

## **BUILDING CAPACITY**

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## **I. Introduction**

There is strong scientific evidence that community water fluoridation has greatly improved the nation's oral health and that the benefits of fluoridated water vastly outweigh any risks. The decisions to fluoridate water systems are frequently made by local referendums and preceded by

activities carried out by both proponents and opponents of fluoridation with unpredictable outcomes and around which little research has been conducted.

The Centers for Disease Control and Prevention (CDC) frequently receives requests for guidance or advice from states and communities that aspire to inform, educate, and empower their citizens to make knowledgeable decisions about fluoridation. To improve its ability to respond to such requests, the CDC is conducting exploratory research to provide a better understanding of the factors that affect outcomes of fluoridation-related initiatives.

This literature review is the initial product of the research activities conducted under contract by ORC Macro, Inc. To achieve an exploratory research design inclusive of the broad array of factors likely to influence community decisions about fluoridation, ORC Macro assembled an expert panel of nationally known social scientists, academic professionals and oral health practitioners with expertise in community organizing, health communication, media advocacy, and political science to provide guidance throughout the study. The expert panel was also asked to identify useful theories and publications for inclusion in this review of relevant literature and to help CDC integrate pertinent concepts into the design of subsequent research activities.

The intent of this review is to provide background information on the issue of fluoridation and to identify social scientific research that may shed light on the factors that influence community decisions to adopt or reject fluoridation. Although fluoridation has been a frequent topic of social scientific inquiry, much of this literature specific to fluoridation dates from the 1960s, 70s, and 80s, and may not reflect the current thinking in the field. Therefore, in addition to these studies, this document includes works from public health and other disciplines such as sociology, political science, and communication that are potentially relevant but not directly focused on fluoridation. Thus, this information merges the different sets of literature to present a more comprehensive view with inclusion of relevant social scientific perspectives. It should be noted that this literature review is not, nor was it intended to be an evidence-based review or necessarily a complete review of the literature.

In addition to this Introduction, the literature review consists of three major parts. Section II provides background on fluoridation, both as a public health issue and as a political issue. Section III examines a number of potentially relevant social scientific perspectives on communication and the factors influencing campaign outcomes. Finally, Section IV discusses potentially important variables relating to fluoridation referendums identified in the literature, as well as the next steps of the research process.

## II. Fluoridation

### A. Fluoridation as a Health Issue

Since initiation of community water fluoridation<sup>1</sup> in Grand Rapids, Michigan, in 1945, fluoridation of public water supplies has dramatically reduced the prevalence of dental caries in the United States. Scientific evidence compiled over more than six decades demonstrates that fluoridation is a safe, cost-effective, and equitable intervention that benefits everyone in a given community regardless of financial status. Early studies of fluoridated and non-fluoridated communities illustrated the significant oral health benefits that communities could realize through fluoridation. Evaluations published between 1956 and 1979 showed that children in communities with fluoridated water had a 50–70% reduction in dental caries in permanent teeth. The reduction of caries in primary teeth was only slightly less dramatic, with most studies finding a 40–60% reduction (Horowitz, 1996; Ripa, 1993). The tremendous success of fluoridation has led CDC to label it one of ten great public health achievements of the 20th century (CDC, 2000).

More recent estimates of reductions in tooth decay attributable to water fluoridation have been lower—ranging from 18-40% (CDC, 2001). This is likely related to fluoride exposure among residents in non-fluoridated communities from other sources (Griffin et al., 2001). Once the benefits of fluoride through community water fluoridation became clear, researchers began to explore other methods to deliver fluoride and by the 1960s manufacturers had developed additional methods to deliver fluoride to the teeth. Exposure to other sources of fluoride, such as fluoride toothpaste, rinses, supplements and professionally applied gels and varnishes, has increased in all communities. In addition, fluoridated water is diffused throughout the population as residents of non-fluoridated communities increasingly consume foods and beverages processed and bottled in fluoridated communities. Thus, many individuals residing in non-fluoridated communities have benefited from fluoridation policies. Although this improvement in oral health in non-fluoridated communities is a positive outcome, it may lead to an underestimation of community water fluoridation's benefits and thus to more difficulty in promoting fluoridation (Griffin et al., 2001).

The percentage of the U.S. population living in areas with fluoridated water grew steadily from 1945 to the mid-1970s. In recent years, the rate of increase has tapered off (Horowitz, 1996; Hinman et al., 1996). In 1975, 49% of the population had access to water with optimal levels of fluoridation (Horowitz, 1996). By 1992, this figure had increased to 62.1% and by 2000 to 65.8%, still far short of the 75% fluoridation target set in both the *Healthy People 2000* and *2010* objectives. However, fluoridation has become the norm among the nation's largest cities, as 48 of the 50 most populous cities either are fluoridated or have approved fluoridation and are awaiting implementation. In 2000, San Diego, San Antonio, Las Vegas, Sacramento, and Mesa

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<sup>1</sup> Community water fluoridation is defined as the adjustment of fluoride concentration in drinking water to levels optimal for preventing caries (i.e. tooth decay).

all joined the ranks of large cities with fluoridated water. To reach the 75% goal, fluoridation advocates will need to focus on the next tier of cities, those with populations of approximately 50,000–330,000.

## **B. Fluoridation as a Political Issue**

From its inception, fluoridation has been a political issue as well as a scientific one. Although there is a strong scientific evidence that fluoridation has greatly improved the nation's oral health and that the benefits of fluoridated water vastly outweigh any risks, the public debate over this issue has often been acrimonious, frequently plagued by fears and claims supported by little or no scientific evidence.

### **Antifluoridationists**

Fears of fluoridation began to surface during the pioneering efforts of Grand Rapids in the 1940s. Complaints about weight gain and skin rashes as a result of fluoridation were reported in Grand Rapids in early January 1945, despite the fact that, due to delays, fluoridation was not even implemented in the area until January 25th (Newbrun, 1996). These isolated complaints in Grand Rapids and elsewhere eventually grew into local, national, and international networks of what are often labeled "antifluoridationists." Numerous authors have analyzed the characteristics of the antifluoridation movement and offered suggestions on how to counter antifluoridationist claims and tactics (Block, 1986; Easley, 1983, 1985, 1986, and 1990; Evans and Pickles, 1978; Hinman, 1996; Isman, 1983; Levallois et al., 1998; Lowry, 2000; Neenan, 1996; Newbrun, 1996; Watson, 1985).

Antifluoridationists include activists from both the right and left of the political spectrum. Often highly organized, opponents of fluoridation have created organizations such as the National Health Federation (NHF), the Safe Water Foundation (SWF), and the Center for Health Action (CHA), which serve as centers for producing and disseminating antifluoridation literature (Evans 1978, 1970; Easley, 1985; 1986; Isman, 1980). Antifluoridationists have exaggerated links between community water fluoridation and bone fractures and erroneously linked fluoridation to Alzheimer's, AIDS, and cancer. Although relatively few in number, they have proven to be effective, often successfully derailing fluoridation campaigns.

In addition to the health-related claims of some antifluoridationists, opponents of fluoridation express concern that it poses an unconstitutional infringement on individual choice and the right to protect one's health (Block, 1986). Although the courts have upheld the constitutionality of fluoridation, many oppose what they refer to as "mass medication" and believe the decision to consume fluoride should be left to the individual (Newbrun, 1996).

While traditional pro-fluoridation arguments are generally limited in scope due to a simple and scientific message—that it has been shown time and time again that optimally fluoridated water prevents dental caries and has no harmful side effects—antifluoridationists have often designed their messages to capitalize on prevalent societal fears. Easley (1985, 2001) has summed up the connections between antifluoridationist messages and corresponding societal concerns, showing that during the 1950s antifluoridationists took advantage of prevalent McCarthyist attitudes by connecting fluoridation to a national communist plot. In the 1960s and 70s, antifluoridationists

commandeered buzzwords such as “toxic waste” and “pollutant” from the environmental movement, and in the post-Vietnam era spoke to societal rejection and mistrust of the government’s motives. In the 1980s, arguments such as those that tied fluoridation to the

breakdown of collagen, the production of wrinkles, and deterioration of ligaments, muscles and tendons, were aimed at a health and image-conscious public. Finally, the 1990s, which brought on a renewed interest in health food and natural lifestyles, as well as heightened awareness and fear of HIV infection and AIDS, provided antifluoridationists with many opportunities to capitalize on public anxiety by branding fluoride as an unnatural chemical and an immune system suppressant. Similar observations have been made by Evans et al. (1978, 1979) and Isman (1980), who suggest that antifluoridationists have capitalized on factors such as distrust of government, environmental concerns, and fears of additives or contaminants in food and water.

Easley (1985) summarizes some of the main campaigning techniques of the antifluoridationists:

<b>Table 1: Antifluoridationist Campaign Techniques</b>	
<b>Neutralizing Politicians</b>	Through intense letter writing campaigns and petitioning, antifluoridationists cause local politicians to shy away from making controversial decisions. As a result, fluoridation measures may be determined by a referendum, where they often fail.
<b>“The Big Lie”</b>	In an attempt to create voter confusion and opposition, antifluoridationists will claim that fluoridation causes cancer, is a communist plot, or that it is linked to any number of other negative outcomes.
<b>Half-Truths</b>	A technique of stating that fluoride is linked to negative health consequences, without qualifying the statement to reflect that the link only exists when fluoride is administered at extremely high levels. This has little to do with public fluoridation, which is the adjustment of fluoride levels in drinking water to <i>optimal</i> levels (for caries prevention).
<b>Innuendo</b>	Taking an idea such as <i>one cigarette wont kill you, but over a lifetime...</i> and applying it to fluoride: <i>one glass won't harm you, but who knows what many glasses could do...</i>
<b>Out of Context Statements</b>	Many antifluoridationists have misquoted, or misrepresented quotes of, professionals to suit their arguments.
<b>“Experts” Quoted</b>	Self-proclaimed fluoridation “experts” are made out to be true experts. Oftentimes these “experts” are scientists, although their area of study may be unrelated to fluoridation, or their arguments scientifically unfounded. The public often lacks the necessary information to discriminate between qualified and unqualified experts, or to determine the validity of the information presented to them.
<b>Conspiracy Theories</b>	As with most conspiracy theories, those associated with fluoridation are hard to disprove, and play off societal fears. For instance, in the 1950s fluoridation was often part of conspiracy theories regarding communist plots in the U.S.
<b>Scare Words</b>	During a campaign, antifluoridationists often use phrases such as “mandatory fluoridation” and “toxic waste byproduct” to create confusion and concern among voters.

