

**The Affective Tipping Point
Do Motivated Reasoners ever “Get It”?**

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Abstract

In order to update candidate evaluations voters must acquire information and determine whether that new information supports or opposes any existing evaluation. Normatively, new negative information about a preferred candidate should result in a downward adjustment of an existing evaluation. However, recent studies show exactly the opposite; voters become more supportive of a preferred candidate in the face of negatively-valenced information. Motivated reasoning is advanced as the explanation, arguing that people are psychologically motivated to maintain and support existing evaluations. Yet do people do this ad infinitum? Are they motivated reasoners even in the face of extensive disconfirming information? In this study we consider whether on encountering a small amount of negatively-valenced information about a liked candidate voters act as motivated reasoners, but once a certain amount of negativity is encountered voters reach a tipping point after which they begin more accurately updating their evaluations. We show experimental evidence that such an affective tipping point does in fact exist. The existence of a tipping point suggests that voters are not immune to disconfirming information after all, even when initially acting as motivated reasoners.

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What does it mean for a voter to be rational? At a minimum, rational voters know their own preferences, update those preferences accurately upon receipt of new information, and choose the candidate that best represents their interests. Such voters should be predictable in the sense that when they encounter new information about a candidate, evaluations of that candidate will be adjusted up or down as appropriate. Yet, real people are not nearly the predictable “cool calculators” rational models seem to require (Redlawsk, 2002.) Recent research has convincingly shown that emotions play an important part in most decision-making realms. While classical political thought drew distinctions between reason and emotion, reconceptualizations from neuroscience (Damasio, 1999) to political science (Lodge and Taber, 2000; 2005; Marcus et al., 2000) demonstrate that emotions must be an integral part of political decision-making processes.

Existing affective evaluations color how people think about candidates (Redlawsk, Civettini, and Lau, 2007) and issues (Lodge and Taber, 2000; 2005) and how new information is processed as it is learned during a campaign. Rational updating supposes that negative information lowers the evaluation of a candidate, while positive information does the opposite (Green and Gerber, 1999). But what if the candidate is the voter’s favorite; a candidate whom the voter has already decided is “good”? What happens when negative information is encountered about that candidate? Evidence shows that voters may operate as motivated reasoners attempting to hold to their existing positive evaluation by using any one of a number of processes to explain away new incongruent information (Kunda, 1990; Lodge and Taber, 2000; Taber and Lodge, 2006; Redlawsk, 2002.) In other words, existing affect may interfere with (accurate) updating.

We argue that existing affect towards a known candidate is an important factor in

determining the extent to which new information is accurately perceived and evaluations correctly updated. We present evidence that voters ignore significant amounts of negative information about a positively evaluated candidate. In fact, voters may become even *more* positive about a candidate they like after learning something negative about that candidate. This tendency, so contrary to classical notions of rational updating, is consistent with theories of motivated reasoning (Taber and Lodge, 2006), research on a “conservation bias” (Steenbergen, 2001), and the concept of cognitive dissonance (Festinger, 1957). Yet we do not believe this can go on without end. At some point even the most strongly held positive evaluation should flag in the face of repeated negative information. In this paper, we demonstrate that there is, in fact, a point at which voters will stop reinforcing their preferences, abandon motivated reasoning and begin “rational” updating. We call this the affective tipping point¹.

Theoretical Perspective

Standard cognitive/rational models do not appropriately account for affect in the evaluation and decision-making process. Green and Gerber’s (1999) description of a Bayesian updating process in which new information updates prior beliefs is typical. New information in agreement with an existing candidate evaluation is assumed to strengthen that evaluation. Information to the contrary does the opposite. Thus a voter’s early positive impressions of a candidate will be strengthened and made more positive by learning something “good” about that candidate. But, when the voter disagrees with that same candidate, the prior evaluation will be updated in a negative direction to account for the disagreement. While the updating process itself is not necessarily linear, nowhere in this model is there any suggestion that existing affect

¹ While the concept of a “tipping point” is not especially new, Gladwell’s (2000) book “The Tipping Point” has brought the idea into the public imagination. It seems a very effective way to describe the point at which things change, in a sense the straw that breaks the camel’s back.

towards the candidate might impede attitude change. Further, there is no serious consideration given to the possibility of asymmetric effects, that negative information might be weighted differently than positive information in the updating process (Redlawsk, 2007).

Holbrook et al (2001) attempt to address this nonlinear asymmetric possibility and in doing so proposes a more nuanced, yet still “rational” updating process. In their Asymmetric Nonlinear Model (ANM) positive information while initially carrying more weight, decreases in importance more rapidly than negative information. Thus, in order to update, a voter must assess the direction of the information before incorporating it into an evaluation. However, this modification of the updating model, while taking into account the asymmetric nature of positive and negative information, proceeds in the same vacuum that other cognitive approaches inhabit; the *existing* evaluation of the candidate merely serves to anchor the updated evaluation, but does not condition the updating process.

Enter Affect

Since Festinger’s (1957) description of cognitive dissonance and Heider’s (1958) development of balance theory, psychological studies of affect and updating have regularly suggested that “cognitive” processes are not so straightforward, and certainly do not proceed in a vacuum. The hot cognition thesis (Abelson, 1963) argues that affect and cognition are inexorably linked; for every concept or piece of information in memory there is an associated affective evaluation that is activated whenever the concept is accessed (Lodge & Taber, 2000, 2005; Taber and Lodge, 2006). Whether positive or negative, affect cannot be separated from the underlying information, so theories that focus only on cognitive updating can only tell part of the story. Indeed, Zajonc (1984) convincingly argues for the primacy of affect; that affective responses occur before conscious processing. There are both cognitive and affective systems wired in the

human brain, and these may well work both in parallel and independently.

Marcus and colleagues (Marcus and MacKuen, 1993; Marcus, Newman, and MacKuen, 2000) propose their theory of affective intelligence to describe effects of emotions on cognitive processes. Affective responses are the result of a dual process emotional system: a behavioral inhibition system and a behavioral approach system (Marcus & MacKuen, 1993). The first system compares new stimuli to existing expectations, and if a stimulus is found to be incongruent with expectations, attention is shifted to the incoming information. Perceived threat generates anxiety, causing the behavioral inhibition system to interrupt normal processing to deal with the threat. This interruption leads to active processing, where attention to the new information and the time to process it increases. Thus, the negative emotion of anxiety motivates the individual to learn more about the stimulus generating the anxiety and the environment in general. If affective intelligence is right, we would expect that during an election campaign anxious voters would be more attentive, more informed, and more likely to make good choices (Lau and Redlawsk, 1997; Lau, Anderson, and Redlawsk, 2008.) In fact, affectively intelligent voters might well look like rational updaters.

But other research on affect and its effects on cognition muddy these waters. Holbrook (2005) used political ads to generate positive, negative, and neutral affect in subjects. Highly anxious individuals were more responsive to new information, but overall they were less able to accurately recall information after the fact. On the other hand Brader (2005), also using political ads to generate affect, found that anxious subjects were more likely to recall information related to the issue in the ads, but failed to seek out more information. Isen (2000) argues that positive affect improves cognitive processing; contrary to Marcus et al. affectively positive individuals are more likely to ignore incongruent information, rather than pay special attention to it. Finally

other evidence has been found supporting the notion that anxious voters may well pay more attention and accurately process more information than those who are not anxious, but that this may be limited to certain conditions where there is a great deal of incongruent information in the environment (Redlawsk, Lau, and Civettini, 2007.)

Where affective intelligence argues that negative affect – in particular anxiety – may produce better decisions, motivated reasoning suggests that this is not quite the whole story (Kunda, 1990; Taber and Lodge, 2006; Redlawsk, 2002.) Motivated reasoners make an immediate evaluation of new information and use it to update an online tally that summarizes their evaluative affect (Hastie and Park, 1986; Lodge et al., 1989, 1995; Redlawsk 2001.) Newly encountered information carries with it an affective tag. Given an existing evaluation (represented by the online tally) these affective components interact so that the online tally directly influences how the new information is evaluated *before* it is used to update the tally. This is the key insight missing from both the cognitive approaches and affective intelligence. Even anxious voters presumably motivated to learn more and make more accurate assessments, may well be subject to the processing biases of motivated reasoning as they affectively evaluate *before* they begin to cognitively process new information.

