# Counter-Framing Effects*

*by*
Dennis Chong
dchong@northwestern.edu
Department of Political Science
Northwestern University
601 University Place
Evanston IL 60208
USA

James N. Druckman
druckman@northwestern.edu
Department of Political Science
Northwestern University
601 University Place
Evanston IL 60208
USA

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**Abstract:**
Electoral campaigns and policy debates are dynamic processes that unfold over time. In the contest for public opinion, each side tries to frame issues to its advantage, but success also depends on developing effective responses to opposition frames. Surprisingly, scholars have paid little attention to the dynamics of counter-framing. In this paper, we explore how the timing and repetition of counter-frames affect their success. Using an over-time experiment, we test several hypotheses that the best counter-framing strategy is contingent on the nature of audience. Our results show that counter-framing effects depend on the extent to which people hold strong or weak opinions. Thus, a uniformly successful communications strategy may be impossible as tactics that are effective on those with weak attitudes may be counterproductive on those with stronger viewpoints. We conclude with a discussion of normative and practical implications.

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Among the essential features of democracy identified in Dahl's (1971) classic analysis, *Polyarchy*, are citizens' ability to participate freely in the political process, continuing government responsiveness to citizens' preferences, and competition among political elites for elected office (also see Schattschneider 1960: 138). Although many studies explore whether government policy reflects citizens' preferences (for a review, see Shapiro 2011), nearly all such work treats preferences as being fixed – that is, unaffected by the debate and rhetoric of competing parties and interests in the democratic process (Bartels 2003: 50-51). This assumption runs contrary to the clear message of the last half-century of research on political communication that the structure of citizens' beliefs and preferences depend considerably on the nature of competitive elite rhetoric (e.g., Chong and Druckman 2011). Disch highlights this paradox when she observes that treating public preferences as the "bedrock" of social choice ignores reality, because citizens rely heavily on the "self-interested communications of elites" to be able to form coherent preferences about politics (e.g., Disch 2011: 100, 110).

Only recently have scholars sought to understand how *competitive* political rhetoric affects citizens' ability to form stable and coherent preferences (e.g., Sniderman and Theriault 2004, Chong and Druckman 2007, Druckman et al. 2012). In this paper, we extend this line of inquiry on the foundations of public preferences by exploring an aspect of elite communications that has clear normative and practical significance, but that has been ignored by prior work: counter-framing.

Counter-framing figures prominently in the dynamics of framing over time. Politicians and interest groups compete to frame policies in terms that support their positions. Their strategies assume that an issue can be given different frames of reference, and that the frame adopted by an uncertain public will influence its evaluation of the issue. For example, individuals who are persuaded to view estate taxes as "double taxation" of income are more likely to oppose such taxes.

Or, citizens who view healthcare reform as promoting equality are likely to support change. A large literature reveals that these types of framing effects occur across populations, times, and issues. The typical study shows that when people are exposed to a given frame, their opinions are swayed in the direction of the frame (e.g., when estate taxes are represented as double taxation, opposition to the tax increases).

Such studies, however, are only a snapshot of what, in practice, is an over-time framing contest: opposing sides react to each other's frames with their own counter-frames. For example, groups or politicians who support the estate tax argue, against the double taxation frame, that the tax is progressive and affects only the most affluent members of society; opponents of health care reform re-frame the issue in terms of excessive government interference – "socialized medicine." How citizens react to these counter-frames often determines what policy wins in the forum of public opinion. Indeed, if the initial framing of an issue can bias and distort expressions of public opinion, the antidote would seem to be debate, specifically exposure to a counter-frame. A competing frame allows individuals to evaluate the relative strengths of alternative positions and to connect policy choices to their priorities and values.

Recent research on over-time framing dynamics indirectly addresses counter-framing (by staggering exposure to competing frames; e.g., Chong and Druckman 2010), but it has not sought to isolate the factors that influence the success or failure of counter-framing. Moreover, the dynamics of counter-framing can take many forms in politics depending on the resources and tactics of competing parties. When resources are limited, the parties in a debate must decide on the timing and frequency of their responses to competing frames. Responses can be immediate or delayed, repeated or not. The public might therefore be exposed almost simultaneously to the frame and counter-frame or it could receive these opposing messages separately over time and in varying proportions.

We offer an initial foray into the study of counter-framing by examining the effects of two critical dimensions: the relative timing of competing messages and the repetition of counter-frames. Our evidence shows that there is no universal ideal counter-framing strategy: citizens – depending on the strength of their prior opinions – will react in varying ways to competing communications. Thus, the reality is that the success or failure of a counter-framing strategy depends on the precise nature of the interaction between messages and audiences. In short, the heterogeneity among the citizenry likely makes a universally successful counter-framing strategy unlikely, if not impossible.

**Theory of Counter-Framing Effects**

A framing effect occurs when a communication changes people's attitudes toward an object by changing the relative weights they give to competing considerations about the object. 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 arguing for allowing the rally on free speech grounds express more tolerance for the group than those who alternatively read an editorial arguing that the rally will endanger public safety (Nelson et al. 1997). Framing is effective in this instance because the communication plays on the audience's ambivalence between free speech and social order.

A frame's effect depends on various factors including its strength or persuasiveness (e.g., does it resonate with people's values?),[1] attributes of the frame's recipients (e.g., their values or party

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[1] Chong and Druckman (2007) show that, when all frames are received concurrently, stronger frames influence opinions more than weaker frames, even when the weaker frame is repeated. A strong frame is typically identified via pre-tests that ask respondents to rate the frame's "effectiveness." For example, strong frames for and against the hate group rally might invoke free speech or public safety while a weak frame might be an argument about traffic disruption.

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identification can moderate the impact of a frame), and the political context. In competitive environments – for example, where individuals are exposed concurrently to each side's strongest frame (e.g., free speech versus public safety) – the frames tend to cancel out and exert no net effect (e.g., Sniderman and Theriault 2004, Chong and Druckman 2007, Hansen 2007, Druckman et al. 2010). Of course, in most instances, individuals receive competing frames not at one point in time, but over time. In the more dynamic context of a campaign, both the timing of exposure to the counter-frame (relative to the original frame) and repetition of the counter-frame may influence how individuals process and evaluate the competing messages.

We define a counter-frame as a frame that opposes an earlier effective frame. There are three notable elements to this definition. First, a counter-frame comes later in time than the initial frame. Thus, we do not view simultaneous exposure to competing frames as counter-framing per se (this would be akin to dual framing) – we assume the initial frame has been received earlier and processed separately. Second, a counter-frame advocates a position on the issue that is contrary to the earlier frame (i.e. it is "counter"). Third, we assume, for present purposes, the initial frame affected opinions on the issue, thus creating an incentive to counter-frame (otherwise a later frame would not be "counter" in terms of its potential effect). In some sense, counter-framing is a subset of competitive framing, which can itself take place simultaneously or over time and involves frames from multiple perspectives.

