# A Feeling Person's Game
# Affect and Voter Information Processing and Learning in a Campaign

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## Abstract

We have developed and carried out a complex experiment using a dynamic information board (Lau and Redlawsk, 2001) in which subjects experienced a primary election campaign under varying conditions of emotional involvement and manipulation. In addition to manipulating potential emotional responses to candidates, we have developed measures to help us understand the implications of these emotional responses for voter information search, acquisition, and learning. Here we report on two basic analyses of these data. First, we want to look at the extent to which subjects can accurately recall their emotional responses to candidate information *after the fact*, and second we wish to establish just how "sticky" initial evaluations of candidates are in the face of countervailing information. We demonstrate that post-hoc measures of affective reactions are good, but not perfect, approximations of affect as it would be reported if measured immediately. The overall level of anxiety, whether through the anxiety threat manipulation or through congruency manipulation, increased the rate at which subjects incorrectly recalled having felt something when they did not report feeling that way immediately after viewing the information. Moreover, there were high levels of errors of recalling felt affect for all subjects. Finally, we find that affect has a non-linear effect on voting – by manipulating subject-candidate agreement, we are able to demonstrate a clear bias against rational updating.

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What role does emotion play in political decision-making, particularly in terms of voter's and elections? Classical political theory separates emotion and reason into distinct realms, clearly placing politics in the "rational" reasoning column. Yet recent advances in neuroscience (for example, Damasio, 1999) and theoretical contributions to political science (Marcus et al., 200) have drawn attention to the centrality of emotion in human decision-making and suggested its necessary involvement in what we previously thought of as rational thought. In previous work with we demonstrated the effect of anxiety and enthusiasm on campaign decision-making but at the same time we argued for a more stringent test of the hypotheses of the theory of affective intelligence (Redlawsk, Lau, and Civettini, forthcoming). We further argued that the typical post-hoc measures of anxiety (measured well after any event that might have caused the emotion) ought to be placed under scrutiny; these measures require our full attention if we are to build upon early assumptions derived from them.

This paper represents an early step in a larger project designed to test a number of assumptions and hypotheses about how emotions and cognition interact in voter decision making. We have developed and carried out a complex experiment using a dynamic information board (Lau and Redlawsk, 2001) in which subjects experienced a primary election campaign under varying conditions of emotional involvement and manipulation. In addition to manipulating potential emotional responses to candidates, we have

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developed measures to help us understand the implications of these emotional responses for voter information search, acquisition, and learning. Here we will report on two basic analyses of these data. First, we want to look at the extent to which subjects can accurately recall their emotional responses to candidate information *after the fact*, and second we wish to establish just how "sticky" initial evaluations of candidates are in the face of countervailing information. This first question matters, since virtually all political science research on affective response relies on self-reports of emotional reactions after the fact of the events that may have caused these response (See Marcus, et al., 1993; 2000; Redlawsk, 2002, Redlawsk, Civettini, and Lau, forthcoming; but see also Lodge and Taber, 2000, for studies of affect that do not rely on such measures.) If people can accurately recall the intensity and valence of emotion even some time after an initial stimulus, then it may be relatively easy for us to measure emotional response. But if not, then we may have to be wary of studies that purport to address emotions by asking people to recall their reactions to candidates and political stimuli.

There is some developing evidence that evaluations are "sticky" because citizens may be motivated reasoners (Kunda, 1990; Lodge and Taber, 2000) with a goal of maintaining existing evaluations, at least until it becomes too difficult to do so in the face of overwhelming countervailing evidence. While Redlawsk (2002) and Redlawsk, Lau, and Civettini (forthcoming) have evidence of this effect in candidate evaluations, these studies are limited in either the data they collected (Redlawsk, 2002, which relies on data not initially collected for this purpose), or the nature of the subjects used (Redlawsk, Lau, and Civettini, forthcoming, which relies on a student subject pool). In this paper we

report the results from our new study which was designed specifically to capture these effects and with non-student subjects.

## Theoretical Background

Rational choice theorists have long argued that judgments should be adjusted by Bayesian updating, where new information is accurately evaluated and used to adjust prior evaluations in a predictable and sensible way. Thus, negative information should cause posterior beliefs to move away from priors, while positively evaluated new information should strengthen existing beliefs (cf. Green and Gerber, 1999). Political psychologists, though, generally believe the updating process is not especially rational, and that people are motivated to maintain prior beliefs, perhaps in the face of quite a lot of countervailing information. A great deal of research beginning with Festinger's (1957) cognitive dissonance, and Heider's (1958) balance theory posits that cognition is not unbiased; that people instead have various cognitive and emotional motivations to see the world in particularistic ways. Recent research proposing a theory of affective intelligence (Marcus, Nueman, and McKuen, 2000) or applying a more cognitively driven motivated reasoning process (Lodge and Taber, 2000) seek to give prominence to the role of affect and emotion in information processing (cf. Lau & Sears, 1986.) This more recent work has brought emotions squarely into the field of political information processing and in doing so has raised some very important questions.