While a negative emotional response may be generated by an incongruence between expectations (existing affect as summarized by the online tally) and new information, motivated reasoning suggests that this incongruence does not necessarily lead to greater accuracy in evaluation or greater information search. Instead voters committed to a candidate may be motivated to discount incongruent information; they may mentally argue against it, bolstering their existing evaluation by recalling all the good things about a liked candidate even in the face of something negative. Motivated reasoning describes an interaction effect between existing

affective evaluations and new information, but unlike affective intelligence, the effect of affect may lead to *less* accurate updating, rather than more.

Inaccurate updating might be of different kinds. One possibility is that a voter updates her beliefs in the correct direction, but not to the appropriate magnitude. That is, instead of becoming less positive by a factor of “X” in the face of negative information, the evaluation might become less positive by something less than “X”, in effect a conservatism bias (Steenbergen, 2001). Such updating failures might have relatively limited consequences, as long as they are directionally accurate. On the other hand, attitude strengthening effects (also called polarization effects) where updating is in the wrong *direction* have been demonstrated. Redlawsk (2002) finds that voters with an existing positive evaluation of a candidate become more positive about that candidate when encountering negative information. Lodge and Taber (2000, 2005; Taber and Lodge, 2006) show a similar effect in studying issue preferences, and Edwards and Smith (1996) find that individuals confronted with an argument in conflict with their prior beliefs judge that argument to be weak, spend longer scrutinizing it, and generate a list of relevant thoughts and arguments that tend to refute the argument rather than support it, a process consistent with an attitude strengthening effect. In the context of a campaign, a voter learning something negative about a favorite candidate might first doubt the validity of the information, spend time reviewing and trying to comprehend it, and in the process create a list of relevant thoughts, most of which argue that the information is either false or unimportant. This thought-listing, in refuting the new piece of information, could call to mind many of the reasons for the initial support of the candidate, leaving an overall better feeling about the candidate after encountering negative information.

Hypotheses

We know that voters update their evaluations based on new information encountered

during the campaign. We also know that affect influences this process in many ways. Voters with positive affect towards a candidate may want to hold on to that evaluation and resist changing their opinion.² The question here is whether there is a point at which the existing positive affect motivated reasoners try to maintain can at some point be overwhelmed allowing more accurate updating to begin.³ And if there is such a point, what drives it? We already know that updating is not a linear process, but it may be that it is also a hybrid process, that voters update one way when encountering just a bit of unexpected (incongruent) information, but another way when the incongruity grows too large. To test this we must do several things. First, an initial candidate evaluation must be established – that is the voter must have time to learn something about candidates. Second, we must challenge the voter’s positive evaluation of the preferred candidate by providing negative information about that candidate. And third, we must assess whether the updated evaluations show evidence of motivated reasoning or more accurate updating, and whether at some point the impact of this new negative information changes.

We believe the updating process works something like this: 1) A voter develops an initial positive evaluation of a candidate through the early information that she learns; 2) if a small amount of negative information is encountered, rather than adjusting the evaluation downward the initial evaluation becomes more positive (the motivated reasoning attitude strengthening

² It is also possible that a similar effect occurs with a disliked candidate – that is, that voters who develop negative affect towards a candidate may be unwilling to positively update their evaluations, at least at first. While the design of our study allows us to examine this possibility, our focus in this paper will be on positively evaluated candidates.

³ Another way to think of this in more Bayesian terms is to consider whether as more negative information is encountered, a voter’s positive “priors” become less and less important in the calculation of the posterior evaluation. Gill (2007) notes in a different context that as the N of new information points goes to infinity, the “data” eventually win. In other words is there a point at which the priors no longer exert influence on the calculation of a revised evaluation given new information? Of course, we would argue in the present case that the N need not go to infinity at all, but that there is a finite tipping point at which evaluation begins to update more accurately.

effect); 3) if enough negative information is encountered to heighten the voter's anxiety about the preferred candidate, affective intelligence suggests that the voter will become more careful in processing additional new information; 4) Finally an affective tipping point may be reached where additional negative information leads to a downward adjustment of the evaluation. We suggest that a voter's evaluation of a candidate they like should follow a pattern like the one seen in Figure 1 as greater amounts of negative information are encountered.⁴

[Insert Figure 1 about here]

Putting this into a more structured hypothesis, we expect that:

H₁: Updating for positively evaluated candidates in the face of incongruent information will begin as a motivated reasoning process, showing attitude strengthening effects. Given enough incongruent information, an affective tipping point exists where anxious voters will begin to update candidate evaluations more accurately in the face of increasingly incongruent information.

Hypothesis 1 suggests that if we find attitude strengthening effects for small amounts of incongruent information then these effects are the result of motivated reasoning. Of course, we cannot see motivated reasoning as it happens, only its results. But one means by which motivated reasoners might support their existing evaluations is by bolstering, that is, bringing to mind positive information already known to offset the new negative information that has been encountered. The results of such a process may then be visible in the memories people report

⁴ It is definitely possible that a given voter might never actually encounter negative information about a liked candidate. There is evidence that given a choice, voters may well work to confirm their evaluations by avoiding information that might challenge them (Taber and Lodge, 2006). This particular study does not address the issue of avoiding incongruent information; instead most of the subjects in the experiment to be described did in fact encounter such information, though a small group did not and thus provide an interesting comparison point.

about candidates after the election. In particular:

H₂: Voters encountering small amounts of negative information about a liked candidate will report more positive memories about that candidate than will those encountering no negative information or those encountering large amounts of negative information.

Finally, increasing anxiety on the part of the voter who is learning bad “stuff” about a positively evaluated candidate may be a mechanism by which motivated reasoning is overcome and attitude strengthening ends. In following Marcus, et al. (2000) on this point, we agree that at a high enough level of incongruity – unexpectedly negative information about a liked candidate – voters will become anxious and in doing so will become more accurate in their updating. Thus we should see evidence of greater anxiety as voters encounter more incongruity:

H_{3a}: Encountering incongruent information generates anxiety that grows as more incongruity is encountered. Anxiety will increase until the voter adjusts to the new information and begins to consider other candidates.

Another way of thinking about this is that voters should also become less certain that they made the “right” choice as their anxiety grows. Thus:

H_{3b}: As increasing incongruity drives up anxiety about a positively evaluated candidate, voters will become less certain that they have made the right choice when called upon to cast a vote.

Methodology

While a decision may be a single choice made at one *point* in time, evaluation is a process that occurs over some *period* of time. To understand a process, we should observe it as it occurs. Process tracing experiments have been employed outside of political science using an

information board that allows subjects to choose exactly what they would like to learn about a set of alternatives presented to them (Ford, Schmitt, Schectman, Hults, and Doherty, 1989; Jacoby, Jacard, Kuss Troutman, and Mazursky, 1987). Within political science similar information boards have been used to examine voting (Herstein, 1981), political decision-making (Riggle and Johnson, 1996), and information search in political environments (Huang, 2000; Huang and Price, 1998) among other subjects. However, they have rarely been used to study candidate evaluation, though it would seem that process tracing could yield great insights into this subject.

The problem is that the traditional information board is *static* and allows constant access to all attributes for all alternatives under consideration. In the context of an election, this would be as if a voter had access to any piece of information about a candidate at any time, allowing easy comparison between candidates across all attribute. In a real election, however, information is much less organized, somewhat more chaotic, and the time allowed for learning and information gathering is limited by Election Day. Information comes and goes, and candidates do not always make it easy for voters to make an comparison or even get a clear understanding of where they stand on issues. Lau and Redlawsk's (Lau, 1995; Lau and Redlawsk 2001; 2006) computer-based *dynamic* process tracing methodology offers a way to model the vagaries of a political campaign in a controlled experimental environment. The system generates an ever-changing information environment that mimics the flow of information throughout a campaign and makes only limited amounts and types of information available at any point in time, much like in an election campaign in which many issues are "here today, gone tomorrow." It can also overwhelm voters with potentially unmanageable amounts of unorganized information in a way that resembles the media maelstrom in a real political environment. Yet, the dynamic information board retains the essential characteristic of process tracing experiments in that it

tracks the evaluation and decision-making process as it happens and as information is acquired.

We use this dynamic process tracing methodology to present a simulated presidential primary election campaign to subjects who learn about candidates, evaluate them, and make a vote choice.⁵ The campaign consists of a wide range of information about each candidate, including 27 issue positions, group endorsements, personality traits and background information, along with pre-election polls. As voters learn about the candidates, the system collects data on the information they access, how long they spend on each item, how they feel about each item, and their vote choices and evaluations of each candidate. These last measures are obtained multiple times throughout the campaign in the form of “polls” in which voters are asked to choose a favorite candidate and rate all candidates. Given all the measures we are able to monitor, this methodology clearly provides an excellent way of tracking the evaluation and decision-making process during a campaign and the role that existing evaluative affect plays in the processing of new information and updating of candidate evaluations.