**Debates**

Public debates between pro- and antifluoridationsists often become personal, unscientific, overly political, and most of all, give the impression that both sides have equal standing and legitimacy (in light of the available science).

Fluoridation, of course, is not the only public health effort to evoke such intense opposition. Public health proponents have had similar experiences with issues such as milk pasteurization, drinking water chlorination, and the immunization of children against diphtheria and smallpox (Newbrun, 1996). Fluoridation, however, presents a different kind of challenge because it is one of the few public health measures often decided by voters at the ballot box.

### **Direct v. Representative Democracy**

In the United States, political decisions about fluoridation are made at the state and local levels. There are two different methods for making these decisions. First, a governing body or agency, such as a legislature, city council, or local health department, may decide fluoridation policy. Second, in many states voters determine such issues through ballot measures, such as initiatives or referendums.<sup>2</sup> Overall, fluoridation referendum campaigns have had mixed success in the U.S. From 1950 to 1967, 1,009 such referendums were held with fluoridation being adopted in 41% and rejected in 59%. From 1980 to 1988, 150 referendums were held with voters approving fluoridation 36% of the time. During the subsequent period 1989 to 1994 the trend reversed with fluoridation supporters winning 19 (59%) of the 32 referendums conducted. Historically, however, adoption of fluoridation has occurred more often through administrative action by governing bodies than through voters. While only one out of every three referendums resulted in adoption of fluoridation from 1980 to 1988, approximately three out of every four administrative actions resulted in adoption of fluoridation during this same period (Neenan, 1996). The greater success with governing bodies than among voters continued in the 2000 election cycle, with pro-fluoridation forces winning ten of eleven votes conducted by city councils or boards, and losing 14 of 23 ballot measures. However, fluoridation was approved by voters in the largest cities or counties where it appeared on the ballot in San Antonio, Texas and Clark County, Nevada, which includes Las Vegas.

The issue of how fluoridation is decided politically falls into a broader debate over the merits of referendums and initiatives, and the advantages and disadvantages of direct versus representative democracy (Magleby, 1984; Cronin, 1989; Bowler and Donovan, 1998; Sabato, 2001; Broder, 2000; Abrams, 2002; Gerber, 1999; Zimmerman, 2001; Waters; Magleby and Patterson 1998; Dubois and Feeney, 1998; Haskell, 2001; Bowler et al., 1998; Caves, 1992; Smith, 1998; Ellis, 2002; Witt and McCorkle, 1997). Most of the framers of the Constitution were strong advocates of representative democracy, and were skeptical of giving voters direct authority over lawmaking. "Pure democracies," James Madison wrote in Federalist 10, "have ever been spectacles of turbulence and contention" (Madison, Hamilton, and Jay, [1788] 1987; quoted in Sabato et al., 2001). The widespread use of referendums and initiatives stems from the Populist movement of the late 19<sup>th</sup> century and the Progressive movement of the early 20<sup>th</sup> century (Cain and Miller, 2001). The use of referendums and initiatives has increased significantly since the

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<sup>2</sup> According to Cronin, an "initiative allows voters to propose a legislative measure ... or constitutional amendment ... by filing a petition bearing a required number of valid citizen signatures" (2). Meanwhile, a "referendum refers a proposed or existing law or statute to voters for their approval or rejection" (2). In this review, consistent with most of the literature on fluoridation, we will refer mostly to referendums, although as the project progresses we will want to note any significant differences between the dynamics of initiative and referendum campaigns.

late 1970s, igniting a debate among citizens, academics, and political practitioners over direct democracy (Ernst, 2001). Sabato et al. nicely summarize both sides of the argument.

Proponents of the initiative process argue that ballot initiatives serve as an important tool of “last resort” when legislatures fail to act in the public interest. They also maintain that initiatives allow the popular will to be expressed directly without the “distortion” of representative politics or “special” interests. What’s more, argue proponents, ballot initiatives encourage change, reduce citizen alienation, heighten voter awareness, and eliminate corruption endemic to the legislative process.

To counter these arguments, critics of the ballot initiative offer a litany of complaints about the conduct and propriety of the process. For example, many critics claim that political consultants and moneyed interests now exercise far too much influence in ballot campaigns, polluting a process originally intended to give citizens voice in policymaking. Other critics claim that voters possess neither the knowledge nor the expertise to understand and evaluate the measures on which they are voting. Still other critics have blasted the ballot initiative process for producing poorly written laws and facilitating the passage of legislation that disregards minority rights. Finally, many critics of the ballot initiatives lament the shrill, uncompromising, and manipulative discourse typically found in contemporary ballot initiative campaigns. Such discourse, they argue, is a poor substitute for the deliberation and compromise that accompany serious legislative debate (x-xi).

### **Community Process for Making Fluoridation Decisions**

Many of these same issues have arisen in communities considering fluoridation, with citizens and groups debating not only the merits of fluoridation itself, but the appropriate process for deciding the issue. The heated nature of many referendum campaigns combined with the tendency for governing authorities to call for voter decision through special elections that do not include their election or re-election status and often result in low voter turnout has led some in the oral health community to believe that deciding the issue at the ballot box should be “avoided at all costs” (Neenan, 1996). However, campaigns are often unable to determine which method will be used and must be prepared to gain the support of voters.

The literature suggests that ballot measure campaigns and campaigns aimed at persuading a governing body share many similarities, including successful coalition building, effective use of the media, and gaining endorsements from influential community, state, and national representatives (Faine et al., 1981; Isman, 1981; McGuire, 1981; Neenan, 1996). However, there are also important differences. For example, when the issue is decided directly by voters, ballot wording, ballot timing, and careful control of public debates have often been cited as important factors influencing the likelihood of victory. A challenge for success of administrative or

legislative campaigns include proving to decision makers that there is a need and a desire for fluoridation on behalf of the community. Another important factor is controlling the level of perceived controversy over the issue. As McGuire (1981) notes, keeping the overall level of controversy low, may help advocates keep the decision at the level of a governing body.

Perceived controversy and public confusion about fluoridation also tend to shift responsibility from the city council to the voters. It, therefore, is imperative for local health professionals and proponents of fluoridation to acquire political acumen to achieve water fluoridation in their community (p. 686).

As McGuire indicates, to be successful, fluoridation advocates need a degree of political sophistication to navigate the volatile political context that surrounds this issue. Victorious fluoridation campaigns adapt to this volatility by adopting diversified strategies that are responsive to a dynamic campaign environment (Jones et al., 1989; Isman, 1981, Faine et al., 1981; Boriskin, 1979).

### **III. Perspectives on Communication and Campaign Outcomes**

This section examines a number of works that may provide useful perspectives on the subject of fluoridation campaigns. Throughout the section, works specifically on fluoridation as well as other potentially relevant literature are explored.

- Part A looks at what much of the sociological literature on fluoridation refers to as “structural” characteristics of communities, such as socioeconomic status, structural differentiation, social integration, centralization of authority, social capital, and demographic variables. In multi-case studies, many of these factors have been observed to influence the likelihood of fluoridation adoption. While these factors may not be elements that campaigns can influence or change, they are nonetheless important variables that should be examined in this study and understood by those who favor fluoridation.
- Part B explores relevant literature on political behavior, drawing heavily from public opinion and voting studies. This subsection investigates many of the cues voters use in referendum elections, and includes topics such as voting in low information elections, cues provided by policy elites, the influence of self-interest, the impact of risk aversion, and the importance of alienation, political efficacy, and trust.
- Part C examines how a risk perception approach may help us understand the issue of fluoridation, and includes an application of Sandman’s “hazard versus outrage” framework to this issue.

- In Part D we explore media and campaign effects, particularly the importance of framing.
- Part E investigates how diffusion of innovations theory may help explain why some communities adopt fluoridation while others do not.
- Finally, Part F looks at specific campaign variables such as organization and professionalism, coalition building, campaign research, campaign finance, ballot wording, and the timing of elections.

## **A. Structural Community Factors**

A variety of scholars have examined how certain structural characteristics of communities can affect decision making and outcomes related to fluoridation. In their frequently cited work, Crain and Rosenthal (1967, 1968), looking both at areas where fluoridation is considered via administrative action and where it is voted on in a referendum, find a curvilinear relationship between community socioeconomic status and fluoridation outcomes, with *low status* and *very high status* communities more likely than *middle class* communities to adopt fluoridation. This finding runs counter to what one would predict based on individual level survey data, which shows a direct positive correlation between education and support for fluoridation. Crain and Rosenthal suggest that the reasons for this apparent contradiction lie in the political decision making process of middle class communities, where citizens are easier to mobilize, more issue oriented, and likely to favor “reform” mechanisms for democratic decision making, such as the referendum and non-partisan elections. Such communities will likely have weak party loyalty, open decision making processes, and cautious politicians. The result, according to Crain and Rosenthal, is a context ripe for political controversies.

