2	Diabetes expert Dr. Howard Smith says, "People who have a specific genetic variation in the TCF7L2 gene on chromosome 10 are much more likely to develop diabetes than people who do not have this variation." Several other scientific studies have supported the idea that genes are associated with the development of diabetes.	Diabetes expert Dr. Howard Smith says, "People who choose to eat too much food that is high in calories and who choose not to exercise are much more likely to develop diabetes." Several other scientific studies have supported the idea that lifestyle choices are associated with the development of diabetes.	Diabetes expert Dr. Howard Smith says, "People who live in neighborhoods where the majority of stores sell food with high calories and low nutritional value, such as fast food restaurants or convenience stories, are much more likely to develop diabetes." Several other scientific studies have supported the idea that people's neighborhoods, including not having convenient or safe places to exercise, and being exposed to many advertisements selling high-calorie foods, are associated with the development of diabetes.
Caption (for photo)	Shirley Jackson, 42, has type 2 diabetes. She recently found out that she carries the genetic variant that makes her more susceptible to diabetes. "Since both of my parents had diabetes," she said, "I wasn't surprised when I got it too."	Shirley Jackson, 42, has type 2 diabetes. She said, "What can I say, I just love to eat junk food and I hate to exercise. I guess it finally caught up to me."	Shirley Jackson, 42, has type 2 diabetes. She said, "It's really hard for me to eat well. Where I live, there are no grocery stores with any fresh vegetables. When I walk down the street, all I see are fast food restaurants."

APPENDIX C—PHOTOS ACCOMPANYING ARTICLES IN EXPERIMENT

Photo Set #1

Photo Set #2

Glucose Testing Device

Caption: People with diabetes check their blood sugar with a device called a glucometer.

Note: Photo licenses for the 4 photos of people were purchased from the stock photo company Inmagine (Bananastock/Jupiterimages Royalty Free License Agreement)

APPENDIX D—SAMPLE SCREEN SHOTS OF EXPERIMENTAL MANIPULATION

Black woman, genetic causal frame

News Article

People with Diabetes Lobby Congress This Week

By Julia Morris/Washington D.C. Wednesday, Mar. 28, 2007

About 1000 patients with type 2 diabetes (also commonly known as adult-onset or non-insulin-dependent diabetes) have converged here as advocates for the American Diabetes Association (ADA). They will be meeting with their members of Congress to discuss their condition and advocate for federal policies to address their disease. In addition, they will hold a rally on Thursday of this week on the National Monument grounds, to attract popular attention to their disease.

According to the Centers for Disease Control and Prevention, nearly 21 million Americans have diabetes, but one-third of these people do not yet know they have the disease. More than 90% of people with diabetes have type 2 diabetes, a form of diabetes which typically emerges when people are adults but which may develop during childhood. The number of people diagnosed with type 2 diabetes has been increasing every year. There were over 1 million new cases of diabetes diagnosed in 2005 among adults. Researchers believe that certain genes increase the chances of getting type 2 diabetes.

Michael Adler/AP

Shirley Jackson, 42, has type 2 diabetes. She recently found out that she carries the genetic variant that makes her more susceptible to diabetes. "Since both of my parents had diabetes," she said, "I wasn't surprised when I got it too."

People with type 2 diabetes develop a problem with the way their body secretes or responds to insulin, a hormone that regulates blood glucose levels. As a result, they have elevated blood sugar levels, which they must check multiple times per day and monitor their food intake.

Researchers are working hard to understand more about what causes type 2 diabetes. Diabetes expert Dr. Howard Smith says, "People who have a specific genetic variation in the TCF7L2 gene on chromosome 10 are much more likely to develop diabetes than people who do not have this variation." Several other scientific studies have supported the idea that genes are associated with the development of diabetes.

