



Beyond rational judgment : a test of the affect heuristic hypothesis  
by Aaron Sargent Richmond

A thesis submitted in partial fulfillment of the requirements for the degree of Master of Science in  
Applied Psychology  
Montana State University  
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**Abstract:**

Finucane, Alhakami, Slovic, and Johnson (2000) postulated that we use affect as a heuristic to guide our decision process. The present study attempts to test Finucane et al.'s (2000) affect heuristic hypothesis. Finucane et al. (2000) suggested that there are affective tags assigned to a given object and we use those tags to subsequently guide our judgments. One hundred and forty three introductory psychology students were assigned to one of two conditions, low-time pressure (LP) and high-time pressure (HP). Participants provided judgments on various scenarios (e.g., "The U.S. welfare system needs to change") and were able to access both cognitive and affective information about the scenarios. Participants' use of heuristics was measured using dimensions of the information search process, (e.g. type, frequency and time duration they spend on the given piece of information). Participants' attitude consistency, affective evaluation and global evaluation of a given topic were measured using the semantic differential scale (Crites, Fabrigor, & Petty, 1994). The positive and negative affect schedule (PANAS) was used to measure participants' mood in order to determine the effects of mood on information seeking and memory recall (Watson, Clark, & Tellegen, 1988). Participants in the HP condition accessed more affective information than cognitive information. Participants recalled more affective information than cognitive information. Participants in the HP condition did not make corresponding judgments on the basis of affective information. These results are inconsistent with Finucane et al.'s (2000) results, suggesting that participants do not use affect as the basis for heuristic judgments.

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APPROVAL

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This thesis has been read by each member of the thesis committee and has been found to be satisfactory regarding content, English usage, format, citations, bibliographic style, and consistency, and is ready for submission to the College of Graduate Studies.

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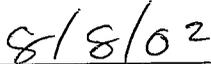
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ABSTRACT

Finucane, Alhakami, Slovic, and Johnson (2000) postulated that we use affect as a heuristic to guide our decision process. The present study attempts to test Finucane et al.'s (2000) affect heuristic hypothesis. Finucane et al. (2000) suggested that there are affective tags assigned to a given object and we use those tags to subsequently guide our judgments. One hundred and forty three introductory psychology students were assigned to one of two conditions, low-time pressure (LP) and high-time pressure (HP). Participants provided judgments on various scenarios (e.g., "The U.S. welfare system needs to change") and were able to access both cognitive and affective information about the scenarios. Participants' use of heuristics was measured using dimensions of the information search process, (e.g. type, frequency and time duration they spend on the given piece of information). Participants' attitude consistency, affective evaluation and global evaluation of a given topic were measured using the semantic differential scale (Crites, Fabrigor, & Petty, 1994). The positive and negative affect schedule (PANAS) was used to measure participants' mood in order to determine the effects of mood on information seeking and memory recall (Watson, Clark, & Tellegen, 1988). Participants in the HP condition accessed more affective information than cognitive information. Participants recalled more affective information than cognitive information. Participants in the HP condition did not make corresponding judgments on the basis of affective information. These results are inconsistent with Finucane et al.'s (2000) results, suggesting that participants do not use affect as the basis for heuristic judgments.

## INTRODUCTION

Every day we make decisions with limited knowledge about given situations. These situations demand a swift and accurate judgment even though they may have severe consequences. Unfortunately, decision makers do not always have the resources or the time to evaluate all aspects of the object in order to make an accurate judgment or decision. When conditions demand swift judgment and provide limited information the heuristics may be used to make a decision. Typically, psychologists refer to heuristics as general problem-solving procedures and heuristics are often regarded as a general rule of thumb as opposed to a specific process of decision making (Best, 2000). For instance, creative experiments designed to test the use of representativeness and availability heuristics identified processes that allow people to make immediate decisions or judgments (Kahneman & Tversky, 1973; Tversky & Kahneman, 1974). These types of heuristics have been extensively researched and have been rigorously applied to multiple situational contexts.

### Affect Heuristic

In a recent study, Finucane, Alhakami, Slovic, and Johnson (2000) found that affect heuristics influenced the judgment of perceived risk and perceived benefits of common technologies (e.g., nuclear power). Finucane et al. (2000) referred to affect as a feeling state that people experience (e.g., happy or sad) or as a quality (e.g., good or bad).

Affect heuristics function to guide a decision based on positive or negative feelings about certain characteristics or images of a given situation (Finucane et al., 2000).

Extending Finucane et al.'s (2000) rationale, Damasio (1994) postulated the somatic marker hypothesis, in which he argued that human thought is primarily made up of images, which consist of perceptual and symbolic representations. Damasio also postulated that positive feelings, negative feelings, or both mark the images we collect over a lifetime, and that these images are connected directly to our somatic or bodily states. Essentially, affect heuristics in judgment and decision making are determined by the positive and negative feelings that we have assigned to certain images pertaining to a decision.

#### Mood, Stereotypes and Information Search

Empirical evidence supports the hypothesis that moods and stereotypes mediate social judgments (Bower, 1981; Devine, 1989). These studies suggest that social judgments may be executed in an automatic fashion. Branscombe and Cohen (1991) found that moods and stereotypes affect social judgments in two specific ways: (a) People may involuntarily activate or seek mood-consistent or stereotype-consistent target qualities, which biases the subsequent judgment, and (b) people use an affective tag associated with the target as a judgmental shortcut, to evade assessment of the target information. That is, people use an affect heuristic to make social judgments.

