A Source of Bias in Public Opinion Stability

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A *long acknowledged but seldom addressed problem with political communication experiments concerns the use of captive participants. Study participants rarely have the opportunity to choose information themselves, instead receiving whatever information the experimenter provides. We relax this assumption in the context of an over-time framing experiment focused on opinions about health care policy. Our results dramatically deviate from extant understandings of over-time communication effects. Allowing individuals to choose information themselves—a common situation on many political issues—leads to the preeminence of early frames and the rejection of later frames. Instead of opinion decay, we find dogmatic adherence to opinions formed in response to the first frame to which participants were exposed (i.e., staunch opinion stability). The effects match those that occur when early frames are repeated multiple times. The results suggest that opinion stability may often reflect biased information seeking. Moreover, the findings have implications for a range of topics including the micro–macro disconnect in studies of public opinion, political polarization, normative evaluations of public opinion, the role of inequality considerations in the debate about health care, and, perhaps most importantly, the design of experimental studies of public opinion.*

Public opinion matters. It determines who wins elections, plays a significant role in shaping public policy, and influences the views of elected officials (e.g., Druckman and Jacobs 2009; Shapiro 2011). It is thus not surprising that politicians, interest groups, and other policy advocates put forth considerable effort to mold citizens' opinions. Political power comes with the ability to push opinions in one direction or another.

A primary means by which elites affect citizens' opinions is through framing—that is, offering alternative understandings of an issue (e.g., Lakoff 2004; Schattschneider 1960). For example, those in favor of universal health care push it as a form of egalitarianism, whereas opponents frame it as an unnecessarily costly measure steeped in government bureaucracy. A generation of research shows that elites can use frames such as these to affect public opinion. Much of this work is experimental; experiments constitute an ideal method to study elite influence because they allow investigators to know the messages to which individuals are exposed and they prevent people from self-selecting messages (Nelson, Bryner, and Carnahan 2011). The typical study finds that, when people are exposed to a given frame, their opinions move in the

direction of the frame (e.g., when estate taxes are represented as double taxation, opposition to the tax increases; for a review, see Chong and Druckman 2007b). This research has been remarkably influential (Iyengar 2010), but it also has been plagued by at least two limitations.

First, policy debates and campaigns take place over time, yet the bulk of framing research (and of elite influence work in general) focuses on a single point in time. Recent work addresses this limitation by investigating over-time communication effects; for example, Chong and Druckman (2010) expose experimental participants to competing frames over time (also see, e.g., Albertson and Lawrence 2009; Druckman and Leeper n.d.[b]; Matthes 2008). They find that the over-time dynamics depend on information-processing style, but conclude that "when people receive competing messages across different periods rather than concurrently, the accessibility of previous arguments tends to decay over time. Consequently, individuals typically give greater weight to the more immediate cues contained in the most recent message... [there is a] general tendency of framing effects to decay over time" (Chong and Druckman 2010, 677). This conclusion echoes those of other experimental research (e.g., de Vreese 2004; Druckman and Nelson 2003; Gerber et al. 2011; Mutz and Reeves 2005; Tewksbury et al. 2000), and of observational work (e.g., Achen and Bartels 2004; Hibbs 2008; Hill et al. 2008; although see Holbrook et al. 2001, 933). This message is that, all else constant, recency effects prevail and elites who dominate at the end, and not the beginning of policy debates, are advantaged.

The second problem with most extant work, including the experimental work just mentioned, is that it ignores how people operate in an information-rich environment. Instead, experiments control the communications people receive and tend to focus on issues that receive scant attention outside the experiment itself (e.g., Chong and Druckman 2010; de Vreese 2004).

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This is a long recognized but seldom addressed critique of using captive audiences in experiments (e.g., Hovland 1959). Although some recent work has begun to explore the implications of using the captive audience approach (e.g., Arceneaux and Johnson 2010; Gaines and Kuklinski 2011; Gaines, Kuklinski, and Quirk 2007; Levendusky 2011), none has done so in an over-time setting. This captive audience problem has increasing relevance given the 21st-century's profusion of media. Citizens, even when not directly looking for it, encounter policy information simply by turning on the television or opening their internet browser.

In this article, we investigate how allowing individuals to choose information (including the choice of obtaining no relevant information) affects the impact of over-time competing elite frames. We do so with an experiment focused on opinions about health care reform. We find that relaxing the captive audience assumption—and allowing information search—has dramatic implications for how over-time competition works. In fact, it completely reverses the conclusions from past work: Messages do not decay, and instead, the first frame put forth dominates opinion. This finding suggests that, when individuals have even minimal interest in obtaining information about an issue, elites who go first are advantaged and primacy prevails. We further show that these primacy effects are substantively equal to what occurs if the side that goes first gets to repeat its message over time. As we explain, the results suggest that opinion stability may often reflect biased information seeking. Moreover, the findings have implications for a range of topics including experimental design, the micro–macro disconnect in studies of public opinion, political polarization, normative evaluations of public opinion, and the role of inequality considerations in the debate about health care.

FRAMING, REPETITION, AND INFORMATION SEARCH

A framing effect occurs when a communication changes people's attitudes toward an object (e.g., policy) by altering the relative weights they give to competing considerations about the object (Druckman 2001, 226–31). A classic example is an experiment in which participants are asked if they would allow a hate group to stage a public rally. Those participants randomly assigned to read an editorial about free speech express more tolerance for the group than those who read an editorial about risks to public safety (Nelson, Clawson, and Oxley 1997). Framing is effective in this instance because the communication plays on the audience's ambivalence between free speech and social order.[1]

A frame's effect depends on various factors, including its strength or persuasiveness (e.g., does it resonate with people's values?),[2] attributes of the frame's recipients (e.g., people with strongly held attitudes are less likely to be affected), and the political context. In competitive environments, in which individuals are exposed concurrently to each side's strongest frame (e.g., free speech versus public safety), the frames tend to cancel out each other and exert no net effect (e.g., Chong and Druckman 2007a; Druckman et al. 2010; Sniderman and Theriault 2004).

Of course, in most instances, individuals do not receive competing frames at one point in time, but rather over time. As mentioned, Chong and Druckman (2010) conducted experiments (on the Patriot Act and on limiting urban sprawl) that looked at two points in time (t1 and t2). At t1, participants were randomly assigned to receive either a Pro frame on the issue (e.g., limiting urban sprawl to preserve open space) or a Con frame (e.g., how limiting urban sprawl will increase housing costs). Then later, at t2, respondents received another frame, often the opposing one (e.g., those who received the Pro open space frame at t1 received the Con housing costs frame at t2). The modal effect is that the t1 frame decays and the t2 frame ends up dominating opinion. For example, those exposed to the open space frame at t1 but the housing costs frame at t2 came to oppose limiting urban sprawl. *Recency effects tend to dominate*.

That said, Chong and Druckman (2010) also report some variations across issues (e.g., there were weaker recency effects on the Patriot Act) and, more importantly, differences based on individuals' processing style. Those who formed particularly strong opinions when exposed to the initial t1 frame were affected largely by the t1 and not the t2 frame; that is, primacy effects prevailed for those individuals (also see Matthes 2008). This effect occurred because strong opinions, by definition, are more stable and resistant to change (e.g., Visser, Bizer, and Krosnick 2006), leading the opinions formed at t1 to endure. Yet the central finding remained: "[W]hen competing messages are separated by days or weeks, most individuals give disproportionate weight to the most recent communication because previous effects decay over time" (Chong and Druckman 2010, 663).

A limitation of virtually all work on over-time communication, including Chong and Druckman (2010), is that it ignores events that occur between exposures (between t1 and t2). In fact, many studies make a point of showing that participants were only exposed to minimal and nonconsequential information outside the experiment (between sessions). This also explains why

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[1] We refer to our focus as "framing" because the arguments emphasize distinct considerations on an issue aimed at influencing underlying considerations. That said, we agree with recent work that the conceptual distinctions between framing effects and other types of communication effects are ambiguous (e.g., Druckman, Kuklinski, and Sigelman 2009; Iyengar 2010). Indeed, we suspect our results are robust across types of communications.

[2] Chong and Druckman (2007a) show that, when all frames are received concurrently, stronger frames influence opinions to a greater extent than weaker frames, even when a weaker frame is repeated. A strong frame is typically identified via pretests that ask respondents to rate the "effectiveness" of different frames. For example, strong frames for and against the hate group rally might invoke considerations of free speech and public safety, whereas a weak opposition frame might be an argument that the rally will temporarily disrupt traffic.

studies often focus on low-salience issues that rarely appear in media coverage (e.g., regulation of hog farms, particular ballot propositions; see, e.g., de Vreese 2004, 202). This focus is sensible in terms of ensuring clean causal inference from the experiment. Yet by design, it also ignores the reality that, in most campaigns and policy debates, information provision does not come to a temporary halt after the first frame is put forth and then start again a week or so later when another frame appears (Lecheler and de Vreese 2010).

Information continues to appear in at least two ways. First, the competing sides promulgate messages; even if the opposing side takes some time to launch a counter-campaign, the initial side is likely to push its message repeatedly. We focus on this possibility here, in part because it provides a useful baseline of comparison for the other manner in which information is obtained. The second way is that individuals seek out information relevant to the issue; for example, after learning about a proposal to limit urban sprawl, an individual may obtain other relevant information. Although this behavior involves a choice to select and read such information, it does not require substantial motivation in an age of information profusion (e.g., on the internet, an individual may happen upon a relevant headline, without having looked, and then click the link). What it means experimentally is a relaxation of the captive audience assumption.

Repetition Effects

We examine what happens when the t1 frame is repeated multiple times before individuals receive the counter-frame (see Chong and Druckman 2011b for the situation where, instead, the counter-frame is repeated multiple times in response to the t1 frame). For example, those who received the open space frame at t1 then receive it a few more times, over time, before receiving the competing economic costs frame. We focus on the case where the initial t1 frame influences, on average, opinions—in other words, cases where the frame is initially effective.

In this situation, repetition likely increases the strength with which one holds the attitude. As mentioned, stronger attitudes are those that are more stable and resistant to change; there are a variety of strength-related attributes of attitudes such as extremity, accessibility, and importance (e.g., Miller and Peterson 2004; Visser, Bizer, and Krosnick 2006). For us, the most relevant dimension of attitude strength is *certainty*: "the amount of confidence a person attaches to an attitude... measured by asking people how certain or how confident they are about their attitudes" (Visser, Bizer, and Krosnick 2006, 3–4). Psychological research shows that repeated exposure to information increases perceptions of its accuracy and familiarity (e.g., Cacioppo and Petty 1989; Moons, Mackie, and Garcia-Marques 2009), which in turn bolsters the confidence people have in their attitudes (e.g., Berger 1992; Druckman and Bolsen 2011). As Visser, Bizer, and Krosnick (2006, 39) explain, "increases in exposure

to new information. . .increase attitude certainty."[3] In short, when hearing a frame multiple times, people come to be more confident and more certain of its veracity; in turn, this strength increase enhances stability and resistance to later frames (which are rejected as inconsistent with a strongly held belief; see Taber and Lodge 2006).

- *Hypothesis 1:* When individuals repeatedly receive an initial influential frame (i.e., at t1), repeating that frame will increase the strength with which they hold the relevant attitude.
- *Hypothesis 2:* When individuals repeatedly receive an initial influential frame (i.e., at t1), they will increasingly resist the effect of a later counter-frame, leading to a primacy effect.[4] (This contrasts with the aforementioned baseline of decay and recency effects.)

Search Behavior Effects

When provided with the opportunity to choose subsequent information (i.e., relaxation of the captive audience assumption), how individuals act depends on their motivation. If individuals are highly motivated to make "accurate" judgments, they will likely seek out diverse information, including that which challenges their prior opinions (which again we are assuming were influenced by the initial frame). Often, however, individuals are not so motivated and instead exhibit a directional orientation, in which they seek out information that confirms prior opinions (what is called a confirmation bias) and they view evidence consistent with prior opinions as stronger (what is called a prior attitude effect). For example, those who oppose laws that limit urban sprawl will likely be drawn to articles that resonate with their beliefs, such as articles that frame limitations as having negative economic consequences or creating overly dense environments. If somehow they happen to find themselves exposed to contrary arguments (e.g., urban sprawl has negative environmental consequences), they ignore or reject them.

This type of search behavior is a case of motivated reasoning. Motivated reasoning means people tend to seek out and evaluate information in a biased or nonobjective fashion. For instance, after watching a presidential debate, a Democratic voter does not search for commentaries representative of alternative viewpoints. Instead, he or she looks only for communications that cohere with the Democratic perspective. Even if such information seems far-fetched (e.g., that the Democratic candidate won even though the candidate performed relatively poorly by most objective standards

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[3] In addition, repeated exposure may prompt recollection, which increases strength (see Cacioppo and Petty 1989).

[4] It is implied that we expect strength to mediate the process by which the t1 attitude resists the effect of the later frame. However, we do not offer a formal prediction because the nature of our design—in which we do not manipulate strength—means that directly testing this type of mediational prediction is not possible (see Bullock and Ha 2011).

such as knowing the issues), the voter accepts the information while analogously rejecting any argument or evidence suggesting the Democratic candidate lost the debate. Along these lines, Levendusky (2011) reports that individuals tend to opt for partisan media sources, which in turn leads them to become even more partisan. Motivated reasoning takes place not only in a partisan manner but also on any issue (regardless of partisan content) on which an individual holds a prior opinion (as in the earlier urban sprawl example; also see Druckman and Bolsen 2011).

These types of biased (i.e., not even-handed) behaviors typically occur without conscious awareness, and they seem to be the norm in politics. Evidence to date shows that on political issues, even when encouraged to be accurate, individuals limit their searches to information that coheres with their prior opinions (that behavior may reflect earlier effective communications; e.g., Iyengar and Hahn 2009; Kim, Taber, and Lodge 2010; Lawrence, Sides, and Farrell 2010; Taber and Lodge 2006). In a recent meta-analysis, Hart et al. (2009) find that political issues have the greatest amount of this selective exposure of any topic.