If left untreated, people with diabetes can become blind, have kidney damage, lose their limbs, or die. Physicians, health plans, employers, and policy-makers are considering new ways to prevent diabetes, help patients manage their diabetes, and reduce this deadly epidemic. It is expected that the U.S. Senate Committee on Health, Education, Labor, and Pensions will consider several bills about diabetes in the upcoming session of Congress.

Next

White woman, behavioral choices causal frame

News Article

People with Diabetes Lobby Congress This Week

By Julia Morris/Washington D.C. Wednesday, Mar. 28, 2007

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Michael Adler/AP

Shirley Jackson, 42, has type 2 diabetes. She said, "What can I say, I just love to eat junk food and I hate to exercise. I guess it finally caught up to me."

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Next

APPENDIX E—CODESHEET FOR CONTENT ANALYSIS

Article ID:_____ Coder initials: _____ Source (abbrev):_____

Region: _____ 1) Northeast; 2) Midwest; 3) South; 4) West; 5) National

Title of article:_____

Date: (ex: 121806) _____ Pg #: _____ Section: _____ Length (no. words):_____

Article type: _____ 1) News or health; 2) Editorial; 3) Sports; 4) Business/Finance;
5) Arts/entertainment; 6) Lifestyle/profile/food; 7) Letter-to-editor;
8) Events/calendar; 9) Obituary; 10) None of above/unknown

Exclude obituaries, letters to the editor, calendar reports, animal diabetes, articles about other health conditions that only mention diabetes in passing, or articles less than 150 words**

Exclude? ____ (1=yes, 0=no) Specify why: _____

Type of diabetes mentioned:

0 Just type 1 or "juvenile" diabetes, explicit *(no need to code further)*
1 Just type 1, implied *(no need to code further)*
2 Just type 2, explicit
3 Just type 2, implied
4 Both types
5 Unknown, not specified nor able to imply
6 Gestational diabetes (only)
7 Gestational diabetes + other type(s)

Causes of T2 diabetes mentioned (1=yes, 0=no) ("risk factors" are ok)

____ Genetics (explicit)
____ Diet, nutrition
____ "Lifestyle"
____ Social environment, neighborhoods
____ Drugs (i.e., anti-psychotics)
____ Other (specify)_____

___ Family history / heredity
___ Obesity, weight gain
___ Exercise, physical activity
___ Poverty, income, SES
___ Biological markers (i.e., insulin, blood sugar)
___ Food costs or availability
___ Aging

Proposals mentioned to address/prevent/manage T2 diabetes (1=yes, 0=no)

___ Drugs/pharmaceuticals
___ Dietary changes/nutrition
___ Taxation on foods
___ Trans fats regulations
___ Health management programs
___ Insurance incentives
___Blood sugar control/monitoring
___Medical mngt of diabetes complications
___Screening for diabetes, un-diagnosed
__ Other (specify)_____

___ Biotech, e.g., stem cells
___ Lifestyle/exercise
___ Food labeling
___Provider incentives/provider programs
___Health education
___School-based programs (i.e., cafeteria)
___Discussion of social structure, poverty
___Weight loss/weight maintenance
___Access to care, insurance coverage

(Published) scientific study/studies mentioned _____ (1=yes, 0=no)

Advocacy group(s) mentioned _____ (1=yes, 0=no) Specify: _____

Pharmaceutical/biotech companies mentioned _____ (1=yes, 0=no)

Mentioned differences in T2 diabetes morbidity or mortality among social groups (1=yes, 0=no)

__African Americans have higher prevalence
__Hispanics/Latinos have higher prevalence
__Native Americans have higher prevalence
__Minorities (general) have higher prevalence
__Asians have higher prevalence
__Other (specify)_____

__ Women have higher prevalence
__ Men have higher prevalence
__ Older people have higher prevalence
__ Increasing rates of T2 among children
__ Poor have higher prevalence

Identifiable individual(s) with T2 diabetes described in narrative _____ (# of people, 0=none)