Middle-class cities will have a less stable government, will be less willing to embark on controversial programs, and when they do attempt to innovate, there will be higher levels of community debate and hence higher levels of controversy and a greater possibility of stalemate. In contrast, in low-status cities, citizens are less readily able to mobilize to influence the decision-making process; this may result in either government by a traditional political machine, or in a government heavily influenced by the local economic elite; but in any case there should be less controversy, and few programs, once begun, will be sidetracked (p. 972).

Crain and Rosenthal’s explanation of the relationship between socioeconomic status, political involvement, and fluoridation outcomes seems to contradict others who have argued that civic involvement and voluntary associations encourage political stability and help avoid controversy (Coleman, 1957). Crain and Rosenthal suggest that civic participation can lead to stability, but only when participation is “*at a high and stable level*” (italics original) (p. 976). Importantly, such involvement is likely to occur only in high socioeconomic status communities. In these communities, where civic involvement is consistent and strong, there will be regularized contact between citizens and government, stable leadership, and predictable public opinion. Also, the number of people available for mobilization will be relatively low because so many people are already involved and active in organizations.

Thus, the linkages between socioeconomic status and political engagement may explain the curvilinear relationship between socioeconomic status and fluoridation outcomes. In low-status communities, the lack of engagement increases the likelihood of adoption. In middle class areas, a higher level of engagement creates political instability and makes passage difficult. Finally, in

high status communities, very high levels of consistent involvement lead to political stability, which facilitates adoption.

Smith (1979) also has examined the impact of community structural features on fluoridation outcomes, focusing on three characteristics: structural differentiation, community integration, and the centralization of authority. Smith suggests that *structural differentiation* will occur when “communities grow and develop a more extensive division of labor in a number of sectors,” leading to greater organizational complexity and more specialized interests (p. 149). Highly differentiated communities will have specialized and professional organizations focused on specific issues. High levels of *social integration* exist when individuals are deeply attached to their communities, and there is “a consensus of values and norms and an extensive and interlocking communications network between community members, organizations and leaders” (p. 149). The *centralization of authority* examines how power is organized in government structures, particularly “the degree of executive centralization and participativeness of the system” (p. 150). Partisan elections, mayoral-council systems, and low use of referendums are characteristics of highly centralized political authority structures. Using a three-part typology of communities that adopt fluoridation, those that reject it, and “nonconsidering” communities that neither adopt nor reject, Smith finds that adopters and rejecters have higher levels of differentiation than do nonconsiderers, while nonconsiderers and adopters have higher levels of integration and centralization than do rejecters. Thus, communities that adopt fluoridation are likely to have relatively high levels of differentiation, integration, and centralization.

Although it has not been applied to this issue, social capital theory may have implications for the study of fluoridation. Popularized by scholars such as Coleman (1990), Fukuyama (1995), and especially Putnam (2000), the concept of social capital has been studied in a variety of disciplines, including public health (see Kreuter and Lezin, 2002 for a review of the public health literature on social capital). Putnam describes social capital in the following manner:

Whereas physical capital refers to physical objects and human capital refers to properties of individuals, social capital refers to connections among individuals—social networks and the norms of reciprocity and trustworthiness that arise from them (p. 19).

Putnam’s work has identified a serious decline in social capital in the U.S. in recent years, particularly in terms of civic and political participation. In public health, scholars have suggested that communities with high levels of social capital may be more successful in implementing community-based health promotion interventions (Kreuter and Lezin, 2002). There are similarities between social capital and the concept of “community capacity,” which is frequently used in community-based public health efforts. Norton et al. (2002) describe community capacity as “the nature and extent of social relationships that exist within communities and the presence of community factors that may affect the ability of communities to mobilize to address systemic problems” (p. 195). The work on social capital and community capacity suggests that

communities with higher levels of social capital or community capacity may be better equipped to pass fluoridation measures.

Neenan (1996) cites several additional factors pertaining to community structure that have been hypothesized to contribute to campaign outcomes. Specifically, she looks at the possible effects of demographic trends on voter mobilization. While Frazier (1980) cites studies that find little or inconclusive evidence for the effects of demographic trends, Neenan favors taking another look at the effects of socioeconomic status, race, language, suburbanization, education, and housing status in fluoridation studies. She argues that in areas where socioeconomic differences exist between urban and suburban populations, suburban voters are likely to turn out at the polls at a higher rate and, as a result, have a disproportionate impact on local referendum outcomes. Moreover, the more mobilized suburban populations are likely to vote based on certain conservative values. Neenan writes,

In 1990, 46 per cent of the population lived within the suburban frontier, where the action is politically concentrated in the US. Suburban enclaves tend to be wealthier, more educated, more Caucasian, more anti-tax, more anti-establishment, and more conservative than big city cores. Suburbanites believe that the government can no longer solve problems pertaining to health care; they just want Washington to keep the economy booming. While the suburbanites vote, inner city residents often do not. The implications of urbanization/suburbanization may impact efforts to fluoridate many of the non-fluoridated cities which are located in the Western states, especially California (p. 12).

## **B. Political Behavior**

This section reviews some of the relevant literature on public opinion and voting behavior as it relates to referendum voting generally, and to fluoridation campaigns specifically. The section focuses on fluoridation as a ballot measure, although some of the same dynamics regarding public opinion could also influence instances when fluoridation is considered by an administrative body. First, we examine how voters make decisions in contests, such as referendum campaigns, where there may be relatively little information available. Second, we look at the relationship between elite and mass opinion. The third part of this section discusses how individuals may pursue their self-interest when making voting decisions. Fourth, we explore how a general inclination toward risk aversion may affect referendum campaigns. The final part of the section examines how alienation, efficacy, and trust may affect public opinion on fluoridation and similar issues.

### **Voting in Low Information Campaigns**

As discussed above, fluoridation is one of the few public health issues regularly decided by a direct vote at the ballot box. Thus, fluoridation campaigns may have some unique characteristics

related to the particular challenges of communicating about public health issues in a charged campaign environment. Nonetheless, fluoridation ballot measures share many characteristics with other issues decided directly by voters. Perhaps most importantly, these campaigns are generally low information elections in which voters lack voting cues and information shortcuts available in other campaigns.

The early, classic works in the study of American public opinion and voting behavior, such as Campbell et al.'s influential *The American Voter* (1960), painted a somewhat bleak picture of the average voter, who in all likelihood knew little about issues or candidates, showed little ideological consistency in his or her opinions across issues, and was even unlikely to maintain consistent opinions over time. Much of this work suggested that one factor, political party identification, had a far stronger impact than any other on how citizens vote. Partisanship was a relatively stable attribute that voters acquired through socialization at a young age—few voters ever changed their party affiliation and few crossed party lines when voting.

However, as the influence of parties began to decline (Wattenberg, 1994), political scientists began to reexamine the nature of party attachments and their role in voting behavior. At the same time, there was increasing evidence that voters were able to make decisions based on issues (Nie et al., 1976). As Neimi and Weisberg (1993) have pointed out, there developed a “revisionist” school of voting behavior that opened the door for new interpretations of voter decision making.

Building on this work, as well as advances in cognitive psychology, many scholars have begun to paint a slightly more optimistic picture of citizens as “reasoning voters,” who, while still lacking in-depth knowledge about many issues, are able to make informed political choices by using cognitive shortcuts or “heuristics” (Popkin, 1991; Sniderman et al. 1991). For instance, research has indicated that when evaluating candidates, voters may rely on information shortcuts such as incumbency/challenger status, a candidate’s group affiliation, or a candidate’s gender (McDermott, 1997). And here again party identification is considered a key to understanding how voters make decisions. In this view, however, party identification is less a socialized characteristic than a cognitive device used by voters to reason about choices, and determine which candidate or position most closely reflects their own beliefs. Faced with uncertainty and incomplete information, voters use reasonable shortcuts to reach political decisions.

In referendum elections, however, many of these cues and shortcuts are not available. For example, no party is identified with the “yes” or “no” choice presented to voters, and no candidates are on the ballot. Moreover, referendum elections may receive less media attention than races for high profile political offices, or may concern issues—such as fluoridation—that are unfamiliar to many voters.<sup>3</sup>

One result from this lack of information is that public opinion during referendum campaigns is more volatile than during candidate races. In his survey of ballot propositions, Magleby found

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<sup>3</sup> For more on public knowledge of fluoridation, see Gift et al. (1994).

that voters are significantly more likely to change their minds over the course of a referendum campaign than during a candidate election (Magleby, 1984). Similarly, in a cross-national study of referendum campaigns, LeDuc (2002) found that “the amount of volatility found in referendum campaigns is, on average, about 50 percent higher” than in other elections.

Thus, fluoridation referendum campaigns may be characterized by low voter information, a lack of common voter cues, and high levels of opinion volatility. In such situations, what type of heuristics *do* voters use? Bowler and Donovan (1998) suggest three possible shortcuts: 1) responding to elite cues; 2) voting in a manner consistent with self-interest; and 3) responding to uncertainty by voting “no.”

### **Cues from Policy Elites**

A great deal of research demonstrates that mass opinion is strongly influenced by elite opinion, and that individual citizens respond to cues provided by elites, such as elected officials, community leaders, or the media (Zaller, 1992). In particular, when the costs of acquiring information about an issue are high—for instance it may cost a considerable amount of time to learn about a new issue—citizens may look to elites in the policy making arena for cues about which position is consistent for their own beliefs. Lupia’s (1994) study of five complex insurance initiatives on the 1988 California ballot shows that relatively uninformed voters were able to use the insurance industry’s position on these issues as a cue for making decisions (1994). Lupia concludes that “voters who lack encyclopedic information about the content of electoral debates can nevertheless use information shortcuts as though they were well informed” (p. 63).

