

# What Makes Us Click? Demonstrating Incentives for Angry Discourse with Digital-Age Field Experiments

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*There is substantial evidence that political actors can incorporate emotional content into their messages with an eye toward evoking politically relevant behaviors. In particular, many studies highlight anxiety as effective in eliciting interest and information seeking. This finding raises the question of why many appeals seem geared to evoke not anxiety, but rather anger. I point to reasons why anger might evoke information seeking under at least some conditions. Then, in a new type of field experiment, I induce feelings of anger and anxiety and passively measure the effects on information seeking. Across three studies, I find anger, evoked alone, to increase information seeking to a large degree—substantially increasing web users’ proclivity to click through to a political website. The results suggest that anger can engage and speak to psychological incentives for political communication, under some conditions, to employ angry rhetoric.*

*“WTH? Aren’t you sick of the DC nonsense & screwed up priorities? Check this out: These politicians already “plunged us” w/debt.”<sup>1</sup>*

*“#GOP has time for light bulbs but not #jobs- Rs bringing bill to Floor this wk that could negatively affect #manufacturing, consumer savings.”<sup>2</sup>*

Imparting information is a first step for many of the tasks that a politician on the campaign trail wants to accomplish. Mobilization requires information about when an election will be held and how to vote. Activism requires information about what the volunteer opportunities are and how to coordinate with others. Persuasion requires providing new reasons to prefer one candidate over another. Politicians have many reasons to explore what tactics succeed in conveying information.<sup>3</sup>

What are they likely to discover? Burgeoning political science scholarship has focused attention on the emotional content of the message. It seems that campaign tactics, such as the imagery and music presented in television ads, can elicit a host of

behavioral responses including interest, attention, learning, and reassessment of attitudinal predispositions (Brader 2011).

To date, one message from the emotions literature is quite clear: campaign appeals can evoke anxiety and fear, and these emotions have audience effects that actors, at least under some conditions, would find attractive. For instance, anxious individuals have been shown to search more widely for political information, to remember more of what they read, to be more likely to vote, to make precautionary plans, and to engage in other protective responses (e.g. Brader 2006; Lerner et al. 2003; Marcus, Neuman, and MacKuen 2000; Redlawsk, Civettini, and Lau 2007). Such results have been taken to illuminate incentives for political elites to stoke fearful sentiments (Lupia and Menning 2009).

Anxiety, though, is but one emotion of the many that exist and potentially carry political relevance. Political appeals often seem geared to foment a different emotion: anger. Indeed, by one analysis,

<sup>1</sup>Sarah Palin’s Twitter feed, May 16th, 2011. “WTH” almost certainly means “What the heck” or “What the Hell?”

<sup>2</sup>Steny Hoyer’s Twitter feed, July 11th, 2011. Pound symbols are “hash tags” that make it easier for users to find posts on a given topic.

<sup>3</sup>On publication, replication files with which to reproduce the numerical results of these studies will be made available on the author’s website at <http://www.timothyjryan.com>. An online appendix with supplementary material is available at [www.journals.cambridge.org/jop](http://www.journals.cambridge.org/jop).

anger arises more often in political advertisements than fear.<sup>4</sup> Why? The political implications of this important emotion are less well understood. As I review below, there is some agreement that anger would likely engender a desire to act, but views differ on whether this means anger should discourage information seeking, or whether instead it means that anger should whet the appetite for at least some kinds of information.

Empirical tests of the effects of anger also leave some open questions. Many studies have been performed in a lab, an unfamiliar context likely to increase subjects' involvement. In contrast, most political appeals (e.g., mail placards, television commercials, online advertisements) arise in a context where politics is far from the primary focus and cognitive involvement is likely to be low. How do anger and anxiety influence behavior in these more mundane settings? Further, lab instrumentation often manipulates emotions using "heavy handed" instrumentation such as induction tasks (e.g. Valentino et al. 2009), which are effective in evoking specific emotions, but leave open questions about the very small amounts of arousal likely to be seen in more realistic contexts. Finally, where observational data have been brought to bear, they often leverage momentous (but rare) events such as the 9/11 terrorist attacks and must make more tentative inferences because of the lack of control over the independent variable (Huddy, Feldman, and Cassese 2007).

Here, I present tests that focus a spotlight on the political significance of anger as it relates to information seeking. Where current views differ on whether anger should ever elicit information seeking, I show that, at least under one set of circumstances, it does, and to a substantial degree—roughly doubling the click-through rate of political advertisements on the Internet. I also test one hypothesis predicting that the information-seeking effects of anger should depend on the *kind* of information available, but find that the search appears to be general. In carrying out the tests, I focus attention on addressing some of the weaknesses mentioned above, executing field studies

high in naturalism that nonetheless preserve the benefits of random assignment.

I begin with a review of the emotions literature that suggests anger is likely to play an important role in evoking politically consequential behavior, but point to some inconsistent results and opportunities for new tests. Next, I describe a way to test how the emotions evoked by political messages influence information seeking using field experiments conducted on the Internet. Three progressively focused experiments converge on the same conclusion: anger can evoke information seeking.

## Why Emotions Affect Information Seeking

The hunch that the emotional content of the political environment powerfully shapes citizens' political behavior is ancient. Aristotle gave emotional appeals their own rhetorical category (*pathos*) and reasoned that the effective orator will "not only try to make the argument of his speech demonstrative and worthy of belief," but also "entertain the right feelings towards his hearers . . . that [they] should be in just the right frame of mind" (*Rhetoric*, 1377b). Political psychologists long agreed with this intuition, but grappled with its application. Affect-transfer hypotheses, for instance, suppose the emotional tenor of political appeals to "rub off" on the subject of the advertisement (Brader 2006, 32–35, 69). Roseman, Abelson, and Ewing (1986), on the other hand, suggested that effective candidate appeals might be the ones whose tenor coincides with a voter's existing state of mind.