Perhaps the most important question arising out of this work is the extent to which processing is biased by affect; that is, are people truly rational Bayesian updaters accurately perceiving the direction of new information and revising their beliefs,

attitudes, and behaviors accordingly? Or are people more likely to stick to their guns, to support their prior beliefs, and thus to allow affect to interfere with updating? Research to date is mixed and incomplete. While Green and Gerber (1999) argue that most, if not all, findings that purport to show bias can be explained in the Bayesian model, an impressive array of studies in multiple domains suggest otherwise. From the earliest studies showing housewives rationalizing decisions already made (Brehm, 1956) to Tversky and Kahneman's (1974) seminal work on heuristic biases, to Steenbergen's (2001) recent reports of a conservatism bias in information updating, a wide array of "mistakes" and "biases" have been documented. These mistakes and biases bring to the forefront the question of whether citizens can actually act in the “rational” ways expected by democratic theory. The results of current research are mixed. On one hand, motivated reasoning suggests that citizens cannot be expected to be cool, rational calculators, ignoring the emotional content of their evaluations. On the other hand, affective intelligence seems to argue that emotions – specifically anxiety – enhance learning and thus, presumably, make citizens into better information processors.

**Motivated Reasoning and Affective Intelligence**

Motivated reasoning relies on a simplified model of cognitive and affective memory focused on two parts: long-term memory and working memory (Steenbergen and Lodge, 1998.) Memory itself is viewed as organized into a network of concepts connected in a series of associations (Anderson, 1983). Spreading activation (Anderson, 1983; Collins & Loftus, 1975) is the mechanism that causes memories to become available to conscious thought. This associative network model speaks to both the general

organization of memory in its consideration of nodes and links as well as to the process by which memories are activated. It does not, in and of itself, address the question of how affect is connected to cognition. The most compelling theoretical model for motivated reasoning is that of hot cognition (Abelson, 1963) which argues that affect is directly and inexorably linked to cognition. Thus, all social concepts are represented in memory not just by their cognitive tags but also with a direct connection to their affective value. The affective value, which may be positive or negative, weak or strong, is stored with the cognitive concept and is always activated when the concept itself is activated (Lodge & Taber, 2000.)

Motivated reasoners make an immediate evaluation (like/dislike) of each piece of information they encounter, maintaining an on-line tally which summarizes the current affect towards the object, such as a political candidate (Hastie and Park, 1986; Lodge, McGraw, and Stroh, 1989; Redlawsk, 2001.) Thus, the memory node for the candidate contains not only cognitive information but also this affective tally, and the tally is updated immediately upon the acquisition of new information. Structurally, affect and cognition are inseparable, and when this on-line processing mechanism is operating, affect is automatically activated along with the cognitive node to which it is tied. When new information is encountered, the affect associated with relevant existing knowledge interacts with affect towards the new information to form a virtually instantaneous assessment of the new information based not on cognitive evaluation but rather on the interplay between the on-line tally and the affective value of the new information.

One of the more interesting findings of motivated reasoning is an attitude strengthening effect (Lodge and Taber, 2000; Redlawsk, 2002). Pre-existing evaluations

appear to condition the evaluation of new information so that prior affect is improperly updated. Thus learning something "bad" about a liked alternative often generates a *stronger* preference for the alternative than existed before the new information was acquired. Lodge and Taber have shown this effect for issues about which citizens care deeply, while Redlawsk has documented the effect for candidate evaluation during a campaign. But neither study addresses the question of when enough is enough. That is, at what point does the weight of the new information overwhelm the original evaluation. Presumably at some point a voter may realize she is simply wrong in maintaining her prior beliefs.

If an attitude strengthening effect exists, we might expect it to look something like in Figure 1. After an initial evaluation is formed, the affect associated with that evaluation may interfere with accurate updating in the face of new information that opposes the initial evaluation. For a range of reasons (Lodge and Taber, 2000; Redlawsk 2002), prior affect may actually be strengthened, so that the citizen becomes more positive about a liked person or position or more negative about a disliked one, rather than attenuating the initial evaluation. But presumably at some point it becomes impossible to fool oneself anymore. The question is: where is that tipping point?

[Insert Figure 1 about Here]

The result is that those learning a little incongruent information about a candidate should be less accurate in their perception of that candidate's position on issues than those learning a lot of incongruent information. But if the presumption that voters eventually learn too much to ignore is correct, then those encountering a great deal of incongruent information should be more accurate than those encountering only a little.

Whereas motivated reasoning connects emotions with cognition, Marcus and his colleagues focus more directly on emotions. (Marcus and MacKuen, 1993; Marcus, Neuman, and MacKuen, 2000). While in general agreement with the motivated reasoning theorists that affect interacts with cognition to direct processing, they argue that the emotional response to a candidate cannot be represented simply by an affective tag tied to a cognitive node. Emotions are generated by a dual structure: a behavioral inhibition system and a behavioral approach system (Marcus and MacKuen, 1993.) The former system monitors incoming sensory stimuli against expectations currently held, and upon determining that new stimuli are incongruent with expectations, the system generates arousal and shifts attention to the incoming stimuli. The latter system "provides active feedback of our ongoing behavior and marshals the physical and mental resources necessary for success" (Marcus and MacKuen, 1993, p. 673). When a threat is perceived anxiety is generated, and the behavior inhibition system interrupts routine processing and focuses attention on the threat. Because routine processing is interrupted, it takes longer to process new information. And, more importantly, this careful processing also generates a motivation to learn more about the environment. From an evolutionary perspective it is easy to see the value in such a system, since heightened anxiety also means more careful consideration of what to do next.

Of course, the threats in the American political system may be substantially different than those facing our distant ancestors. Nonetheless, political candidates do generate emotions and Marcus, Neuman, and McKuen (2000) show candidate information processing effects for these emotions through analysis of NES survey data. In particular, in their analysis a heightened sense of anxiety leads to greater learning

about the campaign. On the other hand the behavioral approach system has the job of providing feedback about ongoing activities. In the political context, the system is responsible for generating enthusiasm, a positive emotion. Enthusiasm does not enhance learning, nor make people better information processors. What it does do is make citizens more likely to participate. Marcus and colleagues show that a greater sense of enthusiasm leads directly to greater involvement.