- *Hypothesis 3:* When individuals are influenced by an initial frame, they will seek out information consistent with their opinions (which reflects the impact of that initial frame). Individuals also will rate arguments counter to their prior opinions as significantly less effective compared to arguments not counter to their prior opinions.

To the extent that individuals behave as Hypothesis 3 predicts, their initial attitudes will strengthen as they become more certain. This occurs not only because such consistent information serves as a form of repetition akin to that discussed earlier but also because direct experiences—the act of obtaining consistent information—leads individuals to think more about their attitudes and thereby increases certainty (i.e., strength; Krosnick and Smith 1994, 287). Consequently, individuals will reject later frames, leading again to primacy effects.

- *Hypothesis 4:* When individuals receive an initial influential frame (i.e., at t1) and search out information consistent with that frame, it will increase the strength with which they hold the relevant attitude.
- *Hypothesis 5:* When individuals receive an initial influential frame (i.e., at t1) and search out information consistent with that frame, they will increasingly resist the effect of a later counter-frame, leading to a primacy effect, all else constant.[5] (This contrasts with the aforementioned baseline of decay and recency effects.)

In sum, we predict that repeating the initial (t1) frame or allowing individuals to search for information after receiving the t1 frame will increase attitude certainty. This generates stable (perhaps even dogmatic) initial attitudes that resist the later counter-frame. The result is a primacy effect—the exact opposite of what occurs when no interim information appears. The implication of the search hypotheses is that the opinion stability evident in the persistence of the t1 opinion stems from the biased interim information search (i.e., seeking out information only consistent with prior opinions). Hence there is a biased source of public opinion stability.

EXPERIMENT

We recruited a total of 547 participants to participate in a study on news coverage. Participants included a mix of Northwestern University students and older nonstudents from the area (see Druckman and Kam 2011 on using student participants). Student participants took part to fulfill a course requirement (as part of a subject pool), whereas nonstudent participants received $20 in compensation.[6] We found no differences in the causal dynamics between the two populations, and thus we do not distinguish them in the analysis.

We chose health care reform—particularly the continuing debate about whether health care should be universally provided by the government or left in private hands—as the study's focus for several reasons. First, we conducted our experiment between November 2010 and February 2011, within months of the Patient Protection and Affordable Care Act and the Health Care and Education Reconciliation Act being signed into law in March 2010 (for details, see Jacobs and Skocpol 2010).[7] It thus was not only a timely issue but also one on which there had been extremely intense recent debate. Second, health care reform has long generated conflict and ambivalence: Most Americans believe there are problems with the provision of health care, but few express confidence about the best solution (Hacker 2008). Third, the issue captures the multidimensionality of many policies in the United States by touching on economic and social considerations (see Lynch and Gollust 2010). Finally, although partisanship has an impact on health care opinions, many other factors matter as well, including how the policy is framed (e.g., Jerit 2008; Winter 2008).

Our first task was to select frames for the experiment. We did so by conducting a content analysis of all health care reform articles in the *New York Times*

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[5] We again avoid formal mediational predictions.

[6] We recruited the nonstudent sample by sending e-mail announcements to Listservs at Northwestern University and the surrounding community. The sample, which included 51% females and 25% minorities, was skewed in terms of partisanship, with 68% being Democrats. This had no apparent effect on causal inferences. The sample also was politically informed (answering correctly, on average, more than four of five political fact questions), but was not notably informed about the issue on which we focused: health care policy (answering correctly, on average, one of four health care fact questions, all of which asked about the details of the 2010 health care law).

[7] In the midst of our study—specifically on December 14, 2010—a federal judge ruled the health care mandate unconstitutional. We measured knowledge of the ruling after it occurred and found no evidence of its effect.

TABLE 1. Pretest Results

Frame	Opposed-Supportive	Effectiveness
Costs (e.g., gov't control of costs)	6.73 (1.48)	3.58 (2.06)
Beneficiary-victim	6.56 (1.43)	5.93 (1.21)
Morality	6.24 (1.82)	5.39 (1.47)
Inequalities	6.19 (1.28)	5.82 (1.04)
Limit insurance companies	6.13 (2.13)	4.98 (1.73)
Political process	2.94 (1.83)	3.65 (1.78)
Free market	2.83 (1.99)	3.41 (2.01)
Choice	2.34 (2.11)	5.11 (1.87)
Government role	2.01 (1.76)	4.53 (1.31)
Costs (e.g., gov't taxes)	1.32 (1.43)	6.07 (1.92)

Note: $N = 54$. Cell entries are means with standard deviations in parentheses.

from February 2009 through March 2010 (totaling 387 articles). We isolated the major frames used and determined whether a given frame was used in opposition or support of universal government coverage (see Chong and Druckman 2011a for more details on the method). The most prevalent frame was one that focused on the costs of health care; the costs frame was sometimes used as an argument for universal coverage. but more often as one against. All other frames were used in one direction or the other. In Table 1, we list the central frames on each side of the issue.

Using brief descriptions of each of these frames, we asked a group of pretest respondents (including a mix of students and nonstudents; $n = 54$) to evaluate the extent to which they viewed the frame as opposed or in favor of universal health care and whether they viewed the frame as "effective" or "compelling." Both questions were on 7-point scales with higher scores indicating increased support and effectiveness; effectiveness is a way to gauge frame strength (see Chong and Druckman 2007a on this approach to pretesting). The final two columns of Table 1 display the results. For our experiment, we used the Con costs frame, given its prevalence (as noted) and the fact that it is significantly viewed as more negative than any other Con frame (e.g., comparing the Con costs frame against the government role frame gives $t_{206} = 2.24$, $p \le .05$, two-tailed test). On the Pro side, we opted for the inequality frame, which was seen as being as supportive as any other frame, other than the Pro cost frame (we avoided using the same frame on each side of the issue; e.g., comparing the Pro inequality frame against the beneficiary-victim frame, gives $t_{106} = 1.42$, $p \le .20$,

two-tailed test). Inequality has increasing relevance in debates about American politics (e.g., Jacobs and Skocpol 2007), and consequently, it offers an intriguing counterfactual given that, in 2010, it was not among the most regularly used frames. Indeed, in our *New York Times* content analysis, we found that the costs frame appeared in 73% of the articles coded, whereas the inequality frame appeared in just 6%. In light of our findings, we later discuss why the inequality frame played such a small role.

Table 1 also shows that the Pro inequality and Con costs frames do not significantly differ in terms of effectiveness ($t_{106} = .84$, $p \le .40$, two-tailed test) and thus any differences due to exposure to these frames can be attributed to their direction and not effectiveness. Both frames also are high in terms of effectiveness and thus can be seen as strong frames. In what follows, we refer to the costs frame as the *Con* frame and the inequality frame as the *Pro* frame. Our pitting of costs against inequality follows Lynch and Gollust's (2010) call for "an experimental design that exposes study respondents randomly to either an inequalities frame or an economic frame (i.e., highlighting pocketbook concerns), or both" (260).

Our experiment involved four sessions, each one week apart.[8] We varied two factors: (1) the order of frame exposures at time 1 (t1) and time 4 (t4), and (2) what happened between those exposures (at t3 and t4). The first element, frame exposure at t1 and t4, replicated the approach taken by Chong and Druckman (2010). We randomly assigned respondents to one of four scenarios: receive the Pro frame at t1 and the Con frame at t4, the Con frame at t1 and the Pro frame at t4, both frames at t1 and no frames at t4, or frames irrelevant to health care (i.e., focused on nonpolitical topics) at both points in time. The dual frame condition with no t4 follow-up provides an interesting baseline because, if the passage of time is irrelevant, the exposure to the two frames over time should result in the same effect as exposure at a single time. As is typical, we presented the frames in the context of news articles about health care reform. A few examples of the Con and Pro articles appear in Appendix A. It is worth noting that our inequality frame was general;

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[8] We chose the time intervals for two reasons. First, the three weeks between the first and last survey—the period over which we evaluated decay—roughly matches the time periods in most other studies (cited in the text) that demonstrate decay. It is thus sensible to see if providing information in the interim counteracts the decay. Second, our time lag resembles that between some of the more intense periods of the health care debate such as the time between Obama's release of a specific policy proposal on February 22, 2010, and the final congressional vote on March 25, 2010 (Jacobs and Skocpol 2010, 15,112–19).

A search for the number of Section A *New York Times* articles mentioning health care reform showed that during the period in which we implemented the experiments, there were an average of approximately 5 articles a week on health care reform compared to 16 during the same period the prior year. We thus follow much other work on over-time dynamics by conducting our experiment during a time of relatively decreased media discussion (e.g., de Vreese 2004, 206).

that is, it captured many dimensions of inequality (e.g., references to various groups).[9]

At both t1 and t4, participants read two health care articles, both of which used the same health care frames (for the given condition). No participant ever read the same article twice; all of the articles we used in the experiment were unique, and all were assessed for realism. The t1 and t4 sessions took place online and included surveys that asked basic demographic and general attitudinal questions. Both the t1 and t4 surveys also included our key dependent variable, which we soon describe.

At t2 and t3, participants came to the political science laboratory (which is formally called a survey center), were seated at a computer, were told not to talk to other participants, and were informed that they were to read different articles that we collected from recent news stories. (We had in fact created the articles ourselves and told participants this at the end of the study.) We then exposed participants to a website that contained a selection of articles. The second factor we varied in the experiment (with the first being the order of frame exposure at t1 and t4) involved randomly assigning participants to one of three scenarios that affected the information available at t2 and t3.

One group, at both t2 and t3, received no relevant information, instead reading eight articles on unrelated, nonpolitical topics (e.g., debate about a college football playoff system, the problems with 3-D movies). Participants had to click through each article to continue in the study. This condition is akin to those of Chong and Druckman (2010) and all other experiments that treat subjects as captive to whatever information the experimenter provides.

Another group read articles in the online environment at t2 and t3, but this time we provided four unrelated articles and four articles that were relevant to health care reform and employed the same frame as the participant read at t1. This group also was captive, but unlike in Chong and Druckman, participants were exposed to a virtual onslaught of the t1 frame. This condition mimics campaigns in which one side launches an intensive campaign before the other side can begin. We refer to it as *repetitive exposure*.

For the final t2-t3 group, we relaxed the captivity norm by allowing participants to search in an environment containing 35 articles.[10] They had 15 minutes to search (which was not sufficient time to read all 35 articles) and had the option of reading nothing. Of the 35 articles from which participants could choose, 4 used the same health care frame as the t1 exposure, 4 used the opposite frame (e.g., the Con frame for participants who received the Pro frame at t1), 6 dealt with health care but used different frames (as described in Table 1), 14 dealt with other issues (e.g., immigration, education, gay marriage, national security, environment) and employed either an inequality or cost frame on the given issue, and 7 dealt with nonpolitical topics. The topic and frame used by each article were made clear in the titles on which participants clicked to access a given article. Participants could choose to read as few or many articles as they preferred. We recognize that in some sense this is not a full relaxation of the captive audience requirement because participants were seated in front of a computer with articles to read. Yet, this approach still dramatically differs from past work given that participants could have easily chosen to read nothing or to read articles on what, for many, were on more interesting nonpolitical topics (such as 3-D movies or colleges sports). We also believe it resembles the common experience of being exposed to an array of choices on an internet news page. All of that said, our results could be seen as a first, nontrivial step toward relaxation of the captive audience constraint.

We presented the articles in the search conditions in an order originally chosen at random.[11] An example of the search environment (from t2) appears in Appendix B; all articles and details on the arrangement of information (i.e., order of articles) in the nonsearch and search conditions are available from the authors. For all conditions, we tracked which articles participants chose to read (which in the nonsearch conditions were always all articles) and how long they spent reading each. These variables allow us to explore how initial t1 opinions influenced search behavior by studying the (search) count of pro versus con health care articles selected.

As mentioned, the t1 and t4 session surveys both asked about our key dependent health care measure: support for universal health care coverage. Following prior work (i.e., resembling an item that has appeared on the American National Election Studies), we asked, "Some people feel there should be a universal government insurance plan that would cover medical and hospital expenses for all citizens. Others feel that medical and hospital expenses should be paid by individuals and through private insurance plans. Where would you place yourself on this scale?" The scale included 7 possible responses and we scaled it so that the lowest scores indicated support for private plans covering all expenses and the highest score indicated full universal coverage.[12] We followed this item by

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[9] We recognize that our cost articles could be construed as being in favor of governmental control. Ultimately, however, the articles highlighted the increased costs that would come from universal coverage. Moreover, our pretests made clear that the participant population viewed the costs articles as con.

[10] The articles offered at each time period were all different (i.e., articles were not reused at any point the study; we created a total of 80 unique articles).

[11] We then used the same order for all participants. We did so because if distinct orders affect opinions differently, the result would be noncomparability within conditions for respondents who received different orders. We thus were risk averse in our initial test by opting to neutralize this potential confound.