There are a host of aspects to counter-framing, such as whether the frame explicitly invokes and argues against the initial frame. We focus here, in this initial foray into counter-framing, on a basic counter-frame that supports an alternative view than the position advocated by the earlier frame.[2] Competition between frames that offer conflicting interpretations of issues characterizes a fair

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[2] We also focus exclusively on "strong" frames with the presumption that opposing sides come to

amount of political communications (see Chong and Druckman 2011). As mentioned, we attend to two aspects of counter-framing strategy: the amount of time that passes between exposure to the initial frame and the counter-frame, and over-time repetition of the counter-frame.

The dynamics of framing over time are more complicated to predict because people are influenced by the order in which information is received. Early messages affect people's attitudes on an issue, which then affect how subsequent information is evaluated. The path dependency of framing therefore depends on the durability of attitudes formed in response to earlier communications. Although time generally erodes the effects of framing, the rate of decay varies according to the strength of people's attitudes – attitudes that are stronger, by definition, last longer and are more resistant to change and persuasion (see, e.g., Visser et al. 2006).

As Chong and Druckman (2010) elaborate, attitude strength is influenced by whether individuals form and update attitudes favoring either an on-line or memory-based approach. When individuals process a message about an issue on-line, they integrate the various considerations contained in the message into an overall evaluation. Individuals then store the summary evaluation in memory, possibly forgetting the original considerations that contributed to the tally. When asked subsequently for their attitude toward the issue, individuals retrieve and report their overall on-line tally rather than reconstruct and evaluate the specific pieces of information that comprise this summary (see, e.g., Hastie and Park 1986, Lodge et al. 1995). For example, an online processor might become more tolerant of a hate group rally after being exposed to a free speech frame, but in due course may forget the reason for his support even though his attitude toward the rally remains *stable*.

In contrast, individuals who use memory-based information processing store considerations

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learn – over time or via market research – what constitutes a "strong" frame (see, e.g., Jerit 2004).

about the issue in memory without necessarily forming an overall judgment, and subsequently

retrieve and evaluate accessible considerations when asked their opinion about the issue (Bizer et al.

2006: 646). For example, if these individuals are initially exposed to a free speech frame, they do not

immediately form an opinion about the hate group rally. The opinions they express subsequently

depend on whether they can recall the earlier frame – and in many instances, their memory of the

frame will have *decayed* to a point where they no longer have access to it (e.g., Lodge et al. 1995,

Chong and Druckman 2010, Gerber et al. 2011).

In short, on-line processors actively integrate information into judgments and tend to develop

stronger attitudes, reflected in the certainty with which they hold their views and the higher

correlation between their attitudes and behavioral intentions (Bizer et al. 2004, 2006: 647). It follows

that on-line processors also will hold more stable attitudes as they can summon a readily accessible

on-line evaluation each time they report their attitude. These strong attitudes can subsequently

condition responses to any new frames and inoculate individuals from further influence. Inoculation

may stem from motivated reasoning, as individuals with strong opinions are driven to preserve their

existing views by counter-arguing and dismissing opposing arguments. For example, an on-line

processor initially exposed to a free speech frame about a hate group rally will form a strong pro-rally

opinion and when later exposed to a public safety frame, may reject it and counter-argue against it.

Taber and Lodge (2006) suggest that motivated reasoning pervades politics (also see Druckman and

Bolsen 2011).

Memory-based processors differ: at any given time their attitudes are based on imperfect and

variable recall of details (see Briñol and Petty 2005: 583). They are less likely to hold the strong prior

opinions that condition responses to later frames (see Tormala and Petty 2001: 1600-1601), and

encourage motivated reasoning (Taber and Lodge 2006). For example, a memory-based processor

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initially exposed to a free speech frame about a hate group rally may initially form a strong pro-rally opinion but he/she will likely forget it later and thus when later exposed to a public safety frame, may accept it. It is because on-line and memory-based processors differ in the in motivated reasoning tendencies, that it constitutes a key piece of our theory.

Evidence from Chong and Druckman (2010) supports the distinction between on-line and memory-based processing. In their experiment, they studied an aspect of counter-framing on attitudes toward the Patriot Act. Participants were randomly assigned at time 1 (t1) to receive either a Pro frame (i.e., the Patriot Act as a counter-terrorism issue) or a Con frame (i.e., the Patriot Act as a civil liberties issue). Ten days later, at time 2 (t2), these respondents received either no message or the opposing frame (i.e., those who received the Pro counter-terrorism frame later received the Con civil liberties frame). In addition to varying the sequence of frames, Chong and Druckman manipulated how participants processed the information contained in the frames. Based on random assignment, individuals were induced to employ either on-line (OL) or memory-based (MB) processing, or they were not manipulated. The purpose of these manipulations was to influence the strength of attitudes formed and therefore the persistence of evaluations over time. They employed common techniques to induce OL or MB processing, as are often used in psychology (as they discuss in that paper and as we briefly touch on below).

Chong and Druckman report that, for MB processors, framing effects at t1 quickly decayed and were dominated by the counter-framing effect at t2, indicating a strong recency effect. OL processors, however, showed the opposite – a primacy effect – as the t1 frame moved them and made them resistant to the t2 frame, which had virtually no influence. Those who were not manipulated to use either MB or OL processing fell between these two tendencies: the t1 and t2 frames largely offset one another resulting in neither a primacy nor recency effect. This result may have reflected the mix

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of MB and OL processing styles in the group that was not treated.

Communication effects therefore can change over time; whether they fade or endure when no additional messages are received, or under pressure of competing messages, depends on how information is processed. Strong attitudes, as presumably form among OL processors, persist and resist persuasive communications aimed at changing them. Those manipulated to form weak attitudes, via MB processing, are more susceptible to the counter-frame (as the initial framing effect decays). Counter-framing success depends on how the initial attitude was formed which in turns depends on processing mode (i.e., was it formed in OL fashion to promote strength or MB fashion do demote strength); those with stronger attitudes are more likely to reject the counter frame (via motivated reasoning). We next expand this discussion to explicitly consider how timing and repetition of exposure to the counter-frame can modify its impact.

Several approaches can be taken to operationalize attitude strength, our core theoretical concept (see Visser et al. 2006). We follow prior work (as discussed below) by opting for a focus on OL versus MB for two reasons. First, there is strong and growing evidence of a strong connection between processes of formation and strength (e.g., Bizer et al. 2006, Chong and Druckman 2010; also see Tormala and Petty 2001: 1600-160, Briñol and Petty 2005: 583, Druckman and Leeper 2012, Druckman et al. 2012). Second, we focus on processes that promote strength at the point of attitude formation (i.e., exposure to the initial frame). Future work should pursue other methods of inducing strength, since dimensions of strength operate in the distinct ways, but our rationale – based on prior work and our focus – leads us to this operationalization.

Therefore, in the following analysis, we presume OL promotes strength and MB decreases it, and we will present evidence to support this claim. That said, our claims are based strictly on a comparison of OL versus MB processing – constructs that are interesting in themselves and that have

been the subject of a growing number of studies since a "need-to-evaluate" measure (meant to capture proclivity to process in an OL fashion) has been routinely included the National Election Study and other surveys (e.g., Federico 2004, Holbrook 2006).