Marcus, Neuman, and MacKuen's (2000) pioneering theory of Affective Intelligence (AIT) represents a significant reconsideration of these approaches. In contrast to previous work, AIT looks for emotions' role where extant work in social and neuro psychology (e.g., Gray 1987, 1994; Panksepp 1998) long said it could be found: as a temporary state of arousal that guides subsequent cognition. Marcus, Neuman, and MacKuen (2000) remind us of Zajonc's (1980) thesis that emotions, perhaps counterintuitively, are *preconscious* and largely *unconscious*. Not only that; rather than being only an end-state—the perceived feeling—emotions are highly functional. They evolved to regulate attention and reliance on habit, as well as to allow humans to respond more quickly to sensory input than the slower, more effortful processes we usually think of as consciousness would allow (Marcus, Neuman, and MacKuen 2000, chap. 3). They are the

<sup>4</sup>See Brader (2006, 154) which is a content analysis of 1,425 ads aired in the 1999 and 2000 elections. Anger is a theme more often than fear, compassion, sadness, and amusement. (It occurs less often than the positive emotions of enthusiasm and pride.) Similarly, Kinder (1994, Table 9.1) examines four presidential candidates who ran from 1980 to 1988 and finds three of them to evoke more anger than fear. Valentino et al. (2011) analyze emotions reported by American National Election Study (ANES) respondents from 1980 to 2004 and find them consistently to report greater levels of anger than fear.

attention regulators that allow us to cope with the overwhelming stream of information our senses constantly collect.

The insight of AIT is that political actors would want to evoke emotions not just of a particular valence—e.g., warmth for the speaker and coldness toward an opponent—but to switch voters to different *modes* of processing—e.g., one in which the audience would be more or less attentive. There is now a substantial base of evidence confirming that emotions do activate different styles of thinking about politics (Lerner et al. 2003; Neuman et al. 2007; Valentino et al. 2011).

The neuroscientific basis of AIT and other views that focus on the cognition-guiding role of emotions illuminate why different states of arousal would lead to different proclivities with respect to information seeking. In the new framework, emotions evolved to serve a *directive* function. Relying on quick, automatic, and preconscious appraisals, emotions are “superordinate” programs that coordinate the interactions of a slew of physiological and cognitive activities (Cosmides and Tooby 2000; Marcus 2002; Marcus, Neuman, and MacKuen 2000). The appetite for information is a central output. As Cosmides and Tooby note, emotions involve “specialized motivations to discover whether certain suspected facts are true or false. What one is curious about, what one finds interesting, and what one is obsessed with discovering should all be emotion-specific” (2000, 104).

## The Impact of Specific Emotions

Scholars agree that there is good reason to expect emotions to influence the appetite for information, but there is divergence with respect to how some specific emotions work.

With respect to anxiety, there is substantial agreement. AIT’s framework posits two emotional subsystems in the limbic region of the brain: the disposition system and the surveillance system. Anxiety arises from activation of the surveillance system, which interrupts routine processing, heightens awareness, and opens doors to learning and persuasion that are usually closed (Marcus, Neuman, and MacKuen 2000, chap. 4). Thus, anxiety, working through the surveillance system, is the powerful switch that transforms the disinterested citizen into one with a motivation “to learn, to gather contemporary information, to know more about the issues and where candidates stand on the issues” (Marcus,

Neuman, and MacKuen 2000, 61). A number of empirical tests confirm these expectations, both with respect to information seeking (Brader, Valentino, and Suhay 2008; Gadarian and Albertson 2010; MacKuen et al. 2010; Redlawsk, Civettini, and Lau 2007; Valentino et al. 2008) and attention (e.g., Marcus, Neuman, and MacKuen 2000; Brader 2005; Huddy, Feldman, and Cassese 2007).

While AIT has much to say about anxiety, applications of the theory to anger are newer and less developed. Unlike anxiety, AIT calls anger an “aversive” emotion (MacKuen et al. 2010, 441). While anxiety signals that habits are not adequate to deal with an obstacle and thus encourages information seeking, AIT expects something different of emotions in the aversion category. Aversive emotions signal that existing habits are adequate to cope with an obstacle and spur a desire to confront an understood adversary (MacKuen et al. 2010, 441–42). New information is not very useful for this task, so scholars working in the AIT framework “expect that those who feel aversion will limit their search for information and any search for information will be biased” (MacKuen et al. 2010, 442).<sup>5</sup>

When it comes to the political psychology of anger, however, some perspectives depart from the predictions of AIT. Specifically, some perspectives see anger not as part of a broader dimension of arousal, but rather a discrete program with more finely grained antecedents and effects (Carver and Harmon-Jones 2009; Lazarus 1991; LeDoux 1996; Lerner and Keltner 2001; Roseman 1991; Smith and Ellsworth 1985). Many of these views emphasize the goal-oriented nature of emotional arousal (e.g., Carver 2004; Gray 1987). If emotions represent goal-oriented motivations, then anger might increase the appetite for information, rather than decrease it, especially if the information is relevant to the goal. For instance, information can be useful for retribution, possibly a

<sup>5</sup>AIT’s precise predictions are somewhat difficult to parse. In keeping with the quote above, the authors say, “The emotions of the surveillance system spur attention to novel information, while aversion *suppresses* the inclination to seek out new information” (448, emphasis mine). Further, Figure 1 therein indicates that anxiety causes citizens to “read more,” while aversion causes them to “read less.” But on the other hand, the authors also write, “[People encountering aversive stimuli] often simply ignore uncomfortable information or, alternatively, bolster their own views *by seeking* confirming information” (441, emphasis mine). I interpret these statements as making two separate predictions. First, holding the confirming/disconfirming nature of available information constant, aversion should decrease information seeking. Second, any information seeking that does occur will serve to confirm existing beliefs. In this article, I am primarily concerned with the first prediction.

motivational goal of anger (Nabi 1999, 2002, 2003). Carver and Harmon-Jones (2009) review a literature suggesting, in contrast with AIT, that anger generally motivates approach and not aversion.<sup>6</sup>

While there is substantial and consistent evidence of the effects that AIT predicts for anxiety (Brader 2006, 2011, for reviews), its predictions for anger have been borne out with less consistency. Both Redlawsk et al. (2007) and Valentino and colleagues find a mixture of negative and null effects for information seeking (Valentino et al. 2008, 2009), but Huddy, Feldman, and Cassese (2007) find anger to increase consumption of news media related to the Iraq War, and more recent studies find internal efficacy combined with threat to evoke anger, habitual political participation (Valentino, Gregorowicz, and Groenendyk 2009), and mobilization (Valentino et al. 2011). Weber (2008) finds anger to increase feelings of efficacy and the desire to learn. But in a laboratory study, MacKuen et al. (2010) find that, among subjects exposed to challenging news stories, anger (aversion in the authors' terminology) decreases the number of opposition web pages viewed as well as the ratio of opposition web pages to total web pages viewed.