[12] Our reliance on a single item to measure our dependent variable raises the prospect of measurement error (Ansolabehere, Rodden, and Snyder 2008). We nonetheless relied on a single item (as do most past framing studies) because we worried that including multiple items at t1 would have signaled our focus on health care attitudes and induced demand effects. Moreover, given our focus on stability, any bias due to measurement error would likely be counter to our central hypotheses (see Ansolabehere, Rodden, and Snyder 2008, 229). Finally, at t4, we included related health care questions (e.g.,

TABLE 2.	Experimental Conditions, with Article/Frame Exposure at Each Time		
	No Interim Information	Information Choice	Repetition of T1
t1 Pro–t4 Con	(1) t1: 2 Pro t2: 8 Nonpolitical t3: 8 Nonpolitical t4: 2 Con	(2) t1: 2 Pro t2: Search t3: Search t4: 2 Con	(3) t1: 2 Pro t2: 4 Pro, 4 Nonpolitical t3: 4 Pro, 4 Nonpolitical t4: 2 Con
t1 Con–t4 Pro	(4) t1: 2 Con t2: 8 Nonpolitical t3: 8 Nonpolitical t4: 2 Pro	(5) t1: 2 Con t2: Search t3: Search t4: 2 Pro	(6) t1: 2 Con t2: 4 Con, 4 Nonpolitical t3: 4 Con, 4 Nonpolitical t4: 2 Pro
t1 Both–t4 None	(7) t1: 1 Pro, 1 Con t2: 8 Nonpolitical t3: 8 Nonpolitical t4: 2 Nonpolitical	(8) t1: 1 Pro, 1 Con t2: Search t3: Search t4: 2 Nonpolitical	(9) t1: 1 Pro, 1 Con t2: 2 Pro, 2 Con, 4 Nonpolitical t3: 2 Pro, 2 Con, 4 Nonpolitical t4: 2 Nonpolitical
No frames	(10) t1: 2 Nonpolitical t2: 8 Nonpolitical t3: 8 Nonpolitical t4: 2 Nonpolitical	(11) t1: 2 Nonpolitical t2: Search t3: Search t4: 2 Nonpolitical	n/a*

Note: All participants in the repetition groups read articles in the same order, but could choose how long they spent on each article. All participants in the search conditions were presented with an identical search environment.
*If no frames were presented at t1, no frames are available for repetition, and thus this treatment group is unnecessary.

asking respondents, "How certain are you about your opinion about Health Care Insurance?" on a 5-point scale, with higher scores indicating increased certainty (i.e., attitude strength). At t1 and t4, we also asked questions that measured opinions on six other issues, and for reasons we later explain, we expected possible effects on two of them: whether immigration should be reduced or increased (on a 7-point scale ranging from "greatly reduced" to "greatly increased") and whether taxes should be increased to cover government services (on a 7-point scale from "greatly reduced" to "greatly increased"). (The other four issues were same-sex marriage, education spending, environmentalism, and defense spending). The inclusion of questions on many other issues ensured that our focus on health care would not be apparent to participants.[13]

At t4, we followed prior work (e.g., Chong and Druckman 2010; Druckman and Bolsen 2011) by asking respondents to evaluate the "effectiveness" of the t4 articles in terms of "providing information and/or
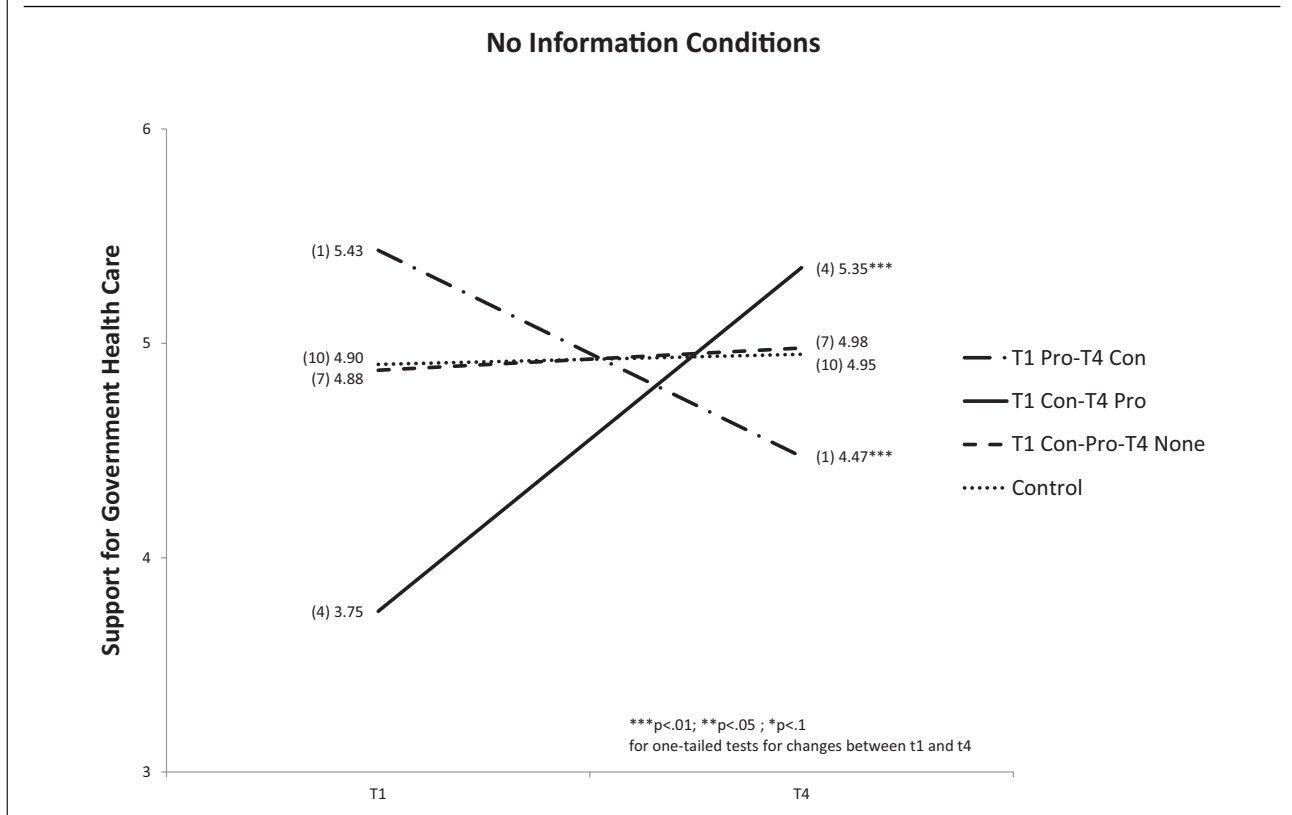
presenting an argument about health care." Respondents answered on a 7-point scale with higher scores indicating increased effectiveness. This item allowed us to explore motivated reasoning. Also at t4, we asked whether the individual would provide his or her e-mail address so that we could send more information about health plans. We used this measure to capture the extent to which the treatments generated a desire for information seeking.

In Table 2, we provide an overview of the conditions. We expect the "no interim information" conditions to generate results that echo those of Chong and Druckman (2010): When frames are received at different points in time (conditions 1 and 4), strong recency effects will occur, and when dual frames are offered (condition 7), opinions should match the control group (10). In the repetition conditions, where there is frame exposure at t1 and t4 (conditions 3 and 6), we should see increased attitude strength and primacy effects. The dual frame condition with repetition (condition 9) should not generate an effect because it resembles balanced exposure throughout. Finally, for the search conditions, we expect individuals in the over-time conditions (2 and 5) to choose articles consistent with the t1 frames (at t2 and t3), which will then generate increased attitude strength and a primacy effect. In short, repetition and information search should lead to the exact opposite patterns as those observed by Chong and Druckman. This would accentuate the dramatic limitations of keeping participants captive.

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support for the recent health care law, which expanded coverage). We found that combining these additional measures at t4 with our main t4 dependent variable strengthened our results. (Analyses are available from the authors.) Because we do not have equivalent measures at t1, we present results here using the single measure.

[13] We disguised our focus on health care in two other ways. First, as mentioned, we told participants that the purpose of the study was to explore news coverage. Second, we did not measure the main dependent variable at t2 and t3; our hypotheses also do not require measurement at t2 and t3.

FIGURE 1.   Support for Government Health Care

No Information Conditions

*** p<.01; ** p<.05 ; * p<.1
for one-tailed tests for changes between t1 and t4

RESULTS

We begin by presenting the average health care reform support scores across conditions; because we confirmed that random assignment produced balance across conditions, we do not include control variables in reporting our results.[14] Figures 1–3 display the mean scores at t1 and t4 in the no interim information, repetition, and information search conditions, respectively.[15] The control condition (10) results are included in all graphs as a baseline. Appendix C provides the standard deviations and Ns.

Although not formally noted in the graphs, the t1 framing effects are exactly as one would expect (i.e., a conventional framing effect). That is, relative to the no-frame control condition (10), we find exposure to the Pro inequality frame significantly increased support for universal government coverage (conditions 1–3), whereas exposure to the Con cost frame significantly decreased support (conditions 4–6). Furthermore, those who received the Pro-Con dual frame at

t1 (conditions 7–9) or no frame at t1 (condition 11) exhibited no significant opinion shift relative to the control group.

In the no information conditions, displayed in Figure 1, the control condition (condition 10) and the t1 dual frame condition (condition 7) did not change over time (recall neither condition included a t4 frame).[16] In contrast, those who received a single frame at t1 and then the opposite frame at t4 exhibited a dramatic flip in opinion (conditions 1 and 4). In condition 1, participants who received the Pro inequality frame at t1 reported an average score of 5.43, but then after receiving the Con costs frame at t4, their opinions dropped to 4.47. Analogously, respondents in condition 4 show a flip from being very opposed to universal coverage (3.75) to being the most supportive group (5.35). For both conditions 1 and 4, framing effects, relative to the control, are significant at t4, just as they were at t1, but the direction of the effects flipped.

Notice that individuals in all but the control group received the same two Pro and Con frames. When received simultaneously, as in condition 7, the frames cancel out, but when received over time they substantially shift opinions, with the ultimate opinion reflecting the most *recently* received frame. These results replicate Chong and Druckman (2010, 669).

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[14] We measured a host of controls shown by prior work to shape health care opinions (e.g., Lynch and Gollust 2010). We find these variables largely match what is reported by prior work.

[15] We also measured belief importance; that is, the importance that respondents attribute to equality and costs when it comes to thinking about health care. Our experimental conditions affected these importance measures in predicable ways, consistent with the effects we report with the overall health care measure. In analyses available from the authors, we find evidence consistent with the possibility that belief importance mediates the frames' effects on overall opinion.

[16] We use one-tailed tests because we have directional predictions (Blalock 1979, 163).
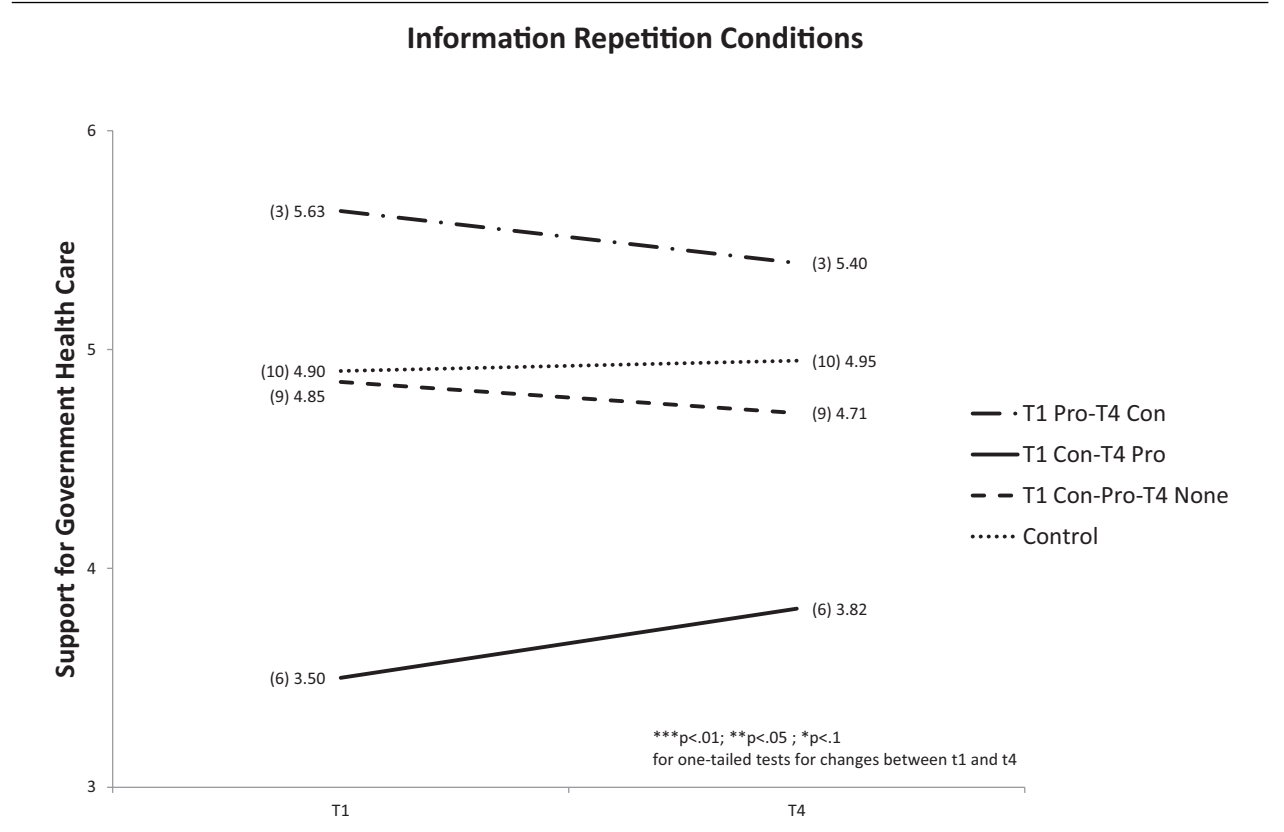
FIGURE 2.   Support for Government Health Care

Information Repetition Conditions

***p<.01; **p<.05 ; *p<.1
for one-tailed tests for changes between t1 and t4

Legend:
— · T1 Pro-T4 Con
—— T1 Con-T4 Pro
— — T1 Con-Pro-T4 None
······ Control

Data points:
(3) 5.63 → (3) 5.40
(10) 4.90 → (10) 4.95
(9) 4.85 → (9) 4.71
(6) 3.50 → (6) 3.82

FIGURE 3.   Support for Government Health Care

Information Search Conditions

***p<.01; **p<.05 ; *p<.1
for one-tailed tests for changes between t1 and t4

Legend:
— · T1 Pro-T4 Con
—— T1 Con-T4 Pro
······ T1 Con-Pro-T4 None
— — T1 None-T4 None
— — Control

Data points:
(2) 5.56 → (2) 5.19
(10) 4.90 → (10) 4.95
(11) 4.70 → (11) 4.71
(8) 4.67 → (8) 4.52
(5) 3.74 → (5) 3.95

