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ATTITUDES AND MEMORY: THE HEURISTIC AND SCHEMATIC FUNCTIONS OF ATTITUDES

The Ohio State University  Ph.D.  1984

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Attitudes and Memory:
The Heuristic and Schematic Functions of Attitudes

DISSERTATION
Presented in Partial Fulfillment of the Requirements for
the Degree of Doctor of Philosophy in the Graduate
School of The Ohio State University

By
Anthony R. Pratkanis, B.S., M.A.

The Ohio State University
1984

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Thomas M. Ostrom

Approved by:

Anthony G. Greenwald
Department of Psychology
A Dedication

Mom, I put a copy of my dissertation next to daddy's coffee cup by the green chair.

--Anthony
ACKNOWLEDGEMENTS

Funding for *Attitudes and Memory* was provided by: National Science Foundation grants SOC74-13436, BNS76-11175, BNS82-17006, National Institute of Mental Health grant MH32317, an O.S.U. Graduate Student Alumni Research Award and a Herbert Toops dissertation prize from the O.S.U. Psychology Department.

I would like to thank the following instructors at Eastern Mennonite College for their contributions to my education: John H. Hess, Galen Lehman, David Glanzer, Vernon Jantzi and especially Titus Bender.

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Four individuals deserve special recognition. The influence of my dissertation advisor, Anthony G. Greenwald, should be readily apparent in this work. Tony's high standards of scholarship are to be admired and emulated. I can't begin to express my gratitude to Steven J. Breckler. He's been a true colleague, and will always be a good friend. This dissertation is dedicated to my parents, Rosemarie Gray and Tony R. Pratkanis. I have them to thank for my positive, unipolar attitude towards scholarship.
VITA

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Education:

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Chapter 1

A History of Attitude and Memory Research

An *attitude* is an evaluative relationship between an individual and an object. This evaluative relationship can be expressed either affectively, behaviorally, or cognitively. An attitude is usually indicated by words such as: oppose/support, like/dislike, pro/con, and accept/reject. Some examples include: I support McGovern; I have a negative feeling towards the draft; I oppose nuclear power; and I am a sports fan.

Attitudes have been found to be important in guiding much of social life. For example, attitudes have been shown to influence behavior (Fazio & Zanna, 1981; Breckler, 1983), to determine social judgments (Sherif & Hovland, 1961), to structure a response to a persuasive message (Greenwald, 1968) and to guide social relationships (Bryne, 1971). The purpose of this dissertation is to explain the role of attitudes in the learning and memory of attitude-related materials. We begin with a description of past research on the influence of attitudes on learning and memory.
1928-1943: Discovery of the Attitude and Selective Learning Effect

Early research. Perhaps the first study to investigate the effect of attitude on memory was conducted by Maria Zillig in 1928 (reported in Wallen, 1942). In this study, males and females were asked to read aphorisms that were favorable and unfavorable toward women. In a later recall task, only 37% of the aphorisms recalled by men were favorable towards women whereas 63% of the aphorisms recalled by women were favorable towards their sex. Other early researchers also found that attitudes could influence learning and memory including Watson and Hartmann (1939) using religious statements, Clark (1940) using a story about an independent women, Seeleman (1940) using pictures of Negroes, Edwards (1941) using a message about the New Deal and Wallen (1942) with the self.

Levine and Murphy (1943). In 1943, Levine and Murphy discovered what would become one of the most widely cited attitude and memory effects. In their study, five pro-communist and five anti-communist students read two persuasive messages — one supporting and one denouncing communism. These subjects attempted to reproduce each message immediately after reading it, after further readings (the learning phase) and after various delays without further study (memory phase). Figure 1 (adapted from Levine and Murphy) shows the average number of correctly recalled ideas for both types of messages and subjects. The results indicated superior learning and memory for material that agreed with the subjects' attitudes — an attitude and selective learning effect.