Evidence from studies of fluoridation campaigns suggests that voters in these settings may employ similar shortcuts and that elites may play a pivotal role. Crain et al. (1969) suggest that support from mayors and civic organizations increased the likelihood of passage for fluoridation ballot and legislative measures in cities with populations of 10,000-100,000. Extending this work to smaller communities with populations of 1,000-10,000, Wong (1978) found similar results. Wong also suggests that voters may take cues from health professionals, finding evidence of a correlation between dental and health professional involvement and fluoridation campaign success.

Another way in which elite opinion may influence election outcomes is through newspaper endorsements. Political practitioners often consider them a crucial part of a successful campaign, and research has largely shown that newspaper endorsements can influence outcomes, with a number of studies uncovering relationships between endorsements and votes in presidential, senatorial, and gubernatorial elections (Coombs, 1981). A recent study of U.S. Senate campaigns by Kahn and Kenney (2002) found that newspaper endorsements also affect campaign coverage. Despite the journalistic norm of separation between a paper’s news and editorial pages, Kahn and Kenney find that “information on news pages is slanted in favor of the candidate endorsed on the newspaper’s editorial page” (p. 381). The authors also uncover evidence that this slanted coverage leads voters to have a more favorable view of the endorsed candidate.

In addition to campaigns for federal office, newspaper endorsements can affect local elections. Krebs (1998) finds a significant positive relationship between newspaper endorsements and candidate vote share in city council elections. Moreover, newspaper endorsements have been found to be particularly important in local elections with *lengthy ballots*, a situation in which fluoridation decisions are often made (Hooper, 1969). Zisk also found that editorial endorsements were related to ballot initiative outcomes, particularly when the newspaper endorsed the “no” position (Zisk, 1987). Studies of fluoridation have linked editorial endorsements to successful campaigns (Mueller, 1966; Crain et al., 1969).

Campaigns also often seek endorsements from politicians, subject matter experts, celebrities, and political or civic organizations, although empirical support for the impact of these endorsements is mixed (Magleby, 1984). Nonetheless, some studies suggest that endorsements can increase the likelihood that a ballot measure will pass. For instance, Baker (1960) argues that a League of Women Voters endorsement of an Oregon reapportionment referendum added prestige to that campaign. In his examination of a 1976 California nuclear power initiative, Magleby found that voters were more influenced by endorsements by scientific elites than by political elites.

This stems in part, Magleby suggests, from politicians' "untrustworthy image" (p. 158). Isman (1981) suggests that a deeper level of involvement by elites in a campaign may be useful. Citing the example of a successful 1978 fluoridation referendum effort in Portland, Oregon, Isman notes that the popular coach of the NBA's Portland Trailblazers, Jack Ramsay, served as campaign champion, or "figurehead." Ramsey did press conferences and radio spots for the campaign, and pictures of the coach appeared in local publications, asking rather cleverly, "Why is Jack Ramsay smiling?" Isman, echoing Magleby's findings, suggests that having a celebrity such as Ramsay as a figurehead is more effective than having a politician.

One influential view of how elites may affect referendum campaign dynamics is the "community conflict" model, which has been used to analyze fluoridation and other controversial political issues (Darcy and Laver, 1990; Boles, 1979; Coleman, 1957; Mansbridge, 1986). This model seeks to explain a particular pattern in public opinion, common to many referendum elections, in which a significant initial majority in favor of a proposition shifts to an eventual majority against the proposition. Labeling this pattern a "referendum dynamic," Darcy and Laver describe it as:

a process which begins with apparent large-scale popular support for some proposal. The proposal is scheduled for a vote, triggering a referendum campaign which ends with a massive short-term opinion reversal and the defeat of the once popular proposal (1990, p. 2).

As Darcy and Laver note, in the 1960s scholars discovered that this dynamic was characteristic of many fluoridation votes (Mueller 1965, 1966). One early attempt to explain this pattern was the "confusion hypothesis," which suggested that during the course of fluoridation campaigns antifluoridationists successfully raised enough doubts to create confusion in voters' minds and shift opinion towards rejecting fluoridation (Sapolsky, 1969; Magleby, 1984). However, as Darcy and Laver note, the confusion hypothesis fails to account for why some opposition campaigns successfully raise doubts while others fail. The community conflict model, on the other hand, provides an explanation for why the referendum dynamic only sometimes appears, by focusing on one key element: the "withdrawal of established elites" from the political arena (Darcy and Laver, 1990, p. 16).

This process leading from initial support to elite withdrawal to proposition failure, according to the community conflict model, begins when an established group or organization develop a concern about a policy issue. Working with political elites, the group is able to push the issue onto the community's political agenda; specifically in this case, the group is able to get the issue on the ballot as a public referendum. However, this new issue draws new groups into the debate, "often ad hoc groups supported by organizations and networks based outside the established political elite" (Darcy and Laver, 1990, p. 15). These new groups, who tend to view the new issue as a threat to their core values, widen the overall scope of conflict and unconstrained by established political norms, bring an unusually divisive tone to the campaign. Concerned about the growing divisiveness of the new issue, established elites essentially withdraw from the debate. Voters take this cue to mean the proposal has lost legitimacy, and it is defeated.



Here again, elites provide cues to the voting public, in this case by essentially avoiding the issue, thereby sowing the seeds of doubt in voters' minds. Additionally, the void caused by elite flight leads to a more contentious tone of political debate, something that has characterized numerous fluoridation battles. Many considered the community conflict model a powerful explanation for the fluoridation campaigns of the 1950s and 1960s (Coleman, 1957; Crain et al., 1969). Although few have applied community conflict to fluoridation in recent years, it remains one of the more developed models for explaining public opinion and voting behavior on this issue.

A final way in which elites may influence a fluoridation race concerns the nature of antifluoridationist movements. Like many groups active in initiative politics, antifluoridationists are often characterized as "grassroots" activists, working in the tradition of American populism. However, in his study of anti-tax activists and the initiative process, Smith (1988) notes that many contemporary, seemingly grassroots, direct democracy movements are in fact "*faux* populist" movements that have a "a populist-sounding message without the political mobilization of 'the people'" (p. 48). In this view, which contradicts most media coverage and conventional wisdom, most anti-tax ballot initiative campaigns of recent years, starting with California's Proposition 13 in 1978, have been top-down, professionalized, and elite-driven efforts. In his critical study of initiative politics, Ellis (2002) similarly concludes that, contrary to naïve views about direct democracy, interest groups and political elites frequently dominate the initiative process. Witt and McCorkle (1997), in their volume on anti-gay rights initiatives, note that the initiative process, championed by Progressives as a check on narrow interests and corrupt legislatures, has in many ways empowered special interest groups.

The irony is that the modern initiative process—with its high priced consultants, paid signature gatherers, sophisticated media campaigns, and single-issue focus—is now frequently a tool of the special interests the Progressives wanted to avoid (p. 3).

These and other scholars suggest that many movements involved in initiative campaigns may be less "populist" than they appear. For this study, the implication is that the nature of antifluoridationist efforts should be explored to determine whether they are grassroots, bottom-up political movements or top-down, elite-led campaigns.

### **Self-interest**

Numerous scholars have examined the impact of self-interest on voting behavior. For example, political scientists have looked for evidence of so-called "pocketbook" voting—supporting a candidate who favors policies that are in your economic self-interest—with mixed results (Markus, 1988). Given the lack of voting cues and low amount of available information, one might expect that voters would be particularly likely to turn to self-interest when casting ballots on referendum issues such as fluoridation. Several studies of referendum voting, however, have failed to support this hypothesis (Hahn and Kamieniecki, 1987; Hall and Piele, 1976; Mueller, 1969; Wilson and Banfield, 1963). An exception is Bowler and Donovan's (1998) study of issues

such as prohibition, school vouchers, and tax policy, in which they find that many referendum voters act in a manner consistent with self-interest.

One way in which self-interest may affect voting on fluoridation measures is in the voting behavior of the elderly. Neenan describes how elderly citizens may not find fluoridation in their self-interest.

Over the last two decades, disenchantment with government and apathy have led to significant declines in voter participation in the United States. However, elderly people do vote and they also tend to view fluoridation as a benefit primarily directed at children and are therefore less likely to be supportive. Simply put, many elderly people do not see a need for fluoridation, nor do they want to pay for it. Framing fluoridation solely as a children's health issue is problematic for campaign organizers (p. 14).

As Neenan suggests, older Americans vote at higher rates than younger citizens, and, as recent research on the politics of Social Security has demonstrated, the elderly are particularly likely to become mobilized when their economic self-interest is at stake (Campbell, 2002). Conversely, those who are perceived to have the most to gain from fluoridation either are unable to vote (children) or are less likely than others to vote (the poor).