FIGURE 4. Attitude Certainty

No Information Conditions

(4) 3.50
(7) 3.46
(10) 3.40
(1) 3.25

(7) 3.64
(10) 3.58
(4) 3.55
(1) 3.40

— · — T1 Pro-T4 Con
——— T1 Con-T4 Pro
— — — T1 Con-Pro-T4 None
· · · · · Control

***p<.01; **p<.05 ; *p<.1
for one-tailed tests for changes between t1 and t4
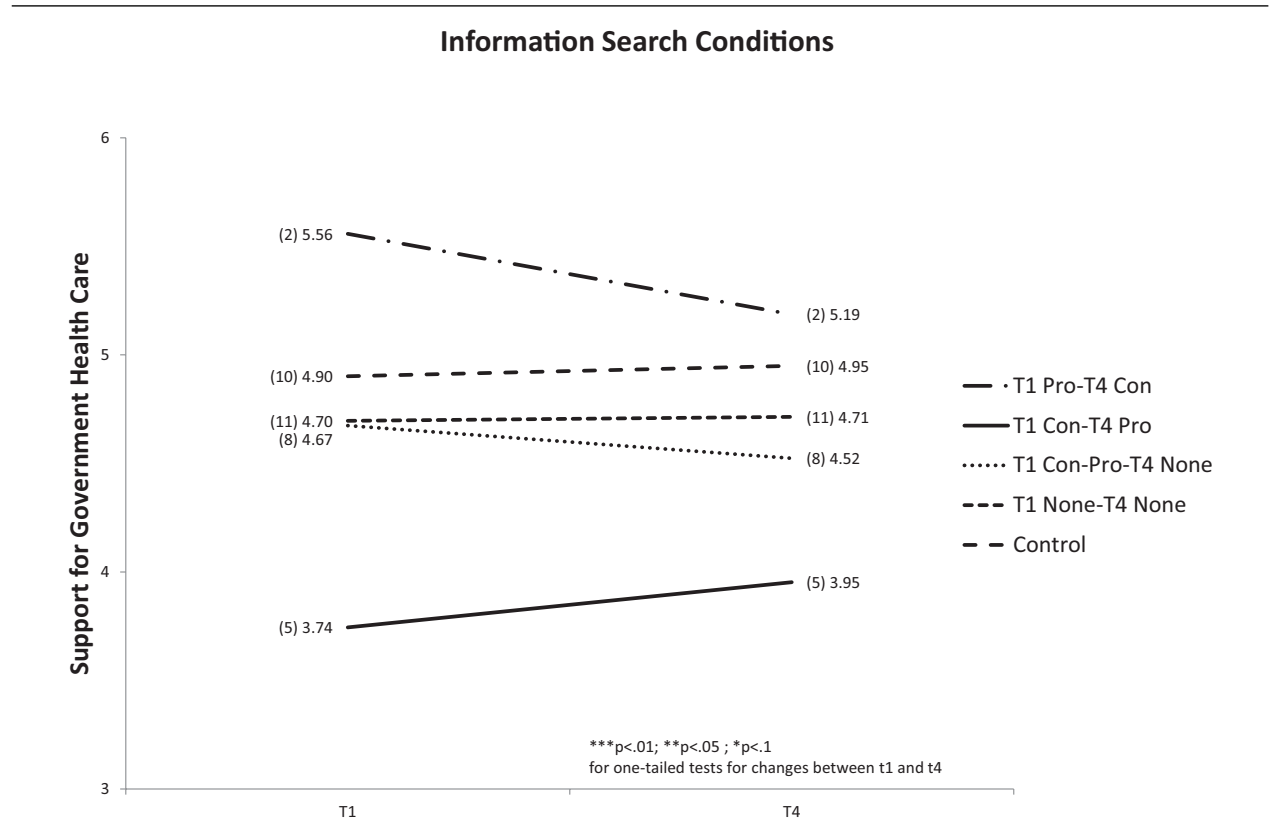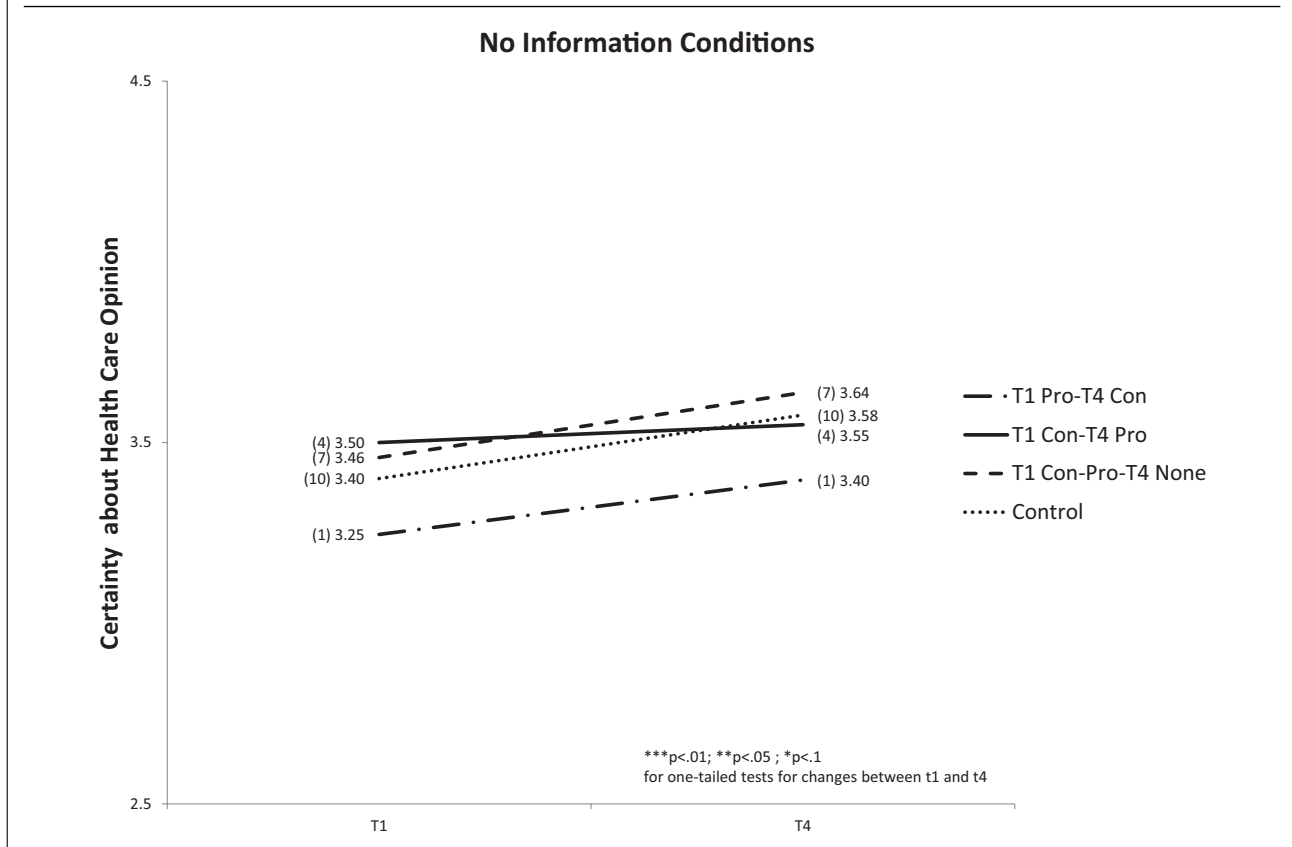
Figure 2 presents the repetition results, in which individuals received the t1 frame two more times at t3 and t4 before being exposed to the counter-frame at t4. We find that dual frames, even when repeated, do not move opinions over time (condition 9). More importantly, when the t1 frame is repeated, the results completely reverse, relative to the no information conditions. Instead of decay and recency effects, we find the t1 framing effect sustains to t4—individuals reject the counter t4 frame, leading to *primacy effects*. For example, in condition 3, on receiving the t1 Pro inequality frame, participants were supportive on average (5.63). This support endured to t4 (5.40), even in the face of the opposing Con costs frame at t4. The same dynamic occurred for the t1 Con-t4 Pro condition 6. For both conditions 3 and 6, the t4 framing effects, relative to control, are significant, as they were at t1. The results support Hypothesis 2: Investing resources in early repetition can inoculate individuals against later opposition.

Figure 3 shows that the information search conditions exhibit nearly identical dynamics to repetition.[17] As Hypothesis 5 predicts, allowing individuals to seek out information at t2 and t3 prevents decay and en-

sures that the t1 framing effect persists, while the t4 counter-frame fails. Exposure to both frames at t1 (condition 8) or no frames at t1 (condition 11), followed by subsequent search, does little to influence opinions. These results imply that the captive audience constraint present in nearly all extant experiments has potentially generated a misleading or at least incomplete portrait of framing effects. In our case, relaxation of this assumption shifted the over-time influence from decay to stability and recency to *primacy effects*. This suggests that using captive subjects does not necessarily lead to an overstatement of experimental effects, as is often suggested (e.g., Barabas and Jerit 2010), but rather changes the very nature of those effects. It is also worth noting that, although primacy effects remained strong, attitudes did not grow more extreme in the repeated exposure or information search conditions (cf., Levendusky 2011).

Attitude Certainty

We posited that exposure to repeated messages and engaging in information search will increase attitude strength, as measured by certainty. Recall that we measured the certainty with which individuals hold their overall attitude toward health care reform at t1 and t4 on a 7-point scale, with higher scores indicating increased certainty. In Figures 4–6 we report certainty

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[17] The one exception is the t4 framing effect for condition 2, which falls short of significance (i.e., 5.19 does not significantly exceed 4.95), and thus the t1 framing effect does not maintain. However, the decline from t1 to t4 is not significant.
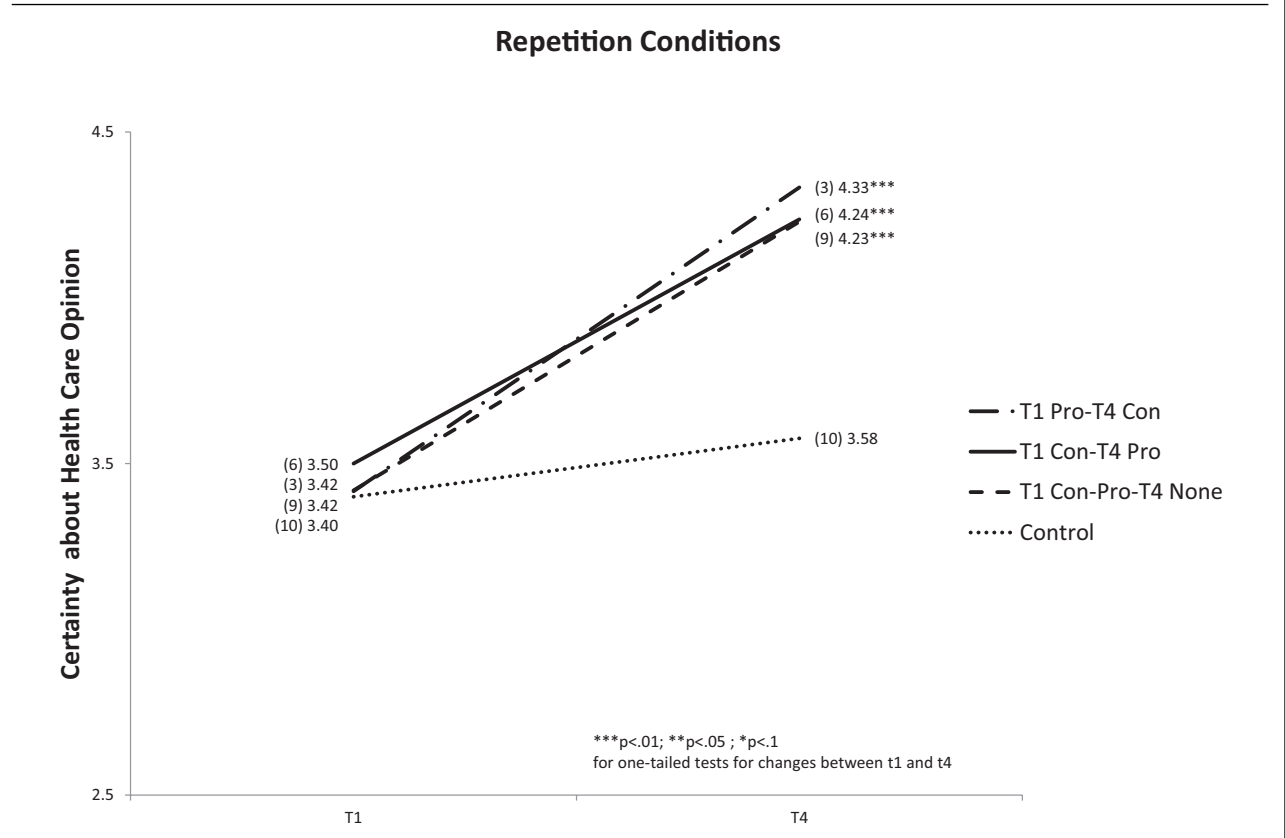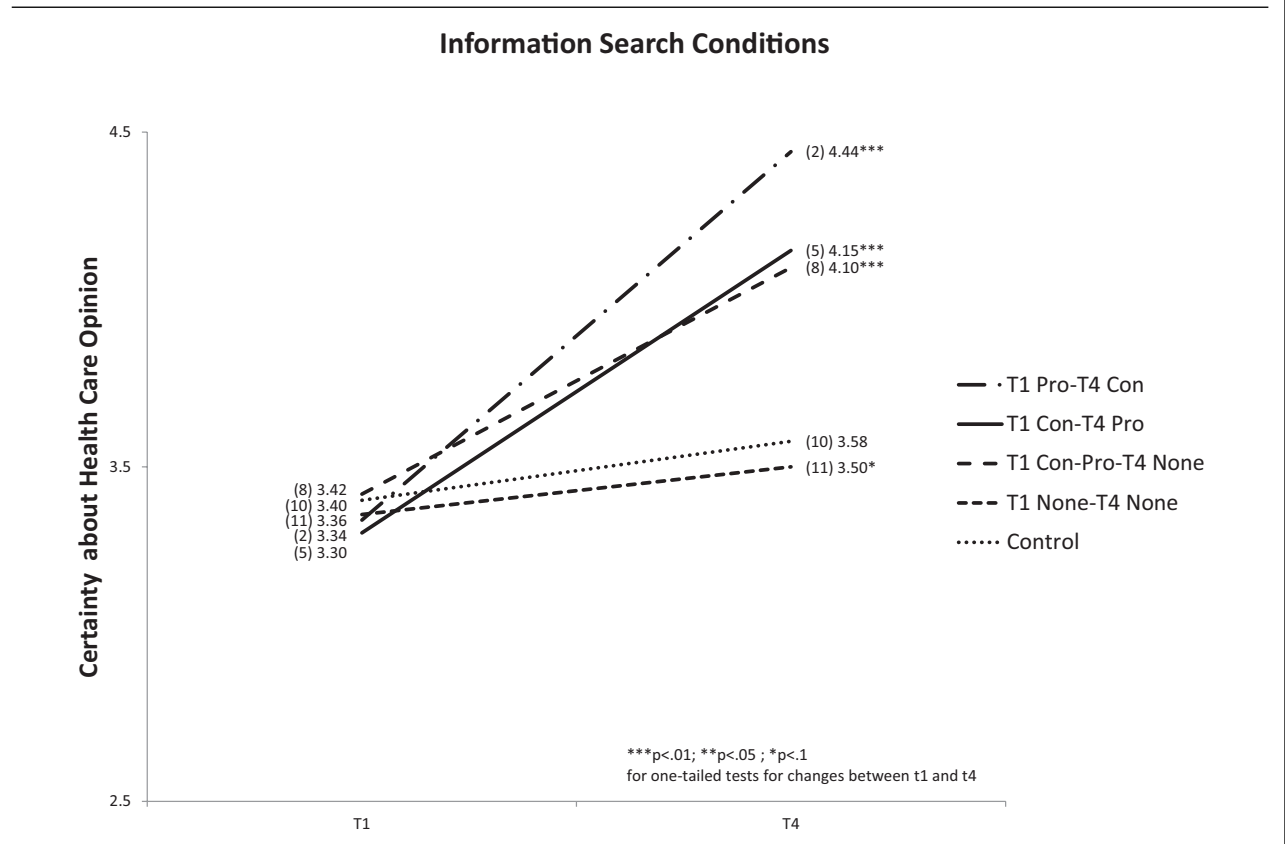
FIGURE 5.   Attitude Certainty