The attitude and selective learning effect defined. An attitude and selective learning effect can be defined as superior memory for newly presented communication content that agrees with one's attitude. (Note: Appendix A contains a definition of the
Figure 1: Results from Levine and Murphy (1943). Average number of pro and con message ideas recalled as a function of attitude. (Results are combined from the learning and memory phases of the study.)
attitude and selective learning effect along with the definition of other terms used in this dissertation. Three patterns of data have typically been taken as evidence for an attitude and selective learning effect. First, it can be expressed as a significant, positive correlation between agreement with a communication and a learning measure (see for example Greenwald & Sakumara, 1967 and Judd & Kulik, 1980). Second, both the communications and subjects can be classified as either favorable or unfavorable towards the attitude object. In this case an attitude and selective learning effect is represented by a positive correlation between attitude and learning measures for favorable messages and a negative correlation for unfavorable messages. In studies using materials on both sides of an issue, an interaction between subject attitude and message direction tests for the attitude and selective learning effect (see for example studies by Levine & Murphy, 1943 and Jones & Kohler, 1958). Finally, some studies (for example Clark, 1949) have used content analysis of recall protocols to indicate an attitude and selective learning effect. In this dissertation the first two indicators will be used to test for attitude and selective learning effects.

Overview of previous research. After its discovery, research on the attitude and selective learning effect progressed through three more stages — affirmation, questioning, and attempts to reestablish the effect. Table 1 presents a chronological listing of over four dozen research reports investigating the effect of attitude on learning and memory. This Table lists the researchers, subjects, topic, message length, message direction (bias), learning task, memory measure, measurement delay and results of each study.
Table 1
A Review of Attitude and Memory Studies

<table>
<thead>
<tr>
<th>Researchers</th>
<th>Subjects</th>
<th>Topic</th>
<th>Message Length</th>
<th>Message Direction</th>
<th>Learning Task</th>
<th>Message</th>
<th>Measurement Delay</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zillig (1929)</td>
<td>males/females</td>
<td>woman</td>
<td>short aphorisms</td>
<td>anti/pro</td>
<td>recall</td>
<td>???</td>
<td>A/S L effect</td>
<td></td>
</tr>
<tr>
<td>Watson &amp; Hartmann (1929)</td>
<td>atheists/theists</td>
<td>God</td>
<td>20 short paragraphs</td>
<td>anti/pro</td>
<td>message rating</td>
<td>free recall</td>
<td>10-20 minutes</td>
<td>nonsignificant A/S L effect</td>
</tr>
<tr>
<td>Clark (1940)</td>
<td>students</td>
<td>story of a woman</td>
<td>long passage</td>
<td>ambiguous</td>
<td>none specified</td>
<td>free recall</td>
<td>15 minutes &amp; 1, 2, 3, 4 weeks</td>
<td>biased recall</td>
</tr>
<tr>
<td>Seissman (1940)</td>
<td>students</td>
<td>black and white faces</td>
<td>pictures and description</td>
<td>anti/pro</td>
<td>viewing pictures</td>
<td>identification</td>
<td>10 minutes</td>
<td>A/S L effect with black faces only</td>
</tr>
<tr>
<td>Edwards (1941)</td>
<td>pro/anti New Dealers</td>
<td>New Deal</td>
<td>long passage</td>
<td>ambiguous with con/pro statements</td>
<td>intentional</td>
<td>recognition</td>
<td>immediate &amp; 21 days</td>
<td>A/S L effect</td>
</tr>
<tr>
<td>Wallen (1942)</td>
<td>students</td>
<td>the self</td>
<td>adjectives</td>
<td>positive or negative</td>
<td>incidental</td>
<td>free recall</td>
<td>immediate, 48 hours, 7 days</td>
<td>recall agrees with self-concept at delay</td>
</tr>
<tr>
<td>Levine &amp; Murphy (1943)</td>
<td>pro/anti Communists</td>
<td>Cossumers</td>
<td>long message</td>
<td>pro and anti messages</td>
<td>succession of learning trials</td>
<td>free recall</td>
<td>immediate &amp; 4 successive weeks</td>
<td>A/S L effect</td>
</tr>
<tr>
<td>Postman &amp; Murphy (1943)</td>
<td>students</td>
<td>Axis powers</td>
<td>paired-associate</td>
<td>attitude compatible/incompatible</td>
<td>intentional</td>
<td>cued recall</td>
<td>immediate</td>
<td>extreme associates learned best</td>
</tr>
<tr>
<td>Cattell et al. (1930)</td>
<td>married male students</td>
<td>lifestyle issues</td>
<td>short statements</td>
<td>pro/con statements</td>
<td>intentional</td>
<td>free recall</td>
<td>immediate</td>
<td>no effect</td>
</tr>
<tr>
<td>Roheath (1952)</td>
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<td>favorable/unfavorable labels</td>
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<td>recall of labels to faces</td>
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<td>mismatch of labels due to prejudice</td>
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<td>Alper &amp; Korchin (1953)</td>
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<td>coeducation</td>
<td>long message</td>
<td>anti-female terms pro/con statements</td>
<td>intentional</td>
<td>free recall</td>
<td>immediate</td>
<td>partial effect with stereotypes</td>
</tr>
<tr>
<td>Doob (1953)</td>
<td>students</td>
<td>T.V.A., war, short paragraphs advertising, religion, &amp; education</td>
<td>one-directional</td>
<td>evaluative</td>
<td>free recall</td>
<td>2 days</td>
<td>extreme statements recalled best</td>
<td></td>
</tr>
<tr>
<td>Taft (1954)</td>
<td>juvenile delinquents</td>
<td>Negro baseball player</td>
<td>long passage</td>
<td>contained bias phrases</td>
<td>intentional</td>
<td>free recall</td>
<td>immediate &amp; 3 days</td>
<td>superior learning by blacks</td>
</tr>
<tr>
<td>Gerber (1955)</td>
<td>students</td>
<td>Russia</td>
<td>long passage</td>
<td>contained bias phrases</td>
<td>intentional</td>
<td>free recall &amp; recognition</td>
<td>2, 4, 6, 8 weeks</td>
<td>A/S L effect with recognition only</td>
</tr>
</tbody>
</table>
Table 1 (continued)