Experimental Design

A total of 207 non-student subjects were recruited from the [identifying location removed] area to participate in a mock presidential primary featuring four candidates from one party.⁶

⁵ A primary election was chosen to limit the direct effects of partisanship in this particular study. Obviously partisanship is of great import during a general election and undoubtedly plays an important role in establishing candidate preference and possibly in resisting change to that preference. However, it adds a layer of individual difference that negatively impacts experimental control. Thus we settled on offering a primary election where partisanship would not be a factor for this initial study. If we can establish the existence of a tipping point, we can move on in future work to examine the conditions under which the tipping point itself varies. The strength of partisanship would clearly be one of those conditions worth closer examination.

⁶ Subjects were recruited in a variety of ways to ensure some level of diversity, specifically in age and income. We do not claim that the subject pool is representative of any particular population. Subjects ranged in age from 18-88 years and had household incomes ranging from 7.5 to 100 thousand dollars per year. Fifty-six (56) percent of the subjects were female. Each subject who completed the study received \$20 for their time.

Candidates in the primary were fictional but designed to realistically represent the range of ideologies within their parties. Since the candidates were not real, subjects clearly had no prior knowledge about any of them, requiring evaluations to be determined only by the information accessed and inferences made during the campaign. Subjects registered as either Democrat or Republican before being exposed to information for four candidates from the chosen party. Subjects were only allowed to vote in the party for which they had registered. Once the campaign began, subjects actively chose what they wished to learn about the candidates from an ever-changing set of candidate attributes presented over a 25 minute time period.

The key experimental manipulation embedded in the election simulation varied the amount of incongruent information a subject could encounter during the campaign. Incongruent information is defined as any candidate attribute at odds with the subject's preferences. For example, if a subject was pro-choice, an incongruent piece of information about a positively evaluated candidate would be that the candidate was pro-life. In this way a pro-choice subject learning her preferred candidate was pro-life would clearly have her expectations violated.⁷

⁷ A second manipulation was intended to generate a global sense of anxiety for some of the subjects just before the simulation began. Approximately half were given instructions telling them that the quality of their performance in the experiment was critically important to the continuation of our research funding. The intent was to make subjects feel that there was something significant riding on their performance and make them somewhat more anxious about doing things "right." While this manipulation was designed to provide a direct test of the affective intelligence thesis that greater anxiety generates more careful processing, analysis of the data suggests that the manipulation did not work as expected, as no effects are shown for it in any of the analyses. Given the failure of this manipulation we do not consider it further in this analysis.

A third manipulation involved asking subjects how they felt about individual pieces of information that they accessed. One half of subjects were asked immediately after viewing each item whether or not it made them feel enthusiastic, anxious, and/or angry toward the candidate. They were also asked to recall this affective response at the end of the study during a cued recall process. The other half were only asked to recall their affect at the end of the study, well after the simulation had been completed. This manipulation was designed to test whether or not subjects could accurately recall the affect attached to information they learned during the election when they are

About seven minutes into the 25 minute simulation, subjects were polled and asked to indicate which candidate they would vote for if the election were held at that point.⁸ Subjects were also asked to evaluate each candidate on a 0-100 feeling thermometer, providing a ranking of candidate preferences. Following this first poll, subjects were randomly assigned to one of five levels of available incongruent information. Those assigned to Group 1 continued to view candidates who were assigned issue positions that remained ideologically consistent throughout the campaign (i.e. the most liberal Democrat always taking the most liberal position or the moderate Democrat always taking the more conservative positions held by his party) and were not manipulated in any way. Any incongruent information encountered was not *intentionally* given to the subject.⁹ In Group 2, subjects were provided access to 10% incongruent information about their most and least highly evaluated candidates, while in Group 3 subjects were provided 20% incongruent information and Groups 4 and 5 were provided 40% and 80% incongruent information, respectively. Available information for the two middle candidates of the four was not manipulated.

When subjects arrived for the study they were seated at a computer and given an oral introduction to the experiment. They then completed an online questionnaire measuring their

asked about it later. An initial examination of the data [identifying citation removed] suggests that this recall is problematic at best. As this manipulation is not directly relevant to our discussion of the affective tipping point we will not consider it in the analyses to follow.

⁸ By the first poll, the average subject had looked at 15-20 pieces of information, which were generally evenly spread across the four candidates in his or her party.

⁹ Because a dynamic process tracing study allows subjects to choose the information they wish to examine, it is not possible to ensure that they will, in fact, encounter all the incongruent information made available. All random assignments were made in terms of available information. In some ways this parallels the “intent to treat” issues found in field experiments in political science (Gerber and Green, 2000). However, in this case all subjects did receive some kind of treatment (or became part of the control) and thus can be analyzed accordingly, with care taken to ensure that results are not driven by individual subject differences rather than the experimental treatment received.

political preferences, knowledge, and interests. These questions allowed us to gauge each subject's placement on the issues that would be used in the simulation which was necessary to be able to manipulate incongruency through subject-candidate agreement. Subjects were given a chance to practice with the dynamic process tracing environment. They then began the primary campaign where they had 25 minutes to learn about the four candidates in their party, following which they voted for one of them. As noted above, the campaign was interrupted after about seven minutes by a poll where subjects were asked to report their vote preference and feeling thermometer evaluations of all four candidates. This poll was repeated two more times, once at about 13 minutes and again at about 20 minutes into the campaign. At the end of the campaign subjects voted and did one more set of evaluations. Subjects were then asked a number of follow-up questions, including a memory-listing task asking them to record "everything you can remember" about each candidate, using only the candidate name as a prompt. Subjects were then prompted to indicate whether each memory made them feel enthusiastic, anxious, or angry about the candidate. Finally, subjects completed a cued recall task where they indicated whether they recalled examining each piece of information they had seen and if so, what they recalled about their affective response to it. They were then debriefed and dismissed.

Data Preparation

Process tracing methodologies provide data that are both extensive and complex. Before we could begin analyzing our results several steps were needed to clean the dataset. To begin with, we dropped eighteen subjects who failed to complete the study or who by their observed behavior did not take the study seriously or who looked at so little information (fewer than two items per minute) or so much information (more than 8 items per minute) that they were clear

outliers. We were left with 189 of the initial 207 subjects whose data were suitable for analysis.¹⁰

It is important to make clear that subjects actively chose the information to which they were exposed. As noted earlier, the incongruency manipulation was intended to provide *access* to the appropriate amount of incongruent information about candidates, but the effect of the manipulation depends to a large extent on the amount and distribution of information that subjects *chose* to examine. Thus, while random assignment placed subjects into groups based on information availability, data analysis requires examining the actual treatment subjects received through their own actions in choosing what to learn about candidates.¹¹

To place subjects into analysis groups based on incongruent information they actually examined during the campaign, we calculated the percentage of all information subjects acquired about a manipulated candidate that was incongruent with expectations. For each issue position, candidate trait, or endorsement, we recorded whether or not it was congruent with the subject's evaluation of the candidate. For traits this was fairly simple, since these were clearly positive or clearly negative – for example, “Martin is considered egotistical and difficult to work with” would certainly be seen as negative, while “Even Martin's opponents consider him an honorable

¹⁰ After debriefing the experimenter coded the degree of seriousness with which the subject approached the study, so this measure is based on observation of the subject's demeanor at the time of the study. Keeping these subjects in the dataset does not substantively change the results.

¹¹ The primary risk of moving subjects out of their randomly assigned groups is that some individual difference factors that might be related to the dependent variable (candidate evaluation) will not be controlled. Random assignment effectively “washes out” individual differences so that each experimental group is likely to contain a similar distribution of individual differences. The need to assign our subjects to groups based on what they actually looked at runs the risk that individual difference factors will not be controlled for. To address this we examined our treatment groups as detailed below, finding that only age differed across groups and then only for one group.

man” would be viewed as a positive trait.¹² Endorsements could also be readily determined to carry positive or negative valence, based on the subject’s own expressed group preferences (as measured in the pre-experiment questionnaire.) If a disliked group endorsed a liked candidate, this was incongruent, while a liked group endorsing the candidate would be clearly congruent.