Bower and Forgas (1991) interpreted the impact of mood on social memory using an associative network approach. Specifically, people store information about a given

target using a corresponding affective connotation (e.g., positive, negative, or neutral). The association becomes stronger as repeated exposures occur (as long as they are the same as the initial affective evaluation). More importantly, people produce an evaluative response through a "How do I feel about it?" heuristic. The findings from Bower and Forgas's (1991) study support the affect heuristic hypothesis.

Studies have demonstrated that mood may influence memory and judgment (Isen & Means, 1983). Niedenthal and Showers (1991) suggested that affective reactions to information bias how the information is interpreted. Isen, Shalke, Clark, and Karp (1978) found that when participants were in a particular affective state (e.g., negative or positive mood) and information was presented as consistent with their affective state, recall was enhanced. Therefore, affect may determine the type of information recall, affect the interpretation of information, and guide the use of heuristics (Niedenthal & Showers, 1991). These two studies illustrate the integral role that affect plays in decision making processes.

### Affect and Attitude

Previous research suggests that affect plays an important role in the formation of attitudes. In particular, attitudes are structured by three components: behavior, cognition, and affect (Cacioppo, Petty & Geen, 1989; Zajonc & Markus, 1982; Zajonc, 1980). The latter component is of most interest as it pertains to the affect heuristic. Affect as a basis for attitudes refers to a person's feelings or emotions that he or she associates with a given attitude object. Research has suggested that people will change their attitude only

when the associated attitude is weak, the argument to change the attitude is strong, or both (Forgas, 2001). Attitudes may be measured by the consistency between the affective component and the cognitive component (Chaiken & Baldwin, 1981). This research suggests that inconsistent attitudes are more amenable than consistent attitudes to persuasive arguments (e.g., a person's cognitive component is at odds with his or her affective component). Consequently, in order to predict whether a persuasive argument will be effective it is important to determine the affective and cognitive consistency of attitude. Crites et al.'s (1994) modified semantic differential scale measures both the affective and cognitive components of attitudes.

#### When Do People Use Heuristics?

Payne, Bettman, and Johnson (1988, 1993) suggested that people have a toolbox of decisional strategies. In order to adopt a given decisional strategy, persons assess situations in the context of costs and benefits of using one strategy over another. Costs are defined as the cognitive effort needed to make a decision and benefits are defined as degree of accuracy needed to make the decision. This cost-benefit model may be bypassed in certain situations (Payne et al., 1988, 1993). For example, Gigerenzer and Todd (1999) suggested that when limited time and limited knowledge constrain decisions, the cost-benefit model may not hold. Consequently, in situations in which there is limited time and limited knowledge, people tend to use heuristics.

### Demonstrating the Use of Heuristics

Gigerenzer and Todd (1999) proposed a process oriented approach that specifies the importance of assessing the information search involved in the decision process; specifically, the amounts of information people seek, type of information, frequency of information, and the duration of time a particular piece of information may be assessed. Additionally, Gigerenzer and Todd postulated that when people use heuristics, they spend less time on irrelevant information, more time on information that seems pertinent to the decision, and are limited in their search. In the present study, aspects of information search were measured using an information board presented on a computer screen. An information board is a matrix of information arranged by different objects (e.g. three different software companies). On the x-axis and on the y-axis are shared characteristics of those companies (e.g., company share price, number of employees, share capital). Participants are allowed to click on information for different companies and different characteristics of those companies. Only one piece of information may be accessed at a time, but participants may view any given piece of information numerous times. The information is only visible when a participant clicks on that particular square of the matrix. The frequency, duration spent on information, and type of information that is accessed will be recorded by the computer program (cf. Gigerenzer & Todd, 1999).

## PILOT 1

Pilot 1 was conducted to determine which topics would not have an attitudinal bias. That is, if a topic like abortion is measured on a Likert scale from 1 (*good*) to 7 (*bad*) and most participants respond toward the *bad* anchor of the scale, then the distribution is skewed. The shape of the distribution is important because if a topic is attitudinally skewed or biased then participants who hold for example, negative attitudes toward abortion may not be influenced by positive information, this pre-test eliminates a confounding factor. Out of the 20 topics chosen for Pilot 1, 2 will be used in Pilot 2 and in the main experiment.

### Method

#### Participants

A total of 53 introductory psychology students (23 males and 30 females), from Montana State University participated in for partial course credit. Participants ranged from 18 to 34 years of age.

#### Materials

Participants were provided with both consent and debriefing forms. Pilot 1 was conducted on the software program Media Lab. Media Lab allows the participant to respond to questions via computer and the software records each answer. Participants completed all measures on personal computers using Media Lab software.

## Procedure

Participants read 20 statements and made a global assessment regarding the statement (e.g., "Nuclear power is a valuable source of energy"). Participants rated these statements on 7-point Likert scales, with the anchors from 1 (*strongly disagree*) to 7 (*strongly agree*). All statements were counterbalanced using the Latin square technique.