<table>
<thead>
<tr>
<th>Researchers</th>
<th>Subjects</th>
<th>Topic</th>
<th>Message Length</th>
<th>Message Direction</th>
<th>Learning Task</th>
<th>Measure</th>
<th>Measurement Delay</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jones &amp; Aneashansel (1956)</td>
<td>students</td>
<td>segregation</td>
<td>short statements</td>
<td>pro only</td>
<td>intentional &amp; utility tasks</td>
<td>free recall</td>
<td>immediate</td>
<td>nonsignificant A/S L effect</td>
</tr>
<tr>
<td>Gustafson (1957)</td>
<td>students</td>
<td>history of races</td>
<td>long passages</td>
<td>positive tone</td>
<td>intentional</td>
<td>quiz</td>
<td>immediate &amp; 30 days</td>
<td>A/S L effect with ID as covariate</td>
</tr>
<tr>
<td>Havron &amp; Cofar (1957)</td>
<td>students</td>
<td>Airport-Vernon values</td>
<td>paired-associates</td>
<td>none</td>
<td>intentional</td>
<td>free recall</td>
<td>immediate</td>
<td>marginal attitude reference effect</td>
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<td>Jones &amp; Kohler (1958)</td>
<td>students</td>
<td>segregation</td>
<td>short statements</td>
<td>pro/anti statements</td>
<td>intentional</td>
<td>free recall</td>
<td>immediate</td>
<td>A/S L effect</td>
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<td>Kanungo &amp; Dias (1960)</td>
<td>students</td>
<td>stereotypes adjectives</td>
<td>about castes</td>
<td>favorable &amp; unfavorable</td>
<td>incidental</td>
<td>recall of a self-rating</td>
<td>2 days</td>
<td>favorable on self with accuracy increase with self overlap</td>
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<tr>
<td>Suinn, Osborne</td>
<td>students</td>
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<td>long passage</td>
<td>congenial &amp; uncongenial</td>
<td>incidental</td>
<td>multiple choice test</td>
<td>immediate &amp; 7 days</td>
<td>A/S L effect with ID as covariate</td>
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<td>Fitzgerald &amp; Ausubel (1963)</td>
<td>students</td>
<td>Civil War</td>
<td>long passage</td>
<td>pro-South</td>
<td>intentional</td>
<td>free recall</td>
<td>immediate</td>
<td>no effect</td>
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<tr>
<td>Waly &amp; Cook (1966)</td>
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<td>pro/anti statements</td>
<td>intentional</td>
<td>free recall</td>
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<td>students</td>
<td>Vietnam war</td>
<td>short statements</td>
<td>pro/anti statements</td>
<td>intentional</td>
<td>cued &amp; free recall</td>
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<td>statements in a transcript</td>
<td>pro/anti statements</td>
<td>incidental</td>
<td>free recall</td>
<td>immediate &amp; 2 weeks</td>
<td>no effect</td>
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<td>Halpnes (1969)</td>
<td>students</td>
<td>the draft</td>
<td>long passages</td>
<td>pro/anti passages</td>
<td>intentional, opinion &amp; quality judgments</td>
<td>free recall</td>
<td>immediate &amp; 1 week</td>
<td>A/S L effect for quality group only</td>
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<td>Keysler (1971)</td>
<td>nurses</td>
<td>police brutality</td>
<td>paired-associates</td>
<td>consistent/ inconsistent</td>
<td>intentional</td>
<td>free recall</td>
<td>immediate</td>
<td>consistent aided recall</td>
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<td>God</td>
<td>short statements</td>
<td>pro/anti statements</td>
<td>intentional</td>
<td>free recall</td>
<td>immediate &amp; 3 weeks</td>
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<td>sex roles</td>
<td>video tape</td>