Coding issues as congruent or incongruent is a little more complicated. For each issue used in the campaign, eight different positions were created which could then be assigned to any of the candidates as the simulation progressed. Once a position was assigned, that candidate consistently took that position. We were then able to calculate the distance between the subject and the candidate on a standard 7-point liberal - conservative scale for each individual issue. Where a subject was randomly assigned to receive an incongruent issue item for a liked candidate, the computer attempted to assign the most distant available issue position to that candidate. For a congruent issue item, the computer picked the closest available position from the set of all positions.¹³ The opposite procedure was used to assign issues to disliked candidates, so that a congruent issue was distant from the subject and an incongruent one close.

Subjects in Group 1 where candidate issue positions were not manipulated to be

¹² An initial set of trait statements was independently evaluated by three research assistants, who coded them as positive or negative. Only statements that were agreed to be positive or negative by all three coders were actually used in the study.

¹³ The issue position ratings were obtained by giving the list of positions to several graduate students and faculty members in the University of Iowa Political Science department. Each person coded all the items and the final rating was the average rating across all coders. The subject’s placement was self-reported during the questionnaire at the beginning of the study.

During the experiment before the first poll was administered and the manipulation began, positions were assigned to candidates as the subject selected pieces of information to read. Since these positions could not be changed after the subject had viewed them, the fewer options were available for the computer to choose from when executing the manipulation. In effect, the strength of the manipulation was attenuated when only a less distant position was available to assign to the candidate.

congruent or incongruent could still conceivably encounter some amount of incongruent information because congruency is based on subject-candidate issue agreement. Many voters have inconsistent ideologies, more liberal or conservative on some issues than others, so these subjects were bound to disagree with even their favorite candidate at times. To account for this, we manually coded items for these subjects as congruent or incongruent based on the actual candidate-subject issue distance. In these cases only, issues closer than 3.5 points on the liberal-conservative scale were coded as congruent and issues 3.5 or more points away were coded as incongruent, though tests of other cut points make no significance difference in the results.

Finally, to calculate the percentage of incongruent information each subject encountered over the entire campaign, we divided the total number of incongruent items the subject viewed by the total number of items that that we could have manipulated for that candidate. For analytical purposes we then grouped subjects into quartiles based on the actual percentage of incongruent information they encountered. In addition, a group that never encountered any incongruent information was also defined, giving us five analysis groups of subjects based on levels of overall incongruency. This better represents what actually happened, but also runs the risk of interfering with the benefits of random assignment. A comprehensive examination of subject characteristics shows little difference between the analysis groups on individual difference factors, with one exception. Subjects in the “no incongruency” group were significantly older (50.3 years compared to a range of 42.5 to 45.4 for the other four groups.)¹⁴

¹⁴ This difference by age is almost certainly a factor of both the tendency of older people to search less information overall and cognitive limitations of aging (Lau and Redlawsk, 2008). Because the experimental manipulation provided the potential to access incongruent information, but did not require subjects to do so, older subjects who typically looked at less information would be more likely to fail to choose enough information to generate the incongruency, so they would be more likely to be in the “no incongruency” group. Hence the fact that the mean age of that group is higher.

But education, race, gender, and political expertise do not vary systematically with the calculated incongruency groups. It is worth noting that we have no theoretical reason to believe that our dependent variable – candidate evaluation – is related directly to age itself.

Results

The Interaction of Affect and Candidate Evaluation

We turn first to our primary interest, candidate evaluation.¹⁵ The first part of Hypothesis 1 suggests an attitude strengthening effect in the face of a small amount of negative information about a liked candidate. To test this we examine evaluations of the most liked candidate at each of the three polls during the campaign. The results are displayed in Figure 2 displaying subjects' evaluations of their most liked candidate over time by level of incongruency. It is immediately clear that subjects experiencing differing amounts of incongruent information evaluated their most liked candidate differently. Subjects who saw no incongruent information at all tended to rate their most liked candidate higher by the last poll (though by a relatively small amount.) This is certainly no surprise. However, attitude strengthening effects are quite clear for those encountering small amounts of incongruency (Groups 1 and 2). These subjects also show an increase in evaluations during the campaign, *despite the fact that they were encountering negative information about the most liked candidate*. Let us make this point clear. Those who encountered in the range of 20% negative information (Group 2) about their most liked candidate rated that candidate at almost exactly the same level as those who never encountered any incongruent information at all. And those encountering a little bit of incongruency – about 10%

¹⁵ While we manipulated both the highest and lower rated candidates, we focus in this analysis only on the candidate most preferred (highest rated) in the first poll, after which the manipulation of congruency began. We would expect some similar effects (though reversed) for a disliked candidate; however it may also simply be that voters ignore a disliked candidate once they establish the evaluation. Available space also precludes us from this examination.

(Group 1) - actually became more positive about their most liked candidate.

[Insert Figure 2 about here.]

On the other hand, subjects in the third and fourth incongruency groups (from 40-80% exposure to incongruent information) do seem more accurate as they consistently rated their initially liked candidate lower over time. As we suggested, at some point attitude strengthening effects appear to be overcome by the weight of incongruent information. Eventually, those who support a candidate must (and do) revise their support in the face of the facts. So while motivated reasoning may be operating initially, it does not go on forever in the face of accumulating evidence, lending support to our theoretical perspective of a hybrid updating process. Eventually the data overcomes the prior affective evaluation.

Looking at the results a different way, Figure 3 plots the relationship of incongruency and candidate evaluation specifically at the time of the second poll. The pattern is strikingly similar to the one hypothesized in Figure 1. The mean evaluation of the most liked candidate is higher for subjects experiencing a small amount of incongruent information than for those who see no incongruent information at all. Again, this should not be the case if subjects are using a “rational” updating process. Subjects appear to resist changing their initial opinions of candidates and even strengthen their existing preference in the face of relatively low levels of incongruent information. However, once voters begin experiencing higher levels of incongruent information they begin to update their evaluation to more accurately reflect the negative things they have learned about their favorite candidate.

[Insert Figure 3 about here]

Motivated Reasoning

It is well established that information that does not violate expectations is more easily

processed than information that does. Encountering unexpected information piques our interest and forces us to concentrate more on it, compared to information that simply confirms expectations. Multiple explanations for this phenomenon have been advanced, including affective intelligence's dual affective systems (Marcus, et al., 2000), Petty and Cacioppo's (1981; 1983) central vs. peripheral routes, and hot cognition's interaction of existing affect and new information (Taber and Lodge, 2006; Redlawsk, 2002). For our purposes this provides a good manipulation check to determine if our subjects processed the information coded as incongruent differently than congruent information.

We examined the amount of time subjects took to read incongruent information for their most liked candidate and compared it to the time they took to read congruent information for the same candidate. Initially we simply compared mean processing time for each type of information across our subjects. The results show that processing time for congruent information was less than incongruent information ($M_{\text{congruent}} = 6.35$ seconds, $M_{\text{incongruent}} = 6.99$, $t = 2.187$, 1797 df, $p < .03$.)¹⁶ As it turns out however, information items in the dynamic process tracing system may be of different lengths. Obvious the longer the item, the longer it will take to read. So the analysis must also control for the number of words in the item and the individual subject's reading ability, measured as the time it took to read a set of instructions. A regression analysis controlling for these factors is shown in Table 1. The result is clear. Even after controls are applied, the congruency of an item affects the length of time it takes to process it. On average, incongruent items take more than half a second longer to process, all else equal.

¹⁶ While we are not examining disliked candidates in this paper, we see the same effect of processing time for those candidates as well. Congruent information (negative information about a disliked candidate) is processed much faster (6.3 seconds compared to 7.1 seconds for incongruent.) The t-test is significant at $p < .02$. These results replicate the findings in Redlawsk (2002).

[Insert Table 1 about here]

The candidate evaluation results support our argument about the form of the updating process, with an initial increase in evaluations in the face of a small amount of negative information, followed by more accurate updating as incongruity builds. And our processing time analysis suggests that incongruent information takes longer to process. But are we seeing motivated reasoning as such? And do increasing levels of anxiety correlate with the downturn in evaluations? Our process tracing data gives us the ability to examine both of these possibilities.

We can look to the memories our voters report as one indicator of motivated reasoning. Motivated reasoners attempt to maintain their affective evaluations in the face of unexpected information. One way in which they may do this is to use bolstering – to recall to memory factors which support the existing evaluation and which may then overwhelm the new incongruent information.¹⁷ If this happens, memory for these attitude-supporting attributes may be enhanced, as repeated access to a concept increases the likelihood that the concept will be remembered (Fisk and Taylor, 1981.) We can examine the likelihood that our subjects recalled positive (enthusiastic) memories as a function of the amount of incongruity encountered. If we find that small amounts of incongruent (negative) information increase positive memory, we will have evidence that motivated reasoning is in fact at work.