## Results

To assess the distributions of each global assessment, the skewness and kurtosis of response distributions were evaluated (see Table 1). The topics gun control, welfare, Electoral College, and food preservatives were among the most normally distributed,

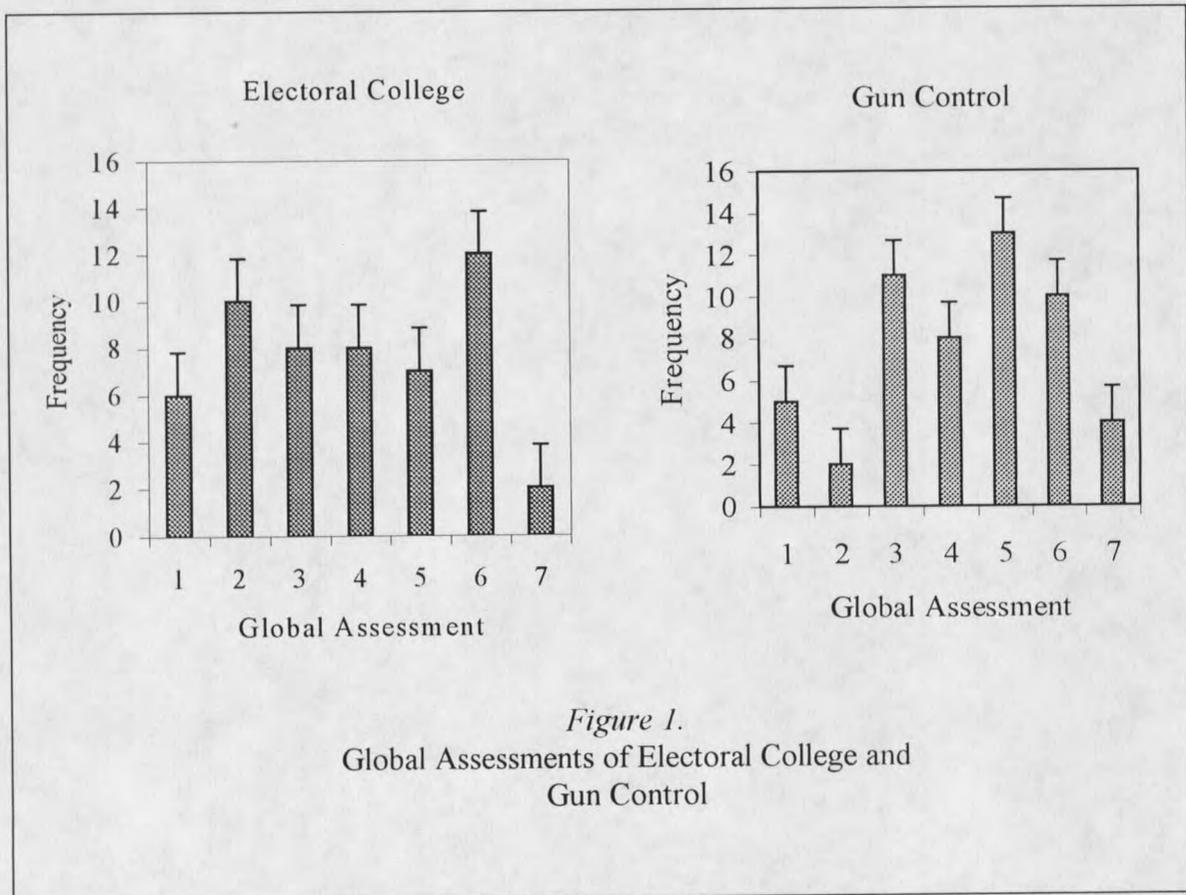
Table 1. Global Assessment of Various Topics