### **Risk Aversion**

A great deal of research suggests that voters are often risk averse, exhibiting a "negativity bias" and seeking to avoid potential losses (Ansolabehere and Iyengar, 1993; Brady and Ansolabehere, 1989; Kahneman and Tversky, 1984). This is consistent with what Sunstein (2002) terms "loss aversion:" "People tend to be loss averse, which means that a loss from the status quo is seen as more undesirable than a gain is seen as desirable" (p. 42). As Bowler and Donovan (1998) suggest, in a low information environment, voters may behave in a risk averse manner and simply vote "no," feeling that it is better to stick with the status quo. A tendency among voters to support the status quo has been noted by many observers of referendum elections, and political professionals generally consider a "yes" vote campaign more challenging than a "no" vote campaign.<sup>4</sup>

### **Alienation, Efficacy, and Trust**

The community conflict model suggests that opinion on fluoridation measures shifts in part because new players enter the political arena once the issue is introduced. These new groups often come from outside the political establishment and frequently do not play by the accepted rules of the game. Another perspective that emphasizes the importance of actors outside the political establishment is the "alienation hypothesis," which, according to Martin's survey of the literature, has been "the most widely used in analyzing the fluoridation controversy" (1989, p. 63). The alienation hypothesis suggests that the issue of fluoridation presents an opportunity for

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<sup>4</sup> Also, see the section below on ballot wording.

protest and resistance by the angry and disaffected: “antifluoridationism, according to this hypothesis, is essentially a revolt of the powerless who have latched onto fluoridation as a symbol of the impositions which they oppose” (Martin, 1989, p. 63).<sup>5</sup>

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<sup>5</sup> In addition to studies of fluoridation, several studies have suggested that alienation explains negative referendum voting in general (Horton and Thomson, 1962; Boskoff and Ziegler, 1964), although Magleby (1984) casts doubts on these findings.

Several researchers found support for this view by examining public opinion data (Gamson, 1961; Simmel, 1961), interviewing antifluoridationist leaders (Green, 1961), and by reviewing antifluoridationist literature (Davis, 1959). However, scholars ultimately turned from the alienation hypothesis because it was difficult to see how a somewhat fixed trait like alienation could account for the short-term swings in public opinion characteristic of fluoridation campaigns, the previously mentioned “referendum dynamic” (Sapolsky, 1968, 1969; Crain et al., 1969; Frazier, 1980).

Nonetheless, while perhaps not a comprehensive explanation of the opinion dynamics surrounding fluoridation, the alienation hypothesis does raise important questions about the types of voters who may be attracted to and mobilized by antifluoridationism. In work subsequent to most of his fluoridation research, one of the proponents of the alienation hypothesis, William Gamson, has advanced the so-called “Gamson hypothesis,” which suggests that at least some citizens who are disenchanted with and distrustful of the political system are ripe for mobilization. Specifically, Gamson argues that individuals with high levels of political self-efficacy and low levels of trust in government are vulnerable to mobilization (1968).

Evidence for this view has been mixed over the years, with some studies suggesting the Gamson hypothesis has little explanatory power (Watts, 1973; Sigelman and Feldman, 1983; Craig, 1979), and others finding at least partial support for it (Paige, 1971; Marsh, 1977; Craig and Maggiotto, 1981; Madsen, 1987). There is some evidence that the hypothesis explains mobilization only on the political right. Zurcher and Monts (1972), for example, found that the hypothesis successfully accounted for the mobilization of ideological conservatives. Similarly, Hollander (1997) found that it successfully predicted the mobilizing effects of talk radio, but only among ideological conservatives. Talk radio, an increasingly important arena for political discourse, especially among conservatives, may often provide a venue for those seeking to mobilize the high efficacy, low trust in government voter that Gamson describes. Neenan has described the important role played by local talk radio during a 1985 fluoridation campaign in San Antonio (1996). As Neenan points out, talk radio listeners tend to be better educated, have higher incomes, and vote more regularly than the average citizen, making them an attractive target audience for those who oppose fluoridation.

### **C. Risk Perception**

The concept of risk, and the discipline of risk communication, may offer a useful lens for understanding public perceptions of fluoridation. Freudenburg (1993) examines some of the theoretical foundations of risk in modern, technologically advanced societies, noting that today we are dependent on others with specialized technical knowledge, and vulnerable to what he terms “recreancy” by these specialists, “the failure of institutional actors to carry out their responsibilities with the degree of vigor necessary to merit the societal trust they enjoy” (p. 916). “Paradoxically,” Freudenburg writes, “the very division of labor that permits many of the achievements of advanced industrial societies may also have the potential to become one of the

most serious sources of risk and vulnerability” (p. 914). Freudenburg examines public attitudes toward nuclear waste disposal and finds that those with lower levels of trust in the federal government or in science and technology tend to have higher levels of concern about disposal. Interestingly, he finds higher levels of distrust among moderate voters than among liberals.

The “antinuclear activists” who are emerging in communities across the U.S. are proving to be almost the polar opposites of traditional stereotype. Many of them are middle-aged, conservative Republicans...many are “silent majority” members who have never before spoken up in public (p. 928).

One strategy for dealing with public perceptions of risk on scientific issues is to provide the public with technical information—what Sandman et al. (1996) have labeled the “knowledge breeds support” perspective, often popular among scientific experts. However, as Sandman et al. note, “the link between technical knowledge and support for controversial technologies show mixed results” (p. 585) (Melber et al, 1977; Kuklinski et al 1982; Nealy et al, 1983; Bord and O’Connor, 1990; Board and O’Connor, 1992; Baird, 1986; Johnson and Baltensperger, 1987; Golding et al, 1992, Wyner and Mann, 1983; Johnson, 1993; Johnson and Fisher, 1989; Weinstein and Sandman, 1992a; Weinstein and Sandman, 1992b). Mazur, on the other hand, has argued that the more information citizens are exposed to, the more concerned about a risk they are likely to become (Mazur, 1981; Mazur, 1990).

Sandman and his colleagues (Sandman, 1987; Sandman, 1991; Sandman, 1993; Hance et al, 1988; Hance et al, 1990; Sandman et al, 1987), as well as many other writers (Kasperson, 1986; Bord, 1987; Krimsky and Plough, 1988; Johnson, 1987; Covello et al, 1988; Covello and Allen, 1988; Slovic, 1987), have suggested that in order to fully understand public perceptions of risk, we must examine the nontechnical aspects of risk communication. Sandman has developed a well-known framework of “hazard,” which refers to technical issues, versus “outrage,” which refers to nontechnical issues.

In Sandman’s terminology, “hazard” is the product of risk magnitude and probability, while “outrage” is a function of whether people feel the authorities can be trusted, whether control over risk management is shared with affected communities, etc. Supporters of this distinction argue that hazard and outrage are both concepts of risk deserving attention, and that laypeople have had as little success communicating what they consider significant about risks to the experts as the experts have had communicating to the public. No matter how serious the risk is (in hazard terms), and no matter how much technical detail is used to explain it, this view maintains that the degree of *outrage* is likely to determine much of the public’s response to the risk (Sandman et al., 1993, p. 585).

Sandman has identified 13 risk communication variables that should be taken into account in order to minimize outrage when conveying information to the public on risk controversies, and has applied these to the issue of fluoridation (Park et al., 1990). The table below, which is

adapted from Park et al. (1990), looks at these variables, along with how Sandman assesses the “status of public outrage” on the issue of fluoridation by assigning positive and negative scores to each.<sup>6</sup>

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<sup>6</sup> The text in Table 2 is taken verbatim from Park et al. (1990), although it does not appear in table format in that article.

**Table 2: Sandman's 13 Risk Communication Variables and Their Application to Fluoride (adapted from Park et al., 1990)**

<b>Variable</b>	<b>Description</b>	<b>Score</b>
<b>Voluntary vs Coerced</b>	When exposure to a hazard is voluntary, it is perceived by the public as being less "risky." A decision to fluoridate made through referendum appears less coercive than an administrative decision by city council.	-
<b>Natural vs Industrial or Man-made</b>	A risk that is "natural" or "naturally occurring" will not generate the same level of public outrage as will man-made or artificial risk (e.g., natural carcinogens in food vs food additives or water treatment)	-
<b>Familiar vs Exotic</b>	Unfamiliarity increases the level of public outrage, leading to increased perception of risk. The public must become familiar with the "unfamiliar" to decrease the perception of risk. Concerning the issue of fluoridation, the public is familiar with the use of fluoride and its dental health benefits, but is unfamiliar with the relative health risks that may be associated with fluoride.	+
<b>Nonmemorable vs Memorable</b>	This principle relates to personal experiences with a particular risk, or the ease with which the public can picture something going wrong. An issue or event can become memorable through increased media coverage, raising the public's sense of outrage and increasing the perception of risk.	+
<b>Not Dreaded vs Dreaded</b>	"Tooth decay" is a far less dreaded disease than "cancer." Growing concern can be expected (increased sense of outrage) regarding the association between fluoride and cancer. The best way to deal with the "fear of cancer" is to acknowledge that a risk may exist, that the public health community is concerned, and that it is willing to examine new information regarding the potential risks. The worst way to address emerging fears is to become overly defensive and to state that the public should not be concerned.	-
<b>Diffuse in Space and Time vs Static and Focused</b>	A risk that is perceived as diffuse in terms of space and time is generally more acceptable than a risk that is concentrated within a relatively short time frame (e.g., risk of dying of lung cancer from smoking vs risk of dying of an outbreak of infectious disease).	+
<b>Knowable vs Unknowable or Unknown</b>	This variable is more than the extent to which experts know or can define the risk. The level of public outrage increases if there is scientific controversy surrounding an identified risk. The general public will seek information concerning the "worst-case scenario," then will tend to view the risk as more serious. When experts disagree, public perception of "unknowability" increases and the level of outrage also increases.	-

**Table 2: Sandman's 13 Risk Communication Variables and Their Application to Fluoride (adapted from Park et al., 1990)**