Race/ethnicity (1=white, 2=black, 3=hisp/latino, 4=native, 5=asian, 6=other, 99=unknown)
Gender (1=female, 0=male, 99=unknown)
Age (1=<18, 2=19-29, 3=30-39, 4=40-49, 5=50-59, 6=60-69, 7=70-79, 8=80+, 99=unknown)
SES (1=poor/working class, 2=non-poor, 99=unknown)

Person/patient #1	*Person/patient #2*	*Person/patient #3*	*Person/patient #4*
___Race/ethnicity	___Race/ethnicity	___Race/ethnicity	___Race/ethnicity
___Gender	___Gender	___Gender	___Gender
___Age	___Age	___Age	___Age
___SES	___SES	___SES	___SES

Accompanying images: (# of photos or graphics, 0=none)

___ Photo(s) (respond below) ___ Graphic(s) (Specify:_____) ___Unclear

Caption text provides sufficient information to suggest photo is of (write in number):

Photo 1	*Photo 2*	*Photo 3*
__Person with T2 diabetes	__Person with T2 diabetes	__Person with T2 diabetes
__Person w/o diabetes	__Person w/o diabetes	__Person w/o diabetes
__Provider	__Provider	__Provider
__Advocate	__Advocate	__Advocate
__Scientist/researcher	__Scientist/researcher	__Scientist/researcher
__Lawyer	__Lawyer	__Lawyer
__Drugs/device/biotech/bldg	__Drugs/device/biotech/bldg	__Drugs/device/biotech/bldg
__Other (specify:_____)	__Other (specify:_____)	__Other (specify:_____)
__Unable to discern	__Unable to discern	__Unable to discern

Brief (one-sentence) description of the main gist of the story:_____
_____

Other things to note about the article:

APPENDIX F—CODE BOOK OF VARIABLE DEFINITIONS

Codebook for Diabetes News Content Analysis (September 17, 2007 version)

Article ID: This is the unique identifier for each article. The first digit is the article set (#1-4) plus the article number of that set's Lexis-Nexis print-out.

Coder Initials: Initials of the person doing the coding.

Source: Identify the source using the following abbreviations:

AJC: Atlanta Journal & Constitution
BG: Boston Globe
CST: Chicago Sun-Times
DP: Denver Post
HC: Houston Chronicle
NYD: New York Daily News
NYP: New York Post
NYT: New York Times
OR: Oregonian
PD: Plain Dealer
SB: Sacramento Bee
SDUT: San Diego Union-Tribune
SFC: San Francisco Chronicle
SLPD: St Louis Post-Dispatch
SPT: St Petersburg Times
ST: Star Tribune
TP: Times Picayune
USA: USA Today
WAPO: Washington Post

Region: Number (1-5) of the region of the country. 1) Northeast; 2) Midwest; 3) South; 4) West; 5) National (i.e., USA Today)

Title of article: Full title of article as listed by Lexis-Nexis.

Date: 6-digit code for the date – if December 12, 2006: 121206; if May 09, 2006: 050906

Page #: Write the page number as it is listed in the Lexis-Nexis output (e.g., 9a, B7)

Section: Write the section as it appears (just before the page number) in the output

Length: Write the number of words listed in the L-N output.

Article type: Pick the number corresponding with the type of article it is, as best as coder can discern: 1) Any general news or general health article; 2) An editorial or opinion piece; 3) A feature about sports; 4) An article about some aspect of finance or business; 5) A piece about arts or entertainment; 6) Any article about lifestyle, food, or a profile of a particular person or people; 7) A letter to the editor; 8) An article about an event (such as a recent charity walk) or an entry in a calendar of events to happen in the coming weeks; 9) Obituaries; 10) Unable to place it in one of these categories.

EXCLUSION CRITERIA:

- Articles less than 150 words – Regardless of the word count listed on the L-N output, there may be small articles in the sample that are about diabetes within a section of only-loosely related news or events. If the *mini-article* that is

specifically about diabetes is less than 150 words (as ascertained by counting), this article can be excluded.