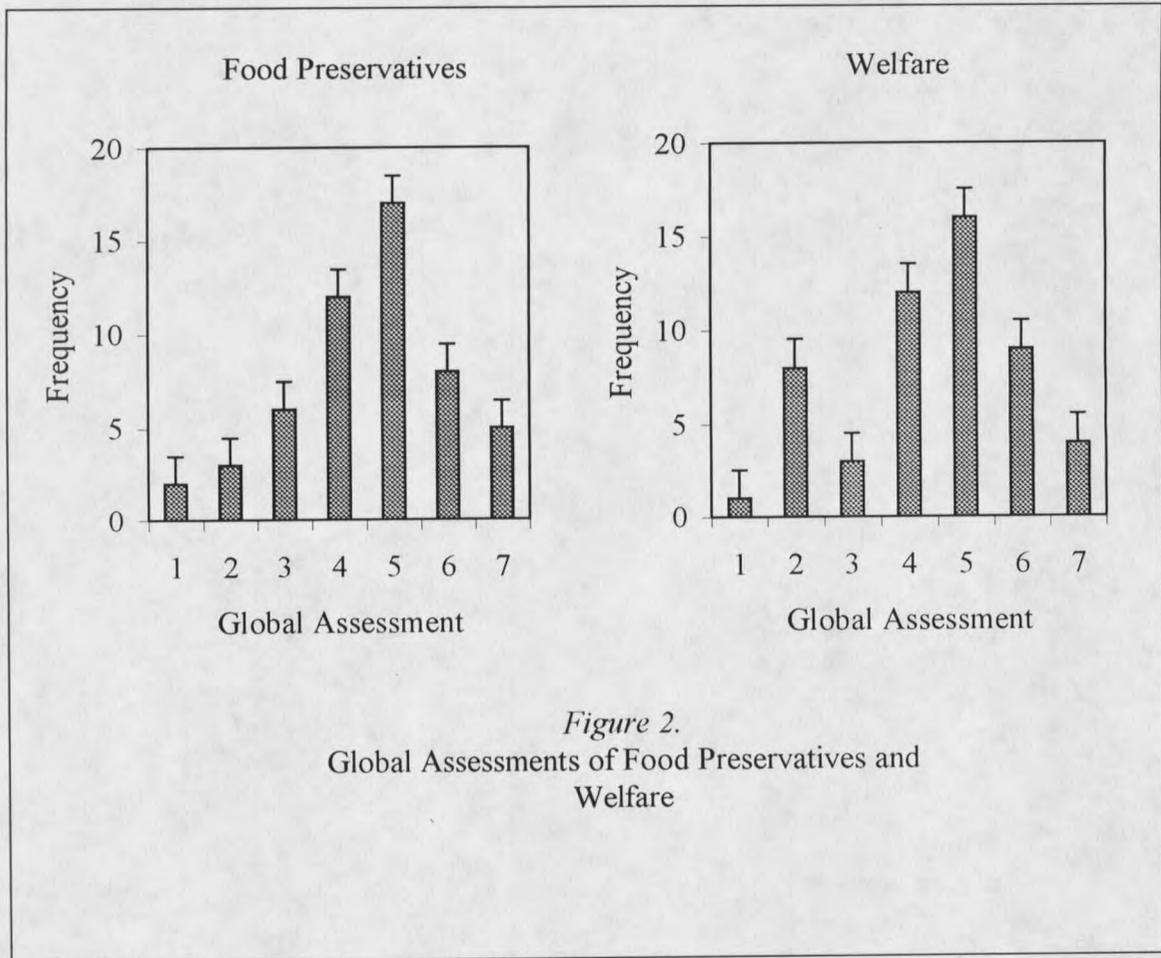
| Topic                | N  | M    | SD   | Skewness | Kurtosis |
|----------------------|----|------|------|----------|----------|
| Capital Punishment   | 53 | 5.19 | 1.71 | -0.81    | -0.38    |
| Electoral College    | 53 | 3.83 | 1.83 | -0.01    | -1.28    |
| Family Planning      | 53 | 5.81 | 1.71 | -1.68    | 2.16     |
| Gay Rights           | 53 | 5.34 | 2.30 | -1.06    | -0.49    |
| Gun Control          | 53 | 4.28 | 1.69 | -0.37    | -0.61    |
| Hydro-Electric Dams  | 53 | 5.49 | 1.45 | 1.04     | 1.03     |
| Logging Industry     | 53 | 3.47 | 1.74 | -0.41    | -0.71    |
| Monopolies           | 53 | 2.13 | 1.27 | 1.73     | 4.01     |
| Natural Gas Industry | 53 | 5.26 | 1.27 | -0.52    | 0.08     |
| Euthanasia           | 53 | 3.75 | 2.03 | 0.08     | -1.36    |
| Food Preservatives   | 53 | 4.57 | 1.47 | -0.43    | 0.02     |
| Nuclear Energy       | 53 | 4.64 | 1.58 | -0.68    | 0.04     |
| Recycling            | 53 | 6.25 | 1.02 | -1.20    | 0.76     |
| Religion             | 53 | 4.38 | 1.98 | -0.20    | -1.01    |
| Solar Energy         | 53 | 5.36 | 1.19 | -0.60    | 0.13     |
| Stock Market         | 53 | 4.70 | 1.08 | -1.05    | 1.67     |
| TV Industry          | 53 | 5.09 | 1.38 | -0.64    | -0.27    |
| Abortion             | 53 | 4.96 | 2.38 | -0.68    | -1.23    |
| Affirmative Action   | 53 | 4.70 | 1.45 | -0.40    | 0.26     |
| Welfare              | 53 | 4.45 | 1.53 | -0.38    | -0.53    |

Note: Scores centered around 4.00 on the mean score represent a neutral global assessment of that topic. Scores on both the skewness and kurtosis measure that are centered on 0.00 represent normality.

with the least amount of kurtosis and skewness. To determine which of these four topics would be used in Pilot 2, it was necessary to assess the distributions on each individual topic and compare them on the basis of normality.

As illustrated in Figure 1 and Figure 2 food preservatives was the most normally distributed, yet it is improbable that negative or positive affective information could be believably created to manipulate affect. Thus, gun control and welfare, which were also normally distributed and showed minimal kurtosis and skewness, were used in Pilot 2.





*Figure 2.*  
Global Assessments of Food Preservatives and  
Welfare

## PILOT 2

Pilot 2 was conducted to determine the specific amount of time that constitutes high and low time pressure conditions. Pilot 2 was also conducted to pre-test negative and positive affective statements and cognitive statements regarding welfare and gun control. It is necessary to pre-test these statements to determine whether participants interpret a statement as either factual or affective to eliminate the possibility of ineffective manipulations.

### Method

#### Participants

A total of 49 male and female introductory psychology students (26 females and 23 males) at Montana State University participated for partial course credit in this study. Their ages ranged from 17 to 34.

#### Materials

Participants were provided with consent forms and debriefing forms. Eight IBM compatible computers with the laboratory software program Media Lab and Mouse Lab was used to record answers for each questionnaire.