Repetition Conditions

Certainty about Health Care Opinion (y-axis, 2.5 to 4.5)

(3) 4.33***
(6) 4.24***
(9) 4.23***

(10) 3.58

(6) 3.50
(3) 3.42
(9) 3.42
(10) 3.40

Legend:
— · T1 Pro-T4 Con
—— T1 Con-T4 Pro
— — T1 Con-Pro-T4 None
······ Control

***p<.01; **p<.05 ; *p<.1
for one-tailed tests for changes between t1 and t4

T1   T4

FIGURE 6.   Attitude Certainty

Information Search Conditions

Certainty about Health Care Opinion (y-axis, 2.5 to 4.5)

(2) 4.44***

(5) 4.15***
(8) 4.10***

(10) 3.58
(11) 3.50*

(8) 3.42
(10) 3.40
(11) 3.36
(2) 3.34
(5) 3.30

Legend:
— · T1 Pro-T4 Con
—— T1 Con-T4 Pro
— — T1 Con-Pro-T4 None
— — — T1 None-T4 None
······ Control

***p<.01; **p<.05 ; *p<.1
for one-tailed tests for changes between t1 and t4

T1   T4

scores by condition with graphs similar to the ones in Figures 1–3. (We again include the control condition in all figures, for comparison purposes.) Appendix D reports the standard deviations and Ns.

Figure 4 shows no significant change in certainty among the conditions without interim information; this makes sense because nothing occurred that would stimulate increased certainty. In contrast, we see that in all but one repetition and information search condition, individuals, on average, increased the certainty with which they hold their attitudes, after having received repeated messages or sought out information (note Figures 4 and 6 include the control with no interim information, and that condition did not see significant changes in certainty; the one exception is condition 11). As expected, this increase in certainty occurred even in cases where the frames themselves did not move opinions; for example, in conditions 8 and 9 where individuals received dual frames at t1 and no frame at t4, opinions did not change over time. Yet, as predicted by Hypotheses 1 and 4, repeated exposure and information search still worked to increase certainty.[18] It was the interim experiences and not persuasion per se that drove certainty.[19]

Our theory implies that information search and repetition generate primacy effects because individuals come to view the t4 opposing frames as ineffective (e.g., they engage in motivated reasoning, dismissing arguments counter to their strongly held prior opinions). We test this assumption with the aforementioned t4 item that asked individuals to evaluate the "effectiveness" of the two t4 articles (on a 7-point scale with higher scores indicating increased effectiveness). In Table 3, we present a regression of t4 effectiveness on a dummy variable for each experimental condition, excluding the control group. The results show that in every case where individuals received a single directional t1 frame and were in a repetition or information search condition, they evaluated the t4 frame as significantly less effective (than the control group). This did not occur for conditions without interim information or in conditions that provided dual frames (which makes sense, given that opinions did not move in response to dual frames). In short, access to interim information not only increases attitude certainty but it also leads individuals to downgrade the persuasiveness of later contrary arguments. This supports a part of Hypothesis 3.

[18] Our hypotheses focus on over-time change; however, we also compared certainty scores for each condition with the control group (condition 10) at t1 and t4. At t1, no conditions exhibit significantly distinct certainty scores relative to condition 10. At t4, all the repetition and information search conditions, except condition 11, significantly differ from the t4 control.

[19] As explained in an earlier note, our experimental design prevents us from formally testing the implied hypothesis that the impact of repetition and information search on overall opinion is mediated by attitude certainty (see Bullock and Ha 2011). Nonetheless, when we engage in what are often taken as conventional mediation tests (Baron and Kenny 1986) the evidence supports mediation.

TABLE 3. Effectiveness of t4 Frame By Experimental Condition

	Effectiveness of t4 Frame
(1) t1 Pro–t4 Con	0.01
No interim information	(0.18)
(2) t1 Pro–t4 Con	−0.50***
Information choice	(0.22)
(3) t1 Pro–t4 Con	−0.35**
Repetition	(0.21)
(4) t1 Con–t4 Pro	0.01
No interim information	(0.19)
(5) t1 Con–t4 Pro	−0.63***
Information choice	(0.22)
(6) t1 Con–t4 Pro	−0.45**
Repetition	(0.25)
(7) t1 Both–t4 None	−0.11
No interim information	(0.18)
(8) t1 Both–t4 None	−0.04
Information choice	(0.19)
(9) t1 Both–t4 None	0.08
Repetition	(0.16)
(11) No frames	−0.20
Information choice	(0.16)
τ_1 through τ_6	See below
Log likelihood	−927.40
N	541

Note: Entries are ordered probit coefficients with standard errors in parentheses. *** $p \leq 01$; ** $p \leq .05$; * $p \leq .10$ for one-tailed tests. The coefficients and standard errors for τ_1 through τ_6 are −1.63 (0.13), −0.83 (0.12), −0.38 (0.12), −0.10 (0.12), 0.91 (0.13), and 2.02 (0.18).
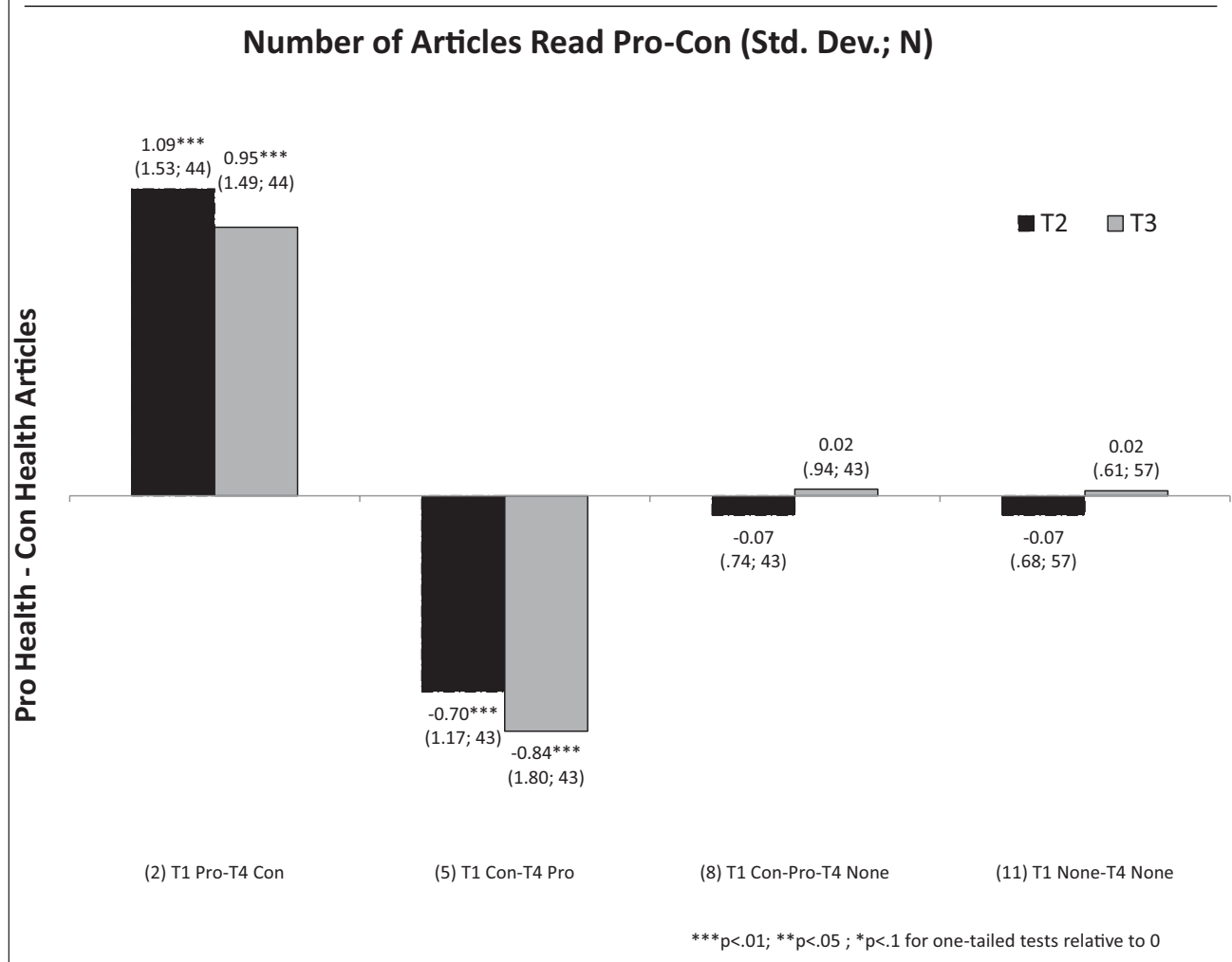
Information Search

A key component of our argument is that, when given the opportunity, individuals engage in biased information search by seeking out information consistent with their extant opinions (which were shaped by the initial t1 frame). We test for this by exploring which articles respondents chose to read in the search conditions.

Given that participants chose from among 35 articles, with many being irrelevant to health care, they could have opted for few, if any articles, or none of the eight articles that employed either the inequality or costs health care frame.[20] We found neither of these scenarios to be the case: Participants in the search conditions viewed an average of 8.27 (standard deviation = 3.55; $N = 187$) articles at t2 and 8.59 (4.30; 187) at t3. They also read, on average, 1.05 and 1.32 articles that

[20] Participants could have chosen other health care articles that used alternative frames (e.g., morality, government's role). In what follows, we focus exclusively on the articles that used the two frames on which we focus; however, all results are robust if we instead include all health-care-related articles.

FIGURE 7.   Information Search Behavior

Number of Articles Read Pro-Con (Std. Dev.; N)

Y-axis: **Pro Health - Con Health Articles**

Legend: ■ T2   □ T3

1.09***
(1.53; 44)   0.95***
(1.49; 44)

0.02
(.94; 43)

0.02
(.61; 57)

-0.07
(.74; 43)

-0.07
(.68; 57)

-0.70***
(1.17; 43)

-0.84***
(1.80; 43)

(2) T1 Pro-T4 Con   (5) T1 Con-T4 Pro   (8) T1 Con-Pro-T4 None   (11) T1 None-T4 None

***p<.01; **p<.05 ; *p<.1 for one-tailed tests relative to 0

employed an inequality or costs health care frame, respectively.[21]

We evaluated the pro–con direction of participants' choices by computing a scale that ranges from −4 to 4, where −4 indicates "read all 4 Con health care (cost) articles and no Pro health care (inequality) articles" and 4 indicates "read all 4 Pro articles and no Con articles" (see Taber and Lodge 2006, for the same approach). Figure 7 shows the number of Pro–Con articles read for t2 and t3, by search condition. The relevant point of comparison would be 0, which means participants read the same number of Pro and Con articles (or none).

The figure shows that, when exposed to both frames (condition 8) or no frame (condition 11), participants engaged in even-handed information searches, with averages near 0.[22] In contrast, exposure to a single di-

rectional frame significantly drove subsequent article choice. Participants who received the Pro inequality frame at t1 (condition 2) accessed approximately one more Pro than Con article in each period. The reverse occurred when the t1 frame was the Con costs frame (condition 5). This supports Hypothesis 3 (and work in general on motivated reasoning; e.g., Hart et al. 2009; Taber and Lodge 2006). It further suggests that exposure to the first frame on an issue can subsequently drive information acquisition.[23]

We next explored whether the primacy effects we found in the search conditions were in fact shaped, in part, by the articles that individuals chose to read (as Hypothesis 5 suggests). We did this with a series

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[21] These results suggest that the t1 frames, if nothing else, prompted participants to focus on the relevant health-care-framed articles to a much greater extent than any other type of article.

[22] In these conditions, participants did in fact access relevant health care articles with the respective t2 and t3 means being .57 and .88

articles; although these are lower than in the single frame conditions, it still indicates participants were significantly motivated to look at health care articles.