One weakness of existing studies is that few tests induce and isolate moderate, rather than substantial amounts of anger. For instance, Valentino et al. (2009) induce anger in one experimental condition, but the amount induced is large, surpassing three-quarters of the scale employed. MacKuen et al. (2010) employ a randomized manipulation, but it activates *both* anxiety and anger (aversion in the authors' terminology) to a substantial degree. Similarly, Weber (2007) finds that an ad tailored to elicit anger also unintentionally elicits a substantial amount of fear. Yet mild amounts of anger arousal might have very different behavioral consequences, such as precipitating minimally expressive acts, whereas substantial amounts might be better at evoking costly action (Folkman et al. 1986).

Finally, in weighing the political significance of a particular emotion, such as anger, it would be reasonable to consider whether its effects might be conditional, rather than deterministic. Conditional

relationships have been identified for anxiety: Valentino and colleagues (Valentino et al. 2009) find anxiety not to be sufficient to elicit information search, but rather that the information available must additionally be useful, a result consistent with Witte and Allen's (2000) meta-analysis of public health campaigns, which concludes that fear appeals most successfully evoke danger-control actions when incorporated into high-efficacy, as opposed to low-efficacy messages. Nabi (2003) finds the effects of anxiety to depend on the type of behavioral outlets (e.g., protective as opposed to retributive) available.<sup>7</sup> Conditional relationships are important because they point to how it might behoove a politician to evoke different emotions depending on the *kind* of information he or she would like the audience to acquire.

The behavioral tendencies of anger are less well specified than those for anxiety, making it more difficult to determine which conditional relationships to test. One possibility, however, is that, where anxiety would whet the appetite for protection-related information (LeDoux 1996), anger motivates a desire to impose costs on others (Lerner and Keltner 2000, 2001; Sell, Tooby, and Cosmides 2009) and thus tendencies toward retribution and risk seeking.

From the discussion above, I derive three hypotheses. First, in keeping with the idea that anger is mobilizing (Valentino et al. 2011), efficacy inducing (Weber 2008), or appetitive (Carver and Harmon-Jones 2009), I expect mild amounts of anger to lead people to seek low-cost information (H1). This expectation contrasts with AIT, which predicts that individuals made to feel angry should generally seek less political information than individuals who do not feel angry.

AIT expects anxiety to increase information seeking. Refinements such as those offered by Valentino et al. (2011) expect the same, although perhaps only when the information seeking is low in cost. Because the tests below concern low-cost information seeking, these expectations converge (H2).

Finally, guided by the motivational tendencies for anger reviewed above, I expect anger to elicit more information seeking where it seems that information would be useful for retribution than where information would be useful for protection. I expect the opposite pattern for anxiety: anxiety will evoke more of an appetite for protection-related information than for retribution-related information (H3).

<sup>6</sup>This review highlights some terminological inconsistencies. AIT suggests that "aversive" emotions like anger, disgust, contempt, and hatred motivate *confrontation*, which sounds like an approach-related behavior. What Carver and Harmon-Jones (2009; and much other work in psychology) call aversion relates instead to *avoidance*. But the terms are not simply reversed, as both frameworks would expect an aversive emotion (which would include anger in one framework, but not the other) to decrease information seeking.

<sup>7</sup>See also Brehm and Self (1989) and Harmon-Jones et al. (2003).

## Digital-Age Field Experiments

In three separate experiments, I expose Internet users to randomly assigned political advertisements during the course of routine web browsing. The ads were displayed on the popular website Facebook.com, which has approximately 135 million adult users in the United States. It is a convenience sample that is not nationally representative in a strict sense. But Facebook is large, heterogeneous, and increasingly a focal point for political activity, making it of interest in and of itself. The ads invited subjects to “click for more information” about a political topic. The design allowed me to record the click-through rate of each advertisement, a passive and very naturalistic measure of information seeking. Facebook allows ads to be targeted based on information that users voluntarily provide in their profiles. Because many users include information that hints at political leanings, treatments can be tailored to include properties especially likely to elicit politically relevant emotions.

These studies illustrate the value of iterative refinement (cf. Platt 1964). Experiment 1 is a pilot study that tested the new type of field experiment. Its chief weakness is the lack of data testing how the stimuli used manipulate emotions. However, its promising results led to Experiment 2, which has such data and provides evidence in favor of the same conclusions. Experiment 3, which also included a manipulation check, was undertaken to address a possible confound in Experiment 2 and also reaches the same conclusion. Because Experiments 1 and 2 are conceptually very similar, I discuss them together.

### Experiments 1 and 2

Experiments 1 and 2 both employ political advertisements with  $3 \times 2$  manipulations of emotion (anxiety, anger, neutral, but see the more nuanced discussion below) and informational outlet (protection, retribution). Figure 1 lays out the conceptual pattern by displaying the stimuli for Experiment 2. The two experiments differ, however, in timing and instrumentation. Experiment 1, the pilot study, was conducted March 1–2, 2010. Although the instrumentation in Experiment 1 has face validity, being a pilot, a manipulation check was not conducted. Experiment 2 ran from October 15 to October 18, 2010 and used different instrumentation that was validated with an external manipulation check.