#### Procedure

Media Lab allows the participant to respond to questions via computer and the software records each answer. Mouse Lab is the software program that presents the previously mentioned information board. The program records information search

pattern (e.g., frequency, time duration and search order). Mouse Lab also can be programmed to only allow the participant to view an information board for a given amount of time. Participants were asked to view an example of the information board, access every piece of information on the board, and read each piece of information thoroughly. Times were measured in milliseconds by the Mouse Lab software. As a manipulation check, participants were then asked to recall as much information as possible to evaluate whether they understood the information. Next, participants rated 10 negative affective statements, 10 positive affective statements, 10 cognitive statements, 8 negative affective attribute titles, and 8 cognitive attribute titles on 7-point Likert scales, on both the respective topics established in Pilot 1 (see Appendix A for list of statement examples). For example, participants were given a statement (e.g., "Because of the bureaucratic red tape I had a hard time filling out the paperwork and my family and I did not receive our welfare check this month"), which is considered a negative affective welfare statement. Participants were asked to rate each statement on two measures. The first measure assessed the affective connotation (affective rating) of the statement and the second assessed the cognitive connotation (cognitive rating) of the statement. Affective ratings were anchored from 1 (*slightly emotional or not at all*) to 7 (*extremely emotional*). Cognitive ratings were anchored from 1 (*slightly factual or not at all*) to 7 (*extremely factual*). These two measures determined whether participants viewed the information in the information board as affectively or cognitively based. Participants evaluated the ease of use of the information board and all the respective instructions.

### Results

In order to determine which cognitive statements would be used in the experiment, paired sample *t* tests were conducted comparing the cognitive rating and the affective rating for each topic (see Table 2 and Table 3). Each pair presented in Tables 2 and 3 represents the cognitive rating subtracted from the affective rating for that specific statement. That is, participants rated each statement for cognitive content and for emotional content.

Table 2. Paired Sample *t* test on Cognitive Statements of Welfare

| Statement Number | Mean Difference | SE   | <i>t</i> | df |
|------------------|-----------------|------|----------|----|
| 1                | 0.96            | 0.28 | 2.78***  | 48 |
| 2                | 0.96            | 0.35 | 1.67**   | 48 |
| 3                | 0.67            | 0.33 | 2.05*    | 48 |
| 4                | 0.59            | 0.27 | 2.16*    | 48 |
| 5                | 0.55            | 0.32 | 1.72     | 48 |
| 6                | 1.27            | 0.29 | 4.43***  | 48 |
| 7                | 0.37            | 0.30 | 1.21     | 48 |
| 8                | 0.12            | 0.23 | 0.52     | 48 |
| 9                | 0.57            | 0.28 | 2.04*    | 48 |
| 10               | 1.08            | 0.27 | 3.94***  | 48 |

*Note:* Each statement is comprised of the difference between one cognitive rating regarding welfare and one affective rating about an individual statement regarding welfare. \*\*\*  $p < .01$ , \*\*  $p < .05$ , and \*  $p < .10$ .

As shown in Table 2, the following statements were rated significantly more cognitive than affective: Statement 1, Statement 2, Statement 6, and Statement 10. These four statements were used in the main experiment as the cognitive statements regarding welfare.

As shown in Table 3, the following statements were rated significantly more cognitive than affective: Statement 2, Statement 3, Statement 5, and Statement 6. These four statements were used in the main experiment as the cognitive statements regarding gun control.

Table 3. Paired Sample *t* test on Cognitive Statements of Gun Control

| Statements Number | Mean Difference | <i>SE</i> | <i>t</i> | df |
|-------------------|-----------------|-----------|----------|----|
| 1                 | 0.70            | 0.25      | 2.78**   | 48 |
| 2                 | 0.90            | 0.28      | 3.17**   | 48 |
| 3                 | 1.43            | 0.33      | 4.26***  | 48 |
| 4                 | 1.02            | 0.34      | 2.98**   | 48 |
| 5                 | 1.27            | 0.31      | 4.09***  | 48 |
| 6                 | 1.41            | 0.32      | 4.37***  | 48 |
| 7                 | 0.12            | 0.29      | 0.43     | 48 |
| 8                 | -0.19           | 0.25      | -0.72    | 48 |
| 9                 | 0.47            | 0.23      | 2.06*    | 48 |
| 10                | 0.33            | 0.29      | 1.12     | 48 |

*Note:* Each statement is comprised of the difference between one cognitive rating regarding gun control and one affective rating about an individual statement regarding gun control. \*\*\*  $p < .01$ , \*\*  $p < .05$ , and \*  $p < .10$ .

Paired sample *t* tests were conducted to determine which positive affective statements would be used in the Experiment for both the gun control and welfare topics. For gun control statements, cognitive ratings were subtracted from affective ratings on each of the 10 tested statements creating a mean difference between the two ratings. Results of positive affective statements regarding gun control and welfare are presented in Table 4 and Table 5 respectively.

Table 4. Paired Sample *t* test on Positive Affective Statements of Gun Control

| Statements Number | Mean Difference | <i>SE</i> | <i>t</i> | df |
|-------------------|-----------------|-----------|----------|----|
| 1                 | -0.12           | 0.27      | -0.48    | 48 |
| 2                 | -0.06           | 0.26      | -0.24    | 48 |
| 3                 | 0.67            | 0.31      | 2.16**   | 48 |
| 4                 | -0.20           | 0.24      | -0.85    | 48 |
| 5                 | 0.97            | 0.30      | 3.24***  | 48 |
| 6                 | -0.53           | 0.30      | -1.42*   | 48 |
| 7                 | 0.00            | 0.27      | 0.00     | 48 |
| 8                 | 0.53            | 0.31      | 1.69*    | 48 |
| 9                 | -0.57           | 0.24      | -2.43**  | 48 |
| 10                | 0.41            | 0.23      | 1.77*    | 48 |

*Note:* Each statement is comprised of the difference between one cognitive rating regarding gun control and one affective rating about an individual statement regarding gun control. \*\*\*  $p < .01$ , \*\*  $p < .05$ , and \*  $p < .10$ .

As shown in Table 4, the following statements were rated significantly more affective than cognitive: Statement 3, Statement 5, Statement 6, and Statement 9. These four positive affective statements regarding gun control were used in the main experiment.