Applying affective intelligence theory to campaigns, we would expect anxious voters perhaps to be "better" voters – more informed, more accurate in placing candidates on the issues, more likely to vote correctly (Lau and Redlawsk, 1997). But none of these effects can be readily established unless we are confident that we can actually elicit from voters their emotional responses to candidates and campaign information. The challenge, though, is that in a "real" election, emotional responses will come and go as information comes and goes. Some days a voter may be very angry at a candidate, but a few weeks later that same voter may be pleased at the candidate's nearly articulated position on an important issue. But affective intelligence, which is clearly a theory of response to information, has been tested by examining citizen responses to survey questions asking them to recall if at any time in the past, a particular candidate made them feel a particular way. While the results Marcus and colleagues report appear to support their thesis, in the end we need to first establish whether relying on this later recall of affect is a reasonable way to measure emotional responses to candidates and campaigns.

Both sets of projects have provided great insights into the role of affect and emotion. But both are limited as well if we are particularly interested in how voters perceive candidates during political campaigns. The Marcus studies have relied primarily

on survey research, which generally measures affect at one point in time, often after the campaign is over and without any knowledge by the researcher of the full range of information that went into the affective responses. The Lodge work is experimental, and provides the type of control typical in experiments. But to date it has focused on the psychology of motivated reasoning, examining sub-second response times to various stimuli, or on how motivated reasoning operates in the realm of issues. Neither approach provides the richness of data needed to get at the role of affect in candidate evaluation *during* a campaign.

## Method and Procedures

### Process Tracing

In order to understand the role emotions play in learning, evaluation, and choice during an election campaign, an approach is needed that can provide controls over the information environment while monitoring the process from beginning to end. Political judgment is not just about one point in time. Instead it is a process that flows over time as information comes and goes. We need to be able to trace that decision-making process as it happens. Such a methodology does exist, and has been used to great effect in many disciplines outside of political science. *Process tracing* designs start with the assumption that decision-making is best studied by collecting data while the decision is actually being made (Ford, Schmitt, Schectman, Hults, and Doherty, 1989; Jacoby, Jacard, Kuss, Troutman, and Mazursky, 1987) and are usually carried out using an information board where experimental subjects choose what they want to learn. A few scholars have used variants on the information board to look at voting (Herstein, 1981), political decision-

making (Riggle and Johnson, 1996), and information search (Huang, 2000; Huang and Price, 1998) in a political environment. However, most studies purporting to look at the role of information in attitude formation and candidate evaluation have not made use of this technique. Yet it would seem that the ability to follow citizens as they make decisions would provide great insight into how attitudes and candidate evaluations are formed and modified.

Unfortunately, the traditional information board suffers from a significant flaw that limits its applicability to political decision making. By nature, the information board is *static* with all alternatives and attributes readily and equally accessible. Subjects can usually spend as much time as they wish learning about alternatives with no risk of missing any. The political environment, however, is not so neat and organized. Politics is messy; information comes and goes somewhat chaotically. Alternatives, whether they are policy options or candidates, do not sit neatly on a shelf, waiting to be examined and compared. And citizens certainly do not have the ability to devote unlimited time to comparison-shopping. What is needed is a way to mimic the relative chaos of the political environment while maintaining the ability to trace information search and decision making as it happens.

We adopt such a technique for this study, the Lau and Redlawsk (2001) dynamic information board technology. This tool modifies the traditional information board into a dynamic, ever-changing simulation mimicking the flow of information during a political campaign. Where the static board allows subjects to have access to all available information at all times the dynamic board emulates the ebb and flow of a campaign over time. The essential feature of the static information board – its ability to trace the

decision-making process as it happens – is retained while information about candidates comes and goes. In order to mimic the sometimes confusing and often-unmanageable campaign environment the dynamic information board may overwhelm participants with information. Further, a real election campaign contains a "here today, gone tomorrow" quality to its information flow and so does the dynamic information board. Finally, where the standard information board makes all types of information equally accessible, from positions on arcane issues to party identification, the dynamic approach models the relative ease or difficulty of finding certain kinds of information at different times during a campaign.

Motivated reasoning and affective intelligence contain assertions that are readily (and perhaps best) tested in the environment of the dynamic information board. For example, affective intelligence suggests a learning process as anxiety is increased, while greater anger may well lead to aversion – a move away from the object causing the anger. The process tracing environment allows careful tracking of how much information voters acquire during the campaign. Clearly if anxiety is increased we should see a move towards greater information gathering. However, since an election campaign has an ending so does the simulated campaign in the dynamic information board. Thus increased efforts to learn are not unbounded. At some point a decision must be made, which may attenuate how much additional learning anxiety can actually generate. On the other hand, aversion effects could be quite clear, since an angry voter can choose to stop investigating the candidate who makes her angry. Thus our larger study, of which this paper reports only a small part, focuses on the interaction of emotional responses to new information and measures of campaign learning. These measures include the total amount

of information examined for candidates and the accuracy with which a voter can place a candidate on issues following the campaign. The expectation is that as voters feel more anxious they will look at more information for the candidate making them feel anxious. They should also then be better informed and better able to place that candidate's position on issues.