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<td>incidental</td>
<td>identification 10 minutes</td>
<td>errors consistent with stereotypes</td>
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<th>Researchers</th>
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<td>sex roles</td>
<td>trait words &amp; behavior</td>
<td>stereotyped/unstereotyped</td>
<td>incidental</td>
<td>forced-choice recognition</td>
<td>immediate</td>
<td>memory consistent with stereotypes</td>
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<td>feminism</td>
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<td>opinion judgment</td>
<td>recognition</td>
<td>immediate</td>
<td>no affect</td>
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<td>sex roles</td>
<td>pictures</td>
<td>stereotyped/unstereotyped</td>
<td>incidental</td>
<td>recognition</td>
<td>immediate</td>
<td>memory consistent with stereotypes</td>
</tr>
<tr>
<td>Judd &amp; Kolik (1980)</td>
<td>students</td>
<td>women rights</td>
<td>short statements</td>
<td>entire scale of attitudes</td>
<td>agree/disagree &amp; pro/anti</td>
<td>free recall</td>
<td>1 day</td>
<td>attitude-extremity effect</td>
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<tr>
<td>Russell &amp; Jones (1980)</td>
<td>students</td>
<td>E.S.P</td>
<td>short paragraph</td>
<td>pro/anti</td>
<td>incidental</td>
<td>recall test</td>
<td>immediate</td>
<td>marginal results</td>
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<td>student activism</td>
<td>long essays</td>
<td>pro/anti</td>
<td>intentional</td>
<td>free recall</td>
<td>immediate</td>
<td>A/S L effect with pro message only</td>
</tr>
<tr>
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<td>students</td>
<td>capital punishment</td>
<td>short statements</td>
<td>pro/anti</td>
<td>intentional</td>
<td>free recall</td>
<td>21 days</td>
<td>no effect</td>
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<tr>
<td>Drabben et al. (1981)</td>
<td>children</td>
<td>sex roles</td>
<td>video tapes</td>
<td>stereotyped/unstereotyped</td>
<td>incidental</td>
<td>recall of a character name</td>
<td>immediate</td>
<td>memory consistent with stereotypes for younger children only</td>
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<tr>
<td>Tyler &amp; Voas (1982)</td>
<td>political science students</td>
<td>Soviet Union</td>
<td>tape-recorded passages</td>
<td>favorable/ unfavorable tone</td>
<td>evaluative</td>
<td>cued recall &amp; recognition</td>
<td>immediate</td>
<td>favorability results unreported</td>
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<tr>
<td>Zenna &amp; Olson (1982)</td>
<td>students</td>
<td>abortion</td>
<td>short statements</td>
<td>pro/anti</td>
<td>clarity rating</td>
<td>free recall</td>
<td>immediate</td>
<td>no effect</td>
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<tr>
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<td>students</td>
<td>nuclear power</td>
<td>long article</td>
<td>anti-nuclear bias</td>
<td>learning task</td>
<td>recognition</td>
<td>immediate &amp; 1 &amp; 2 weeks</td>
<td>distortions due to attitude after delay</td>
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<tr>
<td>Signorella &amp; Liben (in press)</td>
<td>children</td>
<td>sex roles</td>
<td>pictures</td>
<td>stereotyped/unstereotyped</td>
<td>incidental</td>
<td>recall</td>
<td>immediate</td>
<td>memory consistent with stereotype</td>
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Note: A/S L effect refers to a significant attitude and selective learning effect.
1944-1965: Affirmation of the Attitude and Selective Learning Effect