Table 5. Paired Sample *t* test on Positive Affective Statements of Welfare

| Statement Number | Mean Difference | <i>SE</i> | <i>t</i> | df |
|------------------|-----------------|-----------|----------|----|
| 1                | -0.82           | 0.25      | -3.26**  | 48 |
| 2                | -0.84           | 0.26      | -3.16**  | 48 |
| 3                | -0.10           | 0.27      | -0.37    | 48 |
| 4                | -0.33           | 0.23      | -1.42    | 48 |
| 5                | -0.47           | 0.23      | -2.06*   | 48 |
| 6                | -0.43           | 0.19      | -2.30*   | 48 |
| 7                | -0.22           | 0.23      | -0.96    | 48 |
| 8                | -0.65           | 0.22      | -2.98**  | 48 |
| 9                | -0.94           | 0.26      | -3.22**  | 48 |
| 10               | -1.10           | 0.27      | -4.09*** | 48 |

*Note:* Each statement is comprised of the difference between the cognitive rating regarding welfare and the affective rating about an individual affective statement regarding welfare. \*\*\*  $p < .01$ , \*\*  $p < .05$ , and \*  $p < .10$ .

As shown in Table 5, the following statements were rated significantly more affective than cognitive: Statement 1, Statement 2, Statement 9, and Statement 10. These four positive affective statements regarding gun control were used in the main experiment.

To determine which negative affective statements would be used for both topics, paired sampled *t* tests were performed comparing the cognitive rating versus the affective rating on 10 statements of each respective topic. Tables 6 and 7 represent the results of these *t* tests.

Table 6. Paired Sample *t* test on Negative Affective Statements of Gun Control

| Statement Number | Mean Difference | SE   | <i>t</i> | df |
|------------------|-----------------|------|----------|----|
| 1                | -1.63           | 0.27 | -5.94*** | 48 |
| 2                | -0.51           | 0.24 | -2.09*   | 48 |
| 3                | -0.71           | 0.24 | -2.95**  | 48 |
| 4                | -0.53           | 0.30 | -1.78    | 48 |
| 5                | -0.86           | 0.22 | -3.83*** | 48 |
| 6                | -0.49           | 0.26 | -1.89    | 48 |
| 7                | -0.08           | 0.27 | -0.30    | 48 |
| 8                | -0.73           | 0.28 | -2.59*   | 48 |
| 9                | -0.71           | 0.24 | -2.99**  | 48 |
| 10               | -0.14           | 0.27 | -0.52    | 48 |

Note: Each statement is comprised of the difference between the cognitive rating regarding gun control and the affective rating about an individual affective statement regarding gun control.  
 \*\*\*  $p < .01$ , \*\*  $p < .05$ , and \*  $p < .10$ .

As indicated by Table 6, participants rated the following statements as more affective than cognitive: Statement 1, Statement 3, Statement 5, and Statement 9. These

statements were used in the main experiment as the four negative affective statements regarding gun control.

Table 7. Paired Sample *t* test on Negative Affective Statements of Welfare

| Statement Number | Mean Difference | SE   | <i>t</i> | df |
|------------------|-----------------|------|----------|----|
| 1                | -0.55           | 0.28 | -1.95    | 48 |
| 2                | -0.67           | 0.26 | -2.61*   | 48 |
| 3                | -0.90           | 0.31 | -2.99**  | 48 |
| 4                | -1.33           | 0.26 | -5.04*** | 48 |
| 5                | -0.82           | 0.27 | -2.97**  | 48 |
| 6                | -0.00           | 0.25 | 0.00     | 48 |
| 7                | -1.06           | 0.32 | -3.34**  | 48 |
| 8                | -1.39           | 0.29 | 4.84***  | 48 |
| 9                | -0.90           | 0.30 | -2.95**  | 48 |
| 10               | -0.71           | 0.32 | -2.26*   | 48 |

*Note:* Each statement is comprised of the difference between the cognitive rating regarding welfare and the affective rating about an individual affective statement regarding welfare. \*\*\*  $p < .01$ , \*\*  $p < .05$ , and \*  $p < .10$ .

As shown in Table 7, participants rate the following statements as more affective than cognitive: Statement 3, Statement 4, Statement 5, and Statement 8. These statements would be used in the main experiment for negative affective statements regarding welfare.

In order to determine the time duration for low-time pressure and high-time pressure conditions, participants viewed two information boards pertaining eight blocks of information each and were instructed to read each block carefully only once. Participants were also instructed that they would be tested on the material at the end of the experimental session. Times, in milliseconds, were recorded indicating for how long

each box was open and the total amount of time elapsed from the time participants opened the first box to the time they closed the last box. The negative welfare matrix results indicated that participants took an average of  $M = 140.6$  s, ( $SD = 24.0$  s) and the positive gun control matrix results suggest that participants took an average of  $M = 136.4$  s, ( $SD = 20.8$  s). Reading time for the matrix in the high-time pressure (HP) condition was calculated by subtracting 1.5 SD's from the mean reading time as determined by pilot 2. Reading time for the matrix in the low-time pressure (LP) condition was calculated by adding 1.5 SD's to the mean reading time as determined by pilot 2 (see Finucane et al. 2000).