*Timing Effects*

When individuals receive a counter-framed message, their reaction will be affected by their prior opinions (e.g., Chong and Druckman 2007). The timing of a counter-framed message will matter if prior attitudes on the issue weaken over time, which will be the case if communication effects decay. Our hypotheses about the impact of time assume that communication effects decay among all respondents, but that the rate of decay is slower among OL processors and faster among MB processors. Without a formal model of decay, our hypotheses are necessarily inexact about the amount of time needed between exposures to frames in order to produce the effects we discuss. Our hypotheses therefore do not identify precise time lags, but relative intervals. For example, when we contrast the effects of "early" versus "late" exposure to the counter-frame, we mean early enough or late enough to have created the conditions of attitude decay assumed by the hypothesis. The exact time defined by early or late cannot be specified without more extensive data and, in any event, will vary across issues and respondents.

In designing our experiment – where we operationalize time lags – we tried to time our observations at intervals (10 days) that would capture different rates of opinion decay among our respondents depending on how they processed information (in light of prior work; see note 6). We assumed that after 10 days, on-line processors would continue to have access to their original attitudes, but that memory-based processors would have difficulty recalling the content of earlier communications. We further assumed that after 20 days, there would be significant decay of opinions

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even among online processors.[3]

As explained, for MB processors who form weak initial opinions, decay will be very rapid (e.g., Lodge et al. 1995, O'Keefe 2002: 258, Chong and Druckman 2010, Gerber et al. 2011). Unless the counter-frame appears very quickly (nearly immediately or at least within a day or two), the timing of the counter-frame will make little difference. MB processors will be susceptible to the counter-frame shortly after the initial frame and more time will not matter because the original communication effect will have decayed earlier.

*Hypothesis 1:* For MB processors, communication effects decay so rapidly that the amount of elapsed time between exposure to the initial frame and counter-frame will have little or no impact on the success of the counter-frame.

In contrast, OL processors are less influenced by the t2 frame due to the persistence of the initial frame and motivated reasoning. That said, even when people form strong attitudes in response to a communication, these attitudes will not persist indefinitely (e.g., Conner and Armitage 2008: 271). Zanna et al. (1994) report that, while attitudes persist longer when they are strong (also see O'Keefe 2002: 259), they still become significantly less accessible over time. Even strong opinions decay as time elapses between initial exposure and counter-frame exposure, rendering it less of a moderating force and diminishing motivated reasoning (Taber and Lodge 2006). The more the initial attitude weakens, the greater the potential impact of the counter-frame (also see Lecheler and de Vreese 2010). Consequently, the impact of the counter-frame among OL processors will increase as time elapses following exposure to the original frame (because more time allows for increased decay; for MB processors, decay is nearly immediate so more time is not relevant).

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[3] We chose these intervals largely because it matches the time periods in several other over-time studies (e.g., Lechler and de Vreese 2010, Gerber et al. 2011), and resembles some of the time lags found during different policy debates (see, e.g., Chong and Druckman 2011).

*Hypothesis 2:* For OL processors, the effect of the counter-frame increases with the amount of elapsed time between exposure to the initial frame and counter-frame (because increased times allows for greater opinion decay).

### *Repetition Effects*

The effects of repeating a counter-frame will depend on the schedule of repetition. We focus on a counter-frame that is repeated twice at distinct points in time after exposure to the initial frame. The question we explore is whether repetition increases the counter-frame impact.

For MB processors, whether the initial counter-framing effect will be further augmented by a second exposure to the counter-frame is not clear. Although there is a sizable literature, particularly in consumer research, on message repetition, the bulk of this work focuses on one point in time. The modal finding is that repetition can increase the persuasiveness of a message (as long as there is not too much repetition), particularly when elaboration is low (e.g., Moons et al. 2009). Repetition induces increased perceptions of accuracy, familiarity, and accessibility (e.g., Cacioppo and Petty 1989, Moons et al. 2009). Thus, it is possible that over-time repetition may affect opinions, if seeing an argument for a second time increases the accessibility of the initial attitude and forestalls its decay. In this scenario, the effect of the second exposure builds on the first exposure, and pushes opinion (among MB respondents) further in the direction recommended by the frame.

Conversely, repetition may have no additional impact on opinion valence if the updated opinion (from initial exposure to the counter-frame) is also weak and ephemeral. Thus, another exposure to the same counter-frame may not further move opinion (given decay between exposures). Each additional exposure would be akin to seeing a novel frame. Between these alternative possibilities, we do not have a clear prediction, so we will simply test whether repetition of the counter-frame among MB processors moves opinion significantly.

For OL processors, if exposure to the counter-frame at t2 occurs in close proximity to the

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initial frame, the prior opinion will still be strongly accessible. This increases the likelihood that the counter-frame will be discounted, and exposure to it may actually strengthen the prior opinion due to the aforementioned counter-arguing. Indeed, as long as the original attitude is accessible, the counter-frame will prompt rehearsal of the rationale underlying the original attitude and thereby reinforce it. For example, if OL processors are persuaded initially at t1 by a message that frames a hate group rally as a free speech issue, they will be motivated to argue against any contrary frames (such as concerns for public safety) they encounter shortly after at t2. Furthermore, the exercise of counter-arguing at t2 will bolster their initial pro-free speech opinion (Redlawsk 2002) and extend their resistance to subsequent counter-framing attempts at t3. For this reason, the counter-framing message would have been more effective if it had been delayed long enough (until t3) to allow the initial opinion to fade. As long as the original attitude remains accessible, exposure to the counter-frame interrupts the decay process and strengthens the prior.

*Hypothesis 3:* For OL processors, early exposure and repetition of counter-frames can forestall decay and strengthen prior (i.e., initial) opinions.

Our theory also leads to predictions about attitude strength and specifically *attitude certainty*, which is one of several overlapping elements of strength (others include accessibility, extremity, etc.) (Vissser et al. 2006). We focus on certainty because increased exposure to frames will make people more certain of their opinions (indeed, certainty tends to increase with information acquisition; e.g., Bizer et al. 2006, Visser et al. 2006, Druckman and Bolsen 2011).

A first point is that we expect OL processors to show increased certainty upon initial exposure to any counter frame (regardless of repetition) – that is, for OL processors, any exposure to a counter-frame prompts counter-argument (see Redlawsk 2002), which in turn increases certainty (again, presuming the counter-frame occurs close enough in time such that the initial frame's impact remains). We do not expect any increase in certainty among MB processors because their attitudes

will decay quickly and they will lack a strong attitude on which to base a counter-argument.

*Hypothesis 4:* For OL processors only, any counter-framing will increase certainty.

Our second point applies to both OL and MB processors. Specifically, any repetition of a frame that occurs before the initial attitude has decayed has been shown to bolster attitude certainty (e.g., Druckman et al. 2012). When individuals initially receive information, they encode it; receiving the same information again increases perceptions of accuracy and familiarity (e.g., Cacioppo and Petty 1989, Moons et al. 2009), and bolsters the confidence or certainty people have in their attitudes (e.g., Berger 1992, Druckman and Bolsen 2011). As Visser et al. (2006) explain, "increases in exposure to new information...increase attitude certainty" (39).[4] In short, when hearing a frame multiple times, people come to be more certain of its veracity; a stronger attitude, in turn, enhances stability and resistance to later frames.