<b>Variable</b>	<b>Description</b>	<b>Score</b>
<b>Controlled by the Individual vs Controlled by Society</b>	If the public is excluded from the decision-making process, its sense of "control" over the hazard decreases; it becomes more difficult for the public to develop a sense of control over its own destiny. The public health community must share control with the public if we expect to lower the level of outrage and perceived risk related to community water fluoridation.	-- (very negative)
<b>Fair vs Unfair</b>	The level of public outrage is lower if the risks and benefits are perceived to be fair. If the distribution of benefits and hazards is similar, then the potential risk could be viewed as equitable or more acceptable, thus lowering the public's perception of risk. With respect to fluoridation, the benefits and the risks appear to be distributed evenly across the community, and may be considered by the public to be acceptable in terms of risks and benefits. <sup>7</sup>	+
<b>Morally Irrelevant vs Morally Relevant</b>	Issues that are perceived as being morally relevant will tend to increase the public's sense of outrage. The moral relevance of the risk of cancer makes the cost-benefit trade-off of water fluoridation more difficult to defend. It is important to acknowledge both sides of the morality factor, allowing the public health community to be perceived as respecting the values of others. <sup>8</sup>	+ (even)
<b>Trustworthy vs Not Trustworthy</b>	If the public perceives the source of information as being "trustworthy," then its level of outrage toward an issue would be lower. The extent to which the public views government agencies and authority figures as trusted sources of information depends on whether these sources are accountable. In general: 1) people want to perceive themselves as partners in the decision-making process, 2) there is more trust on a person-to-person level, and 3) the public perceives a warning message with a higher degree of trust than it would a reassuring message. The public health community and the dental profession no longer can maintain the inflexible position that "we are experts, trust us," without offending the public's sense of trust. We must invite the public to establish systems of accountability. The public will in fact trust us more if we invite them to "trust us less."	-- (very negative)

<sup>7</sup> Note that this may contradict Neenan's statement about older citizens' perceptions of fluoridation benefits.

<sup>8</sup> A threat is "morally relevant" when it is perceived as so threatening that any risk of it occurring is essentially unacceptable.

<b>Table 2: Sandman's 13 Risk Communication Variables and Their Application to Fluoride (<i>adapted from Park et al., 1990</i>)</b>		
<b>Variable</b>	<b>Description</b>	<b>Score</b>
<b>Open Sources vs Secret or Closed Sources</b>	Society becomes angry when it perceives that information is withheld. The price of releasing information is less expensive than not releasing it.	-- (very negative)
<b>Courtesy and Caring vs Arrogance and Defensiveness</b>	Contempt for the public's perception is inappropriate. Authority figures often are perceived by the public as demonstrating an air of "technical coldness," which is interpreted as being arrogant and defensive. The public health community must acknowledge the public's outrage in a courteous and caring manner. Further, Sandman stated that it is imperative that the scientific and public health community not only respect the opposite viewpoint, but acknowledge that there may be substance in new information. He recommends that fluoridation advocates should "not trash new information" when it does not agree with past experience. The best approach is to acknowledge its existences, recognize that it may not be definitive, and comment publicly that the information will be investigated thoroughly.	-

Summing up the number of positive and negative ratings, the overall score for fluoridation is a -7, which means it is an issue ripe for public outrage. Sandman also offers nine recommendations for how to reduce outrage on fluoridation matters (reprinted here from Park et al., 1990, p. 287):

- Make decisions on fluoridation and the use of fluorides more voluntary
- Increase the public's familiarity with the risks
- Acknowledge the dread
- Temper expert disagreement
- Share control with the public, increasing the likelihood of community referendums
- Acknowledge the moral relevance
- Invite the public to become our partners and to set up systems of accountability
- Release important information
- Demonstrate concern and caring

Thus, Sandman advocates an open decision making process and a campaign that acknowledges public concerns and provides citizens with relevant information. Some studies suggest that fluoridation campaigns have not always followed this kind of approach in the past, as several authors note that past campaigns have been plagued by a somewhat arrogant posture on the part

of pro-fluoridation experts who, relying on the weight of scientific evidence, have been dismissive of public concerns (Frazier, 1980; Sapolsky, 1969).

A final way in which perceptions of risk may affect public debate on issues such as fluoridation concerns Sunstein's notion of "group polarization." This dynamic suggests that public discussion of risk can push individuals toward extreme points of view.

When like-minded people are talking mostly to one another, especially interesting things are likely to happen. If members of a group tend to think that (an issue) poses a significant danger, their discussions will move them, not to the middle, but to a more extreme point in line with their original tendencies (p. 88).

Public debate therefore, can have a reinforcing effect, solidifying opinions that may not accurately reflect objective risk assessments. Over the course of a campaign, public opinion may grow increasingly polarized and, in the case of fluoridation, it may become more and more difficult to persuade voters who lean toward the antifluoridationist position.

#### **D. Media and Campaign Communication**

Having witnessed the German propaganda of the 1930s and 40s, many early scholars of mass communication feared the persuasive power of political propaganda. "Social scientists of the time," Kinder writes, "worried whether ordinary citizens could maintain their democratic values and economic autonomy in the new and scary world of mass communication" (1998, p. 185). These fears, however, were often based on intuition or observation, not on rigorous social scientific testing. Scholars who began empirically investigating these claims came to very different conclusions, perhaps captured most famously in Klapper's (1960) "minimal effects" model, which suggested that propaganda rarely changes individual attitudes; instead, it tends to reinforce existing attitudes.

But in recent years political communication specialists have questioned the minimal effects model, judging it "not so much wrong as incomplete" (Kinder, 1998, p. 189). While mass communication may rarely result in high levels of persuasion and large swings in public opinion, other more subtle effects have become apparent, including agenda setting, priming, and framing. In one classic study, Iyengar and Kinder (1987), used experimental methods to examine the agenda setting and priming effects of television news coverage. Regarding agenda setting, Iyengar and Kinder found that viewers exposed to news broadcasts edited to emphasize a particular problem were more likely to consider that problem a priority. In support of their priming hypothesis, the authors found that viewers tended to evaluate politicians based on issues they had been exposed to through the edited broadcasts. For instance, those who had been exposed to broadcasts emphasizing national defense tended to evaluate candidates based on their stance regarding defense.

Framing is another important way in which media may affect public opinion. Numerous studies from public health and political communication examine how the media, campaigns, and advocates frame issues to influence attitudes and behavior (Iyengar, 1991; Wallack et al., 1993; Bales et al., 1998). Iyengar describes framing as “subtle alterations in the statement or presentation of judgment and choice problems, while the term ‘framing effects’ refers to the changes in decision outcomes resulting from these alterations” (1991, p. 11). Whereas studies of agenda setting and priming tend to focus on the amount of media coverage, analyses of framing tend to emphasize the content of communication (Nelson et al., 1997; Gamson, 1992; Gamson and Lasch, 1983; Gamson and Modigliani, 1987, 1989; Iyengar, 1991; Nelson and Kinder, 1996). In many ways, as Simon and Xenos note (2000), framing is about constructing messages to link associated concepts, “To say a message constructs an issue, we are really saying that it has built-in particular associations between concepts.” “Thus,” they continue, “framing analysis is a careful examination of the way concepts are associated within discourse” (p. 367). In a situation, such as referendum voting, where voters lack normal voting cues and have relatively little information, framing may be particularly important as voters may be particularly susceptible to new information and campaigns may be able to create new associations in voters’ minds (see also section below on ballot wording).

A framing perspective has been used by many scholars to examine media effects. In addition, several studies have looked at how political campaigns use framing to achieve their electoral goals (Popkin, 1991; Jamieson and Waldman, 2003). Rival campaigns, through rhetoric, advertising, and other communication efforts, try to frame issues in ways that will encourage citizens to agree with their positions. Frames, in this sense, represent an effort to define an issue and characterize the available political choices. They are the tools political elites use to garner mass support (Nelson and Kinder, 1996; Mannheim, 1991; Skocpol, 1994). “Elites,” Nelson and Kinder write, “wage a war of frames because they know that if their frame becomes the dominant way of thinking about a particular problem, then the battle for public opinion has been won” (p. 1058). Political campaigns may develop different frames for different target audiences, frequently using polling or focus group research to identify messages that are particularly effective with targeted segments of the voting population. Similarly, in the field of public health, behavior change and health education campaigns will develop tailored message concepts for different demographic or cultural groups (see for example Brugge et al., 2002).

The discipline of media advocacy, which Wallack and Dorfman (2001, p. 393) define as “the strategic use of mass media in combination with community organizing to advance public health policies,” has recently focused a great deal of attention on the importance of framing for public health campaigns. Opposing sides on issues such as tobacco policy, nuclear energy, and abortion have used “contested frames” in attempts to define these issues in the public mind (Wallack et al. 1993). For instance, the tobacco industry successfully undermined the 1978 California indoor air initiative—which would have created non-smoking areas in certain public spaces—by framing it as a referendum on government intrusion on individual rights, rather than as a vote about non-smoker rights (Magleby, 1984).

Central the success of any political campaign is the ability to define the campaign issues in a favorable light. The literature on fluoridation suggests that frames can be extremely important. For example, Isman (1980) has suggested that allowing a phrase like “mandatory” fluoridation onto the ballot can shift a referendum from a public health issue to an issue of government interference and individual rights.

One final note on the subject of campaign communication concerns the issue of public campaign debates. Such debates have become a staple of many political campaigns, the best known of course being the presidential debates every four years between the major party presidential candidates. Debates can serve a useful educational purpose, informing voters about the major issues and choices they face in the voting booth. However, many fluoridation advocates have determined that public debates do not serve their side well because they appear to lend credibility to the opposition, giving antifuoridationists an equal platform and seemingly legitimizing views that have little scientific support. Indeed, in their analysis of a successful fluoridation campaign in La Crosse, Wisconsin, Jones et al. (1989) note that fluoridation advocates explicitly avoided debates for this reason. Another problem faced by fluoridation advocates is that opponents have clear and direct messages, while scientific answers are usually highly qualified, giving the impression that scientists cannot provide definitive answers to highly charged claims.