Experiment 1 took place at a moment of high excitement surrounding the health care reform package championed by Barack Obama. One month

earlier, Scott Brown was sworn in to the U.S. Senate seat previously held by Ted Kennedy, leading to dramatic legislative maneuvering and energetic grassroots campaigning over the fate of the legislation, which had been passed in different forms by both the House and Senate, but which now lacked a supermajority necessary to approve a conference report. The experimental stimuli sought to take advantage of the high level of salience surrounding this landmark legislation. Because I expect ads to be most effective when they are narrowly tailored (cf. Goldstein, Cialdini, and Griskevicius 2008), I leveraged Facebook’s ability to target ads at a political subgroup: liberals, specifically the approximately 4.5 million users over the age of 18 who choose to be Facebook “fans” of Barack Obama.<sup>8</sup>







Emotions were induced by text and an image. In the first condition, the title of the advertisement is “Afraid?” and subjects saw a masked surgeon leaning toward the camera wielding a scalpel, an image designed to remind subjects of their mortality (cf. Solomon, Greenberg, and Pyszczynski 1991). In the second condition, the title of the advertisement is “Angry?” and subjects saw a clenched fist, an image chosen to remind subjects of their ability to inflict costs on others. A control condition removes explicit priming of emotions: the title of the advertisement is “Health care” and subjects saw an image of the Capitol Building.

In a second manipulation, the “outlet” manipulation, the treatments also indicate what kind of information will be provided by clicking an advertisement. In the protection condition, the text read, “The Republicans are blocking health care reform. Get the facts you need to *protect your health*.” In the retribution conditions, the text read, “The Republicans are blocking health care reform. Get the facts you need to *win your next argument*” [emphases added]. This text was chosen in an attempt to make the available coping outlet seem to match—or not—the behavioral inclination evoked by the emotion manipulation.

Experiment 2 followed the conceptual pattern established by Experiment 1, but employed different instrumentation, shown in Figure 1. The images, emotionally expressive faces (Ebner, Riediger, and Lindenberger 2010), were chosen to make subjects construe the text as emotionally evocative in the desired way. Their inclusion stems from work on

<sup>8</sup>One ideological group—rather than two or several—was chosen because of funding constraints. There are about 75% as many Republicans on Facebook as Democrats, so Democrats provided a fuller initial test.

FIGURE 1 Stimuli for Experiment 2

	Protection condition	Retribution condition
Anxiety	(A) <b>I'm frightened</b>  A double dip recession? Could it ruin your retirement? Get the facts you need to protect the money you've saved.	(B) <b>I'm frightened</b>  A double dip recession? Could it ruin your retirement? Get the facts you need to win the election in November.
Anger	(C) <b>Republicans make me mad</b>  Republicans want to steal your money. Get the facts you need to protect what you've saved.	(D) <b>Republicans make me mad</b>  Republicans want to steal your money. Get the facts you need to win the election in November.
Neutral	(E) <b>Politics</b>  Get the facts you need to protect the money you've saved.	(F) <b>Politics</b>  Get the facts you need to win the election in November.

emotional contagion that finds viewing facial expressions to elicit congruent emotional responses in the viewer (Hatfield, Cacioppo, and Rapson 1993; Hess, Philippot, and Blairy 1998; Hsee, Hatfield, and Chemtob 1992; Laird et al. 1994; Schneider et al. 1994), a finding compatible with the notion that facial expressions evolved to signal (Ekman and Friesen 1975). Further, facial expressions are also effective at capturing attention, again likely for evolutionary reasons (Bannerman, Milders, and Saharaie 2010). Text also varies across conditions. In one condition, designed to evoke anxiety, the text raises the prospect that a “double dip” recession could

“ruin your retirement.” In the anger condition, the advertisement insinuates that “Republicans want to steal your money”—the theft theme representing an appraisal recognized as evoking anger (Lazarus 1991).

Using both text and images to manipulate emotions represents something of a trade-off. Ideally one would manipulate emotions in the most narrow and direct way possible—for an extreme example, by exogenously administering neuropeptides (e.g., Taylor 2002)—but that is only possible in a lab. Alternatively, one could manipulate only incidental factors (e.g., imagery and music, as in the television advertisements constructed by Brader 2005), but

online advertisements, being small and not including audio, are far more constrained in this respect. Manipulation checks (method described below) found an approach in which the facial imagery changed while holding text constant moved emotions in the expected direction, but the differences were small. Thus, like real ad campaigns, the approach adopted here uses text and imagery in tandem to evoke emotions more powerfully. The cost is a small amount of parallelism. For instance, Experiment 2's anger condition leverages a partisan mention (albeit a vague one) to evoke anger. If differences are observed between the anger advertisement and others, it will remain to be seen whether they arise because the partisan mention evoked anger or because a partisan mention evokes information seeking through a channel other than emotional arousal. Experiment 3 is designed to address this possible concern.

Finally, isolating and manipulating a single emotion is difficult (Diener and Iran-Nejad 1986). In particular, it is difficult to disentangle anxiety and anger, as the two often occur together. Plant and Devine (2003), for instance, find anxiety about an interracial reaction to evoke feelings of hostility and anger. Similarly, Wacker, Heldmann, and Stemmler (2003, 185) find a fear induction to activate anger to an equal degree. Political scientists similarly find anger to come with fear, although not necessarily the reverse (MacKuen et al. 2010, Figure 3; Valentino et al. 2009, Table A1; Weber 2007, Figure 2). As I explain more fully below, my manipulation check finds a similar pattern: anger can come alone, but anxiety brings anger along with it. It is still possible to test predictions about the two emotions by observing differences as they are added one at a time (i.e., first introducing anger alone and then introducing anger and anxiety together). Thus, one condition isolates anger. Another condition evokes both emotions, but there is reason to believe that, in such a case, the effects of anxiety would predominate as the more powerful and primordial emotion (Bradley 2000; LeDoux 1996).

Figure 1 lays out the conceptual pattern shared by Experiments 1 and 2 by showing the stimuli used in Experiment 2.<sup>9</sup> I continue to refer to the anxiety-focused advertisements as ads A and B, the anger-focused advertisements as ads C and D, and the neutral advertisements as ads E and F, as indicated in the figure.