During the period from around 1944 - 1965, the attitude and selective learning effect occupied a prominent place in social psychology. Krech and Crutchfield (1948) in their introductory textbook state: "A number of experiments can be cited which indicate that people remember better those items which are in accordance with their beliefs and attitudes, than those items which contradict them." (p. 191). They then presented the details of the Levine and Murphy study.

Theoretical explanations. One reason for the popularity of the attitude and selective learning effect is the ease with which many theoretical perspectives could interpret the finding. Six major interpretations of the selective influence of attitudes on learning and memory were promoted during this period.

1. Attitudinal frame of reference: (Watson & Hartmann, 1939; Levine & Murphy, 1943). Attitudes provide a framework or guide for response. Materials that are compatible with an attitude frame of reference are learned quickly whereas those responses that do not fit the frame are not easily made.

2. Bartlett's reconstructive memory: (Clark, 1940; Seeleman, 1940). Attitudes provide a means of reconstructing the past. Individuals have beliefs about the way the world should be. Recall is a construction in support of these beliefs. An attitude and selective learning effect is obtained when the reconstruction overlaps with the learned materials.

3. Freudian theory: (Edwards, 1941; Rokeach, 1952). Any experience that conflicts with the ego's desires (attitudes) will tend to be forgotten more readily. Thus, attitude-incompatible materials are repressed from consciousness. Sometimes the attitude-incompatible materials may escape from the unconscious in the form of "slips
of tongue" or memory distortions.

4. *ego-involvement*: (Alper & Korchin, 1952). Attitude-related material is ego-involving and motivates learning. The task of learning attitude-compatible material is personally meaningful for the subject and is therefore accomplished with greater skill.

5. *drive-reduction hypothesis*: (Doob, 1953). Stronger drives (evoked by attitudes) produce greater recall. Attitude intensity represents a drive that needs to be reduced by learning. Extreme attitudes, as well as agreeable or disagreeable attitudes, can evoke this drive state.

6. *functional approach*: (Taft, 1954; Jones & Aneshansel, 1956; Jones & Kohler, 1958). The learning of attitudinal-related material is influenced by the function it performs for the organism. Under most conditions, the learning of attitude-consistent material is most useful to the individual since it can be used to support one's position.

*Four goals of affirmation research.* During the period of affirmation, attitude and memory research took on four goals.

1. *Generalizing the effect.* Researchers attempted to generalize the attitude and selective learning effect to different topics, subjects, experimental tasks, and memory tests. Messages were presented on such topics as the axis powers, segregation, Russia, advertising, the Civil War, and various ethnic groups. Subjects were given a variety of experimental tasks such as to learn, to evaluate or to just read the messages. Subjects were asked to remember the messages using free recall, cued recall, identification, matching, recognition, or short answer quiz formats. Although studies of this time period generally found at least one effect of attitude on memory, the effect
was often obtained with only one message, with only some of the subjects, in only one treatment, or using a lenient criterion (such as a selective interpretation of a content analysis).

2. **Crucial tests.** A second goal was to test cognitive (for example, frame of reference and reconstructive) versus affective or motivational (for example, Freudian, drive-reduction, and ego-involvement) theories of the attitude and selective learning effect. The two most explicit tests were performed by Garber (1955) and Fitzgerald and Ausubel (1963). Neither study conclusively resolved the issue.

3. **Applications.** Research was also directed at investigating the practical applications of the attitude and selective learning effect. For example, Gustafson (1957) demonstrated that group membership (i.e. having a positive attitude towards one's group) influenced learning in an educational setting. Jewish, Negro, and white Americans were each superior in learning information about their own group.

4. **Producing counter-findings.** A fourth goal of research was to discover the conditions under which the attitude and selective learning effect would not occur. Jones and Aneshansel (1956) suggested that the usefulness of attitude-related material varied as a function of attitude and that this could be moderating the attitude and selective learning effect. In their experiment, pro- and anti-segregation students studied short statements arguing against segregation. Half of the subjects were instructed to learn the statements whereas the other half were told that they would later have to argue against a pro-segregation position. In the learning treatment the attitude and selective learning effect occurred (even though it was not significant). However, an opposite pattern resulted when the utility of the message was reversed by the advocacy task.
Jones and Kohler (1958) suggested that the plausibility of an argument also influenced its utility. Learning agreeable, but implausible statements would be of little value in supporting an attitude. However, learning disagreeable and implausible statements may be of use in derogating the opposition. In the Jones and Kohler study, pro- and anti-segregation students learned pro and anti-segregation statements. When the statements were plausible the expected attitude and selective learning effect was obtained. However, when the statements were implausible a reverse effect occurred.