## E. Diffusion of Innovations

Diffusion of innovations theory provides another perspective for understanding the issue of fluoridation. Used widely in public health, this theory explores why “innovations”—such as public health strategies, policies, or tools—spread across communities. In a seminal work, Rogers (1983) identified five categories of innovation adopters: innovators, early adopters, early majority adopters, late majority adopters, and laggards. As Oldenburg et al. (2002) note in their survey of the diffusion of innovations literature, “The identification of such categories is the basis for designing and implementing intervention strategies targeted at particular groups of individuals” (p. 272). The implication for the study of fluoridation is that the characteristics of late majority adopters and laggards need to be identified, and interventions need to be designed to encourage these groups to adopt the innovation of community water fluoridation.

In addition to developing categories of adopters, scholars have identified characteristics of innovations that affect the likelihood they will be adopted. Hunt (1983) has applied diffusion of innovations theory to fluoridation, and has analyzed how these characteristics apply to this issue. Table 3 provides definitions for each characteristic (from Glanz and Rimer, 1997) and summarizes Hunt’s analysis of how each applies to fluoridation.

<b>Table 3: Innovation Characteristics and Fluoridation</b>		
<b>Characteristic</b>	<b>Definition</b>	<b>Application to Fluoridation</b>
<b>Relative</b>	The degree to which an innovation is	It may not be readily apparent to the

<b>Advantage</b>	seen as better than the idea, practice, program, or product it replaces.	public that the benefits of fluoridation outweigh the financial, social, and political costs.
<b>Compatibility</b>	How consistent the innovation is with values, habits, experience and needs of potential adopters.	Adopting fluoridation may be more difficult in certain individualistic political cultures.
<b>Complexity</b>	How difficult the innovation is to understand and/or use.	Although the impact of fluoride on tooth decay may not seem complex, antifluoridationists are often successful in confusing the public and making the issue appear complex.
<b>Triability</b>	Extent to which the innovation can be experimented with before a commitment to adopt is required.	Fluoridation cannot be tried on a limited basis.
<b>Observability</b>	Extent to which the innovation provides tangible or visible results.	The benefits of fluoridation may be long-term in nature and the reduction in caries not easily seen by the public.

This analysis of fluoridation as an innovation leads Hunt to conclude that it “clearly has a low adoptive potential, especially when decided by referendum” (p. 154).

The communication channels used to disseminate information about an innovation also may strongly affect the likelihood of adoption. For public health innovations, both medical professionals and community leaders may play an important communication role. In his study of fluoridation in small Iowa communities, Hunt found that mayors play a significant role in adoption. He also found that when “opinion leaders,” including in some cases local dentists, spoke at local council meetings where the issue was being debated, the council tended to support the side with the most speakers supporting its position. Thus, the diffusion of innovations literature further highlights the important role policy, health, and community elites may play in the decision making process.

## **F. Other Campaign Variables**

In addition to effective communication strategies, there are many other factors that may influence the success of a political campaign, whether it is a referendum effort or a campaign to pass an initiative through a governing body. This section explores a number of these factors: campaign organization, coalition building, research, campaign finance, ballot wording, and the timing of an election.

### **Campaign Organization**

Political practitioners usually view campaign organization and professionalism as a key to electoral victory in both candidate elections and ballot measures. In a practical, how-to guide for fluoridation supporters, the American Dental Association (1997) suggests a number of steps for organizing an effective campaign, including establishing campaign committees and subcommittees (such as steering, finance, and legal committees), developing campaign slogans

and logos, acquiring lists of registered absentee voters, conducting telephone canvassing, and contacting local editors and other members of the media.

One important component of a successful campaign is having good personnel, including “a well organized and vigorous staff” (Faine et al., 1981), as well as potentially hiring various campaign consultants for research, petition drives, get out the vote efforts, advertising, media purchasing, message and materials development, voter targeting, and other purposes. It is also important to solicit help from volunteers and to enlist the support of a wide variety of community members.

### **Coalition Building**

As many observers of public health and political campaigns have noted, building broad-based community support is often crucial to success. Jones et al. (1989) provide an example from the successful 1988 fluoridation referendum campaign in La Crosse, Wisconsin. Here, the campaign organized a 34-member coalition in support of the initiative, the “Citizens for a Better Dental Health in La Crosse,” which “met twice a month for five months preceding the April referendum, planning and implementing an educational and political campaign for fluoridation” (p. 1406). As Butterfoss and Kegler (2002) note in their survey of the coalition literature, the field of interorganizational relations has demonstrated that organizations are likely to join a coalition when they perceive the benefits of participation as outweighing the costs of participation (see also Gray, 1989; Prestby et al., 1990; Roberts-DeGennaro, 1986; Whetten, 1981). Isman (1981), discusses how fluoridation advocates may get organizations involved in a coalition by emphasizing the particular benefits those organizations may realize if fluoridation is adopted. For instance, he suggests that arguments concerning the potential reduction of dental costs will be persuasive to business groups, organized labor, and, especially, health insurance organizations.

### **Formative Research and Use of Data**

Several studies of referendum politics note the importance of campaign research, such as focus groups and survey research (Gerber, 1999; Schultz, 1996; Donovan et al., 2001). Campaigns use scientific polling of registered voters for a variety of purposes, including measuring the current state of public opinion, targeting potential supporters, testing the impact of potential endorsements, and testing the effectiveness of campaign messages both for and against a proposal. Focus groups are also used by campaigns to hone messages and identify persuasive and motivating language. Of course, these research efforts can be too expensive for campaigns with limited finances.

In their study of fluoridation efforts in Tennessee, Brumely et al. (2001) discuss another way in which campaigns may use research, which they label the “community diagnosis process.” In 1995, oral health advocates in Tennessee decided to collect and disseminate local oral health data as a means of educating decision makers about the need for fluoridation. They conducted oral health surveys on children in various local communities and presented these data to county health councils comprised of representatives from civic organizations, business, health professions, government, and education, as well as general consumers. The data showed a

significant difference in levels of dental caries among children in fluoridated and non-fluoridated areas. When presented with the data, health councils in four non-fluoridated counties decided unanimously to make fluoridation a top health policy priority and to push for its adoption. The councils then presented their recommendations to the local decision making body, in this case the utility district board, and in end, fluoridation was adopted in all four counties. This example illustrates how local data might be used in campaigns where a governing body has jurisdiction over the decision to fluoridate. Brumley et al. do not speculate about how this method might apply to a situation in which voters make the decision, but the community diagnosis process may have some utility in those cases as well.

### **Campaign Finance**

Another important factor for any campaign is the role of money. Particularly if an issue is to be decided at the ballot box, a campaign will need sufficient resources for advertising, and if possible, for other expenses such as paid staff and research. A sizeable amount of research has been conducted on the influence of money in referendum and initiative campaigns (Shockley, 1980; Lydenburg, 1981; Lowenstein, 1982; Zisk, 1987; Bowler et al., 1992; Cronin, 1989; Magleby, 1984). Several of these studies have indicated that campaign finances are an extremely important factor in such elections, frequently determining victory. Many critics of direct democracy argue that a financial imbalance between opposing sides of a referendum often leads to an unfair competition at the polls (Gierzynski, 2000). Zisk's (1987) study of ballot measures in California, Massachusetts, Michigan, and Oregon is generally consistent with these reservations. Zisk found that the side with more campaign funds won 78% of the time. Other authors have discovered a slightly more nuanced relationship between spending and victory, finding that money is most important when spent by the side that opposes the ballot measure (Bowler and Donovan, 1998).

### **Ballot Wording**

Another campaign specific factor that must be considered when analyzing referendums is the issue of ballot wording. Studies of fluoridation have found that proposition wording can affect the likelihood of passage. According to Boriskin (1979), in many cases, ballot wording is the only piece of election literature that all voters ever see during a fluoridation campaign. Thus, the wording becomes both education and campaign material, and must be "clear in its intent, but also informative, explaining fluoridation's purposes and benefits" (p. 58).

The case of the 1974 East Bay Municipal Utility District (EBMUD) referendum in California is instructive. In two previous elections—both unsuccessful—the proposition's wording read: "Shall the East Bay Municipal District add fluorine and fluorine compounds to the water supply of said district?" Besides being inaccurate (fluorine is a gaseous element, versus fluoride, whose use as a preventative dental health measure is more familiar to the public), the proposition's wording contained virtually no information on either the purpose or benefits of fluoridation. In the successful 1974 campaign, however, although the proponents were not able to achieve all the wording changes desired, the wording was updated to use the word "fluoride" instead of

“fluorine,” and included the statement “subject to the regulations of the California State Department of Health” (Boriskin, 1979, p. 58).

Isman (1981) provides another salient example of the importance of ballot wording, raising issues of clarity and bias. In the 1978 campaign for the fluoridation of Portland, Oregon’s water supply, proponents of fluoridation voted simply for the “fluoridation of municipal water supply.” In the subsequent 1980 campaign led by antifuoridationists to repeal the previously successful effort, the proposition read: “Eliminates mandatory fluoridation of city water” (p. 717). The 1980 proposition passed, eliminating fluoridation in Portland.

According to Isman, two key elements of the ballot wording influenced the outcomes of the two elections. First, confusion was created in the latter case because a “no” vote meant voting for fluoridation, and a “yes” vote was against it. Other authors have argued that propositions should always be worded so that a positive vote is in favor, and a negative vote is against the measure (McGuire, 1981; Boriskin, 1979). In the Portland case, a follow-up survey of three hundred voters revealed a high level of confusion about how to vote for or against the proposition. Secondly (as noted previously), the use of the word “mandatory” in the proposition wording, according to Isman, created a bias against the measure because of the word’s negative connotations. Promoting the idea that government or administrative measures are being forced upon the general population is a popular tactic among antifuoridationists. Obviously, the issue of ballot wording also falls under the more general issue of message framing.