*Manipulation check.* To ensure that stimuli manipulate emotions in a way that allows testing of the hypotheses above, I conducted an external

manipulation check in which subjects reported the emotions they felt upon viewing ads being considered for instrumentation. The manipulation check took the form of a brief survey conducted on Amazon.com's Mechanical Turk (MTurk) service.<sup>10</sup> First, subjects were asked to report their age and partisanship. Then the computer randomly assigned each respondent to view one of the several advertisements under consideration, whereupon subjects reported the extent to which they felt hopeful, angry, sad, afraid, excited, happy, nervous, and outraged. MTurk includes workers from all over the world, but because partisanship is only meaningful to U.S. respondents (and for other reasons), the manipulation check was only administered to respondents who live in the United States. Further, to minimize careless or haphazard responses, the assignment was offered only to workers with quality ratings above 95%, indicating that their past work had been approved at least 95% of the time. Because Experiments 1 and 2 focus on Democrats, the manipulation check below focuses only on self-identified Democrats.

A number of plausible ads were tested, and six ads were chosen based on their ability to manipulate fear and anxiety while holding other emotions constant. Table 1 presents the mean responses for each emotion by treatment condition.<sup>11</sup> As mentioned above, an ad that isolated anxiety without evoking anger was not identified. In light of this difficulty, ads were chosen based on their ability to induce each of these emotions one at a time. Relative to the control, one set of advertisements (C and D) evokes anger alone, while the other (A and B) evokes anger and anxiety together. As Table 1 shows, as one moves from the Neutral condition (E and F) to the Anger condition, the two anger-related emotions, "angry" and "outraged," both exhibit significant differences ( $p < .06$ ). Differences for all other emotions are much smaller and have  $p$  values of .21 or larger. As one moves from the Anger condition to the Anxiety condition, the two anxiety-related emotions, "afraid" and "nervous," exhibit large, significant differences

<sup>10</sup>MTurk is an online community in which workers are paid to complete Human Intelligence Tasks (HITs) designed by employers. Analyses of MTurk demographics show them to mirror the general population much more closely than the samples of convenience frequently employed for experimental research and has been used successfully to replicate canonical experiments (Berinsky, Huber, and Lenz 2012). Results from MTurk have been shown to have high reliability (Burhmester, Kwang, and Gosling 2011).

<sup>11</sup>The responses are to the question, "When you look at this advertisement, how [emotion] do you feel?" Response options were, Not at all = 0, A little, Somewhat, Very, and Extremely = 4.

<sup>9</sup>Stimuli for all experiments are available in the online appendix.

TABLE 1 Manipulation Check: Emotions Aroused, by Condition

Emotions Measured	Means of Reported Emotions			Significance of Difference		
	(1) Anxiety Condition (A & B)	(2) Anger Condition (C & D)	(3) Neutral Condition (E & F)	(1) vs. (2)	(2) vs. (3)	(1) vs. (3)
Afraid	1.38	0.63	0.42	0.02	0.45	< .01
Nervous	1.67	0.83	0.46	0.03	0.21	< .01
Angry	1.19	1.13	0.54	0.85	0.06	0.04
Outraged	1.29	0.96	0.38	0.41	0.06	< .01
Happy	0.29	0.42	0.17	0.60	0.23	0.61
Hopeful	0.05	0.33	0.50	0.10	0.46	0.01
Excited	0.33	0.21	0.17	0.57	0.80	0.47
Sad	1.29	0.96	1.00	0.35	0.89	0.32
n	21	24	24			

Note: Numbers on the left-hand side of the table grid represent  $p$ -values from tests of the hypothesis that the numbers in the referenced columns are equal. Numbers on the right-hand side of the table grid represent mean reported value for each emotion (0 = Not at all; 4 = Extremely), depending on which ad subjects viewed.

( $p < .02, .03$ ) while the other emotions all exhibit much smaller differences that, with one exception, fall far short of significance.<sup>12</sup> Comparing the Anxiety condition (treatments A and B) to the Neutral condition (E and F) confirms this interpretation.<sup>13</sup>

*Random assignment.* The ideal and most efficient way to randomly assign advertisements to Facebook users would be at the individual level, but barring a special arrangement with Facebook that is not possible.<sup>14</sup> Here, I explain why not and how to perform a random assignment at the group level.

<sup>12</sup>The one difficulty for the pattern concerns hopefulness, which exhibits a marginally significant decrease as anger and anxiety are aroused. It may be that increases in anxiety generally lead to decreases in hope. Nevertheless, the inferential complications are surmountable for two reasons. First, the changes for anger and anxiety are much larger. Moving from conditions C and D to conditions A and B increases fear and nervousness by .75 and .84, respectively, while hope decreases by only .28. Second, Experiment 3 successfully replicates the substantive conclusion about anger while holding hope constant.

<sup>13</sup>An additional concern is that the emotion manipulation would interact with the outlet manipulation such that emotions are evoked differently depending on the outlet manipulation. Thus, I additionally test differences in emotional arousal *within* each emotion condition. The results raise no concerns. There are two differences of marginal significance for sadness ( $p < .08, .10$ ) that might merit more consideration if the main results reported below depended on the outlet manipulation, but they do not. Otherwise, all  $p$  values are larger than .25. The main contribution here is to neutralize any worry that the claim that treatments A and B evoke both anxiety and anger, while C and D evoke only anger, is driven by a particularly strong result for just one member of a given pair.

<sup>14</sup>One such collaboration may be in the midst. See Bond et al. (2011).

When a given Facebook user loads a page on the site, a proprietary mechanism conducts an instant auction among all the advertisements competing to target people with his or her attributes. The “bids” in this auction are based on maximums that advertisers stipulate when they begin an advertising campaign. Such a mechanism has some stochastic properties, but is not truly random. Relying on it to assign ads would take control out of the hands of the researchers and detract from transparency.