- All letters-to-the-editor and obituaries should be excluded.
- Any calendar listing of events (such as diabetes support groups or screening days) should be excluded.
- Any articles about diabetes in animals should be excluded.
- The search strategy ought to prevent this, but occasionally there may be an article that mentions diabetes but is not really about diabetes (it may be, for example, about a hospital that has a diabetes clinic, but is otherwise about the administration and leadership of that hospital.) These articles should be excluded.
- Any article that is a *direct* repetition of another article appearing in the same source (there can be times when a national journalist's article gets picked up by multiple sources—these should all be coded; but if it's a repeat article from the same source, exclude any multiples).

Exclude: If the article meets any of the above criteria, indicate 1; if not, 0. Be as specific as possible as to why the coder has decided to exclude the article.

Type of diabetes mentioned:

0 The article explicitly is about ONLY type 1 diabetes, stated as such or as "juvenile diabetes." No mention is made of any other type of diabetes. *No need to code any further*.

1 The article never says which type of diabetes it is describing, but based on the context (i.e., it discusses diabetes as a disease resulting from an immune disorder, emerging in kids, insulin-dependent, not caused by diet, etc.) the coder can discern that the article is only about type 1. *No need to code any further.*

2 The article is quite explicit that it is about type 2 diabetes, stated as such or as "non-insulin dependent" or "adult onset" diabetes.

3 The article never says which type of diabetes it is describing, but based on the context (i.e., it discusses diabetes as a disease linked to diet, obesity, or inactivity), the coder can discern that the article is only about type 2 diabetes.

4 The article is about both types of diabetes, whether explicit or implicit. More attention may be paid to one or the other, but the article at least mentions or describes the existence of both types.

5 It is impossible to deduce which type of diabetes the article is discussing.

Causes of *type 2* diabetes mentioned: (do not code any causes of type 1 diabetes, obesity, or any other associated condition – must be linked directly to type 2 diabetes)

Articles will not necessarily describe the "causes" of diabetes, but they will most often discuss "associations" or "risk factors" or "diabetes is linked to…" For each of the following, indicate with a 1 or a 0 whether this factor is mentioned in the article. They may be causes the author or source discusses as true, poses as a possibility, or states may

not be true. (I'm interested in the overall social construction of diabetes' causes in the media, not just ones that have support.)

Genetics: must explicitly state "genetics"

Diet, nutrition: mentions dietary habits or food content

"Lifestyle": states the word "lifestyle" explicitly

Social environment, neighborhoods: Discusses associations with the social or environmental conditions in which people live

Drugs: Mentions link between pharmaceutical agents (i.e., anti-psychotics)and diabetes

Other (specify): write in any cause not identified here.

Family history / heredity: Identifies family history or heredity.

Obesity, weight gain: Discusses obesity, being overweight, or gaining weight.

Exercise, physical activity: Specifically discusses little physical activity as a cause.

Poverty, income, SES: Identifies a link between individuals' or groups' socioeconomic conditions and diabetes.

Biological markers: Links the cause of diabetes to biological characteristics such as problems with insulin, elevated blood sugar, etc.

Food costs or availability: Discusses some aspect of cost, accessibility, or availability of health food (or cost/availability of junk/fast food)

Treatments or prevention of type 2 diabetes

Indicate 1=yes or 0=no for each of the following proposals to address, manage, treat, or prevent type 2 diabetes.

Drugs/pharmaceuticals: Identifies drugs (e.g., Glucophage, metformin, insulin) that people with diabetes (or pre-diabetes) take

Dietary changes/nutrition: States that diabetes can be managed/prevented through diet.

Taxation on foods: Identifies taxation strategies to modify demand for food.

Trans fats regulations: Identifies regulations to restrict the amount of harmful fats in restaurant (or grocery store) food as an approach.