Figure 4 plots the level of incongruity by the mean number of reported memories for each group. The results almost perfectly support our expectations. Subjects who saw a small

¹⁷ Let us be clear about this process. We do not suggest that this is cognitively driven at the start. Bolstering itself is a by-product of the associative nature of memory (Anderson, 1983) and hot cognition (Lodge and Taber, 2005). In activating the construct stored for the candidate (and the affect associated with it) other connected memory nodes are also activated. Since we are dealing with positively evaluated candidates, most of these associations are also positive. As memory nodes are activated they are more likely to be recalled when later tested. The net result is that more positive memory traces should be evident when negative information stimulates processing since incongruent information is processed more carefully than congruent information (Redlawsk, 2002.).

amount of negative information about their most liked candidate (Group 1, about 10%) report more positive memories and more overall memory than any other group, including those who never encountered incongruent information (Group 0). Further, those in Group 2 (about 20% incongruent) also reported more positive memory than those learning only positive information about their liked candidate. It is not until the extreme levels of incongruency that positive memories for the initially liked candidate begin to decline. We take this as evidence of a motivated reasoning process leaving memory traces from bolstering.

[Insert Figure 4 about here]

Affective Intelligence

What about once evaluations begin to adjust more accurately in the face of large amounts of incongruent information? What causes this change, this tipping point? Hypotheses 3a and 3b tests the claim of affective intelligence that more anxious voters are better voters (Marcus, et al, 2000.) If anxiety is increasing as incongruency increases, it may be the mechanism that leads to the increasingly accurate updating of evaluations past the tipping point. While we cannot show with certainty that anxiety is the cause, we can see whether or not our subjects express greater negative affect as incongruency increases, and whether they find the task of voting more difficult and as a result have less confidence in their decision.

We have three measures of the impact of the primary election on our voters. First, we asked voters after they had voted to indicate how difficult it was to make a choice between the candidates. Following this they were asked how confident they were that they had chosen the “right” candidate. These two questions were asked on a simple scale from 1-5 coded so 1 was “Very Easy” or “Not at all Confident” and 5 was “Very Difficult” or “Very Confident”. Our third measure comes from a short questionnaire administered at two points in time – before the

experiment, and again after voting, final candidate evaluation, and the memory task, but before the cued recall process. This questionnaire assessed subjects' feelings using the Positive and Negative Affect Scale (PANAS) developed by Watson, Clark, and Tellegen (1988).¹⁸ These measures are examined to determine whether the amount of incongruent information encountered is related to the difficulty of the choice, confidence, and the overall level of negative affect generated by the campaign.

Figure 5 presents a summary of both the difficulty and confidence measures by incongruency group and Figure 6 presents the assessment of change in overall negative affect from beginning to end of the campaign. All three point in the same direction. As levels of incongruent information increase so do difficulty and negative affect, while confidence decreases, but only up to a point. Subjects encountering the greatest incongruency about their most liked candidate actually report less negative affect, an easier decision, and greater confidence at the conclusion of the campaign than those at somewhat lower levels of incongruency. We speculate that this may be because those subjects essentially made peace with the fact that their most liked candidate was just not what they thought he was. Examining vote choice, this seems plausible, as voters in the highest incongruency group were less than 20% likely to vote for the candidate they originally preferred, well below all other groups. As negative affect reached high enough levels, our subjects began to reassess their initial evaluations as Hypotheses 3a and 3b suggested they would.

[Insert Figure 5 and Figure 6 about here]

¹⁸ The PANAS instrument, prefaced by asking subjects to indicate how they felt at that specific point in time, requires subjects to rate twenty affective words on a scale of 1 to 5 with 5 indicating that the word strongly described their current feeling. These words include markers of both positive and negative feelings. For our analysis we created a scale of the negative affect words representing an "anxious" state.

Calculating an Affective Tipping Point

It appears that our intuition is right. Our data establishes patterns suggesting an updating process consistent with a hybrid of motivated reasoning ultimately overcome by a return to reality. Voters do not evaluate candidates in a vacuum; existing candidate preference plays a strong role in later evaluations, but not in so straightforward a way. Instead, voters start by resisting small amounts of negative information about a candidate they like. But, given enough “bad stuff” about a liked candidate, voters begin to adjust. We can calculate the point mathematically – at least in our experiment – where the tipping occurs, the point at which our voters turn from motivated reasoners to more accurate updaters. The relationship between incongruence and candidate evaluation approximates a quadratic form (Figure 3), so a model examining the *change* in subjects’ evaluations would be calculated at the first derivative of the quadratic. To that end, we specify a linear model to test for the effects of the amount of incongruence on updating evaluations. The x-intercept of this linear model, if our hypothesis is correct and the amount of incongruence is a significant predictor, is the tipping point at which, on average, subjects begin to accurately update – that is *lower* – their evaluation of the liked candidate in the face of negative information. We should note here that the establishment of such a tipping point is our goal in this paper, not a detailed analysis of the conditions under which such a point occurs. It is possible – in fact likely – that in a partisan election, strength of partisanship would play a significant role in a motivated reasoning, as would any factor strengthening (or weakening) an initial affective evaluation. Future research can examine this, and other possibilities. For now we simply wish to show that the theorized evaluation process in fact is supported in the data.

This tipping point model is very simple, and includes the actual amount of incongruent information subjects were exposed to – that is, the amount they actually encountered, rather than the incongruency groups we constructed for the earlier analyses – and candidate evaluation at the first poll (since the manipulation did not begin until after this poll.) We also include a number of subject characteristics to see whether obvious individual difference factors – age, gender, education, political expertise – condition the tipping point.¹⁹ We test both the main effects and interactions of these factors with the amount of incongruency. We predict the *change* in evaluation between the initial poll and the final poll taken just before the end of the campaign. In order to find the tipping point we will need to solve the resulting equation for the point at which the slope of the quadratic becomes zero – the tipping point.

The initial OLS model fully specified as above (not shown) finds neither main effects nor interaction effects for subject gender and education. Somewhat unexpectedly, age shows main effects with older subjects significantly more likely to show more positive change in their evaluation over time, all else equal, but this is independent of the amount of incongruency. Expertise does not quite reach significance for main effects, but the interaction between expertise and incongruency is significant and positive, showing that experts hold on to their initial positive evaluation of the liked candidate for longer than non-experts in the face of negative information.

Table 2 reports a parsimonious model of change in evaluations as conditioned by incongruency, dropping the highly non-significant variables from the original model. Thus we

¹⁹ Age and education are entered in years, gender and political experts are dummy variables, with experts defined as those in the top 25th percentile of expertise among all subjects. Expertise is measured as a combination of political knowledge, interest, and activity, as recorded on the pre-simulation questionnaire. Specification of models with different conceptions of expertise – a median split, or the top 1/3 – finds no effects, suggesting that only at very high levels of expertise are voters more likely to hold on to their evaluations – that is to be less likely to adjust initial evaluations in the face of incongruent information. This is an interesting finding worth greater exploration, but space precludes that investigation here.

have the following:

$$(1) \quad \begin{aligned} \text{Change} = &-.167(\text{Pct.Incongruent}) - .344(\text{FirstPollRating}) + 5.974(\text{Top25\% Expert}) \\ &-.164(\text{PctIncongruent} * \text{Top25\% Expert}) + .114(\text{Age}) + 21.224 \end{aligned}$$

Setting expertise to zero we can calculate the tipping point for the lower 75th percentile of expertise by substituting the mean initial poll rating for liked candidates (68.8) within this group and their mean age (40.8), leading to:

$$(2) \quad \text{Change} = -.167 * (\text{Pct.Incongruent}) + 2.21$$

Solving for the x-intercept we set $\text{Change} = 0$:

$$(3) \quad \begin{aligned} 0 = &-.167 * (\text{Pct.Incongruent}) + 2.21 : \\ \text{PctIncongruent} = &13.23 \end{aligned}$$

Thus we find that in this dataset, the 141 subjects in the lower 75th percentile of expertise examined about 13% negative information on average about a liked candidate before reaching a tipping point and beginning to update in the normatively correct direction. We should note that prior to this point as they examined negative information about their most liked candidate, their evaluations of that candidate *increased* on average, so it is important to note that the accurate updating that begins once the tipping point is reached starts from a more positive evaluation than the initial evaluation.