My approach is to randomize groups, rather than individuals. For each experiment, I conduct a series (dozens or, in Experiment 2, nearly 200) of miniature campaigns and randomize the attributes of each (i.e. some campaigns have anger advertisements, while others have anxiety advertisements). Then, I measure the performance of each campaign. In this way, campaigns, rather than individual people, become the unit of analysis and the auction mechanism is placed “downstream” of the random assignment.

A question that arises in executing this approach is, how to target the campaigns? One could imagine fielding a number of campaigns at the full U.S. population of Facebook users, but this approach is not optimal. A particular person could be exposed to several different versions of the treatment. And there would be no useful covariate information to sharpen estimates of treatment effects.

I adopt an approach that solves both of these problems. First, I define a population of Facebook users – in these experiments, the 4.4 million fans of Barack Obama between the ages of 18 and 64 (18 and



59 for Experiment 1) living in the United States. I then use information in the users' profiles to divide them into arbitrary, disjoint cohorts. For Experiment 1, the cohorts are defined by the users' ages. For Experiment 2, they are further subdivided by sex and two geographical groups.<sup>15</sup> Thus, Experiment 1 included 42 age cohorts, while Experiment 2 included  $47 (\text{age}) \times 2 (\text{sex}) \times 2 (\text{geography}) = 188$  cohorts. I then randomly assigned each cohort to be the target of a campaign with precisely one version of the treatment. The results this approach generates provide covariate information on any of the dimensions used to divide and randomize.

In each experiment, I block the randomization based on users' ages. This approach increases efficiency by ensuring that this characteristic (and any correlated with it) will be balanced across experimental conditions (Horiuchi, Imai, and Taniguchi 2007).

One question that might arise, given the randomization approach, is whether, in conducting statistical tests, standard errors require any adjustment to account for within-group commonalities, as is often the case when individuals are randomized in clusters. Because I conduct statistical analyses at the group level—the same level used to randomize—they do not (Arceneaux 2005).

**Results.** Table 2 reports the number impressions and clicks by condition. It is immediately clear that impressions are cheap because click-through rates are very low—typical for online advertising. (The cost per click comes to between \$1 and \$2.) Still, the differences across conditions are large enough to be informative.

Table 3 reports an OLS regression of the click-through percentage –  $(\text{clicks} / \text{impressions}) \times 100$  – for each cohort in the experiment on the treatment assignments. Because these rates are averages with different variances—for instance, because older people are less active on Facebook than younger people and therefore received fewer impressions—I weight each observation by an analytical weight that is the number of impressions for that campaign (which is inversely proportional to the observation's variance).<sup>16</sup>

Experiments 1 and 2 each include three regression models. First, cognizant of concerns about regression

adjustments to experimental data (Freedman 2008), models (1a) and (2a) include only the three randomly assigned variables (dummies for each of the two emotion conditions and the outlet conditions) plus a constant. Second, models (1b) and (2b) include interactions between the two treatment dimensions. Models (1c) and (2c) omit the interactions, but include available covariates—age for Experiment 1 and, additionally, geography and sex for Experiment 2.

The results of the first two experiments are consistent. If anger leads to less information seeking, then conditions C and D should exhibit lower click-through rates than conditions E and F. It is quite the opposite; conditions C and D exhibit considerably more information seeking than any other conditions, as can be seen in the significant coefficients on anger in the noninteractive models.<sup>17</sup> These results are consistent with Hypothesis 1.

Hypothesis 2 predicts that anxious individuals will seek more information than individuals who do not feel anxious. As such, we would expect to see more information seeking in conditions A and B, where anxiety is present, than in any other conditions. In fact, conditions A and B exhibit similar levels of information seeking to the Neutral condition, and far less than conditions C and D. The addition of anxiety thus appears not to have an effect, contra Hypothesis 2.

Hypothesis 3 predicts an interaction such that conditions A and D, where the emotional arousal and coping outlet match, will exhibit more information seeking than conditions B and C, respectively. In fact, as clear in models (1b) and (2b), the level of information seeking is nearly the same whether the outlet is retribution oriented or not, making it impossible to reject the null. It seems that, with these stimuli, having a match between arousal and coping outlet does not increase information seeking. The information seeking appears to be general, at least with respect to the condition I test.

There are several null results, but the stark and consistent pattern for ads that focus on anger contributes much to our understanding of emotions in political communication, as I explain more fully in the discussion.

<sup>15</sup>There were two geographical divisions. The first was Florida, Georgia, Illinois, Michigan, and California. The second was New York, Texas, North Carolina, Ohio, and Pennsylvania. These states were chosen because they are high in population and, on their face, quite diverse. Any systematic differences between the two groups would not be problematic for internal validity because the assignment is random across them.

<sup>16</sup>Leaving observations unweighted does not change substantive inferences. Results of an unweighted regression appear in the online appendix.

<sup>17</sup>As a check, I estimate identical models with heteroskedasticity consistent standard errors (not reported). The results are nearly identical. The coefficients for Anger remain significant at the same level in five of the six models. For model 1b, an interactive model, it becomes marginally significant ( $SE = .015, p < .12$ ), but a Wald test that the main and interactive coefficients are jointly equal to zero conclusively rejects the null ( $F = 4.48, p < .02$ ).

TABLE 2 Impressions and Clicks, by Condition

	Experiment 1	Experiment 2	Experiment 3
<b>Anxiety</b>			
Impressions	192,454	257,755	-
Clicks	26	30	-
Rate	0.014%	0.012%	-
<b>Anger</b>			
Impressions	180,358	248,756	122,272
Clicks	72	70	51
Rate	0.040%	0.028%	0.042%
<b>Neutral</b>			
Impressions	215,482	417,946	139,546
Clicks	38	44	29
Rate	0.018%	0.011%	0.021%
<b>Totals</b>			
Impressions	588,294	924,457	261,818
Clicks	136	144	80
Rate	0.023%	0.016%	0.031%

### Experiment 3

The results of Experiments 1 and 2 suggest that anger, when evoked alone, leads to information seeking. Still, there is reason to be cautious in drawing conclusions too quickly. Experiment 1 did not

include a manipulation check. There is empirical evidence that the stimuli used in Experiment 2 do evoke the intended emotions, but one can also imagine that the observed effects are attributable to an unrelated difference between the treatment conditions. In particular, conditions C and D contain a