[23] As mentioned, we recorded the amount of time that participants spent reading each article. When we look at time instead of simple article counts, the results are virtually identical to those presented here.

TABLE 4. Search Behaviors

Dependent Variable	t4 Health opinion	t4 Health opinion	t2 Search	t3 Search	t3 Search	t4 Health opinion
(2) t1 Pro–t4 Con Information choice	0.28** (0.17)	0.05 (0.18)	0.93*** (0.23)	0.88*** (0.23)	0.49** (0.24)	0.01 (0.18)
(5) t1 Con–t4 Pro Information choice	−0.48*** (0.17)	−0.18 (0.17)	−0.57*** (0.23)	−0.42** (0.22)	−0.20 (0.23)	−0.13 (0.17)
(8) t1 Both–t4 None Information choice	−0.17 (0.17)	−0.18 (0.17)	−0.03 (0.22)	0.06 (0.22)	0.06 (0.22)	−0.18 (0.17)
t1 Health opinion		0.41*** (0.03)	0.15*** (0.05)	0.07* (0.04)	0.02 (0.05)	0.40*** (0.03)
t2 Search behavior					0.47*** (0.08)	−0.01 (0.07)
t3 Search behavior						0.09* (0.06)
τ_1 through τ_6 (or τ_8)	See below	See below	See below	See below	See below	See below
Log likelihood	−982.27	−864.42	−242.64	−272.20	−254.98	−859.26
N	541	538	185	185	185	537

Note: Entries are ordered probit coefficients with standard errors in parentheses. ***$p \leq .01$; **$p \leq .05$; *$p \leq .10$ for one-tailed tests. The coefficients and standard errors for τ_1 through τ_6 (or τ_8), for each respective model, are: −1.83 (0.11), −1.05 (0.07), −0.58 (0.06), −0.28 (0.06), 0.06 (0.06), 0.88 (0.07); −0.42 (0.16), 0.63 (0.14), 1.22 (0.14), 1.62 (0.14), 2.07 (0.15), 3.06 (0.17); −2.00 (0.39), −0.76 (0.27), −0.06 (0.26), 1.60 (0.28), 2.17 (0.30), 2.71 (0.33), 3.94 (.50); −1.81 (0.33), −1.17 (0.28), −0.87 (0.27), −0.42 (0.26), 1.08 (0.26), 1.79 (0.28), 2.60 (.34), 3.16 (.42); −2.26 (0.35), −1.61 (0.30), −1.28 (0.28), −0.79 (0.27), 0.81 (0.27), 1.64 (0.29), 2.66 (0.36), 3.35 (0.46); −0.51 (0.16), 0.56 (0.14), 1.15 (0.14), 1.56 (0.15), 2.01 (0.15), and 3.00 (0.17).

of regressions in Table 4; because these analyses focus exclusively on the search conditions, we use the no t1 and no t4 frame condition (11) as the control.[24]

In the first column, we regress t4 support for universal care on the experimental search conditions. As shown earlier, we found that single frame conditions significantly shaped t4 opinions in the direction *consistent with the t1 frame*. In the second column, we add t1 opinion, finding that it rendered the condition dummies insignificant; in short, the impact of the condition dummies on t4 opinions works entirely through t1 opinion (which makes sense because the initial frames exert their influence at t1).

The next two columns regress the t2 and t3 search counts (i.e., search behavior or the number of pro versus con health care articles chosen) on the condition dummies and time 1 opinion. The results show that search behavior did in fact depend on prior opinion and experimental condition. The fifth column replicates the t3 search regression, but adds t2 search behavior. Interestingly, here we see that t3 search behavior is largely determined by t2 search behavior.

The final column regresses t4 overall opinion on the conditions, time 1 opinion, and search behavior. As we expected, the conditions fall to insignificance, with their effects being absorbed by t1 opinion and t3 search behavior. Search behavior at t2 is not significant, with its effect apparently working indirectly to influence t3 search behavior. In sum, as Hypothesis 5 suggests, the t1 frames affect t1 opinion, which in turn influences

search behavior and then combines with search behavior to determine t4 opinion.

Downstream Effects

Downstream effects refer to "knowledge acquired when one examines the indirect effects of a randomized experimental intervention" (Green and Gerber 2002, 394). With our experiment, we anticipated two possible downstream effects. First, those participants in conditions that generated greater attitude certainty—the repetition and information search conditions—should have less incentive to acquire more information. These individuals will be less likely to worry about maintaining a mistaken or misinformed attitude (see, e.g., Murray 1991, 10). We test this expectation with a t4 item that offered respondents an opportunity to provide their e-mail address so as to receive more information about health care reform.

In Table 5, the first column regresses whether the responded provided his or her e-mail address on the experimental conditions. The results show that repetition and information search significantly decrease interest in receiving subsequent information. (This holds across all conditions, except the information search, no frame condition 11). In the second column, we add the t4 certainty measure, which is highly significant, revealing that increased certainty generates less interest in information. (Some of the experimental condition dummies become insignificant.)

Another downstream effect we explore is spillover to other issue attitudes. Lacy and Lewis (2011) argue that opinions on health care strongly relate to immigration and tax attitudes (i.e., people maintain nonseparable preferences over them). Indeed, the

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[24] Our analyses here are less vulnerable to the aforementioned mediation critiques because, in this case, our data were collected at different points in time.

TABLE 5. Acquiring Additional Information and Other Issue Opinions

Dependent Variable	Email for Information		Immigration		Taxes	
	(1)	(2)	t1	t4	t1	t4
(1) t1 Pro–t4 Con	0.12	0.09	0.33**	−0.25*	0.40**	−0.26*
No interim information	(0.25)	(0.25)	(0.17)	(0.19)	(0.19)	(0.18)
(2) t1 Pro–t4 Con	−0.43*	−0.27	0.33**	0.34**	0.32**	0.27*
Information choice	(0.28)	(0.28)	(0.19)	(0.20)	(0.17)	(0.18)
(3) t1 Pro–t4 Con	−0.35*	−0.23	0.48***	0.34**	0.30**	0.41**
Repetition	(0.27)	(0.27)	(0.21)	(0.20)	(0.18)	(0.21)
(4) t1 Con–t4 Pro	0.08	0.07	−0.35**	0.35**	−0.18	0.31*
No interim information	(0.25)	(0.25)	(0.19)	(0.20)	(0.20)	(0.20)
(5) t1 Con–t4 Pro	−0.51**	−0.43*	−0.52***	−0.45**	−0.38**	−0.37*
Information choice	(0.29)	(0.29)	(0.21)	(0.20)	(0.22)	(0.23)
(6) t1 Con–t4 Pro	−0.54**	−0.45*	−0.38**	−0.35*	−0.47***	−0.41**
Repetition	(0.30)	(0.30)	(0.21)	(0.24)	(0.20)	(0.21)
(7) t1 Both–t4 None	−0.41*	−0.41*	0.22	0.21	0.18	0.09
No interim information	(0.27)	(0.28)	(0.22)	(0.20)	(0.18)	(0.21)
(8) t1 Both–t4 None	−0.41*	−0.33	−0.28*	0.02	0.02	−0.11
Information choice	(0.28)	(0.29)	(0.20)	(0.22)	(0.19)	(0.20)
(9) t1 Both–t4 None	−0.44**	−0.31	0.11	−0.04	0.11	−0.08
Repetition	(0.25)	(0.27)	(0.19)	(0.18)	(0.18)	(0.19)
(11) No frames	0.05	0.04	0.00	−0.08	−0.01	−0.01
Information choice	(0.24)	(0.25)	(0.18)	(0.20)	(0.17)	(0.18)
Certainty T1		−0.26***				
		(0.05)				
Constant	−0.46***	0.46**				
	(0.17)	(0.24)				
τ_1 through τ_6			See below	See below	See below	See below
Log likelihood	−292.90	−278.31	−881.74	−818.22	−964.71	−920.94
N	538	536	545	540	549	540

Note: Entries are probit coefficients for e-mail regressions and ordered probit coefficients for immigration and taxes regressions. Standard errors in parentheses. ***$p \leq .01$; **$p \leq .05$; *$p \leq .10$ for one-tailed tests. The coefficients and standard errors for τ_1 through τ_6, for t1 and t4 immigration opinions and t1 and t4 taxes opinions, respectively, are −1.95 (0.16), −1.21 (0.14), −0.59 (0.13), 0.46 (0.13), 1.07 (0.14), 1.98 (0.15); −2.24 (0.18), −1.58 (0.15), −0.91 (0.14), 0.30 (0.14), 0.96 (0.14), 1.98 (0.17); −1.52 (0.13), −1.01 (0.12), −0.52 (0.12), 0.03 (0.12), 0.72 (0.12), 1.91 (0.14); −1.83 (0.16), −1.24 (0.14), −0.72 (0.14), −0.08 (0.14), 0.79 (0.14), and 1.73 (0.15).

expansion of immigration pits equality of opportunity against the costs absorbed by citizens, and support for increased taxes and government services similarly relates to egalitarianism and costs. As explained, we measured support for expanding immigration and for increasing taxes/government services, at t1 and t4, on 7-point scales. We expect the Pro inequality frame will increase support and the Con costs frames will decrease support for each. We report the results, for t1 and t4, in the last four columns in Table 4. The results mimic those we found for health care—at t1, for both issues, the t1 frames significantly move opinions with the dual frames largely canceling out. At t4, we also see nearly identical over-time dynamics to that found on health care. The frames used on one issue and the opinions on that issue appear to carry over to related issues. We did not find such carryover on the other four issues for which we had measures, which is not surprising given the frames do not fit those issues as clearly. Overall, there appear to be important secondary downstream effects to issue frames both in terms of how people seek information and their opinions on alternative issues.

DISCUSSION

As with any other study, our results are susceptible to questions about generalizability. Along these lines, we believe there are a number of directions in which future work should go, and these directions touch on various methodological and substantive topics that we next discuss.

The Captive Audience Assumption

Our results accentuate the consequences of treating experimental participants as captive. Prior work consistently suggests that most over-time communication effects quickly decay, leading to recency effects (e.g., Achen and Bartels 2004; de Vreese 2004; Druckman and Nelson 2003; Gerber et al. 2011; Hibbs 2008; Hill et al. 2008; Mutz and Reeves 2005; Tewksbury et al. 2000). Most of these studies involve participants who were restricted from obtaining relevant information over time and/or had scant incentives to do so (e.g., because of the focus on minor issues or campaigns). We find that allowing participants to acquire

information—after exposure to an initial message—is akin to providing that message repetitively. The consequence is strong primacy rather than recency effects. The persistence of the initial primacy effect (i.e., the opinion stability) stems, in the search conditions, from a dynamic of biased information search. As such, when opinions display stability, it may reflect an underlying bias rather than considered opinions arrived at after deliberating over alternative perspectives.

Our main point is that, going forward, experimental work on communication effects needs to carefully consider the consequences of the long-standing but often debated norm of treating participants as captive. The benefits of moving away from this norm can also be seen in recent work by Arceneaux and Johnson (2010) and Gaines and Kuklinski (2011) that focuses on comparisons between those who seek political information and those who opt out (also see Levendusky 2011; Prior 2007). Future work would particularly benefit by relaxing the captive audience assumption even more than we did (e.g., Iyengar et al. 2008); for example, by allowing respondents to tune out from the experimental subject matter altogether and engage in alternative activities (see, e.g., Kim 2009). Additionally, research is needed to explore the impact of alternative mass communication contexts (e.g., more explicitly competing messages, clear counter-arguments, a mix of strong and weak messages, different time lags) and distinct search environments. It could be that these factors constrain the motivated reasoning we discovered, thereby leading to less stability.[25]

We view our article as one of the first pieces of evidence that demonstrates just how impactful the captive audience assumption has been in communication research. Moreover, our article provides initial evidence on how different mixes of competitive campaigns (in our case, the initial side was repeated multiple times) can influence opinion formation.

Issue Variance

We suspect that citizens regularly acquire information on issues that directly affect their lives, such as health care. Doing so simply requires opening one's internet browser and even unintentionally glancing at the headlines. Had we designed our study around a lower salience issue, we suspect our findings would have differed.[26] Motivated search occurs most dramatically when individuals hold strong attitudes on the

issue at hand. It is on these issues that individuals seek information that coheres with their extant opinions. On less relevant issues, individuals hold weaker attitudes and engage in less motivated information acquisition, if they search at all (Holbrook et al. 2005; Taber and Lodge 2006).

This is exactly what we suspect occurred in Gerber et al.'s (2011) field experiment during the initial stages of the 2006 Texas gubernatorial campaign. Gerber and his colleagues found that ads immediately move public opinion in favor of the ad's sponsor, but the effects decay rapidly, with candidate preferences quickly reverting to levels observed before the ads. However, they explained that "the circumstances of this experiment are unusual: the start of a yearlong campaign in which a GOP incumbent governor squared off against two independent candidates and an as yet unnominated Democrat . . . [and] a single ad that [was] deployed. . . with no ads preceding or following it" (138). Thus voters were not exposed to repeated messages (as in our repetition conditions) and likely had minimal incentive to seek out information this early in a campaign they knew or likely cared little about. Consequently, as in our no information conditions, decay occurred.[27]

On the flip side, a hyper-rich environment also may generate distinct dynamics. If voters are bombarded with competing messages—as in a typical presidential or other high-intensity campaign—they may act differently. Perhaps ironically, when information is widely available, only the most engaged citizens will seek out and select information on their own (at least in a proportion that rivals the information received by happenstance). Consequently, mass communication effects may not endure among less engaged citizens, who do not seek out information, because the messages they do receive will cancel out in a competitive environment (e.g., Chong and Druckman 2007a). However, more motivated individuals might be affected by early communications that stick because they pursue reinforcing information. This dynamic is precisely what Hill et al. (2008) report in their study of the 2008 U.S. presidential campaign: They found rapid decay of the effects of presidential advertisements as counter-ads emerge, except among the most informed voters (who also are more likely to engage in motivated reasoning; see Taber and Lodge 2006).[28]

These studies from the Texas gubernatorial and U.S. presidential campaigns could suggest that the dynamics we identified do not apply to electoral campaigns. Yet experimental data, collected by one of the authors, from the 2010 Illinois 9th District House campaign suggest otherwise. The race pitted incumbent Democrat Jan Schakowsky against Republican Joel Pollak

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[25] Redlawsk, Civettini, and Emmerson (2010) find that asymmetric search environments—where counter attitudinal information dominates—can overwhelm motivated reasoning, which can in turn temper long-term stability. We suspect that such asymmetries will matter most on low-salience topics. Indeed, Redlawsk, Civettini, and Emmerson (2010, 572) study fictional political candidates about which participants "clearly had no prior knowledge."