**Timing**

Isman (1981) also mentions another important variable for referendum campaigns, the timing of an election. Isman feels that fluoridation has the best chance for success at the polls when turnout is high. Situations when turnout is low, as with most special elections, “tend to draw special interest voters who are more likely to vote against fluoride than for it” (p. 719). Generally, turnout is higher for general elections than for primaries, and is highest for presidential elections.

**IV. Discussion**

As this survey of the literature suggests, the number of potentially relevant works and perspectives on fluoridation is quite large. The challenge for the *exploratory research* project will be to identify the most important factors that influence the success of fluoridation campaigns and to develop a research design that examines those factors. This review is the first step in that process.

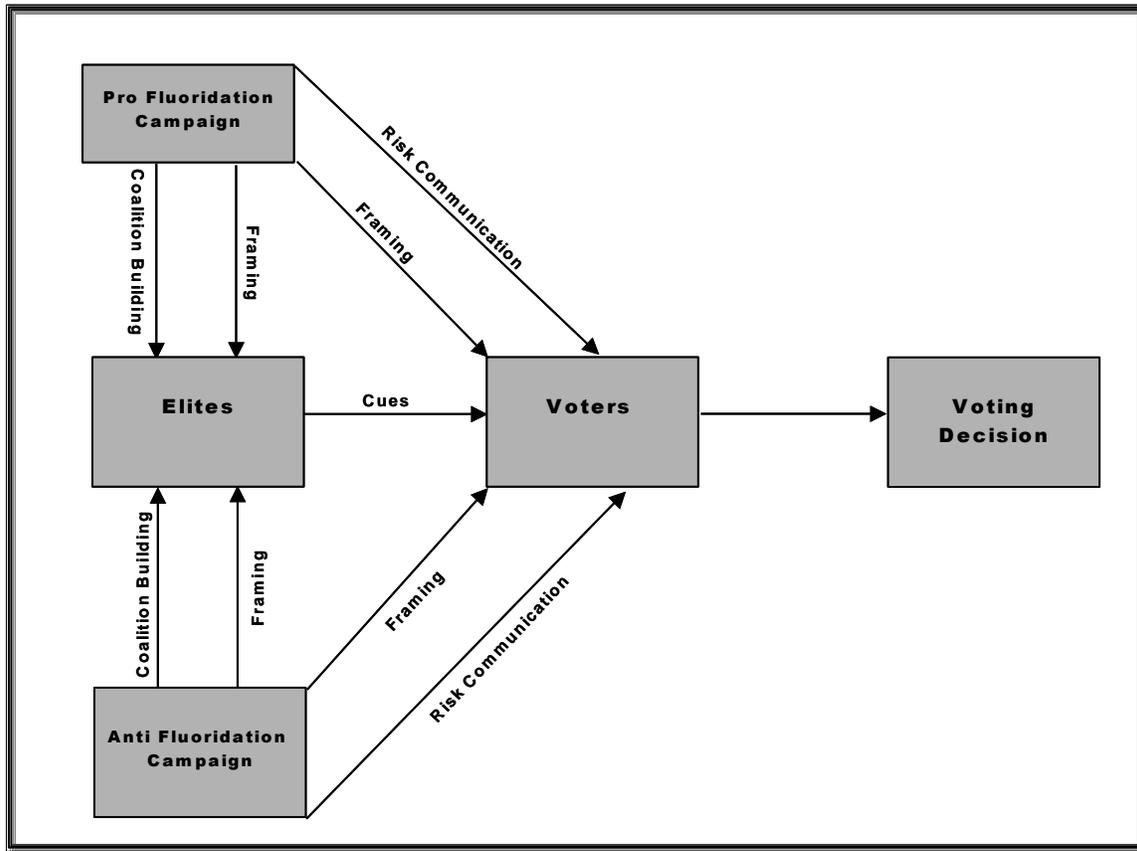
The table below lists some of the major variables identified in the literature, grouping them into five categories, structural, elite level, voter level, campaign communication, and other campaign variables.

<b>Table 4: Potentially Important Variables Identified in the Literature</b>	
<b>Structural variables</b>	Socioeconomic status
	Structural differentiation
	Social integration
	Centralization of authority
	Social capital
	Community capacity
<b>Elite level variables</b>	Involvement of health professionals
	Newspaper endorsements
	Elite endorsements/figurehead
	The nature of policy elite participation
<b>Voter level variables</b>	Age/presence of children
	Alienation, efficacy
	Trust in government
	Trust in science in technology

<b>Campaign communication variables</b>	Campaign's main communication themes/frames
	Public debates
	Sandman's risk communication variables
<b>Diffusion of innovations variables</b>	Characteristics of innovation
	Communication channels
<b>Other campaign variables</b>	Organization/professionalism
	Coalition building
	Research
	Campaign finances
	Ballot wording
	Election timing

Campaigns, whether conducted to gain the approval of a governing body or to win victory among voters, are dynamic, complex events and their effects are extremely difficult to measure. Nevertheless, in order to understand how fluoridation campaigns can develop better strategies for success, it is necessary to understand more about the complex relationships among the variables affecting success or failure, some of which are highlighted in this review. Below, in an effort to begin the process of exploring these relationships, we present a preliminary model of the communication processes involved in fluoridation referendum elections.

**Figure 1: Fluoridation Referendum Campaign**

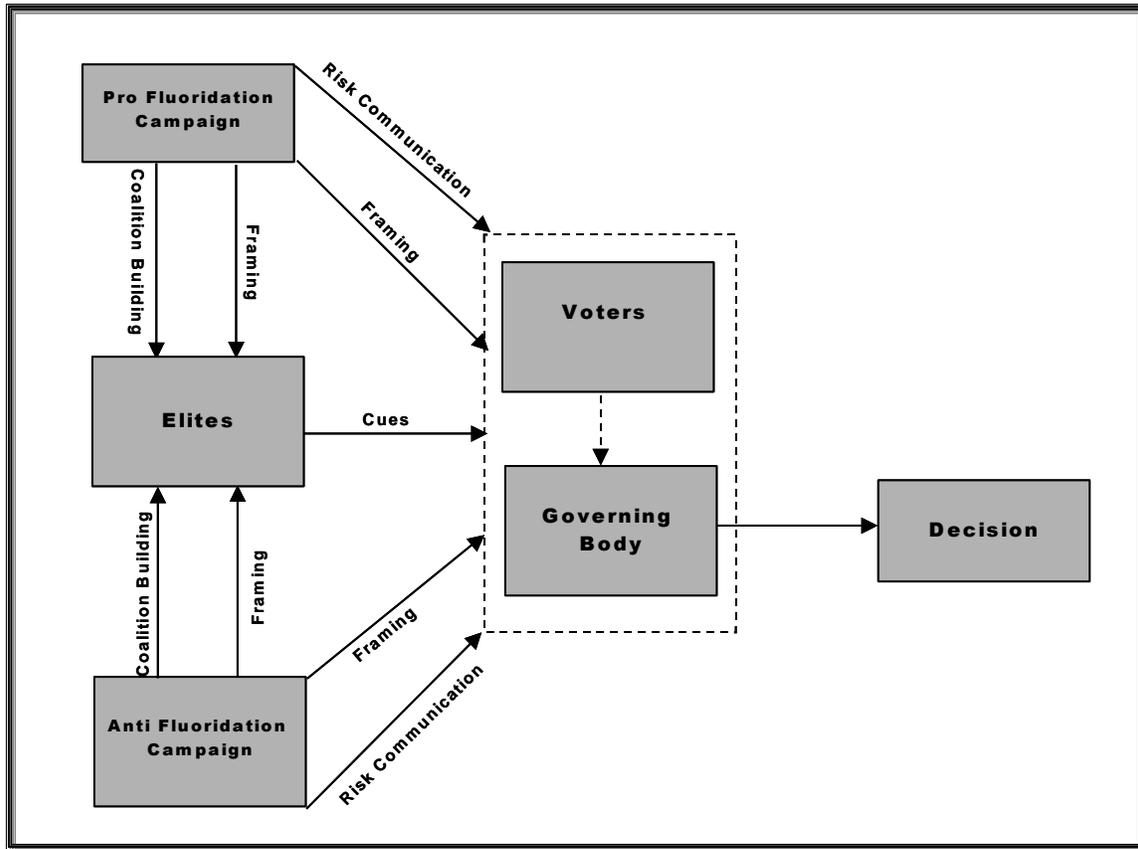


In this model, pro- and anti-fluoridation campaigns attempt to influence both elites and voters through message framing. Both campaigns also try to build coalitions among elites and attempt to either alleviate public concerns about fluoridation or, in the case of anti-fluoridationists, increase those concerns. Elites, after being lobbied by both sides, provide valuable cues to voters, who weigh the information they have been given and ultimately determine the outcome.

The model for a campaign in which a governing body will decide the outcome is quite similar. The major difference in this model is that the message framing, risk communication information, and cues are provided both to voters and the governing body, under the assumption that campaigns will want to influence voters because they believe voters will in turn have influence over the governing body. This linkage between voters and the governing authority is also represented in the model.<sup>9</sup>

<sup>9</sup> Ultimately, the important variables in referendum campaigns and campaigns directed at governing authorities may prove to be quite different, or may at least operate quite differently in the two contexts. This is an issue that will be explored in greater depth in the next phases of the research.

**Figure 2: Fluoridation Campaign for Governing Body**



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