Generating anxiety (and anger and enthusiasm) should be possible by manipulating the distance between the voter's preferences and a candidate for any particular piece of candidate information, such as issue positions. When voter-candidate agreement is high, voters should feel enthusiastic about that candidate. When it is especially low – the candidate is quite distant – the voter may feel angry. And anxiety may occur when information is not distant enough to be scary, but not close enough for comfort. Evidence that this is in fact the case is found in Redlawsk, 2002, and replicated within this study as well. To ensure that these effects are clear, our study identified a voter's preferred and rejected candidates early on, and then manipulated information about those candidates. In the end affective reactions to the preferred candidate should probably be stronger since voters may be more invested in that candidate than in a rejected one.

**Subjects**

We used this dynamic process tracing methodology to collect a unique dataset incorporating observations of the information processing techniques employed by subjects as they negotiate an election campaign designed to bombard them with affectively charged information. Data were collected unobtrusively on what participants

learn about each candidate, how long they spend processing each discrete piece of candidate information, likes and dislikes about candidates and issues, and of course, their evaluations and vote choice. As a means of testing propositions about the role of emotion in information processing, this provides the best available insight into what voters are actually doing during a campaign.

A total of 207 non-student subjects were recruited from the greater Iowa City area to participate in a mock presidential primary election featuring four candidates from the same party.[2] Subjects were told that the computer presented the kind of political information which would normally be available in any real primary election, and that the candidates, while all invented, were designed to represent a realistic ideological spectrum of their political party. Subjects registered for one of the parties prior to the election, and were shown information about and constrained to vote only for a candidate from within their chosen party (as in a real closed primary). By creating mock candidates crucial control is retained over the differences between subjects in prior knowledge of actual politicians. No subject knew anything about any of the candidates before the mock campaign began.

**Experimental Design**

Three experimental manipulations were embedded in the primary election. The first varied the overall emotional state of subjects before the campaign began. Roughly

[2] While no claim is made that the subject pool is specifically representative of any particular population, subjects were recruited using a range of techniques that ensured some diversity, especially in age and income. Subjects ranged in age from 18 to 88 years of age and had household income that ranged from 7.5 to 100 thousand dollars per year. Fifty-six percent of subjects were female. Subjects were paid $20 for their time.

half of all subjects were given a prompt meant to increase their overall sense of anxiety. This prompt suggested that their performance in the experiment was critically important to our ability to receive research funds in the future, and thus we would be assessing their performance. They were urged to do as good a job as possible. The prompt read,

> Our ability to continue to receive funding for research into voting and campaigns such as this project depends highly on whether we can report interesting and important results. While we don't want you to worry too much about this, you should be aware that how well you follow the instructions throughout this study and the outcome of your participation will be critical factors that funding agencies use in deciding whether we will receive future research funding. This means that how you carry out your participation in this project is of critical importance to us.

The remaining subjects did not receive this prompt. Thus about half of our subjects should have begun the experiment in a more anxious state than the others. Our intention was to be able to test the extent to which heightened general anxiety would enhance processing of campaign information, as implied by Marcus and colleagues (2000).

Our second manipulation varied the valence and amount of affectively charged information subjects encountered. Subjects were first interrupted by a "poll" after they had about 7 minutes to learn about each candidate and asked for their (then current) evaluation of each candidate in their party as well as which candidate they would vote for if the election were to be held at that point.[3] This allowed an assessment of early evaluation and thus of affect towards each candidate prior to the manipulation.[4] At this point, subjects were randomly assigned to one of five groups based on the affective

[3] In 7 minutes, the typical subject had examined about 15-20 total pieces of information, generally relatively evenly spread across the 4 candidates in their party.

[4] In addition to the initial "poll" question referenced above, subjects were also polled two more times during the campaign to assess the direction and valence of their evaluations over time. At the end of the election they then voted and evaluated candidates one more time.

nature of subsequent information about the most and least preferred candidates. In group 1, no manipulation was made, so that all four candidates fulfilled the subject's initial expectations and consistently reflected their pre-established ideological positions, from relatively liberal to relatively conservative (scaled within their own party). In group 2, approximately 10% of all subsequent information about the candidates was be incongruent with subject's expressed preference – that is, negative about the preferred candidate and positive about the least preferred. In group 3 the percentage of incongruent information increased to 20%, while group 4 faced 40% and group 5 faced 80% incongruent information. The purpose of this manipulation was to create varying levels of anxiety towards an initially preferred candidate.

Our third manipulation was designed to test whether emotional responses to information can be accurately recalled at a later time. At the end of the primary campaign, after subjects had voted for their choice, evaluated all the candidates, and answered a short series of questions about the candidates and campaign, all subjects were taken through a detailed cued recall process designed to establish what they recalled learning about each candidate and how they felt about each piece of information. Subjects were shown the gist of each item they examined in the order they had chosen them – for example, "Donald's position on Iraq", and asked a series of questions to ascertained whether they 1) recalled looking a the item, 2) had chosen it "by mistake",[5] and 3) recalled any emotional response to the item. If subjects did not recall looking at an item, no other questions were asked about it. Emotional responses were measured by three

[5] Because of the scrolling nature of the dynamic information board, subjects would occasionally click on an item that they did not intend to examine at that moment. This was an attempt to quantify how many such mistakes were made. On average, subjects indicated that about 5% of information was mistakenly chosen.

response categories, labeled “angry, bitter, contempt, or disgusted”, “enthusiastic, hopeful, or proud”, and “anxious, uneasy, or afraid”. Subjects could choose any combination or none of the options. Again, all subjects went through this recall procedure. In previous research (Redlawsk, 2001; 2002; Redlawsk, Civettini, and Lau, forthcoming) this cued recall was the only measurement of emotional response to individual pieces of information available in the dynamic process tracing environment. In this study, however, one-half of subjects were required to express their emotional response *immediately* after viewing each piece of information and video they encountered. Thus for this group of subjects we have both an immediate measure of emotional response and a recalled measure, which can be compared to one another.