## EXPERIMENT

The experiment was designed to demonstrate the use of the affect heuristic in two evaluative judgment tasks (e.g., "Would you vote for or against the installation of a nuclear power plant in your community?"). The main objective of the study was to link the use of affective information with the use of heuristics. The study also investigated whether or not participants use heuristics and affective information to guide their judgments. Pilot 1 determined which topics to use in Pilot 2. Pilot 2 determined the average time it takes to evaluate the information on the information board, which in turn determined the allotted time for both HP and LP conditions. Pilot 2 also determined which affective statements (both positive and negative) and which cognitive statements would be used in the experiment for each respective topic. The following are the predicted effects for the experiment:

### Hypotheses

*Hypothesis 1:* Participants in the HP condition will access more affective information than cognitive information, and participants in the LP condition will access more cognitive information than affective information.

*Hypothesis 2:* Compared to participants in the LP condition, participants in the HP condition will base their judgments of topic value relatively more on affective information and provide a corresponding judgment (e.g. negative affective laden information will produce a negative judgment).

*Hypothesis 3:* Compared to participants in the LP condition, participants in the HP condition will recall relatively more affective information than cognitive information.

## Method

### Participants

A total of 143 introductory psychology students (56 males and 87 females) at Montana State University, participated for partial course credit. Participants ages ranged from 18 to 53 years of age.

### Design

The experiment was mixed 2 X 2 design, with time pressure (low vs. high) manipulated between subjects and affective tone (positive vs. negative) manipulated within subjects. The dependent variables were free recall, semantic differential ratings, PANAS scores, evaluative judgments, amount of information accessed, type of information accessed (e.g., cognitive vs. affective information), and the amount of time spent reading information.

### Materials

Participants were provided with participant consent forms and debriefing forms. Eight IBM compatible computers with the laboratory software programs Media Lab and Mouse Lab were used to record answers for each questionnaire.

### Procedure

Participants were randomly assigned to either the LP condition or the HP condition. Participants completed all measures on personal computers. In order to evaluate participant's attitudes towards the manipulated topics on both the cognitive and affective components, as suggested by Crites et al. (1994) (see Appendix C for example), participants completed the semantic differential scale on five different topics (e.g., nuclear power, euthanasia, etc.). These topics were presented in Latin square counterbalanced order and participants made ratings on Likert scales anchored by 1 (*valuable*) to 7 (*worthless*). Among the five topics, gun control and welfare were the critical topics. To measure mood, participants completed the positive and negative affect schedule (PANAS; Watson et al., 1988, see Appendix B for example). Next, participants in both conditions performed a distractor task. During the 5-minute distractor task, participants were instructed to experiment with the mouse and perform various tasks using the mouse (e.g., clicking boxes, moving things with the mouse).

After the distractor task, participants in both conditions were informed that the screen would contain various statements about gun control (e.g., accidents involved with rifles or assault weapons, which would be affective information, and facts about the effectiveness of current gun control laws, cognitive information). They were also instructed not to make an overall judgment until the clock in the lower right hand of the screen ticked down into the red zone and the computer began to beep. Participants in both the LP and HP conditions received one scenario on each topic. Participants in the HP condition received a limited amount of time to access information and perform the

judgment, as determined by Pilot 2, whereas those in the LP condition received ample time to make the judgment.

The information board contained cognitive-based information and either negative or positive affect-laden information (see Appendix A for a list of all affective and cognitive statements for both topics). That is, all participants received the same cognitive information; however, participants received only negative affective information about one topic and only positive affective information about the other topic. Participants were then asked to judge whether they agreed or disagreed with a statement about the topic (e.g. "The United States gun control laws need to change"). After the scenario, all conditions then completed the semantic differential scale a second time. After the end of the first information board, participants were asked to recall as many aspects of the scenario as possible (free recall measure). Manipulation checks were performed for both independent variables (time pressure and type of information). On Likert scales, participants were asked to rate whether they had enough time to read information in the information board screen and whether the information was positive, negative or neutral. Participants were then debriefed (see Figure 3 for diagram of experiment).

## Results

### Manipulation Checks

Time Pressure. To evaluate whether participants felt like they were in a time pressure condition, a one-way between-subjects ANOVA was conducted on the

manipulation check for both information boards. Participants rated each information board matrix on a scale from 1 (*not enough time*) to 7 (*plenty of time*). There was a significant difference between the LP condition ( $M = 4.71, SD = 2.60$ ) and the HP condition ( $M = 2.18, SD = 1.96$ ),  $F(1, 139) = 47.70, p < .001$ . Suggesting that the manipulation of time pressure was successful. That is, participants in the HP condition responded that they did not have enough time to view all of the information, whereas participants in the LP condition responded that they had enough time to view all of the information presented in the matrix.

Affective Information. To evaluate whether participants viewed information in each information board matrix as pertaining to positive or negative affect, separate one-way between-subjects ANOVA's were conducted for each critical topic (e.g., gun control and welfare). Participants were asked to rate each information board matrix on a scale of 1 (*positive information*) to 7 (*negative information*). There was a significant difference between those who received negative welfare information ( $M = 2.37, SD = 2.30$ ) and those who received positive welfare information ( $M = 5.92, SD = 1.25$ ),  $F(1, 39) = 133.25, p < .001$ . There was a significant difference between those who received positive gun control information ( $M = 4.92, SD = 2.71$ ) and those who received negative gun control information ( $M = 3.13, SD = 2.24$ ),  $F(1, 139) = 18.33, p < 0.001$ . Suggesting that when people received negative information, they viewed this information as negative and when participants received positive information they viewed the information as positive, which suggested that the manipulation was successful.