[26] During the period of our study, when asked to name the most important problem facing the nation, an average of 9.6% of respondents in national samples named health care, which places it near the top of issues named, ranking only behind various sorts of economic issues. (Data are based on all surveys in the *iPOLL* database that asked about the most important problem question from November 2010 to February 2011.)

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[27] Mitchell (n.d.) also reports the rapid decay of information in her over-time study of a fictional congressional campaign. Her study provided no repetition of information and no incentive to seek outside information because the candidates were hypothetical.

[28] Borah (2011) reports that motivated individuals exposed to mixed information environments are more likely to express an interest in information seeking.

(Schakowsky won with 66.3% of the vote, which was not surprising in this highly Democratic district). As part of a study of the effectiveness of campaign website strategies, a small sample of eligible voters was randomly exposed to a mock-up, but factually correct, version of either Schakowsky's ($n = 23$) or ($n = 25$) Pollak's site.[29] Participants then rated their likely voting intent on a 7-point scale, with 1 indicating "definitely will vote for Pollak" and 7 indicating "definitely will vote for Schakowsky." This part of the study occurred during the week of May 16, 2010. Then approximately five months later on October 15, participants responded to a follow-up survey that again asked them their vote likelihood, as well as whether they had actively sought out information on each candidate.

Three findings are noteworthy. First, individuals' preferences were shaped by the website to which they were initially exposed. with those accessing the Schakowsky site reporting a score of 5.44 (1.27) (of voting for Schakowsky) versus 4.08 (1.12) for those exposed to the Pollack site ($t_{46} = 3.93$; $p \leq .01$, one-tailed test). Second, the site to which a participant was exposed significantly affected the likelihood of subsequently seeking information about the candidate. Specifically, 57% of those exposed to the Schakowsky site later reported pursuing information about her, compared to 24% of those initially exposed to the Pollak site ($z = 2.32$; $p \leq .01$, one-tailed test). Analogously, 68% of Pollak site participants sought information about him, compared to just 9% of Schakowsky participants ($z = 4.17$; $p \leq .01$, one-tailed test). Finally, the average change in attitude over time was 1.5 (1.10, 18) for those who did not seek out information about their candidate compared to .87 (.78, 30) for those who did ($t_{46} = 2.32$; $p \leq .01$, one-tailed test).[30] Although these data cannot definitively establish causation, the results are consistent with an initial effectual communication shaping subsequent search behavior that, in turn, generated attitude stability. And this effect occurred over a considerable time lag during an actual electoral campaign.[31]

The mix of findings across these three electoral contexts accentuate the need not only to identify the issues and circumstances on which attitudes persist (e.g., Hill et al. 2008, 26) but also the conditions that determine when and how individuals seek information.

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[29] These data were part of a pretest for another study, conducted by the first author, Martin Kifer, and by Michael Parkin, in which participants were exposed to versions of both sites.
[30] When we regressed t2 vote preferences on initial site exposure, t1 vote preference, and the two search variables, we found all were significant in the expected directions (e.g., accessing more Pollak information decreases t2 vote away from Schakowsky, whereas more Schakowsky information does the reverse).
[31] Two other studies of note also run counter to rapid decay. First, in their work on attitudes toward presidential candidates and political parties, Holbrook et al. (2001) find that "the first piece of information about a candidate produces greater change in attitudes... than all subsequent information. ... Our findings... are consistent with a primacy effect" (933, 944). Also, in his panel survey study, Matthes (2008) reports that the individuals who are susceptible to framing effects are not most susceptible to recent frames per se; he attributes this to the real-world ongoing campaign (271).

As Bennett and Iyengar (2010) explain, "[A]udiences increasingly self-select the programs to which they are exposed. This means exposure to political communication is not exogenous" (36). The endogeneity of information selection presents a dilemma for experimenters. On the one hand, clear causal inference requires control over communication environments. Indeed, it is for this reason that, like virtually all other over-time experiments, we opted for a time period in which external information on the issue was limited (e.g., Lecheler and de Vresse 2011, 968–69).[32] On the other hand, it is critically important that scholars account for how information-seeking behavior occurs outside the confines of a particular experimental study.

The Study of Political Communication and Public Opinion

Our framework leads us to isolate three factors that likely explain differential rates of persuasion and decay (see Lau and Redlawsk 2006; Payne, Bettman, and Johnson 1993). First, the *importance of the issue* generates varying levels of motivation to seek out and evaluate information.[33] Second, *informational contexts* differ widely, including on these criteria: (a) the nature and competitiveness of mass communications, (b) the social context (e.g., social information and accountability), and (c) the opportunities and ease of information acquisition. With some effort, one can find virtually any information on the Web, but the ease of doing so can fundamentally shape exposure and reception (DiMaggio et al. 2004). Third, *individuals differ* in their general motivation to seek information and, perhaps more importantly, in how they assess that information. Some are extremely motivated to arrive at the most accurate assessments, whereas others tend to lapse into biased information search and assessment that accord with their predispositions (Lodge and Taber 2000). Identifying individual and contextual conditions that lead to accuracy—rather than directionally motivated reasoning—is a topic ripe for further exploration.

Unraveling the relative influence of these factors will provide insight into numerous ongoing debates. For example, we suspect that increased attention to the nature of the policy issues studied will help resolve a long-standing tension between two public opinion literatures. Micro, individual-level studies typically report that "opinion statements vacillate randomly" (Zaller 1992, 28), whereas most macro or aggregate-level data analyses reveal "a remarkable degree of stability" (Page and Shapiro 1992, 45). One notable difference between micro and macro studies is that the former tend to focus on relatively less salient issues such as a particular ballot proposition (Albertson and

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[32] We were able to check for the influence of external information by charting changes in the control group opinions, of which there was virtually none.
[33] Of related relevance are the types and number of choice options available to individuals (see, e.g., Sniderman and Stiglitz 2012).

Lawrence 2009), regulation of hog farms (Tewksbury et al. 2000), or opinions about urban sprawl with respondents not directly affected (e.g., Chong and Druckman 2007). In contrast, macro studies rely on publicly available survey data that tend to report opinions on highly salient issues of the day (e.g., health care, Social Security, the economy, war; e.g., Soroka and Wlezien 2010). Increased attention to the issues being studied and the concomitant attitude strength on these issues may well explain the discordant micro–macro findings (for detailed discussion, see Druckman and Leeper n.d.[a]).[34,35]

Another topic for which our work has implications is polarization. One of the more contested questions in political science is whether elite polarization (e.g., partisan members of Congress becoming more homogeneous and distinctive from the other party) has led to citizen polarization (e.g., citizens taking more extreme opinions; e.g., Fiorina and Abrams 2008; Stroud 2011, 130–36). Although our evidence does not allow us to definitively answer this question, our results highlight two often overlooked factors. First, opinion dispersion depends on the information environment: Absent the ability and incentive to seek out information or exposure to repeated messages, initial citizen polarization may fade. Second, our downstream results reveal that polarization on one issue can spill over to other issues, raising the intriguing question of whether polarization should be studied within distinct clusters of issues.[36]

Normatively our findings paint a fairly unflattering portrait. Respondents who received no interim information flipped their opinions based on the most recent information, suggesting a level of malleability that makes democratic responsiveness difficult. Yet, other respondents, once they formed their initial opinions, clung to those opinions, became certain of them, sought out consistent information, and rejected what otherwise looked like a reasonable counter-argument. Although such stable opinion facilitates responsiveness, it also raises the specter of an inflexible dogmatism, stemming from biased information search, which could be problematic for many conceptions of good citizenship. Ostensibly, our results suggest there was little deliberate consideration of the competing arguments offered at the first and last stages of the study (also see Chong and Druckman 2010; Druckman 2011; Druckman and Leeper n.d.[b]).

Finally, we view our approach as a blueprint for the design of future experiments. The dominant paradigm for communication experiments came out of psychology (e.g., Iyengar et al. 1984), where competitive information and over-time dynamics continue to receive scant attention. This approach—of designing experiments on canonical designs in other disciplines such as psychology or economics—pervades most experimental work in political science. Although it makes sense to build on extant designs, experimental political science has sufficiently matured so that increased attention needs to be paid to distinguishing elements of political contexts (for general discussion, see Druckman et al. 2011; Druckman and Lupia 2006). For many political phenomena, over-time evolution, competition between dueling factions, and information selection are defining elements. We call for increased attention to ecological validity or the extent to which the samples of settings and participants reflect the ecology of application. This likely means more complex experiments, which in turn will require consideration of the standards and expectations for experimental *political science* (e.g., increased weight on tests across distinct political settings).

Health Care Frames and the Politics of Inequality

Our experiment also speaks to the politics of health care reform. The apparent effectiveness of the inequality frame echoes recent work by Lynch and Gollust (2010), who conclude that "perceptions of the unfairness of health care (quality and access) inequalities strongly influence opinions about whether the government or the private market should be providing health insurance—even after controlling for the effects of . . . self-interest considerations and political orientations" (868). These results raise the question of why the inequality frame was used so seldom during the Obama administration's 2009–10 campaign for health care reform.[37]

As Lynch and Gollust (2010) explain, "Obama's and his allies' early efforts to win public support for health care reform tended to invoke self-interest. . . . An emphasis on health reform as a means to greater equity and fairness has not been central to mainstream politicians' appeals" (873). Although this may reflect a missed opportunity, we believe that it instead accentuates the complexity of framing strategies. Policy advocates need to carefully consider the various implications of a frame choice. First, when building a policy coalition, advocates have to consider how major media outlets will cover the campaign and their susceptibility to counter-frames (e.g., Jacobs and Skocpol 2010, 50–51). This latter point is notably relevant for such a multidimensional frame as inequality. As

[34] The restriction of information search in virtually all micro studies also may lead to more instability.

[35] One approach to gauge issue variation is to include more regularly survey measures of attitude importance—a plea, which has been largely unheeded, made twenty years ago by Krosnick and Abelson (1992).

[36] The psychological dynamics underlying our spillover effects is an area in need of more research. Lacy and Lewis (2011) offer evidence that, over certain subsets of issues, individuals link their standing attitudes so that changes on one generate changes on others (i.e., because of nonseparable preferences). An alternative is that the frames themselves carried over to the construction of attitudes on other relevant issues.

[37] Lynch and Gollust (2010) suggest that "if the nascent inequalities frame were to become more dominant in health policy discourse. . . beliefs about fairness could become increasingly important determinants of health policy opinion and support for a larger government presence in providing health insurance could increase" (873).

mentioned, we employed a generalized inequality frame that tended toward inequalities in health care access, but also touched on outcomes and included references to various groups. However, a counter-attack could have drawn unwanted attention to less effective inequality arguments such as those that focus narrowly on outcomes or attend strictly to racial inequalities (see, e.g., Rigby et al. 2009). Second, advocates need to consider the types of downstream effects we identified: How will arguments affect the way the public seeks out information and also influence other issue positions (also see Lynch and Gollust 2010, 874–75)?

Third, frames are not simply chosen because they appeal, writ large, but rather political actors contrive the most effective strategies to build the coalitions needed for policy success. "Who says what to whom" matters. Health care inequality arguments—such as citing the role of income, education, and housing in determining health—resonate much more strongly with liberals, minorities, and those of lower socioeconomic status (Robert and Booske 2011). When elites rely on themes mostly supported by their fellow partisans, the effects on moving public opinion can be minimal (e.g., Baum and Groeling 2009). The groups that Obama needed to appease—in attempts to ensure sufficient support to move forward—were moderates/conservatives and those with substantial financial interest in reform. Jacobs and Skocpol (2010) explain, "Having witnessed the demise of Clinton's reform effort, Obama's team accepted that major economic-interest groups with profits at stake would be much more vigilant, motivated, and organized than the diffuse public that would benefit from reforms.... Cutting deals with potential knock-out opponents was seen by Democrats in office as a necessary strategy" (69). This assuredly played into the calculation to avoid an inequality frame that most of these critical actors wholly reject.[38]

Obama's rhetorical choices throughout his health care reform campaign make clear that studies of political communication need to better situate themselves in the politics of the time. This means identifying the key political subgroups and accounting for the historical policy context (see Jacobs and Mettler 2011). The events also highlight the substantial difficulties faced by individuals and groups intent on vitiating social and economic inequalities in the United States. Not only do social and economic disadvantages closely track with political input and influence (e.g., Bartels 2008) but also, on specific policies, introducing inequality discourse is often avoided because the critical policy coalition does not include the potential policy beneficiaries. For better or worse, politics can substantially constrain public discourse aimed at lessening social ills.

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[38] A consequence was some backlash among liberal supporters who felt betrayed by Obama's promise to work to lessen inequalities (Jacobs 2012).

APPENDIX A: TWO EXAMPLES OF PRO INEQUALITY ARTICLES AND TWO EXAMPLES OF CON COST ARTICLES

Disparities in Americans' Health on the Rise; Income, Race, Insurance Major Factors in Differences

Even as health care costs continue to escalate, many Americans—especially minorities and the poor—still do not receive high-quality care, according to federal reports published by the National Institutes of Health. The quality of health care is improving slowly and some racial disparities are narrowing, the reports found, but gaps persist and Hispanics appear to be falling even further behind. Officials called the reports, mandated by Congress to study the quality and distribution of health care, the most comprehensive assessments of their kind.

"We can do better," Former Health and Human Services Secretary Mike Leavitt said at a Washington conference on racial and ethnic disparities in health care. "Disparities and inequities still exist. Outcomes vary. Treatments are not received equally."