Given the complexity of the experimental manipulations, Figure 2 may make it easier to understand exactly what subjects encountered during the campaign. Subjects were, of course, unaware that we were manipulating any part of the experiment.

[Insert Figure 2 about Here]

Summarizing the basic experimental procedure, upon arriving at our laboratory, subjects began by completing a fairly standard political attitudes questionnaire used to determine their political interests, preferences, and knowledge.[6] Following an opportunity to practice with the computer, they then experienced the primary election campaign presented via the dynamic information board. At the end of the primary, subjects voted for one candidate in their party, and evaluated all the candidates. They then made global assessments about the candidates, expressing the extent to which each candidate made them feel “enthusiastic”, “anxious”, or “angry” (using NES-style questions) and were

[6] About 20% of our subjects were run through the experiment at remote locations, rather than our lab.

asked to place each candidate's position on a series of issues examined during the campaign on a liberal-conservative scale. Subjects then took an unexpected memory test to determine what they remember from the campaign and were asked to indicate the extent to which each memory made them feel anxious, angry, or enthusiastic. Finally, subjects participated in the cued recall process described above, were debriefed and allowed to ask questions and then dismissed.

## Manipulation Checks and Key Variables

In order to assess whether our experimental manipulations of emotions did in fact have the effects we expected, we administered the Positive and Negative Affect Schedule (PANAS), a measure of both positive and negative affective states (Watson, Clark, and Tellegen, 1988) before the primary election campaign began and again after the primary election was complete. Subjects were asked to respond to a series of twenty words – representing ten positive and ten negative emotions – with an indication of how much those words described how they were feeling at that particular moment in time.[7] The ten positive and negative items were then averaged to create affective scores for each subject prior to and following the experiment. Because of the design of our manipulations we administered the initial PANAS before the generalized anxiety manipulation. Thus we cannot use the initial PANAS to test for differences in these groups. We can, however, compare the post-election PANAS results with the pre-election results for those subjects

[7] The prompts were: interested, irritable, distressed, alert, excited, ashamed, upset, inspired, strong, nervous, guilty, determined, scared, attentive, hostile, jittery, enthusiastic, active, proud, and afraid. The scale ranged from 1 to 5, with 1 rated "very slightly or not at all", 2 rated "a little", 3 rated "moderately", 4 rated "quite a bit", and 5 rated "extremely".

who were in the control group for the candidate-level manipulation, that is, those for whom candidate positions were not manipulated (38 of our subjects).

The generalized anxiety manipulation had exactly the effect we hoped it would. Overall, subjects who received the prompt were more negative and less positive on the post-campaign PANAS scale than those who did not. At the same time, the initial PANAS (administered before the manipulation) shows no difference at all between the groups. But subjects in the generalized anxiety condition exhibited a greater decrease in average positive affect than those subjects who did not receive the anxiety prompt (.57 versus .21 on the 1-5 scale) as well as a significant increase in average negative affect of .26 versus no change in average negative affect for the control group (both $p < .05$, one-tailed). Further, the affective labels that most represent anxiety – "afraid", "nervous", and "distressed" – show differences between those receiving the prompt and those who did not, with average change for subjects in the threat condition and control groups at .29 and 0, respectively ($p < .1$, one-tailed). Thus we are comfortable asserting that half our subjects entered into the campaign in a heightened state of anxiety.

A comparison of subjects who were received some level of the manipulation of individual candidate positions with the group that did not, shows that this manipulation also heightened anxiety, as we expected. Subjects in all levels of this congruency manipulations exhibited a .23 increase (post-election PANAS versus initial PANAS) in average negative affect versus no change for the control group and a .41 decrease in average positive affect, compared to .21 for the control group (both $p < .1$, one-tailed). For the three item battery consisting of "afraid", "distressed", and "nervous", the control group did not see any change in average affect while the manipulated groups saw an

increase of .27 ($p < .05$, one-tailed). Thus, manipulating the congruency of information about the liked and disliked candidates resulted in significantly lower average positive affect and higher negative affect in our subjects. Clearly our two direct manipulations of our subjects' emotional responses were successful.

## Results

In this paper we are specifically interested in the degree to which our subjects could accurately recall their immediate emotional response to candidate information after the campaign was over (30-40 minutes later) in response to prompts about each item they examined about every candidate. Research to date has been unable to effectively capture emotional responses at the time they occur, thus requiring that recalled emotions stand in for the immediate kind. Whether NES or experiments, emotions have been tapped after everything was over. The question is: can people accurately remember their emotional responses? Marcus and colleagues depend on this, in their use of the NES studies, which as voters to recall if a candidate *ever* made them feel angry, enthusiastic, etc., which might require considering how one felt about a candidate months before being asked. In other work, we have been forced to rely on the same kind of recall, though of a much more immediate nature (30-40 minutes) to assess emotional response (Redlawsk, 2002; Redlawsk, Civettini, and Lau, forthcoming.) To assess this we rely on the half of our subjects who were asked their emotional response to candidate information immediately after encountering it, and then again after the campaign was over in a cued recall process. We are interested in the degree to which those reports correspond – if an item was judged to generate anxiety at its initial viewing, was the same items also judged to have caused

anxiety when examined in retrospect? We might anticipate that the likelihood of correspondence will vary by the type of emotion expressed – it may be that some emotional responses like anger might be more memorable than others like enthusiasm. In any case, this is a test of the extent to which emotional responses can be accurately recalled.