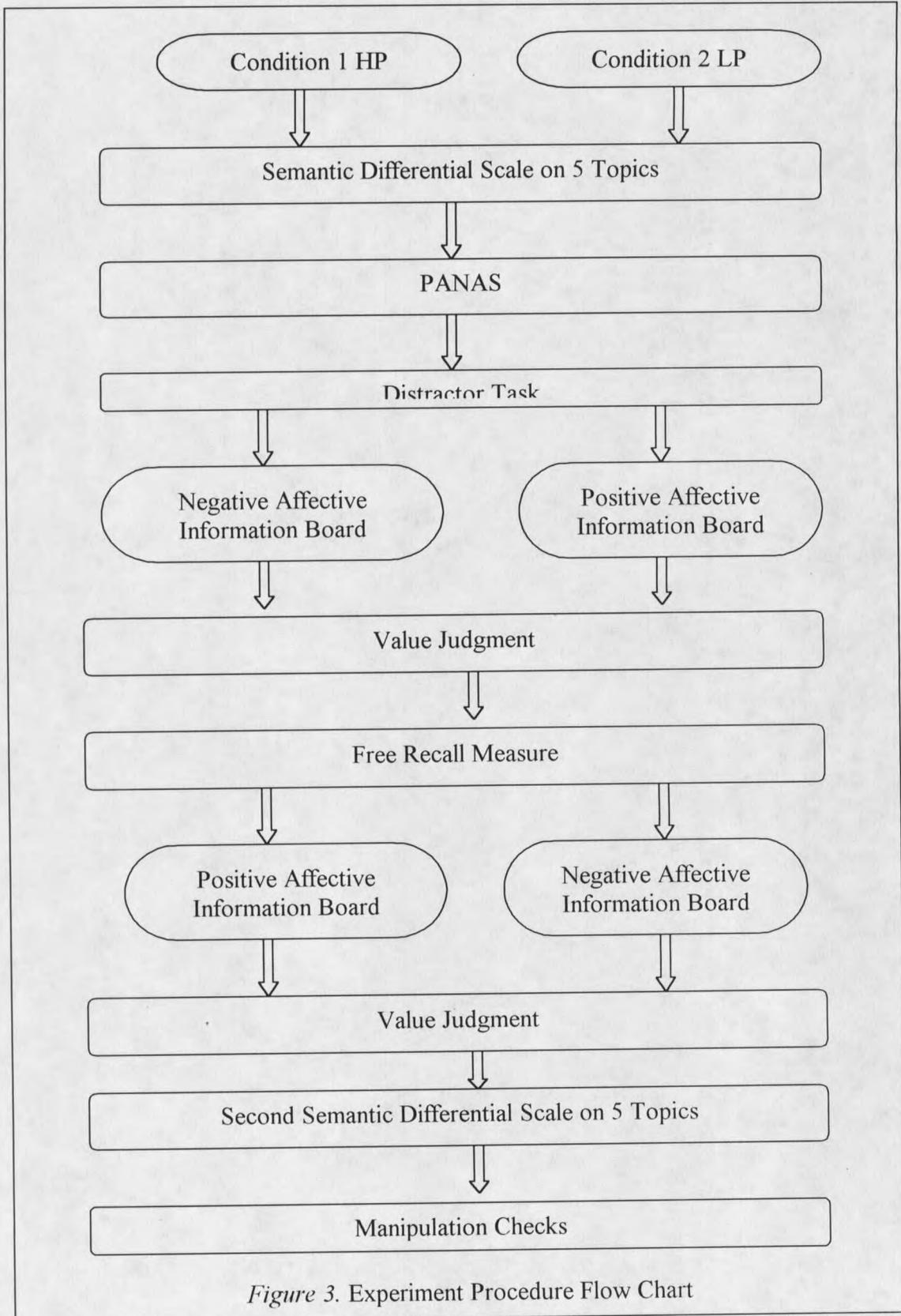


Figure 3. Experiment Procedure Flow Chart

### Hypothesis 1

As stated previously, Hypothesis 1 suggested that participants in the HP condition would access relatively more affective information than cognitive information, and participants in the LP condition would access relatively more cognitive information than affective information. In order to evaluate the amount and type of information accessed between the LP and HP groups, a 2 X 2 mixed-model ANOVA was conducted, with time pressure as the between-subjects and type of information accessed as within-subjects. The results showed no significant main effect of type of information accessed,  $F(1, 141) = 0.85, p = .36$ . Finally, Hypothesis 1 was supported by a significant interaction: Participants in the HP conditions accessed relatively more affective information ( $M = 3.53, SD = 0.82$ ) than cognitive information ( $M = 3.25, SD = 0.89$ ), whereas participants in the LP condition accessed relatively more cognitive information ( $M = 6.95, SD = 2.40$ ) than affective information ( $M = 6.47, SD = 2.06$ ),  $F(1, 141) = 11.64, p = .001, \eta^2 = .08$  (see Figure 4). The effect size listed above is considered a partial  $\eta^2$  (see Green et al., 2000, p. 169). Green et al. (2000) suggests, "the traditional cutoffs of .01, .06, and .14 for small, medium, and large  $\eta^2$  are too large for partial  $\eta^2$ ." Actually, Pearson's  $r$  is typically used as an effect-size indicator and is a special case of  $\eta$ . Effect sizes are identified as small, medium, and large and have a corresponding  $r = .10, .30, \text{ and } .50$ , respectively (Cohen, 1977). Consequently, if there is an  $\eta^2 = .09, \eta = .30$ , this would be what Cohen called a "medium" effect size.

















