We should thus see increased attitude certainty for both OL and MB processors upon second exposure to a counter-frame (from t2 to t3), presuming the t2 exposure remains at least marginally accessible (which may or may not be the case for MB processors). This leads to the following hypothesis:[5]

*Hypothesis 5:* For OL and MB processors, repeated counter-framing will increase certainty.

## The Patriot Act Experiment

Our study of counter-framing extends the Patriot Act experiment analyzed in Chong and Druckman (2010). The Act refers to a piece of legislation enacted shortly after the September 11th, 2001, terrorist attacks to increase the powers of law enforcement agencies to monitor

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[4] Also repeated exposure may increases strength via recollection (see Cacioppo and Petty 1989).

[5] We are putting aside the possibility of complete decayed MB accessibility; if that were the case, we would not see increased certainty given it would be akin to non-repetition.

communications, records, and financial transactions in an effort to identify terror threats. Of course, we recognize the limitation of focusing on a single issue (although we do point out that this is not too different than focusing on a single election; e.g., Gerber et al. 2011, and that other studies have similar single issue foci; e.g., Nelson et al. 1997, Druckman et al. 2012). More importantly, we believe this issue is representative in the sense of being periodically salient and touching on both economic and social dimensions, given the debate around the proper balance between national security (which has an economic dimension) and civil liberties. Opinions on the Act also are liable to change (e.g., Best and McDermott 2007), which allows us to test hypotheses about the moderating effects of attitude strength before people have developed crystallized (i.e., very strong) opinions. We will return in the conclusion to discuss the generalizability of our results on a single issue.

As intimated, the study used data gathered in two waves (t1 and t2) separated by a 10-day interval; the current study uses those same data but also adds data gathered in a third wave (t3) approximately 14 days following wave 2. The experiment was conducted via the internet with a sample drawn to be representative of the U.S. population.[6]

Opinions about the Act, while colored by partisanship, also reflect a value tradeoff between personal safety (from terrorism) and civil liberties. Participants answered basic demographic questions at the start of the time 1 (t1) questionnaire, and additional demographic and political questions after completing the time 2 (t2) and time 3 (t3) questionnaires. Our main dependent

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[6] We contracted with a survey research company (Bovitz Research Group) to collect the data. As with most internet survey samples, respondents participate in multiple surveys over time and receive compensation for their participation. Demographics of the sample are available from the authors. The study took place in December, 2009, and January, 2010. Eight-one percent of t1 participants responded at t2 and 83% of t2 participants responded at t3.

variable in each period is the extent to which one opposes or supports the Patriot Act, measured on a

7-point scale with higher scores indicating increased support.

There are three key elements to our design. First, we used pretests to select two competing

"strong" frames; as mentioned, these included a Strong-Pro (SP) frame that emphasizes the threat of

terrorism (e.g., the Act improves the government's ability to identify terrorist plots) and a Strong-Con

(SC) frame that points to the Act's infringement on civil liberties (e.g., the Act expands the

government's search and surveillance powers).[7] Second, we investigate the endurance of t1 framing

effects when there is (a) no exposure to additional frames at t2, but exposure to a counter-frame (i.e.,

the opposite frame) at t3, and (b) exposure to a counter-frame at both t2 and t3. Third, we used a

standard procedure to manipulate the strength of attitudes formed in response to frames by

exogenously inducing either memory-based (MB) or on-line (OL) processing of messages. As

mentioned, this is a strongly established approach in psychology and shown to directly influence

attitude strength (e.g., Hastie and Park 1986, Mackie and Asuncion 1990, Bizer et al. 2006).

Participants read a series of framed statements (varying by condition) about the Patriot Act,

taken from newspaper coverage.[8] As is typical for processing manipulations of OL and BM, the OL

was designed to produce stronger attitudes, and thus, respondents were instructed to evaluate each

statement according to the extent to which it decreased or increased their support for the Act.

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[7] In their content analysis of *New York Times* coverage of the Act, Chong and Druckman (2011)

report these are the most frequently appearing frames (also see Best and McDermott 2007: 12).

[8] We told respondents the statements came from recent news coverage. We opted for a series of

statements rather than complete news articles so as to more closely resemble the processing

manipulations used conventionally in psychology. We pre-tested all statements to ensure they

captured Civil Liberty (SC) and Terrorism (SP) considerations and were seen as strong.

Respondents in the OL condition were also told they would be asked to report their attitude toward the Patriot Act at later points in time (see Hastie and Park 1986). In the MB manipulation, intended to produce weaker attitudes, respondents were asked to rate each statement according to the extent it seemed "dynamic" (i.e., used more action-oriented words); these respondents were not informed that they would be asked for their opinion on the issue.

We randomly assigned participants to one of 16 conditions, including a control group. Respondents in the control group received no frames at t1, t2, or t3 and were not instructed on how to process information (i.e., there was no manipulation of their processing mode). In the other 15 conditions, we tested how individuals responded to sequences of messages using MB or OL processing (induced as described above) or with no manipulation of processing mode. Processing mode was manipulated consistently in each of the three periods.

Within each processing group (MB, OL, or no manipulation), there were five sequences of messages across three periods. One set of conditions involved exposure to frames only at t1 and t3 (i.e., *there was no exposure to a t2 frame*).[9] Respondents were exposed at t1 to the Terrorism (SP) frame, the Civil Liberties (SC) frame, or both frames simultaneously. Individuals who had received the SP frame at t1 received the opposing SC (counter) frame at t3. Individuals who had received the SC frame at t1 received the opposing (counter) SP frame at t3. Individuals who received both SP and SC frames at t1 received the SC frame at t3. This adds up to nine conditions that vary processing mode (MB, OL, or no manipulation) and t1 frame exposure (SP, SC, or SP-SC). Finally, there were six conditions in which individuals again received either SP or SC at t1, but the counter-frame in *both* t2 and t3.

Because we are interested here in the dynamics of counter-framing, we will exclude from the

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[9] The dependent variable was measured at t2 but embedded in a fairly lengthy survey.

analysis the control condition and the three conditions in which participants were exposed simultaneously to the Pro and Con frames at t1. In the end, our total N at t3 is 1077. After removing the 283 participants who fell in the control group and three simultaneous competition conditions, we are left with 12 conditions and a sample size of 794. Table 1 displays the full set of conditions we analyze. (The condition numbers in Table 1 are not sequential because of the excluded conditions.) It is important to note that in no case are the condition means in the t3 subsample significantly different from the means in the full sample. Moreover, all of the significant over-time changes reported in Chong and Druckman (2010) hold in the sub-sample (at least at the .1 level).

**<Table 1 about here>**

With these conditions, we can:

- test the effect of varying the time lag between the initial frame and the counter-frame. We compare the t1-t3 difference in conditions where the counter-frame is received for the first time at t3 against the t1-t2 difference in parallel conditions where the counter-frame is received first at t2 (e.g., as described in Table 1, t3-t1 in condition 1 against t2-t1 in condition 11).