Other attitude and memory effects. In addition to the attitude and selective learning effect, two other effects of attitude were also obtained during this period. First, attitudes were found to selectively distort memory. For example, Rokeach (1952) found that ethnocentric subjects mismatched surnames with negative connotations to Negro faces in a memory task. Both Clark (1940) and Seeleman (1940) found memory distortions consistent with their subjects' attitudes.

The second effect can be termed an attitude-extremity effect (superior memory for items rated at the extremes of the attitude scale). In a study by Postman and Murphy (1943), subjects recalled more paired-associates describing Axis powers that they had previously rated at the extremes of an attitude scale. Doob (1953) has also found that attitude extremity promoted the recall of persuasive materials.

A null result. An infrequently cited study by Cattell et al. (1950) stands in contrast to the many studies accepting the attitude and selective learning effect. Cattell et al. sought to develop a variety of objective attitude measures. One measure of attitude suggested by previous research on attitudes was immediate memory. Memory for attitude-related material should vary as a function of attitude and thus serve as a measure of attitudes. Cattell et al. presented brief statements supporting and undermining various lifestyle attitudes. They found that the immediate recall of
attitude-consistent material did not correlate with any other attitude measure.

1966-1970: Questions About the Attitude and Selective Learning Effect

Waly and Cook (1966) published the first report to explicitly question the attitude and selective learning effect. The goal of their research was to develop the attitude and selective learning effect into an indirect measure of attitude. They began by attempting a replication of the Jones and Kohler (1958) study. In the Waly and Cook study, pro, neutral, and anti-segregationist students were instructed to learn (over five trials) pro and con statements on the topic of segregation. No relationship between attitude and learning was obtained. Waly and Cook attempted two more replications, with students from the Northeast and the South, and failed to obtain the attitude and selective learning effect both times.

More null results. Shortly after the Waly and Cook publication, other researchers also reported a failure to obtain an attitude and selective learning effect. Greenwald and Sakumura (1967) found no relationship between subjects' attitude and their learning of statements about U.S. involvement in Vietnam. Brigham and Cook (1969) failed to find the attitude and selective learning effect using plausible and implausible pro segregation and pro integration statements embedded in a long transcript. Smith and Jamieson (1972) could not produce the attitude effect using statements about God. Eiser and Monk (1978) failed to obtain the effect using statements about feminism.

1970--: Reestablishing the Attitude and Selective Learning Effect

The first attempts to reconcile null and positive attitude and selective learning effect results hypothesized moderators of the effect. Suggested moderators have included: message plausibility (Waly & Cook, 1966), message familiarity (Greenwald &
Sakumara, 1967), dogmatism (Kleck & Wheaton, 1967), learning task (Malpass, 1968), behavioral commitment (Kiesler, 1971), ego-involvement (Smith & Jamieson, 1972), message utility (Weldon & Malpass, 1981), personality variables (Zanna & Olson, 1982; Callahan & Olson, 1981), and multiple processing strategies (Tyler & Voss, 1982). None of these suggested moderators have consistently produced an attitude and selective learning effect. Nevertheless, four lines of research have provided some evidence in reestablishing the effect of attitude on memory.

1. **Message utility.** Weldon and Malpass (1981) presented pro and con essays on student activism to subjects whose attitudes varied towards the topic. An attitude and selective learning effect was obtained with the pro essay, but not with the con message. To interpret their results, Weldon and Malpass revived the message utility explanation (of Jones & Aneshansel, 1956 and Jones & Kohler, 1958). They argued that the utility of their messages varied with the novelty of the arguments. The attitude and selective learning effect was not obtained with a con message that contained novel arguments. Presumably these novel arguments would have equal utility for both pro and con subjects and thus be learned equally well. On the other hand, Weldon and Malpass did find the effect with a pro message that presented familiar arguments. They assumed that con subjects would not find it useful to learn these familiar, uncongenial arguments whereas pro subjects would. The failure of Waly and Cook (1966) to replicate the Jones and Kohler (1958) study which also varied message utility (through plausibility) lessens the strength of this explanation.