[Insert Table 2 about here]

But when we turn to the group in our study that is most expert about politics – those in the top 25th percentile, something interesting happens. Using the same calculation approach substituting the average age of this group (53.64) and their initial liked candidate rating (70.3) we find that these 47 most expert subjects examine on average *twice as much* incongruent information (27.1%) before reaching the tipping point. Where the affective intelligence thesis suggests that these increasing levels of incongruency ought to lead to learning and thus accurate

updating, and where we might expect experts to be especially good at seeing and responding to the incongruity, nothing could be further from the truth. Instead experts seem to have particularly sticky initial evaluations, and work to defend them against countervailing information for much longer than do those with less political expertise. Thus while all voters appear to be subject to motivated reasoning effects to some degree or another, experts seem especially so.²⁰ This finding would suggest a fruitful area for future research.

Discussion

Motivated reasoners strive to maintain existing evaluative affect, even in the face of countervailing information. This effect has been well established in the literature (Kunda, 1990) and replicated here. Thus where we would expect “rational” voters to approximate normatively correct updating, motivated reasoners show evidence of attitude strengthening, becoming even more positive about a liked candidate in the face of negative information about that candidate. And while the voters in our experiment show heightened negative affect and evidence that the choice becomes more difficult as incongruity grows, they also show attitude strengthening effects as motivated reasoning predicts. But for the first time we show clear evidence that these effects do not necessary continue under all circumstances. At some point our voters appear to wise up, recognize that they are possibly wrong, and begin making adjustments. In short, they begin to act as rational updating processes would require. Why? We argue that our results are consistent with the idea that as anxiety increases (leading to more difficulty in the decision and less confidence) voters pay closer attention to the environment (and processing time increases). This allows them to begin more carefully considering new information and potentially overriding

²⁰ While it is not the purpose of this paper to look closely at the role of political expertise in candidate evaluation, this finding fits into the general results reported by Lodge and Taber (2005) that political experts are more subject to motivated reasoning, rather than less.

affective expectations. Such a process would be consistent with the expectations of affective intelligence.

While the findings in this study are robust, it is worth keeping in mind the limitations as well. The study is experimental, the environment in which our voters operated, while having many of the key features of a real world election environment, certainly was not a real campaign. Experimental control meant our candidates were made up, and while our subjects told us the candidates engaged them and seemed quite real, no subject knew anything about them before the study. Further, we limited ourselves to a primary election, thus negating any effects that partisan identification might have. We would expect, for example, that strong partisans in a general election would have a very high tipping point, at least compared to non-partisans. Likewise, ideologues, as opposed to moderates, might also be harder to move off their initial support for a candidate very close to them. We do not test either of these possibilities here. Yet while our environment is not a real election, we believe that the psychological processes our subjects engage in their attempts to learn about and evaluate candidates are really no different whether in the laboratory or in the midst of a “real” campaign. Voters learn about candidates, assess whether the new information fits with their expectations, and in some fashion ultimately create and update evaluations in both environments.

Thus we are led to believe that the role of affect in candidate evaluation is not a matter of either/or. Voters are not either motivated reasoners or rational processors. Instead, as our experiment demonstrates, voters can be both depending on the information environment in which they are operating. When the amount of incongruency is relatively small, the heightened negative affect does not necessarily override the motivation to maintain support for a candidate in which the voter is already positively invested. But as V. O. Key (1966) noted four decades ago, voters

are not always fools. An affective tipping point exists at which existing positive evaluations give way to a newly understood reality – the candidate is just not what he or she seemed to be at first.

If voters are, in fact, somewhat immune to some amount of negative information about their favored candidates, what are the implications in the real political world? Should candidates not worry about minor mess-ups, flip-flops, and fleeting scandals, or is the atmosphere of the modern campaign already so negative that most voters are pushed way past the tipping point months before Election Day? A closer look at the modern campaigning environment might help answer that question, but the fact remains that for a while at least, a candidate's early supporters will probably resist attempts to change their minds. Candidates who need to win new voters without alienating their bases should be able to lean to the middle, as long as they don't lean too far. However, in a real campaign where prior beliefs about candidates are long standing and based on much more information than subjects in our study were exposed to early on, reaching the affective tipping point will require substantially more negative information than our subjects encountered. It is easy to imagine a long-time fan of a presidential candidate rejecting virtually all new negative information about him or her and sticking to an early evaluation. Yet even such a fan might, in the face of overwhelming information counter to expectations, awake to the changed reality and revise her beliefs accordingly. It might just take an awful lot of negative information to generate enough anxiety and uncertainty to make this happen.

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Figure 1
Expected Effects of the Amount of Incongruent Information on
Evaluation of a Liked Candidate