Our second interest is the extent to which our subjects accurately adjust their evaluations of the candidates in the face of information which is contradictory to their first impressions of the candidate. Recall that different groups of subjects encountered differing amounts of this incongruent information. Affective intelligence would suggest that in encountering such information which should increase anxiety, voters should be more receptive to learning, and this presumably to accurately updating their prior beliefs. Motivated reasoning, however, suggests that if updating occurs, it will be "sticky" (Redlawsk, Civettini, and Lau forthcoming) as voters are first motivated to maintain their existing evaluation even in the face of contradiction (Redlawsk, 2002). We are interested here in the extent to which this actually happens, and the degree to which increased levels of anxiety overcome this stickiness.

**The Recall of Affect**

Experiments and survey research alike often rely heavily on the ability of subjects (or respondents) to accurately recall how they felt at a particular moment in time. Previous tests of the role of affect in political decision-making are no exception; Marcus and colleagues rely upon affect questions in the National Election Studies to test their hypotheses derived from the theory of affective intelligence. Elsewhere, Redlawsk,

Civettini, and Lau (forthcoming) employ post-hoc affective questions to measure the concepts and some of the questions that lie at the heart of this research program, with very good results. At the same time we argue that we must examine whether this reliance on post-hoc measures of affect is sufficient by measuring affect when it happens as well as after the fact. The current study was designed to specifically examine this by requiring half our subjects to respond to a question about each piece of information they examined immediately after examining it. Subjects were asked, "Thinking about the information you just saw, how does it make you feel?" They were instructed to choose as many of the four options as applicable: "Angry, Bitter, Contempt, or Disgusted", "Enthusiastic, Hopeful, or Proud", and "Anxious, Uneasy, or Afraid" or "I Don't Feel Any of These". Subjects could actually choose any combination of the three emotional responses. The same stimuli were used in the cued recall process following the election simulation.

We conceptualize error in affective recall as being of two types and refer to those as Type I and Type II Errors. Type I errors of affective recall are those where no affective reaction is recorded initially but the subject indicates recalling having an affective reaction in the post-hoc recall period. As we conceive them, Type II errors of affective recall occur when a subject cannot recall in post-hoc evaluation having felt some way about a particular item of information when feeling was reported at the time of viewing the same item. In short, Type I affective errors are those where a subject incorrectly recalls having felt something that they did not feel and Type II is where a subject can't correctly remember having felt something that they did actually feel.

[Insert Table 1 about Here]

Table 1 shows Type I errors of affective recall for all items accessed for those subjects who were asked for affective reaction immediately after viewing an item of information. Type I errors were very low in the control group, ranging from less than one percent for anger to just over ten percent for enthusiasm. This means that for the most part subjects are not recalling much affect after the fact that they did not feel immediately after viewing the item of information. However, Type I affective errors were significantly more prevalent for subjects exposed to either of our experimental manipulations. Table 1 compares subject by experimental manipulation that were subject to only one manipulation, thus isolating main effects of those manipulations. Subjects in both manipulation categories were more likely to experience Type I errors for all three affective groupings. When we combine this with the fact that both manipulations were designed to increase the overall level of anxiety for subjects, we are led to conclude that an increased state of anxiety led to an increase in incorrectly recalling affect when no affect was initially reported.

Is it overall affective state or specific affective reactions that lead to increased Type I errors? For subjects in a congruency manipulation condition, we compared Type I errors for items of information where congruency was manipulated with those items not manipulated. For items where congruency was manipulated, subjects were significantly *less* likely to commit Type I errors recalling enthusiasm, but significantly *more* likely to commit Type I errors recalling anxiety (both $p < .1$). It seems clear that affective state more consistently leads to Type I errors, as whether or not an individual item was manipulated only leads to larger rates of Type I affective errors for anxiety and not enthusiasm or anger.

[Insert Table 2 about Here]

We conceive of errors of affective recall where a subject cannot accurately recall having felt something that they initially reported feeling as Type II affective errors. Table 2 shows Type I errors of affective recall for all items accessed for those subjects who were asked for affective reaction immediately after viewing an item of information. It is clear from Table 2 that there is little significant difference between the control group and either manipulation when it comes to Type II errors. Only for anxiety in the congruency manipulation was the rate of Type II affective errors significantly higher. This suggests that the overall increase in anxiety caused by the manipulations did not increase the extent to which subjects could not accurately recall felt affect. However, a perhaps more interesting story is the overall rates of Type II errors present for all affective categories across both manipulations and the control: ranging from roughly thirty percent for enthusiasm to roughly sixty percent for anger. Type II errors of affective recall occur at relatively high rates.

**Affect and Voting**

In this study we have seen that our manipulations significantly altered the affect of subjects and that the same manipulations led to decreased agreement between immediate affective responses to individual items of information and post-hoc memories of those responses. What, however, is the influence on vote choice? The theory of affective intelligence suggests that increased anxiety leads to more information search and presumably better choices. In previous analysis Redlawsk, Civettini, and Lau (forthcoming) found that subjects who experienced a greater percentage of information

put through the congruency manipulation were less likely to stay with that candidate. These findings were highly attenuated and the authors hypothesized that a conservatism bias might be involved in the process, generating a relationship that was not merely rational updating. In that previous study, the authors used incongruency levels of 20, 40, 60, and 80 percent. In this study we are able replicate this analysis with incongruency levels of 10, 20, 40, and 60 percent.