2. **Attitude distortion.** Read and Rosson (1982) argued that beliefs and attitudes can be used to reconstruct history. According to this hypothesis, subjects use their attitudes to guess and fill-in missing details of a text. This attitude-based reconstruction can result in a distortion of the original message or superior memory when the guessing happens to coincide with the presented materials. In the Read and
Rosson study, subjects read an ambiguous message about nuclear power -- that is, although the message was anti-nuclear in tone it contained both pro and con statements. After a delay of two weeks, Read and Rosson found that subjects' memory of the message was distorted in an attitude-consistent manner. Subjects tended to falsely recognize unpresented statements that agreed with their attitudes.

3. Gender role research. Research on gender role development provides additional evidence for the effect of attitudes on memory. This research typically finds that children with traditional gender role attitudes (compared to those who lack these attitudes) demonstrate superior memory for materials that portray traditional sex roles and often make attitude-consistent memory errors (see for example, McArthur & Eisen, 1976; Koblinsky et al., 1978; Liben & Signorella, 1980; Drabman, et al., 1981; and Signorella & Liben, in press). These findings are explained in terms of the development of a gender schema in memory.

4. Attitude-extremity effect. A final line of research has provided additional evidence for an attitude-extremity effect (superior memory for material rated at the extremes of the attitude scale). In a study by Judd and Kulik (1980), subjects provided an agreement rating of Thurstone-scaled statements on the topics of women's rights, South Africa and the death penalty. After a one day delay, Judd and Kulik found that statements given an extreme rating were best remembered. Judd and Kulik interpret their results as support for the bipolar nature of attitude schemas. They also point out that the results of previous studies may be confounded because they did not use statements that were evenly distributed along the attitude continuum.

Another moderator? Table 1 suggests another potential moderator of the attitude and selective learning effect -- message length. In general, studies that used longer messages were more likely to obtain an effect than those studies that used short
statements. (This moderator was also noted by Sheppard, 1981). For example studies that used long texts and found an effect (in at least on treatment) include Edwards (1941), Levine and Murphy (1943), Malpass (1969), and Weldon and Malpass (1981). Studies that used short statements and have not found an effect include Cattell et al. (1950), Waly and Cook (1966), Greenwald and Sakumara (1967), Smith and Jamieson (1972) and Eiser and Monk (1978). Only the Jones and Aneshansel (1956) and Jones and Kohler (1958) studies (both of which used short statements) stand counter to this general pattern. It should be noted that other factors such as format of message presentation and memory test procedures covary with message length and may also be moderating the effect.

Conclusions and Overview

For the most part this review echoes Greaves (1972) description of previous attitude and memory research as "unambiguously inconclusive". Although interesting hypotheses have been put forth, there has not yet been a reliable demonstration of the selective influence of attitudes on memory and learning. The goal of this dissertation is to produce an attitude and selective learning effect -- that is, a positive correlation between an attitude measure and recall of presented, attitude-related materials.

To accomplish this goal, the research in this dissertation is based on a newly-developed research strategy termed the design approach (see Greenwald et al., 1984). According to this approach (described in Chapter 2), research begins with a theory that should be capable of providing guidance on engineering a desired effect or pattern of data. Chapter 3 describes this beginning theory -- that attitudes serve as heuristics. Chapter 4 demonstrates how this theory can be used to produce a selective recall of past events. Chapter 5 reports on preliminary data collections used to develop the experimental materials. Chapters 6 and 7 report two studies that attempted to
demonstrate that attitudes can serve as a heuristic in promoting the recall of attitude-consistent materials. Both studies failed to obtain an attitude and selective learning effect. Consistent with the design approach, information from these studies was used to develop a theory of cognitive structures supporting attitudes (presented in Chapter 8). Central to this theory is the distinction between attitudes that are supported by a bipolar knowledge structure (contains information on both sides of the issue) and a unipolar structure (contains information on only one side). Chapter 9 presents a study that used this to obtain an attitude and selective learning effect. The dissertation concludes by positing two cognitive functions of attitude: a heuristic function that involves the simple evaluative element of an attitude and a schematic function that employs the knowledge structure supporting an attitude.
Chapter 2

The Design Approach

As noted in Chapter 1, research on the attitude and selective learning effect has gone through four distinct phases: (1) discovery, (2) affirmation, (3) questioning and (4) attempts to reestablish the effect. Other social science effects have also (or are going) through a similar lifecycle. Some examples include: the sleeper effect in persuasion (Pratkanis and Greenwald, in press), the attitude-behavior relationship (Zanna and Fazio, 1982), the trait-behavior relationship (Mischel, 1981) and forced compliance and attitude change (Wicklund and Brehm, 1976). Such lifecycles produce a variety of null and contradictory findings. In this chapter, we look at the ways social science currently deals with null results. In addition, a design approach (first advanced by Greenwald, Pratkanis, Leippe, and Baumgardner) is described as a superior way of dealing with null results.