- test the impact of repetition by using the conditions in which there is exposure to frames at all three points in time. We compare the t3-t1 change in conditions without a t2 counter-frame against the t3-t1 change in conditions with exposure to the counter-frame at both t2 and t3 (e.g., as described in Table 1, t3-t1 in condition 1 against t3-t1 in condition 11).

Throughout our analysis, we will look at change scores because the t1 framing effects vary slightly in absolute value across the conditions.

## Results

The aggregate t1, t2, and t3 means are respectively 4.41 (standard deviation = 1.79; N = 794), 4.39 (1.71; 794), and 4.40 (1.73; 794). Although these mean values suggest very high stability, there is actually significant individual level opinion change over time. Some evidence of change is available from simply looking at t1, t2, and t3 correlations, which respectively are: .54 (t1-t2), .47

(t2-t3), .29 (t1-t3). All are significant at the .01 level but they are far from perfect and thus there are sources of variation. In what follows, we identify the sources of this variation.

***Time Lags and Repetition***

We report the over-time means in Figures 1-3. The means and standard deviations are reported in the Appendix. The graphs are suggestive but not strict tests of our hypotheses.[10] (In the figures N = no frame exposure.) Note first that the t1-t2 results match the results reported in Chong and Druckman (2010) in all cases. Specifically, in the absence of a t2 frame, MB respondents (in Figure 2) at t2 retain no t1 effects but instead recede toward the control group mean; when MB respondents receive an opposing frame at t2, they adopt the position advocated by the counter-frame. OL respondents (in Figure 1), by contrast, are resistant to change between t1 and t2, regardless of whether they receive a t2 counter-frame.

**<Figures 1-3 about here>**

However, if initial exposure to the opposing frame is delayed until t3, the counter-frame has a dramatic and significant effect on OL respondents. Given the much smaller effects of exposure to the counter-frame at t2, this suggests (consistent with hypothesis 2) that the extra time lag between t2 and t3 weakens resistance to contrary messages. In contrast, when initial exposure to the counter-frame occurs at t2, followed by a second exposure at t3, the t3 framing effect is marginal. These results confirm (consistent with hypothesis 3) that two quick repetitions of the counter-frame are less effective among OL processors than one delayed counter-frame communicated later in time. At least theoretically, patience has its advantages.

For MB processors, varying the time between exposure to the initial frame and counter-frame

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[10] As noted, we had four additional conditions that did not include explicit counter-framing. The results from these conditions are available from the authors.

makes less difference. The counter-frame is equally effective whether it is received first at t2 or at t3, which is consistent with hypothesis 1. We also see that the effect of repeating the counter-frame was not symmetrical. A second exposure to the Con frame dramatically strengthened opposition to the Patriot Act, but repetition had no additional effect in the case of the Pro frame. Perhaps this reflects a negativity bias. Thus, we have a mixed answer to the question of whether repetition augments initial exposure for MB processors. Finally, the results for non-manipulated conditions (Figure 3) more closely resemble the findings for OL processors.

Tables 2 and 3 report more formal tests of our hypotheses. We specifically compare two key differences: whether the difference between t3 and t1 attitudes is greater than the difference between t2 and t1 attitudes for equivalent frame sequences under specific processing conditions, and whether the t3-t1 differences vary significantly if there was an early t2 counter frame that was repeated. Table 2 contains the time lag comparisons, with the third column reporting the change over time when the lag was short and the fourth column reporting the change for the longer lag. The final column reports the absolute difference in the change scores – when the difference is significant, it indicates the lag significantly affects the impact of the t3 frame.[11]

**<Table 2 about here>**

As suggested by the graphs, the data confirm that the longer lag for OL processors made a dramatic difference. With the short lag, the counter-frame had no or marginal impact, while the longer lag allowed decay of the original opinion and consequently a more substantial counter-frame effect (as predicted by hypothesis 2). For MB processors, the longer lag mattered in one case but not the other, and even in that one case, the effect was only marginally significant. Thus, as predicted by hypothesis 1, the longer lag had little or no impact among MB respondents because their opinions

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[11] We assess significance by regressing the difference in change scores on the conditions.

decayed significantly even when the lag was short. Similarly, varying the time lag had little effect on the non-manipulated group. In sum, delaying exposure to the counter-frame produces greater opinion change when the audience consists of those who initially formed strong attitudes (viz., OL processors). Waiting however has little direct effect among those who formed weaker attitudes.

Table 3 reports the repetition results. A significant difference between conditions at t3 indicates that repetition matters (i.e., repeating the frame at both t2 and t3 had a significantly different effect beyond only one exposure at t3). For OL processors, repetition is a counter-productive strategy, as predicted by hypothesis 3. Repeating the opposing frame (either SP or SC) leads to a *smaller* change in the direction of the counter-frame; for example, the change in attitude between t1 and t3 with no repetition for the SP counter-frame is .94 whereas double exposure to the SP frame in this period moves opinion only .37. For OL processors, exposure to the counter-frame at t2 appears to have reinforced initial attitudes by spurring counter-argument and inoculating respondents against subsequent exposure to the counter-frame at t3. Therefore, opponents might do better to avoid raising the issue among those who form initially strong attitudes, because counter-framing keeps the original attitude salient and accessible. For MB processors, we again see some evidence of a positive repetition effect, when the counter-frame is Strong-Con. We see no significant effects for non-manipulated individuals, presumably because this group aggregates individuals who hold t1 attitudes of varying strengths.

**<Table 3 about here>**

Overall, then, the outcome of a quick counter-framing strategy depends on the audience. If individuals formed strong attitudes in response to the first frame, counter-framing can keep the original attitude salient and forestall its decay. If people formed an initial weak attitude, waiting to counter-frame makes little difference as it will be effective in most cases; moreover, repeating the

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counter-frame may also be productive among such individuals. Fluctuations in the intensity of attitudes therefore create changing opportunities for persuasion and framing through communications. We will return later to the question of whether it is possible to devise an optimal communications strategy to capitalize on these variations in the public.

*Attitude Certainty*

We measure certainty by asking respondents how certain they are of their opinions, on a 7-point scale with higher scores indicating greater certainty. We provide the attitude certainty averages, standard deviations, and Ns for each condition in the Appendix. The first item to note, which is not entirely evident from the Appendix table, is that aggregating the OL, MB, and non-manipulation conditions, attitude certainty is significantly higher in the OL conditions, at every time period, followed by the non-manipulated group and then the MB group. This is exactly what we would expect since the OL manipulation is presumed to promote strength, and, as explained, certainty is a key dimension of strength (the specific aggregated averages by processing mode are available from the authors). This confirms that our manipulation successfully influenced strength (as we assumed it would), echoing Bizer et al.'s (2006) results. (That the non-manipulation group displays significantly higher certainty scores at each time, relative to the MB group, is to be expected since the MB manipulation is meant to weaken dimensions of strength.)

<center>**\<Table 4 About Here\>**</center>

We test hypotheses 4 and 5 in Table 4. The table reports, for each processing condition, the amount of *change in attitude certainty* between t2 and t1 and then t3 and t2 (in the rows), with or without exposure to the counter-frame at t2 (noted in the columns; to see how we computed the figures in Table 4, see the note below the table). In short, it compares cases of exposure and then also cases of repetition with non-repetition.