TABLE 3 Anger Conditions Increase Information Seeking

	Experiment 1			Experiment 2			Experiment 3	
Click-Through Percentage	(1a)	(1b)	(1c)	(2a)	(2b)	(2c)	(3a)	(3b)
Anxiety (A, B)	-0.0039 (0.007)	-0.0066 (0.009)	-0.0028 (0.005)	0.0006 (0.004)	0.0001 (0.006)	0.0011 (0.004)	-	-
Anger (C, D)	0.0222*** (0.007)	0.0246** (0.010)	0.0203*** (0.005)	0.0170*** (0.004)	0.0178*** (0.006)	0.0185*** (0.004)	0.0209** (0.008)	0.0186** (0.008)
Retribution (B, D, F)	0.0044 (0.005)	0.0040 (0.009)	0.0036 (0.004)	0.0036 (0.004)	0.0038 (0.006)	0.0036 (0.004)	-	-
Anxiety × Retribution (B)	-	0.0056 (0.013)	-	-	0.0010 (0.009)	-	-	-
Anger × Retribution (D)	-	-0.0045 (0.014)	-	-	-0.0017 (0.009)	-	-	-
Age (coded 0 - 1)	-	-	0.0386*** (0.008)	-	-	0.0128* (0.008)	-	0.0172 (0.016)
Geography	-	-	-	-	-	-0.0014 (0.004)	-	-
Sex (Female = 1)	-	-	-	-	-	-0.0094** (0.004)	-	-0.0148* (0.008)
Constant: Neutral, Protection (E)	0.0153*** (0.005)	0.0156** (0.007)	-0.0031 (0.006)	0.0093*** (0.003)	0.0093*** (0.003)	0.0117*** (0.005)	0.0208*** (0.005)	0.0276*** (0.009)
Observations	42	42	42	188	188	188	94	94
R <sup>2</sup>	0.32	0.33	0.57	0.09	0.09	0.13	0.07	0.11
F	6.01	3.57	12.19	6.17	3.68	4.49	6.82	3.59

Note: Standard errors in parentheses. \*\*\*  $p < .01$ , \*\*  $p < .05$ , \*  $p < .1$ .

partisan mention, raising the possibility their success is attributable, for instance, to a social identity effect (cf. Green, Palmquist, and Schickler 2002) that works through a conduit other than emotional arousal. For all of these reasons, I undertake to establish the result a third time, and in a different way.

Experiment 3 compares one of the anger inducing ads from Experiment 2—condition D—to a new neutral condition. The new condition used the image from conditions E and F above, but different text. The title was “November,” and the text below read, “Get the facts you need to help the Democrats win the election.” The two conditions in Experiment 3 are thus highly parallel. They both cue partisan identity.<sup>18</sup> They both make reference to the November election. But, as in Experiment 2, a manipulation check confirms that they evoke emotions in the desired way.<sup>19</sup>

<sup>18</sup>The two conditions cue partisan identity in different ways. One mentions the outgroup, Republicans, while the other mentions the ingroup, Democrats. Why the sacrifice of exact parallelism? Why not manipulate emotions using images alone, keeping text constant? Such an approach raises a different problem. I developed such instrumentation, but manipulation checks found intended-to-be-neutral advertisements mentioning the outgroup to evoke a substantial degree of anger. Thus, such instrumentation would not be suited to test a hypothesis about what happens when anger is turned on and off. Lacking a reason—other than the anger hypothesis—to expect cueing partisanship with an outgroup (Republicans) to evoke more information seeking than cueing it with an ingroup (Democrats), I see the instrumentation chosen as the clearest way to separate anger effects from partisanship. These explorations, I note, hint at one reason mentioning disliked outgroups might be an attractive strategy in politics: because doing so seems to evoke anger.

<sup>19</sup>The second manipulation check was conducted on October 18 and 19, 2010. As earlier, the check exposed respondents to different versions of the advertisements and asked them to report their emotional arousal. Twenty-four Democrats evaluated the anger-inducing advertisement, while 15 evaluated the neutral advertisement. In addition, because the anger advertisement is identical to condition D from Experiment 2, I combine the 10 Democrats who earlier evaluated advertisement D with the evaluators from the second round. (T-tests that evaluations of the same advertisement differed by when the manipulation check was completed revealed no significant differences ( $.25 < p < 1.0$ ), suggesting it is reasonable to pool the two sets.) Thus, there are  $24 + 10 = 34$  evaluations of the anger condition, and 15 evaluations of the neutral condition.

The results confirm that the anger condition does in fact evoke anger ( $p < .01$ ) and, related, outrage ( $p < .10$ ). Fear and nervousness are actually *lower*—albeit insignificantly—for the anger condition than the neutral condition, providing a good, discriminating test of AIT, which would expect the condition higher in “surveillance” emotions to evoke information seeking. Other emotions are far from significance, with one exception. Sadness is significantly higher ( $p < .03$ ) in the neutral condition than the anger condition. As such, one cannot completely dismiss the possibility that any observed differences in how the ads perform are due to differences in sadness. However, since sadness was quite stable in Experiment 2, similar effects in Experiment 3 would make an attribution to anger much more likely.

Like Experiments 1 and 2, Experiment 3 divided Facebook users into a series of arbitrary cohorts for random assignment. There were  $47 (\text{age}) \times 2 (\text{sex}) = 94$  cohorts, each of which geographically encompassed the entire United States. The experiment was fielded among Facebook fans of Barack Obama on October 20, 2010 and received 261,818 impressions and 80 clicks.

Table 3 reports the results of the experiment. As before, the model (3a) is an OLS regression of the click-through percentage, weighted by each observation’s number of impressions, on the assignment to the anger condition. Experiment 3 had only one treatment dimension, so there is no interactive model (3b). Model (3c) includes available covariates, which in this case are age and sex.