[Insert Figure 3 about Here]

Figure 3 shows the likelihood that a subject not in the congruency manipulation chose to vote for the candidate that she said she would vote for if the election were held at the time of the first poll, prior to the congruency manipulation. Initially, as the subject-candidate congruency of the information for the liked candidate is manipulated, subjects became more likely to stay with the liked candidate in making their final choice. However, this relationship appears to follow an inverse U shape, as subjects later become less likely to choose the initially preferred candidate. We see that the point at which subjects became less likely to vote for the preferred candidate was between the 20% and 40% manipulation levels. In other words, this means that when between 0 and 20% of the information accessed about a candidate was made incongruent with the subject's *own* preferences, that subject was *more* likely to vote for that candidate. However, after a certain point the incongruency is too much and overwhelms the preference bias, leaving subjects less likely to choose the initially preferred candidate. The threat level overall has no significant independent effect on the proportion of subjects who voted for the liked candidate.

Figure 3 also shows a similar pattern in reverse for the proportion of people voting for the initially disliked candidate but did not receive the anxiety prompt. Though the proportion in the no manipulation condition is highest, the authors suspect that repeated iterations of the experiment would find smaller values for the absence of congruency manipulation. In Figure 3 we wee that the proportion of subjects voting for the initially disliked candidate decreases at first as the congruency levels increase, but then after a tipping point they begin to increase. This is due to the fact that as the information about the liked candidate is being manipulated to make it incongruent with the subject's own preferences, the disliked candidate's positions are being manipulated to make them more congruent with the subject's. The U shape results, we suspect, from the bias in overcoming the negative standing evaluation associated with the disliked candidate. However, a quick comparison of the two trend lines shows that only subjects in the 80% manipulation were more likely to choose the disliked candidate than to choose the liked candidate. Clearly the bias resulting from initial preferences is difficult to overcome. It is not clear whether the same percentages would exhibit similar curves if these were the only two candidates in the primary, though they would likely be similar.

## Discussion

In this study we demonstrate that post-hoc measures of affective reactions are good, but not perfect, approximations of affect as it would be reported if measured immediately. The overall level of anxiety, whether through the anxiety threat manipulation or through congruency manipulation, increased the rate at which subjects incorrectly recalled having felt something when they did not report feeling that way

immediately after viewing the information. Thus, future work on the role of affect in public opinion, political behavior, and individual decision-making generally should be aware of the overall anxiety level for the subject when measuring affect post-hoc. When the anxiety level is high, there will be inaccurate recall of affect. Further, the type of error in affective recall that is more likely when overall anxiety is high is Type I. This means that post-hoc measures of affect are missing affect, and missing *more* affect the higher the level of global anxiety. In our experiment, we manipulated the overall anxiety in a campaign environment. It is likely that close elections create such an anxiety condition, which implies that affective responses for the NES, for example, would be less accurate reflections of true affect in 2000 and 2004 than they would be in, say, 1996 or 1984. The overall anxiety level has an effect on the extent to which we can be confident in post-hoc measures of affective reactions.

The level of anxiety and congruency of information are related to voting in a significant way, as we have begun to show here. As subject-candidate agreement is manipulated away from the subject's own preferences, subjects are more likely to choose that candidate up to a point. The relationship is parabolic; further, the reverse is true of a disliked candidate being manipulated to have more positions in agreement with the subject's own preferences. The practical implication of this for the study of elections is that candidates have a fair amount of leeway once they have become the preferred candidate for a voter. However, it should be stressed that experimental results are not directly transferable to real world situations, despite the high degree of mundane realism of the experimental setting.

This paper represents an early step in a larger project designed to test a number of assumptions and hypotheses about how emotions and cognition interact in voter decision making. Using a dynamic information board (Lau and Redlawsk, 2001) in which subjects experienced a primary election campaign under varying conditions of emotional involvement and manipulation, we have demonstrated the effect of affect on voting and affective recall itself. In future analyses we will explore the extent to which affect in a campaign environment effects subject memory about candidates, evaluation of candidates, information search, and information processing. We will situate the findings of this study in the larger body of experimental work by Redlawsk and Lau in order to further the emerging picture of how voters make decisions in a campaign environment. This first piece of the puzzle establishes the role of affective state on recall of individual affect and demonstrates the effect of affect on vote choice, providing the most complete and direct test of the role of affect in voter decision-making in the literature on affect and political decision-making.