<center>21</center>

Recall that hypothesis 4 predicts that for OL processors only, any counter-framing will increase certainty. This hypothesis gets partial support. On the one hand, when we look at the *t2-t1* comparisons (in those rows), we see no significant increase in certainty among MB and non-manipulated respondents (as predicted – these respondents do not become more certain upon any exposure). We also see that, among OL respondents, when exposed to the initial counter-frame at t2, there is a large and significant growth in certainty (.25; note the .05 first entry is from a case with no counter-frame exposure at all) – consistent with the idea that those with strong attitudes (OL processors) counter-argue and become even more certain of their opinions. However, the results in the t3-t2 row (with no t2 exposure) show that OL respondents who received their first counter-frame after a long delay – at t3 – moved only .06, which is not a significant increase. Thus, as noted, even OL opinions may weaken over time and any counter-frame exposure will generate increased certainty only if relatively close in time to the initial frame. As explained, the insignificant changes in all the other first column cells were expected, as we did not expect MB or non-manipulated individuals to show increased certainty by the time of a t3 exposure.

We see more consistent support for hypothesis 5, which predicts that for OL and MB processors, repeated counter-framing will increase certainty. This can only occur at t3 since at t2, even for those exposed to the counter-frame, it was their first exposure. In the table, the second (repeated exposure) column reports the changes for all individuals who received such repeated exposure to the counter frame from time *t2 to t3* (each of these cells, notes there was a second repetition at t3). As hypothesis 5 predicts, for all processing modes, we see a significant increase in attitude certainty. Thus, there is strong support for hypothesis 5 (in the t3-t2 relevant rows) – when the delay is not so long that initial exposure fades – repetition enhances certainty. In fact, the weakest result is for the OL condition but we suspect that reflects a ceiling effect, as OL processors upon their

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second exposure to the counter-frame at t2 already had such a high certainty score (of 5.67) that there was little room for subsequent increase (they did move in the predicted direction by .15 to 5.82).

It is important to recall, however, that increased certainty has dramatically different implications for the OL and MB processors. For the OL processors, it means they are becoming more committed to their initial opinions, which as we showed were shaped by the t1 frame. In sharp contrast, the increased t3 certainty evident among MB processors reflects growing confidence in an opinion that was pushed in the opposite direction by the t2 counter-frame. Thus, quick repetition always increases certainty but the evaluative direction of the more certain attitude depends on the direction of the initial opinion (recall that increased certainty limits susceptibility to persuasion and makes behavior based on the opinion more likely).[12]

## Conclusion

Our empirical starting point in studying the effectiveness of counter-framing is that all framing effects will decay. As the effects of earlier communications fade, individuals become newly susceptible to opinion change. Thus the effectiveness of communications is tied to their timing. A critical qualification is that the rate of decay varies depending on how individuals process information. OL processors tend to form stronger attitudes than MB processors. Strong attitudes decay gradually and persist longer; when strong attitudes are accessible, counter-frames are rejected and may even serve to reinforce the original attitude. Ironically, discussion of competing positions can lead to polarization of opinions if participants engage in counter-arguing and motivated reasoning. However, with more elapsed time between discussions of the issue, a counter-frame has

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[12] Further evidence that motivated reasoning is at work comes from a question that asked respondents who received a frame in the OL conditions to assess the effectiveness of the frames. The specific results from those analyses are available from the authors.

greater potential to change attitudes. Delayed counter-framing potentially allows the original attitude to weaken and become susceptible to a contrary argument.

Given the moderating effects of processing mode, a communications strategy that is effective overall may be impossible as tactics that are effective on those who have weak attitudes may be counterproductive for those who have a strong viewpoint. Optimal strategies therefore depend on audiences. If most voters are MB processors, then it pays to dominate the media in the latter stages in the campaign. If most voters are OL processors, then it is better to start one's campaign early and solidify one's position periodically if resources permit. In short, the heterogeneous populations make a single effective communication strategy not only challenging but possibly implausible (in that it could work among some and backfire among others).

Indeed, although quick counter-framing failed among OL individuals, it was effective among MB individuals and those who were not manipulated in the experiment. The MB and no-manipulation groups responded favorably to the counter-frame at both t2 and t3; moreover, the effectiveness of the t3 frame was not undercut by previous t2 exposure to the same counter-frame. In addition to moving the opinions of MB and non-manipulated respondents in the direction of the counter-frame, the repetition of the counter-frame increased attitude certainty.

There was also evidence in our experiment that repetition of the frame enhanced its impact in these two groups of respondents, although the schedule of repetition probably matters. We suspect a lengthier delay (than the interval used in the experiment) between repeating the counter-frame could allow any initial counter-framing effect to decay among MB respondents; therefore, if t2 and t3 are sufficiently far apart, there is unlikely to be any cumulative effect from repeated exposure to the counter-frame. Strategies also depend on resources. Making one's case too early can be susceptible to a counter campaign if the original position cannot be reinforced owing to lack of resources. If the

other side has limited resources and expends them in an early campaign, it is more prudent to go last.

Of course if adequate resources are available, it is always best to saturate the media – early and often – with the strongest arguments for one's position. Given the strategic dynamics of competition, each side will want to establish its position first. If one side is slow off the mark, it should seek a way to counterattack that does not inadvertently strengthen the attitude it is challenging. An alternative strategy to waiting is to develop appropriate counter-frames that can weaken confidence in the original rationale for the t1 attitude. This might be possible by constructing arguments that protect and enhance the values of the individuals one is trying to win over. If resigned to a counter-framing strategy, the strength of the frame and its ability to undermine the dominant frame becomes a critical quality.

Once again, our results remind us of the difficulty of initiating open-minded deliberation on the issues among motivated individuals. Repetition of competing frames may only prove to fortify existing attitudes, and increase the tendency to discount and disagree with alternative frames. A striking aspect of the experimental results is that online respondents quickly closed themselves off from new frames on the Patriot Act issue. The path to motivated reasoning among OL respondents in the experiment began innocently enough with random assignment to receive either the Pro or Con frame accompanied by an instruction to review the communication carefully with the intent of forming an evaluation. But this simple manipulation was sufficient to cause initial attitudes toward the Patriot Act to persist for over 3 weeks as OL respondents were hardly budged by two exposures to a new frame that raised relevant considerations against their original stance. Once a strong initial attitude was formed, it was subsequently defended against contrary frames instead of being updated as new information was received.

On a more positive note, OL respondents who received a counter-frame only at t3 ended with

a more moderate or balanced position between competing arguments, which suggests they were integrating information received at t1 and t3. They did not swing fully to the side of the counter-frame in contrast to MB respondents and, to a lesser degree, the respondents who were not manipulated. Less encouraging is our finding that individuals in the last two groups gave no evidence of cumulative learning. Instead, they crisscrossed positions depending on which frame they received first and which they received last (either in t2 and t3 or in t3 alone). The simple order of arguments dominated their substantive content. It is even more sobering that these are likely to be the swing voters who decide elections.