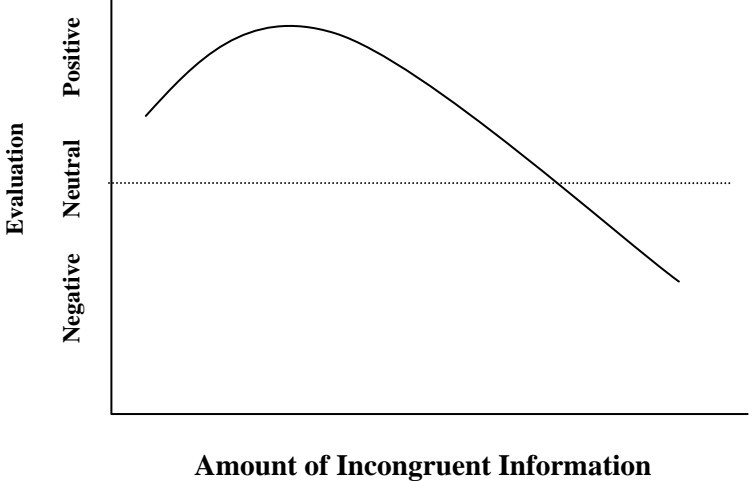


Figure 2
Evaluations of Liked Candidate over Time
by Levels of Incongruity

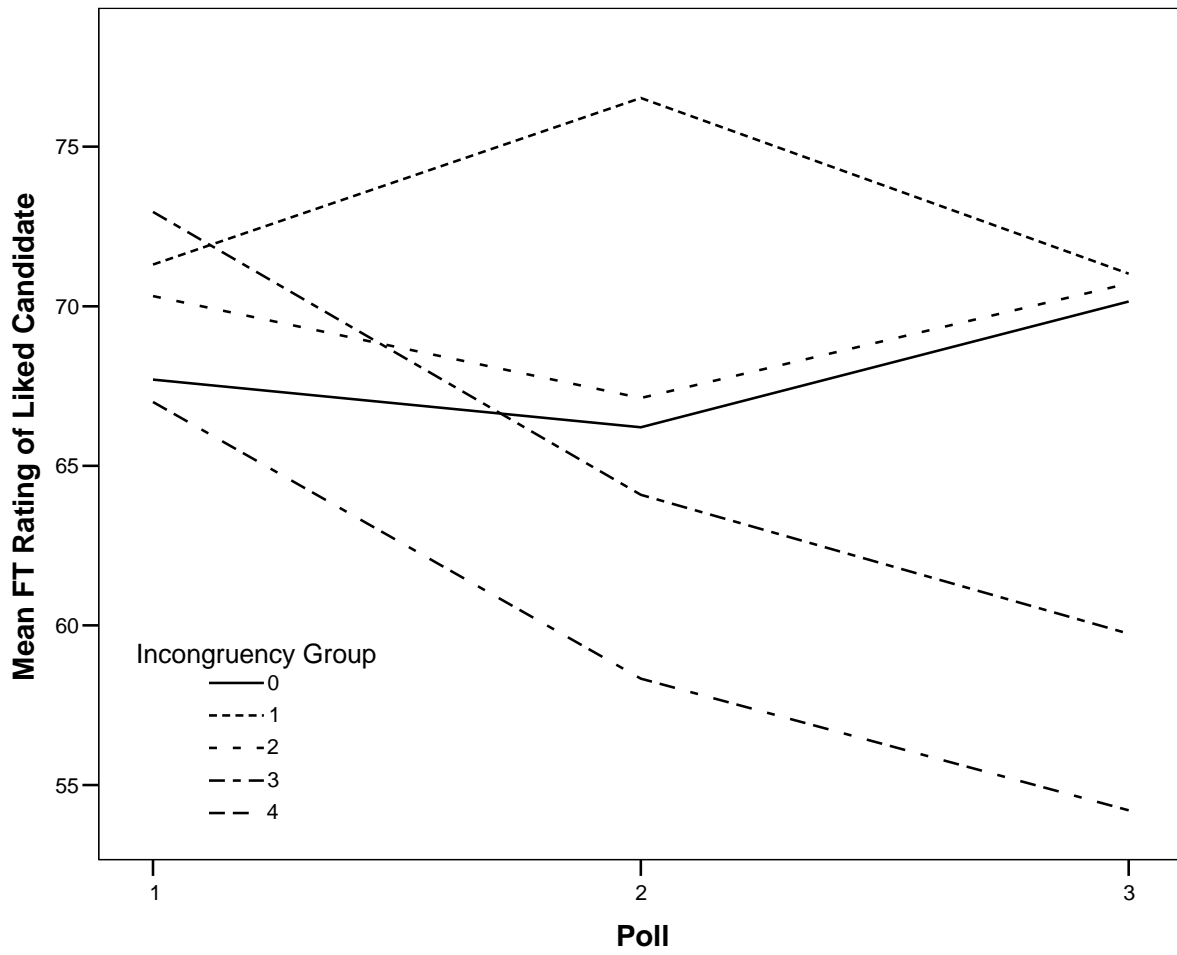


Figure 3
Evaluation of Liked Candidate by Levels of Incongruity at Second Poll

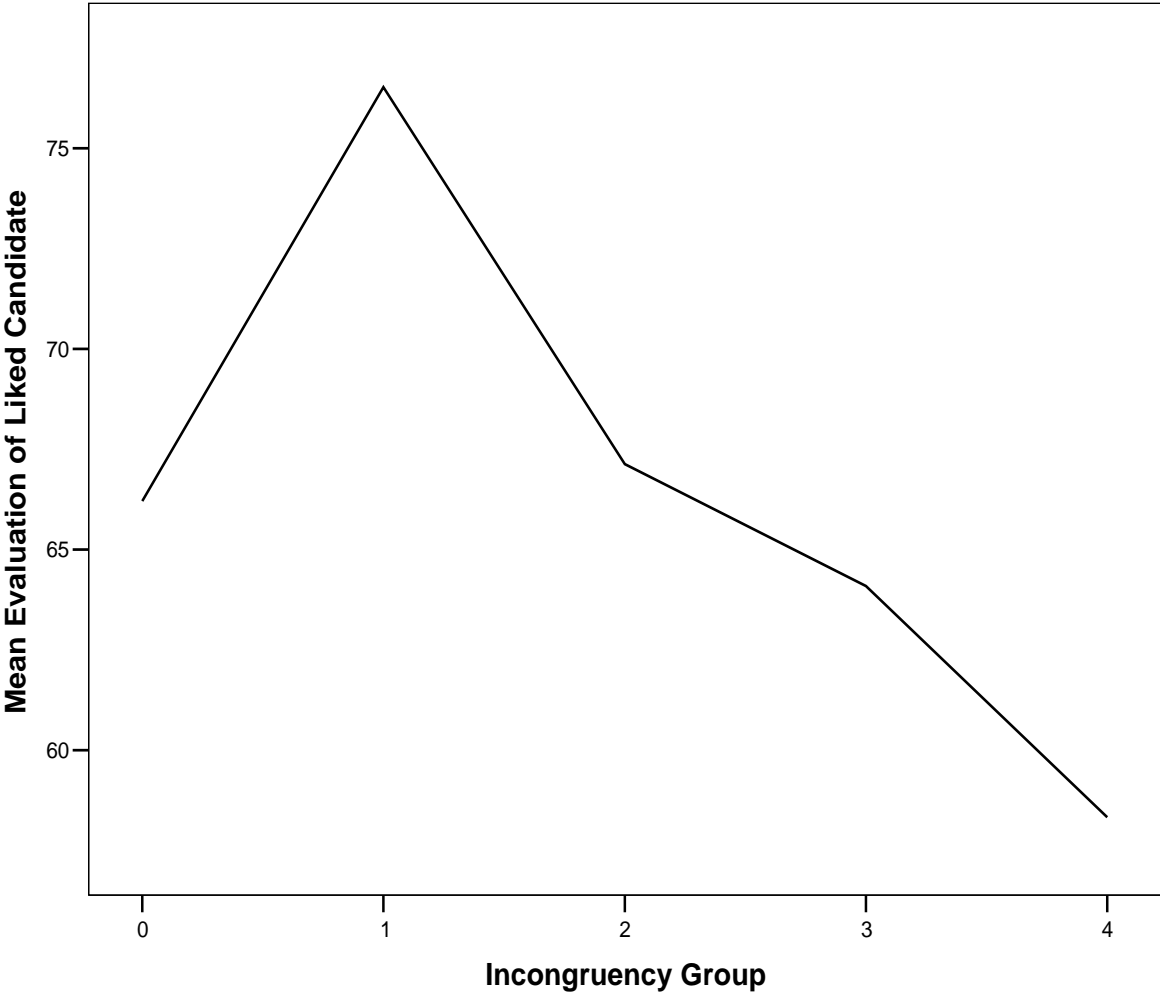


Figure 4
Incongruity and Memory for a Liked Candidate

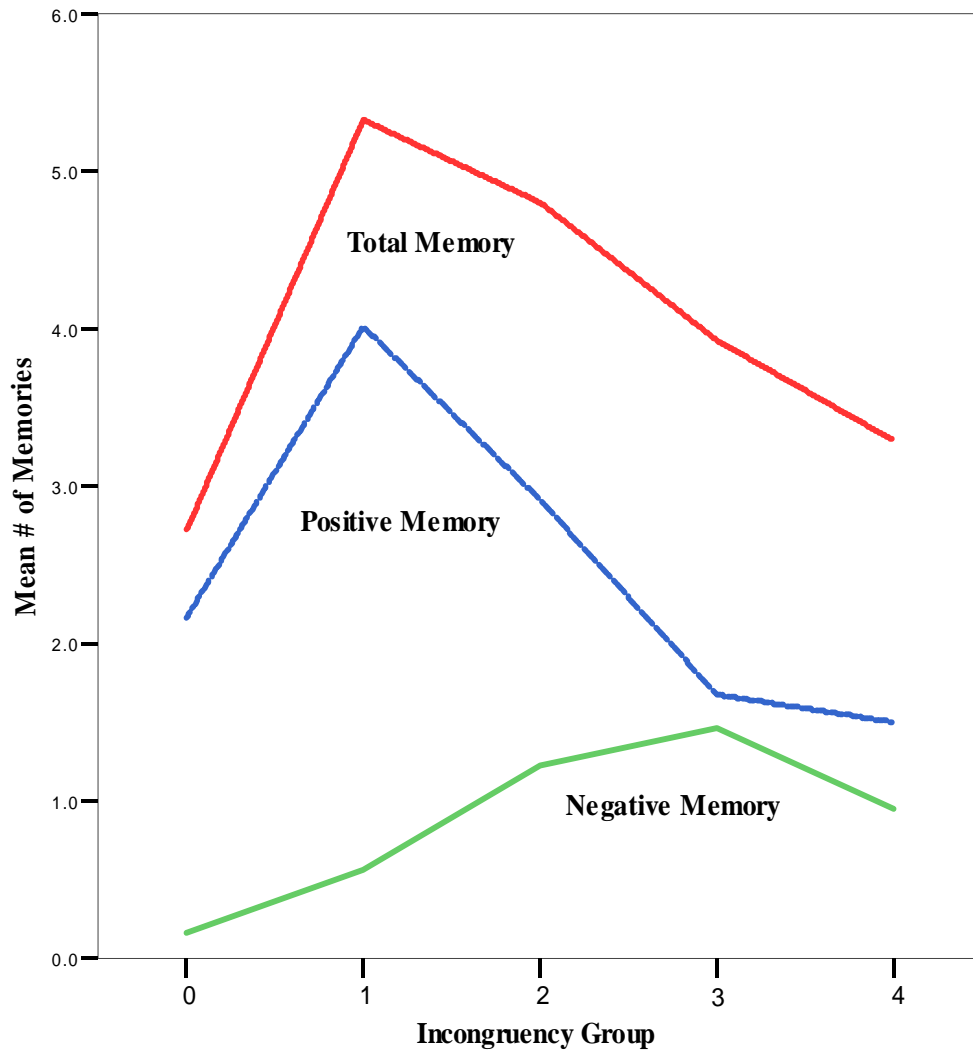
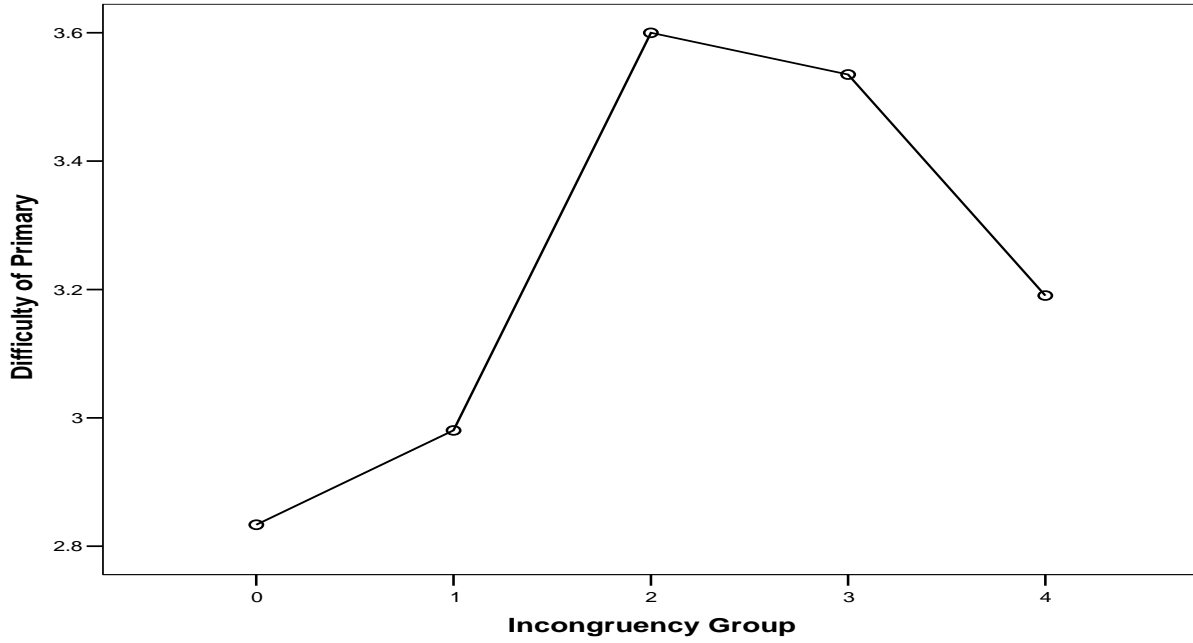