Despite the different instrumentation, the results once again suggest that anger, induced alone, effectively caused information seeking. Subjects who saw an anger advertisement were approximately twice as likely to click on it as subjects who saw the emotionally neutral advertisement, a highly significant difference ( $p = .011$ ).<sup>20</sup> In light of the results from Experiments 1 and 2, the pattern is very stable.

Table 3 also shows some convergence in the relationship of covariates. Age is always positively related to the click-through rate in each experiment. It is once highly significant and twice marginally so. Females are significantly less likely to click the advertisements than males.

## Discussion

The results above complement existing knowledge in several ways. First, they strongly confirm the idea that politicians have a strong incentive to use emotionally charged communication. Consider the substantive significance of the effects of the anger conditions. The click-through rate for condition E (the constant term in the model) is, in Experiment 1, a mere .015%, equating to perhaps one click-through for every 7,000 impressions. The anger condition accrues three clicks through over the same campaign. The difference may seem small, but in an important sense, it is quite large. The anger-inducing advertisement more than *doubles* the click-through rate. If a campaign were to purchase advertisements in the tremendous bulk that their low cost permits—tens of millions of

<sup>20</sup>Using heteroskedasticity consistent standard errors makes virtually no difference ( $SE = .08, p < .015$ ).

impressions are affordable—the anger-evoking advertisement would permit it to accrue the same number of clicks at half the expense. Moreover, it is worth noting that other online advertising forums, such as Google's Adwords, enjoy substantially higher base click-through rates—often around 2%.<sup>21</sup> If anger-inducing ads were similarly to multiply such a baseline, the results would be impressive by any measure. It behooves politicians to be emotionally evocative.

Second, the results show that even very mild forms of emotional arousal can be influential. The average level of reported emotions was never above the midpoint of a 5-point scale; the manipulations changed emotions only about one-fifth of the scale. Yet these changes appear to have a measurable effect.

Third, the tests I present suggest, contrary to some alternative perspectives, that anger *can* evoke information seeking. Possibly anger is well suited for evoking less effortful behavior, such as clicking on a hyperlink, a low-cost action that takes just a few moments. Or possibly Internet advertisements are, by their nature, construed as likely to provide conflict-oriented information well-suited for coping with anger (Folkman et al. 1986). In either case, the results above provide a hint as to why anger emerges so commonly in political discourse—why politicians so often paint their opponents as immoral scoundrels and why rhetoric so often strikes notes of offense and outrage. Generating anger in this way is, at least sometimes, an effective way to attract attention. Moreover, the null results with respect to Hypothesis 3, the emotion-goal matching hypothesis, suggest that anger-inducing advertisements do not need to be precisely tailored to a particular goal to be effective, although I certainly allow that other approaches to defining and operationalizing goals might illuminate starker differences.

Finally, the results invite more research on the conditions under which anxiety evokes attention and interest. In these studies, advertisements that elicited anxiety did not differ from emotion-neutral control conditions. Perhaps anxiety needs to be evoked to a higher degree to exhibit its previously identified effects. Or perhaps very mild levels of anxiety evoke “seizing” or “freezing” behavior with respect to information seeking (Arduino and Gould 1984; Schmidt et al. 2008). Or perhaps clicking an online

advertisement is not a sufficiently expressive act for coping with anxiety (Folkman et al. 1986). Future studies could investigate these possibilities with attention to the degree of anxiety evoked and by presenting a more finely grained menu of behavioral outlets.

## Conclusion

Why do clicks on a web site matter? First, citizens continue to turn to online sources for political information with greater frequency in every election, a trend that shows little sign of weakening (Smith and Rainie 2008). These studies show that politicians seeking to entice viewership can greatly increase their success rate with subtle changes that evoke different emotions. Although we know that viewing information is but one necessary link in the chain of events by which information can change attitudes and that, once information is acquired, biases in processing (e.g., motivated counterarguing) can arise (Nyhan and Reifler 2010; Taber and Lodge 2006), it nonetheless seems likely that such strategies have remarkable potential to influence opinions and engagement. More broadly, the results herein may help us understand not only clicks on a web page, but also engagement in other arenas. Anger might well be effective in enticing citizens, under some conditions, to scan headlines, subscribe to blogs, read flyers, and open direct mail, for instance. Finally, the results outline systematic psychological tendencies in the electorate that impel some politicians to adopt angry, heated rhetoric.

If anger can evoke information seeking, what should we infer about politics more broadly? Some might suppose that, if an emotion causes information seeking, it is desirable. Such a conclusion would likely be premature. Even if anger succeeds in dispersing information, our understanding of what *kind* of information it disperses is incomplete: the information search may be biased, and there may well be opportunity to mislead. Moreover, if anger has informational benefits, these would need to be weighed against other more troubling effects. Given current concerns over polarization and the inability to construct political compromises, the finding that incivility makes people construe the views of political foes as less legitimate (Mutz, 2007) points to how the strategic use of anger could have damaging effects.

To close, I hope to call attention to a new methodological tool. Understanding the phenomenon of selective exposure is taking on new importance as media become more fragmented (Prior 2007; Stroud

<sup>21</sup>Google's much higher conversion rate is likely due to the fact that its consumers are actively searching for information online, and the advertisements often provide precisely what they are looking for. On Facebook, in contrast, clicking an ad almost certainly represents a *deviation* from what one was doing.

2011). But the tools used to study the phenomenon are constrained. As Iyengar and colleagues note, "Virtually all controlled research to date on selective exposure has relied on nonspontaneous or limited information search situations" (2008, 187). I present an approach suited to studying selective exposure that allows random assignment while still being high in mundane realism (Aronson, Brewer, and Carlsmith 1985) and minimizing the likelihood of expectancy bias (Rosenthal and Rubin 1978). The approach also has substantive advantages. New media is unquestionably taking on a more central role in political communication. We ought to test, rather than assume, the extent to which existing explanations transfer to the new forums through which citizens and elites engage in politics. For all the reason field experimentation is attractive in the tangible world (Gerber and Green 2008), it should be attractive in this important new domain.

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