In terms of political power, the results show that identifying which party is most powerful in shaping opinions is not straightforward and is, instead, highly contingent. It depends not only on the nature of the frames employed, but also on their timing and repetition – two factors whose influences are in turn dependent on the nature of the audience. Our findings reveal that, as a baseline, delaying counter-framing can be effective and repetition can be ineffectual. How these factors play out in more varied competitive environments requires future research.

Any communications strategy has to take account of the calculations and choices of each side in the debate. While one side waits to counter, the other side has an opportunity to reinforce existing attitudes. Druckman et al. (2012) report that repeated exposure to a consistent frame strengthens opinions and promotes stability. Thus, future work should explore what happens when the repetition of the initial frame competes over-time with the counter-frame. There may also be a significant tendency for individuals to selectively expose themselves to frames that cohere with their prior opinions rather than look at counter-frames. This will strengthen prior attitudes further and ensure greater stability and resistance to opposing views. Another factor to consider is that opinions not only decay at varying rates across individuals depending on how they process information, but individual

opinions on issues will be at different stages of decay at any point in the campaign. We mention these scenarios to emphasize the complexity of any over-time competitive campaign context. Uncovering these types of dynamics should define the next generation of research.

Our results are potentially circumscribed by our focus on a single issue and a single approach to operationalizing attitude strength. However, we believe our theory should apply to any issue, including hotly debated issues on which most people hold strong prior opinions; attempts to frame public opinion on such issues will be more difficult or may fail outright. For reasons explained, the Patriot Act would appear to have the characteristics of many typical political issues that divide on traditional ideological lines and ebb and flow in salience over time. Nonetheless, it would be illuminating to monitor opinion dynamics on a novel issue as it emerges on the agenda and evolves over time as competing parties settle on their preferred frames– the trick here of course is to anticipate such issues. Alternative approaches to attitude strength can be taken than the strategy we have adopted in this study; in this regard, we are merely echoing a plea made by Krosnick and Abelson (1992) for the regular inclusion of attitude strength measures in surveys. Indeed, a growing literature has shown attitude strength to be a key construct and one that deserves more explicit study in the political realm. Surveys are also more commonly including measures of an individual's need-to-evaluate in order to gauge the nature of heterogeneity of processing mode in a population (e.g., Federico 2004, Nir 2011).

We close by observing that normative democratic theory has just begun to grapple with the reality that citizens' preferences are highly dependent on strategic elite rhetoric. The endogeneity of public preferences calls into question the basic responsiveness model of democracy and forces us to reconsider the conditions in which the public can exercise autonomy and provide meaningful input in the democratic process.

**Appendix**

**Overall Attitude Means And Attitude Certainty Means at Each Time**

| Condition | Overall Attitude Mean Scores | | | | Attitude Certainty Mean Scores | | |
|---|---|---|---|---|---|---|---|
| | t1 | t2 | t3 | | t1 | t2 | t3 |
| 1 OL SC-None-SP (N = 70) | 3.47 (std. dev: 1.73) | 3.59 (1.68) | 4.41 (1.60) | | 5.21 (std. dev: 1.63) | 5.28 (1.55) | 5.48 (1.24) |
| 2 MB SC-None-SP (70) | 3.69 (1.67) | 4.47 (1.70) | 5.11 (1.44) | | 4.40 (1.68) | 4.37 (1.64) | 4.41 (1.45) |
| 3 No Man. SC-None-SP (63) | 3.90 (1.76) | 4.21 (1.87) | 5.17 (1.42) | | 4.98 (1.42) | 4.98 (1.52) | 4.75 (1.37) |
| 4 OL SP-None-SC (69) | 5.06 (1.63) | 5.03 (1.57) | 4.17 1.65) | | 5.29 (1.72) | 5.32 (1.42) | 5.23 (1.37) |
| 5 MB SP-None-SC (63) | 5.17 (1.67) | 4.27 (1.77) | 3.71 (1.89) | | 4.33 (2.21) | 4.30 (1.97) | 4.44 (1.60) |
| 6 No Man. SP-None-SC (69) | 5.12 (1.45) | 4.57 (1.52) | 3.90 (1.90) | | 4.94 (1.61) | 4.83 (1.68) | 4.80 (1.70) |
| 11 OL SC-SP-SP (65) | 3.71 (1.49) | 3.97 (1.36) | 4.08 (1.45) | | 5.38 (1.40) | 5.63 (1.26) | 5.82 (1.14) |
| 12 MB SC-SP-SP (75) | 3.88 (1.66) | 4.91 (1.44) | 5.04 (1.38) | | 4.55 (1.50) | 4.64 (1.49) | 4.84 (1.52) |
| 13 No Man.SC-SP-SP (62) | 3.76 (2.01) | 4.52 (1.86) | 4.77 (1.73) | | 5.10 (1.41) | 5.19 (1.25) | 5.34 (1.34) |
| 14 OL SP-SC- SC (65) | 5.08 (1.63) | 4.86 (1.72) | 4.88 (1.64) | | 5.46 (1.26) | 5.72 (1.23) | 5.83 (1.22) |
| 15 MB SP-SC-SC (51) | 5.08 (1.70) | 3.78 (1.77) | 3.00 (1.74) | | 4.61 (1.64) | 4.37 (1.57) | 4.75 (1.52) |
| 16 No Man. SP-SC-SC (72) | 5.14 (1.54) | 4.28 (1.71) | 4.17 (1.74) | | 5.11 (1.31) | 5.04 (1.52) | 5.40 (1.26) |

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**Table 1: Experimental Conditions**

| Condition | Induced Processing Mode | T1 Frame | T2 Frame | T3 Frame |
|---|---|---|---|---|
| 1 | On-Line | Civil liberties (SC) | None | Terrorism (SP) |
| 4 | On-Line | Terrorism (SP) | None | Civil liberties (SC) |
| 11 | On-Line | Civil liberties (SC) | Terrorism (SP) | Terrorism (SP) |
| 14 | On-Line | Terrorism (SP) | Civil liberties (SC) | Civil liberties (SC) |
| 2 | Memory-Based | Civil liberties (SC) | None | Terrorism (SP) |
| 5 | Memory-Based | Terrorism (SP) | None | Civil liberties (SC) |
| 12 | Memory-Based | Civil liberties (SC) | Terrorism (SP) | Terrorism (SP) |
| 15 | Memory-Based | Terrorism (SP) | Civil liberties (SC) | Civil liberties (SC) |
| 3 | None | Civil liberties (SC) | None | Terrorism (SP) |
| 6 | None | Terrorism (SP) | None | Civil liberties (SC) |
| 13 | None | Civil liberties (SC) | Terrorism (SP) | Terrorism (SP) |
| 16 | None | Terrorism (SP) | Civil liberties (SC) | Civil liberties (SC) |