Figure 5

Reported Difficulty of Primary Decision
by Levels of Incongruity



Reported Confidence in Primary Decision
by Levels of Incongruity

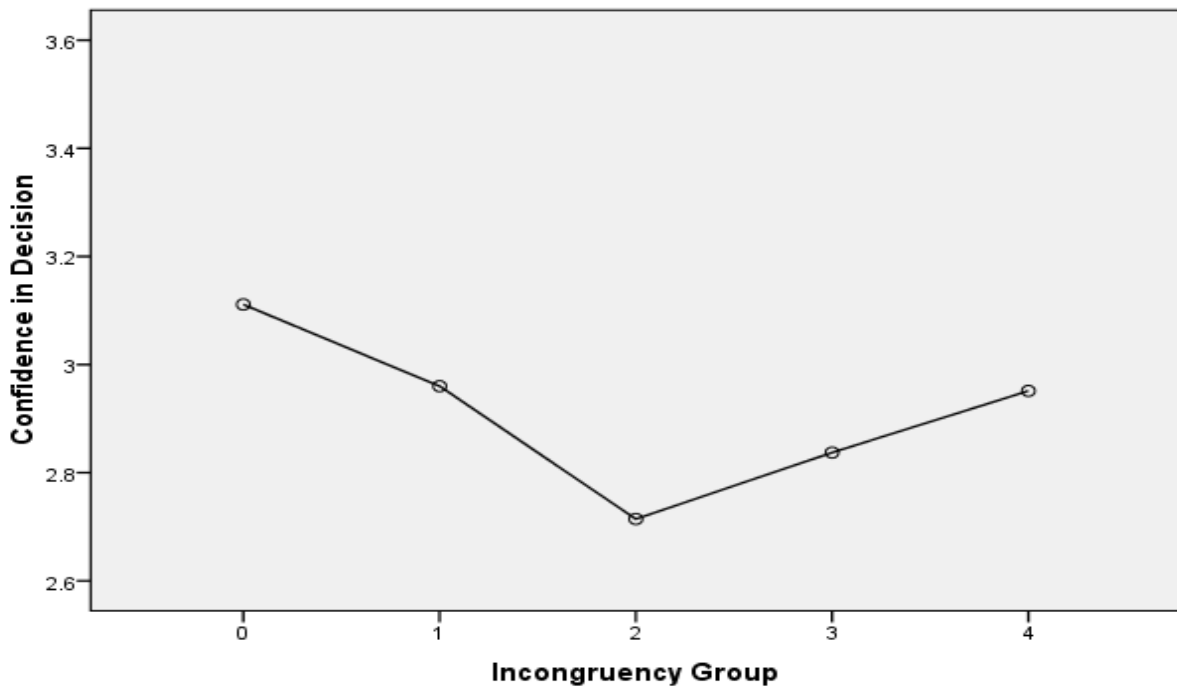


Figure 6

**Reported Negative Affect at End of Campaign
by Levels of Incongruency**

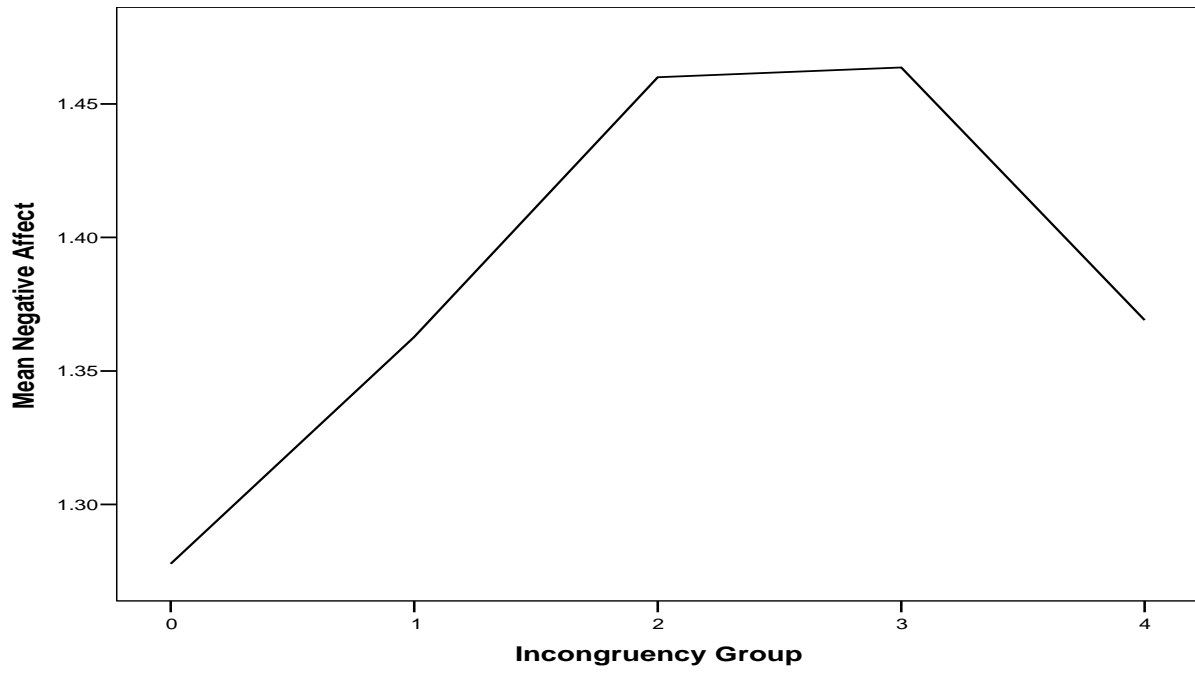


Table 1
Processing Time for Congruent and Incongruent Information
Most Liked Candidate

Predictor	B	SE
Information Incongruency (1=Congruent)	-.637***	.228
# Words in Item	.154***	.006
Reading Speed	-.401***	.012
Constant	4.257***	.343
Adj R ²	.487	

* p<.1, **p<.05, ***p<.01

Table entries are un-standardized OLS coefficients and Standard Errors. N=1587 Items.

Table 2
Change in Evaluation for a Liked Candidate

Predictor	B	SE
PctIncongruent	-.167**	.042
Top 25% Expert	5.974	4.296
Top 25% Expert * PctIncongruent	-.164*	.061
Age	.114*	.070
FirstPollRating	-.344***	.085
Constant	21.224***	6.852
Adj R ²	.207	

* p<.1, **p<.05, ***p<.01

Table entries are un-standardized OLS coefficients and Standard Errors. N=187.