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## Figure 1

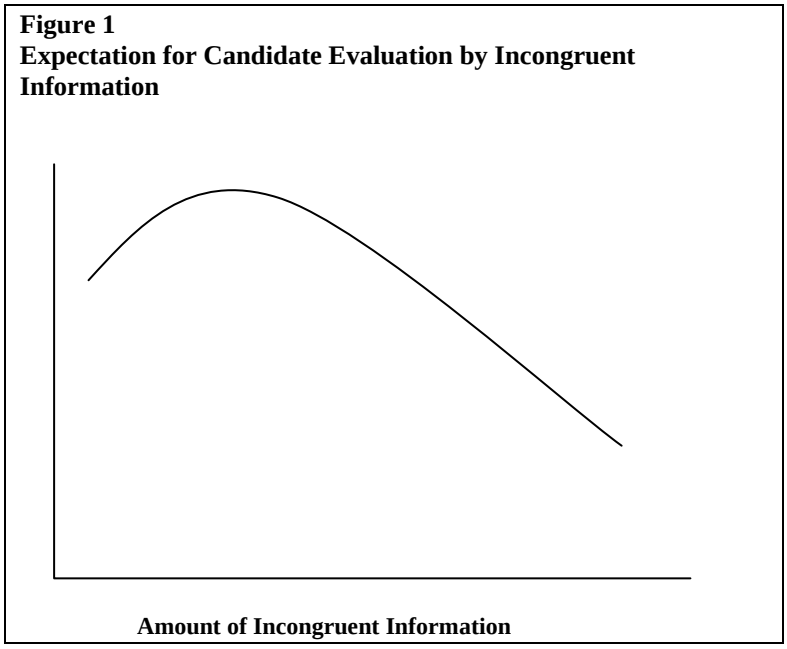
Figure 1
Expectation for Candidate Evaluation by Incongruent Information
Amount of Incongruent Information

**Figure 2**

**Experimental Manipulations**

| | *Initial Global Anxiety Prompt* YES | | *Initial Global Anxiety Prompt* NO | |
|---|---|---|---|---|
| | *Immediate Emotion Report* YES | NO | *Immediate Emotion Report* YES | NO |
| *Incongruent Information* | No Manipulation | No Manipulation | No Manipulation | No Manipulation |
| | 10% | 10% | 10% | 10% |
| | 20% | 20% | 20% | 20% |
| | 40% | 40% | 40% | 40% |
| | 80% | 80% | 80% | 80% |

## Figure 3

**Figure 3. Percent of Subjects Voting for Liked/Disliked Candidate By Level of Congruency Manipulation**

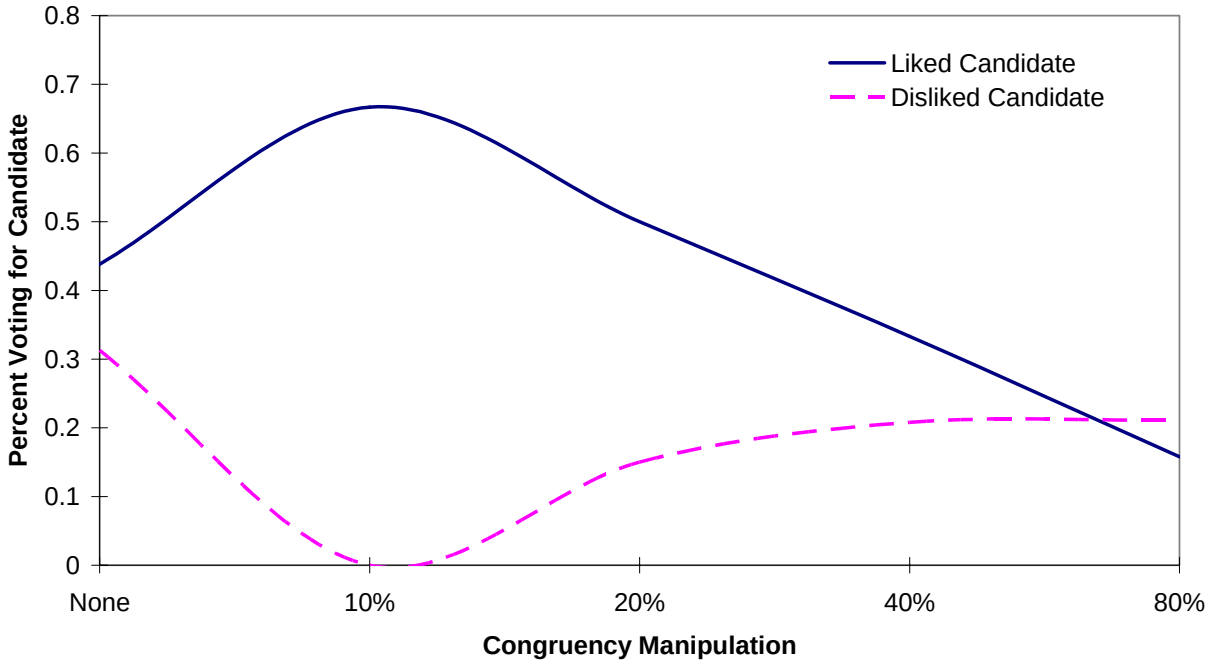

**Table 1. Type I Error in Affective Recall For All Items Examined.**

| | Enthusiasm | Anger | Anxiety |
|---|---|---|---|
| No Manipulations - Control | 0.104 | 0.006 | 0.045 |
| Congruency Manipulation Only [a] | 0.161*** | 0.030*** | 0.098*** |
| Threat Manipulation Only [a] | 0.188*** | 0.036*** | 0.170*** |

[a] Significance of t-tests as compared to control group.

** denotes significance at the .05 level, one-tailed.

*** denotes significance at the .01 level, one-tailed.

**Table 2. Type II Error in Affective Recall For All Items Examined.**

| | Enthusiasm | Anger | Anxiety |
|---|---|---|---|
| No Manipulations - Control | 0.287 | 0.571 | 0.377 |
| Congruency Manipulation Only [a] | 0.288 | 0.686 | 0.524** |
| Threat Manipulation Only [a] | 0.302 | 0.623 | 0.470 |

[a] Significance of t-tests as compared to control group.

** denotes significance at the .05 level, one-tailed.

*** denotes significance at the .01 level, one-tailed.