Health management programs: Proposes some kind of comprehensive diabetes management (counseling, employment-based programs, etc)

Insurance incentives: Proposes that insurance design be linked to diabetes control (such as offering better coverage to those who adhere to some diet or drug regimen)

Biotech: Identifies new biotechnological advances (such as stem cells).

Lifestyle/exercise: Describes changing one's daily lifestyle or physical activity.

Food labeling: Proposes voluntary or mandated changes to food labels

Provider incentives/provider programs: Proposes programs for health care providers to help pts manage or prevent diabetes (such as paying pharmacists to provide counseling).

Health education: Suggests more health education is needed (includes pamphlets, campaigns, group, or one-on-one education)

School-based programs: Describes changes to school curricula (like phys ed) or cafeteria (eliminating junk food)

Other (specify): Describe any proposal not mentioned here.

Discussion of social structure, poverty: Proposes changes in the distribution of socio-economic resources.

Scientific studies mentioned: Indicate 1 if article mentions findings/results from one or more scientific or social scientific study (includes FDA or drug company studies), 0 otherwise.

Advocacy group(s) mentioned: Indicate 1 if article mentions one or more advocacy/activist/patient support group (such as the ADA), 0 otherwise.

Pharmaceutical/biotech companies mentioned: Indicate 1 if article mentions one or more pharmaceutical or biotech company specifically (such as Glaxo-Smith-Kline) or in general (such as "pharma" or "drug companies", 0 otherwise.

Difference in prevalence between social groups mentioned: Indicate 1 if the article describes a higher morbidity or mortality or other adverse diabetes-related event associated with one social group over another, 0 if the article does *not* mention such a difference in the prevalence of type 2 diabetes. (Note: indicate 1 as below if the article mentions increasing rates of type 2 diabetes among children or adolescents.)

__African Americans have higher prevalence
__Hispanics/Latinos have higher prevalence
__Native Americans have higher prevalence
__Minorities (general) have higher prevalence
__Asians have higher prevalence
__Other *(specify if some other social group difference is mentioned that is not listed).*

__ Women have higher prevalence
__ Men have higher prevalence
__ Elderly have higher prevalence
__ Increasing rates of T2 among children
__ Poor have higher prevalence

Identifiable individuals described in the narrative: Indicate the number (0 if none) of specific people with type 2 diabetes that are described in the article narrative. They must be described as having type 2 diabetes (or assumed type 2 diabetes).

For each of the identifiable individuals, identify his or her race/ethnicity, gender, age, and SES *wherever possible.* Use clues from the narrative (such as describing residents of a high African-American density neighborhood, or the individual has a Hispanic/Latino surname) to identify the race/ethnicity of each individual, if possible. If not, indicate 99 (for unknown). For SES, use clues in the narrative (such as the individual requires food stamps, is on Medicaid, received charity care, etc) to determine whether the person is poor/working class; or, rely on occupation (such as "lawyer") to indicate that the person is not poor/working class. If unable to discern, use 99.

If more than 4 identifiable individuals, indicate the race/gender/age/SES for any other individuals in the margins (to be added to the database).

Accompanying images: The Lexis-Nexis output will indicate, at the end of the article, whether or not there was a graphic (and if so, whether it was a photo or something else).

Indicate the number of photos that the coder can identify (0 if none), the number of graphics (0 if none), and on the line for "graphic: specify" indicate coder's best guess about what the photo/graphic is of. Indicate "unclear" if there is no way to determine how many photos or graphics there are or what they are of.

For each photo, using caption text (if available), indicate who is pictured in each photo (indicate how many people/things of each category are listed, 0 if none, or whether coder is unable to discern).

Brief one-sentence description: Write in a summary statement about the article, such as "Article is about new findings from a study linking high rates of diabetes to South Boston."

Anything else to note (optional): If desired, write in anything interesting about the article, its use of language, topic, anything that was difficult to code, or anything else.