**Table 2: Impact of Time Lag On Counter-Framing Effectiveness**

| Induced Processing Mode | Frames | Over-Time Change Short Lag (T2-T1) | Over-Time Change Long Lag (T3-T1) | Absolute Difference |
|---|---|---|---|---|
| On-Line | SC-SP | 0.26 (cond. 11) | 0.94 (1) | 0.68*** |
| On-Line | SP-SC | -0.22 (14) | -0.88 (4) | 0.66*** |
| Memory-Based | SC-SP | 1.03 (12) | 1.43 (2) | 0.40* |
| Memory-Based | SP-SC | -1.29 (15) | -1.46 (5) | 0.17 |
| None | SC-SP | 0.76 (13) | 1.27 (3) | 0.51* |
| None | SP-SC | -0.86 (16) | -1.22 (6) | 0.36 |

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


**Table 3: Impact of Repetition On Counter-Framing Effectiveness**

| Induced Processing Mode | Frames | Over-Time Change No Repetition (T3-T1, with no T2 frame) | Over-Time Change Repetition (T3-T1, with T2 frame) | Absolute Difference |
|---|---|---|---|---|
| On-Line | SC-None/SP-SP | 0.94 (1) | 0.37 (11) | 0.57** |
| On-Line | SP-None/SC-SC | -0.88 (4) | -0.20 (14) | 0.68*** |
| Memory-Based | SC-None/SP-SP | 1.43 (2) | 1.16 (12) | 0.27 |
| Memory-Based | SP-None/SC-SC | -1.46 (5) | -2.08 (15) | 0.62** |
| None | SC-None/SP-SP | 1.27 (3) | 1.02 (13) | 0.25 |
| None | SP-None/SC-SC | -1.22 (6) | -0.97 (16) | 0.25 |

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

## Table 4: Change in Attitude Certainty Over-Time[A]

| | Change in Attitude Certainty When Counter-Frame Exposure Occurs ONLY at t3 (*i.e., no repetition at t3*). | Change in Attitude Certainty When Counter-Frame Exposure Occurs at BOTH t2 and t3 (i.e., *repetition* at t3). |
|---|---|---|
| OL t2-t1<br><br>(i.e., for OL processors, change in certainty between t2 and t1) | .05<br><br>*(NO exposure to counter-frame)* | .25**<br><br>*(INITIAL exposure to counter-frame at t2 and thus NOT repeated yet.)* |
| OL t3-t2 | .06<br><br>*(INITIAL exposure to counter-frame at t3 and thus NO repetition.)* | .15[+]<br><br>*(REPEATED counter-frame exposure at t3)* |
| MB t2-t1 | -.03<br><br>*(NO exposure to counter-frame)* | -.04<br><br>*(INITIAL exposure to counter-frame at t2 and thus NOT repeated yet.)* |
| MB t3-t2 | .09<br><br>*(INITIAL exposure to counter-frame at t3 and thus NO repetition.)* | .27**<br><br>*(REPEATED counter-frame exposure at t3)* |
| None t2-t1 | -.06<br><br>*(NO exposure to counter-frame)* | .01<br><br>*(INITIAL exposure to counter-frame at t2 and thus NOT repeated yet.)* |
| None t3-t2 | -.13<br><br>*(INITIAL exposure to counter-frame at t3 and thus NO repetition.)* | .26**<br><br>*(REPEATED counter-frame exposure at t3)* |

***$p<.01$; **$p<.05$ ; *$p<.1$; [+]$<.13$ for one-tailed tests.

[A]To see how we computed the differences in the table, consider the entry: .05 (i.e., OL t2-t1, recalling any t2-t1 difference is non-repetitive because when a frame appeared at t2 it was always a novel counter-frame). This comes from taking the difference in the average certainty scores between conditions 1 and 4. We merge the conditions because the direction of opinion is not relevant *per se* when it comes to certainty. Similarly, .06 comes from the t3-t2 average difference from conditions 1 and 4. .25 comes from looking at OL conditions that had repetition or, in other words, the difference at t2 and t1 in the average certainty scores of conditions 11 and 14. Analogously, we took the difference in these averages between t3 and t2 (where there was repetition) to get .15 Following this logic, the other entries come from the following conditions: MB repeated from conditions 12 and 15, MB not repeated from conditions 2 and 5, non-manipulated repeated from conditions 13 and 16 and non-manipulated not repeated from conditions 3 and 6.
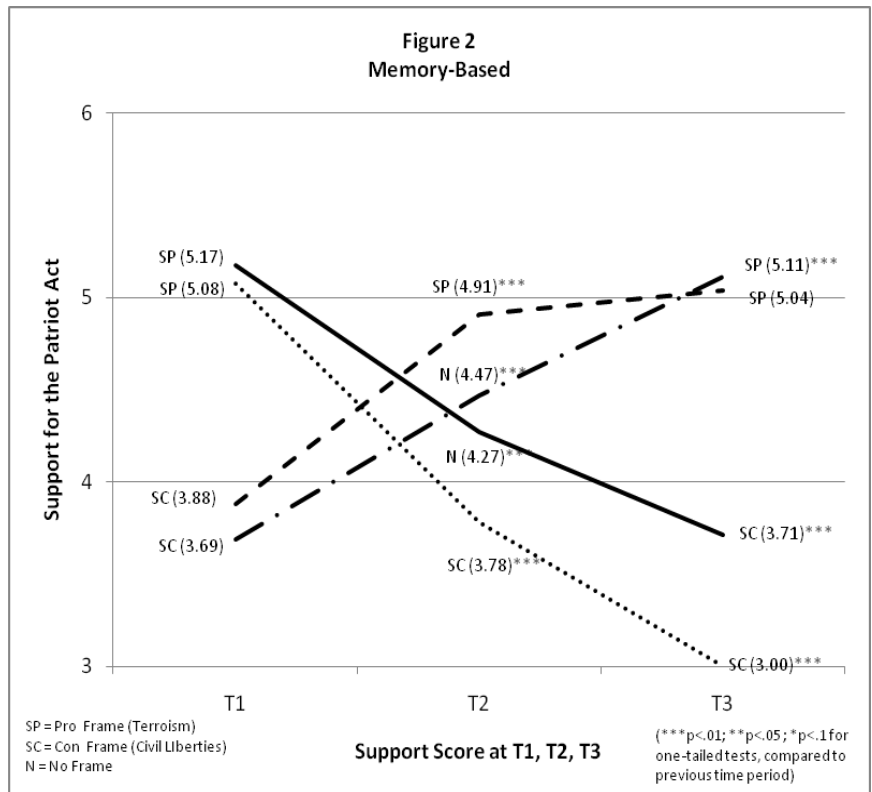
**Figure 1**
**On-Line**

SP = Pro Frame (Terrorism)
SC = Con Frame (Civil Liberties)
N = No Frame



**Figure 2**
**Memory-Based**

SP = Pro Frame (Terrorism)
SC = Con Frame (Civil Liberties)
N = No Frame

(***p<.01; **p<.05; *p<.1 for one-tailed tests, compared to previous time period)

**Figure 3**
**No Manipulation**

SP = Pro Frame (Terroism)
SC = Con Frame (Civil Liberties)
N = No Frame

Support Score at T1, T2, T3

(***p<.01; **p<.05; *p<.1 for one-tailed tests, compared to previous time period)