One study of 13,000 New Jersey heart patients found that far fewer African American patients received catheterization to clear the arteries, despite exhibiting the same symptoms. Another study involving 13,600 nursing home residents found that blacks "had a 63 percent greater probability of being untreated for pain relative to whites."

In the National Healthcare Disparities Report, researchers found more measures on which the quality gap between whites and racial minorities was shrinking than widening. But the report found that major disparities remained for all groups and that the gap had widened for Hispanics.

Forty-six disparities were discussed in the report. Of those experienced by blacks, 58 percent were narrowing and 42 percent were widening, the researchers found. For Hispanics, 41 percent of disparities were narrowing, whereas 59 percent were becoming larger.

Embedded in the American urban landscape, you'd see poor, black people inhaling lethal amounts of exhaust and nicotine. Their hearts would be heavy with fat and artery-clogging plaque, while their brains would be awash in alcohol and drugs. Some might see such a condition as terminal, set up a triage and hope it works itself out. But a good doctor might recognize the regenerative powers of the body politic and come up with a comprehensive treatment plan that also attacks root causes—including the twin cancers of racism and poverty.

Take, for example, that the average life span for black men in the nation's capital is about 57 years, a year more than that of Native Americans on the Pine Ridge Reservation in South Dakota but about 23 years lower than that of white men in the District. That kind of racial and economic disparity in well-being reflects fundamental problems in America's health care and health insurance systems. There is doubt that all reform proposals under consideration in Congress will fully correct these inequalities. But one thing is certain: The current health care system does much to perpetuate them.

Rich Americans' Health Coverage Better than that of Working Class and Middle Class

Real barriers here are the costs facing low-income people without insurance or with skimpy coverage. But even Americans with above-average incomes find it more difficult than their counterparts abroad to get care on nights or weekends

without going to an emergency room, and many report having to wait six days or more for an appointment with their own doctors.

The United States has a great disparity in the quality of care given to richer and poorer citizens. Americans with below-average incomes are much less likely to see a doctor when sick, to fill prescriptions or to get needed tests and follow-up care.

Mississippi and Arkansas, two of the nation's poorest states, also have the highest death rates from cervical cancer - a result of poor access to basic screenings and health care for a large number of women, says Peter Bach of New York's Memorial Sloan-Kettering Cancer Center.

Yet in Mississippi, where a cervical cancer vaccine could save a great number of lives, only 16% of teen girls in 2008 received the shot, called Gardasil, according to Bach's paper in Saturday's *The Lancet*. About 22% of Arkansas girls ages 13 to 17 got the vaccine, which costs $390 for three shots.

In the wealthier state of Rhode Island, where cervical cancer mortality is half as high as in Mississippi and Arkansas, 55% of girls received Gardasil, the paper says. Though there's nothing wrong with wealthier girls getting the vaccine, Bach says, the low vaccination rates in poor states are "a failure."

Under current reform discussions, disparities in health are only going to be exacerbated by pushing the cost of reform onto working class families that are already falling behind in the bad economy. In an era of rising wealth inequality and stagnant middle-class wages, failure to equitably finance reform may only make things worse for families with poor health or no health care coverage.

Instead of increasing the burden on working men and women by labeling their medical insurance "gold-plated," why not finance health care reform by looking at those who really have gold-plated plans?

Or, why not place a small surtax on the wealthy, whose taxes were cut so significantly under President George W. Bush? Why not apply the Medicare tax to unearned income that the very wealthy collect in interest and dividends on their investments? Why not limit deductions for itemized expenses or eliminate the subsidies we give to the insurance industry in order to equalize health benefits for everyone, while fairly distributing the burden of paying for the reforms?

The wealthiest nation in the world should be able to provide high quality, affordable health care for all without adding to the burden on working families or making their quality of life worse.

Real Sources of Health Care Costs Growing Out of Control

America's overall health care budget has soared to about $2.25 trillion, about 17 percent of GDP. Waste and vast overhead costs, overuse of medical services, insufficient competition, and lack of information about most cost-effective practices are among the culprits.

Premiums rose 6.1 percent last year, more than twice the rate of inflation and significantly outstripping the 3.7 percent increase in workers' earnings, according to the Kaiser Family Foundation's 2007 Employer Health Benefits Survey. Since 2001, health care costs have increased 78 percent, according to Kaiser. Meanwhile, high health care costs make it increasingly difficult for businesses to compete against companies overseas that typically don't offer health benefits. Since 2000, the portion of firms offering health insurance has shrunk from 69 percent to 60 percent.

With business and working families bearing the greatest burden of rising health care costs, more attention needs to be paid to the real sources of rising costs. Rather than fund health insurance with higher premiums and taxes on those already paying too much, targeting the source of high health care costs would save real money, making health care more affordable for everyone. Reducing the $32 billion that the health care industry spends each year on marketing and figuring out the premium for each individual or group customer in each state would lead to major savings.

And one source of cost the American Medical Association hopes no one will notice is that American doctors make a lot more money than doctors elsewhere - roughly twice as much. The average incomes of $274,000 for specialists and $173,000 for general practitioners are, respectively, 6.6 and 4.2 times those of the average patient. The rate in the other countries is 4 and 3.2.

While higher volume is the story behind higher physician costs in the United States, the culprit for spending on hospitals and drugs is higher prices. While Americans spend fewer days in the hospital than people elsewhere, that efficiency is more than offset by a higher average cost per day - $1,666, four times the industrial-country average. There are multiple causes for this $224 billion in annual overspending on hospital services - everything from more serious illnesses to more nurses per bed to extraordinary overhead and capital costs.

The cost of medical malpractice adds another $55.6 billion to annual health care spending, an amount that has been increasing by about 10% per year since 1975. About 10 cents of every dollar paid for health care goes to malpractice insurance premiums that doctors must pay in order to protect themselves in case patients sue them. While trial lawyers rack up millions in fees from malpractice cases, doctors pass the high costs of insurance on to patients.

Of course, any effort to reduce these excess costs faces determined opposition from well-financed lobbies, which is why many reformers prefer to focus on the goal of extending coverage to the 47 million Americans who don't have health insurance. But doing the one without the other would be economic folly. According to the McKinsey Global Institute, the research arm of a global management consulting firm, offering universal coverage without reining in costs would add another $77 billion each year in unnecessary and unproductive health spending.

Insurance-market reform could eliminate much of that expense. And by focusing on covering the uninsured, advocates of some reform proposals fail to address both administrative inefficiency and excess costs, which are the factors holding back long-term cost control.

States Struggle to Bear Costs of Health Care

National health insurance advocates propose that turning the nation's insurance companies into government-regulated utilities will lower insurance premiums. In Massachusetts, a universal health care mandate has brought both higher premiums and more medical spending. The Massachusetts plan has come in for a lot of criticism and its costs are running much higher than expected, mainly because it turns out that there were more people without insurance than anyone realized. Other states are watching Massachusetts carefully to understand the potential costs of nationwide reform.

In fact, the nation's governors are emerging as a formidable lobbying force on health care, especially as states

overburdened by the recession brace for the daunting prospect providing for millions of uninsured residents. The wake-up call for the nonpartisan National Governors Association (NGA) came early in the summer, when Sens. Baucus and Grassley announced hearings on the nation's rising spending on public health insurance programs.

California Gov. Arnold Schwarzenegger, for one, estimated that expanding Medicaid coverage could cost his state $8 billion a year. Sen. Dianne Feinstein, also of California, underscored those concerns with her own pledge: "I could not support any reform that pushes additional costs on California state government or its counties."

Recession victims already are flocking to Medicaid, and enrollment is expected to rise through fiscal 2010, according to the Kaiser Family Foundation's Commission on Medicaid and the Uninsured. The pace of increase is expected to ease after fiscal 2010, but the long-term outlook is rising costs for states to provide ever-more expensive care.

"States are already at a breaking point," Sen. Grassley told colleagues during the panel's two-week-long debate on reform. But he also expressed concern that any broader reform proposals might not seriously reduce costs. On Thursday, the Democratic Governors Association delivered a letter to the panel. "We recognize that health reform is a shared responsibility and everyone, including state governments, needs to

partner to reform our broken health care system," the letter noted.

Part of the problem in calculating the costs of reform, is lack of data on how many people lack insurance and what different proposals would cost to provide them with public or private insurance. If public programs expand, governors can't say for certain how many people will show up to claim the new benefits. Because low-income people are harder to track— they tend to move more frequently, and they often don't file tax returns - state officials don't know precisely how many will be eligible. Massachusetts showed that drawing accurate estimates is challenging, and the costs of reform can be much higher than expected.

Another mystery is how many people who qualify for Medicaid under current rules—a sizable portion of the uninsured population—will decide to finally sign up. This is the "woodwork effect" that unnerves state officials around the country because it could lead to much higher costs.

"That's part of the problem we're having, is getting hard numbers," says a researcher at the NGA. "We just don't know." Such uncertainty is troubling for policymakers because the difference between estimates in the number of uninsured translates into hundreds of millions of dollars in potential new spending.

APPENDIX B: EXAMPLE OF SEARCH ENVIRONMENT

Sampling of Recent News Stories

Health Care for all Isn't Socialism; it is Social Responsibility

In Hospital Decision, Obama Finds Safe Ground on Gay Rights, But Further Action Necessary

Who's the Teacher? (Mr. Danza)

Community-Garden Rules Receive a Mixed Reaction

Deficiencies in U.S. Health Care System Spur Increase in the Number of the Uninsured

Immigrants Face Unfair Penalties in Criminal Cases

Minority and Low-Income Students are Less Likely to Graduate and Attend College

Soaring Costs Jeopardize Missile Defense Systems

Swiss Health Care Model Effective At Low Cost Without National Insurance Plan

Bush Tax Cuts Near Expiration

Noise Pollution from SunChips Bags Prompts Change in Packaging

Choice Matters: Public Cares About Public Option(s) In National Health Care

Gay Marriage Increasingly Seen as a Civil Rights Issue

Governor Proposes Rise In Income Tax For Illinois

A Dozen States Pledge to Fight Government's Expanded Role in Health Care

Spammers Use the Human Touch to Avoid CAPTCHA

Gender Differences in Education Need Innovative Solutions

Pay for Teachers Rises by 7.1%

National Health Insurance Plans Simply Pile on New Mandates, Taxes, and Subsidies

Barnes & Noble Turns the Page

Obsessions With Minutiae Thrive as Databases

High Systemic Costs Keep Insurance and Health Care Out of Reach

Fears and Misperceptions about Immigrants Prompt Unjust Legislation

Repealing the Estate Tax Would Benefit Only Wealthy Americans

New Ozone Rules Could Cost Industry Billions

The Coffee-House Effect

Members of Congress Address Geographic Disparities in Medicare Spending

National Plan Not Essential to Effective Health Care Market Reform

How to Fix the Health Care System? Slash High Salaries for Doctors

The Practices of Monopolistic Insurers have Damaging Consequences for Many Americans

Years-long Battle Ended; Greater Fuel Efficiency Expected to Offset Cost

Without Coverage, Health and Political Voice of Uninsured Falling Behind that of Other Americans

Health Insurance out of Reach for Many Working Families Caught Between Poverty Line and Affordable Coverage

Present Insurance System Means Health Care Distributed Unequally Across Urban, Rural Areas

Painting a Rosy Picture of a Costly Fighter Jet

Finished?

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APPENDIX C: HEALTH CARE OPINIONS AT TIME 1 AND TIME 4

Condition	Time 1 Opinion	Time 4 Opinion
(1) t1 Pro–t4 Con No interim information	5.43 (std. dev. = 1.32, N = 53)	4.47 (1.61, 53)
(2) t1 Pro–t4 Con Information choice	5.56 (1.35, 43)	5.19 (2.04, 43)
(3) t1 Pro–t4 Con Repetition	5.63 (1.32, 49)	5.40 (1.75, 48)
(4) t1 Con–t4 Pro No interim information	3.75 (1.62, 52)	5.35 (1.63, 51)
(5) t1 Con–t4 Pro Information choice	3.74 (1.69, 43)	3.95 (1.86, 42)
(6) t1 Con–t4 Pro Repetition	3.50 (2.18, 38)	3.82 (2.15, 38)
(7) t1 Both–t4 None No interim information	4.88 (1.72, 48)	4.98 (1.48, 47)
(8) t1 Both–t4 None Information choice	4.67 (2.12, 43)	4.52 (1.99, 42)
(9) t1 Both–t4 None Repetition	4.85 (1.76, 61)	4.71 (1.58, 62)
(10) No frames No interim information	4.90 (1.76, 61)	4.95 (1.59, 59)
(11) No frames Information choice	4.70 (1.97, 56)	4.71 (1.89, 56)
Overall	4.73 (1.84, 547)	4.76 (1.81, 541)

APPENDIX D: CERTAINTY OF HEALTH CARE OPINIONS AT TIME 1 AND TIME 4

Condition	Time 1 Certainty	Time 4 Certainty
(1) t1 Pro–t4 Con No interim information	3.25 (std. dev. = 1.07, N = 53)	3.40 (0.99, 53)
(2) t1 Pro–t4 Con Information choice	3.34 (1.10, 44)	4.44 (1.47, 43)
(3) t1 Pro–t4 Con Repetition	3.42 (1.23, 48)	4.33 (1.65, 48)
(4) t1 Con–t4 Pro No interim information	3.50 (1.11, 52)	3.55 (1.12, 51)
(5) t1 Con–t4 Pro Information choice	3.30 (1.12, 43)	4.15 (1.67, 41)
(6) t1 Con–t4 Pro Repetition	3.50 (1.03, 38)	4.24 (1.53, 38)
(7) t1 Both–t4 None No interim information	3.46 (0.85, 48)	3.64 (1.21, 47)
(8) t1 Both–t4 None Information choice	3.42 (0.88, 43)	4.10 (1.41, 42)
(9) t1 Both–t4 None Repetition	3.42 (1.02, 62)	4.23 (1.52, 61)
(10) No frames No interim information	3.40 (0.92, 60)	3.58 (1.07, 59)
(11) No frames Information choice	3.36 (1.15, 56)	3.50 (1.08, 56)
Overall	3.40 (1.04, 547)	3.89 (1.38, 539)

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