The Null Result

Null results and scientific discovery. A null result is the absence of a relationship between two variables. In an experiment, a null result means the failure of the independent variable to influence the dependent variable. The following two examples of scientific discovery have one thing in common -- they were prompted by null results.
• In a perhaps apocryphal experiment, Galileo Galilei dropped two lead balls differing in weight from the Tower of Pisa. Years earlier Aristotle had predicted that the objects would accelerate in proportion to their weight. They both reached the ground simultaneously. Although scholars of the day argued that the tower must be taller to produce the effect, Galileo's work led to the modern concept of gravitational force.

• In the 1880s, Michelson and Morley conducted a series of experiments that sent light signals out at right angles. Mirrors reflected the beam back to the point of origin allowing the speed of light to be measured. The ether theory of the day predicted that the light should return at different rates (since one beam was following the ether stream and one was going perpendicular to it). Michelson and Morley repeatedly failed to detect an effect of direction of beam on the speed of light. Einstein (1961) claims this null result played a major role in the formulation of the theory of relativity. Michelson became the first American to win the Noble prize for physics.

Prejudice against the null hypothesis. How do behavioral scientists react to null results? Greenwald (1975) argues that in the behavioral sciences, researchers are biased against accepting null results. An informal review of leading texts and papers on the experimental method in social psychology revealed these beliefs about the null hypothesis:

1. Given the characteristics of statistical analysis procedures, a null result is only a basis for uncertainty. Conclusions about relationships among variables should be based only on rejections of null hypotheses.

2. Little knowledge is achieved by finding out that two variables are unrelated. Science advances, rather, by discovering relationships between variables.

3. If statistically significant effects are obtained in an experiment, it is fairly certain that the experiment was done properly.

4. On the other hand, it is inadvisable to place confidence in results that support a null hypothesis because there are too many ways (including incompetence of the researcher), other than the null hypothesis being true, for obtaining a null result. (Greenwald, 1975, p. 2).
The Theory Confirming Approach

A description of the theory confirming approach. The prejudice against the null hypothesis results from theory confirming strategy adopted by many social psychologists. Figure 2 describes the steps taken by a researcher using the theory confirming approach. The researcher begins with a rationally developed theory. An expected empirical observation is derived from the theory that should occur if the theory is true. An experiment is conducted that ostensibly could or could not obtain this result. If the result occurs then the theory is supported (but not necessarily proven) and the evidence is sent for publication.

A problem occurs when null results are obtained. Greenwald and Ronis (1981) have called this the disconfirmation dilemma -- is the null result due to a faulty theory or faulty experimental operations? Traditional wisdom admonishes that the theory has been disconfirmed (since a good theory should specify operations). Practice differs from the ideal (since investigators are often trying to confirm their own or their PhD. advisor's theory). Researchers become what McGuire (1973) terms a stage-manager -- a sufficiently ingenious experimenter who can produce the conditions that demonstrate the hypothesis is true. Some techniques for confirming a hypothesis are to try new data analyses, to run more subjects (if the significance level is close) or to change the experimental procedures. This process is labeled the calibration loop in Figure 2 -- repeating an experimental test with variation until it comes out right. A sanitized version of the study is then submitted for publication ignoring much of the details of the calibration process.

Consequences of the theory confirming approach. The systematic application of the theory confirming approach results in a research history similar to that of the attitude and selective learning effect. Researchers selectively interpret and publish their
Figure 2: The theory confirming approach
findings. It is indeed fortuitous that null results have been published. Four problematic consequences of the theory confirming approach can be identified.

1. **Accepted effects may be Type I errors.** A Type I error is the false rejection of a true null hypothesis. Repeatedly conducting the same or similar experiments (as in the calibration loop) increases the chances of a Type I error. For example Pratkanis and Greenwald (in press) find that one out of seven studies are capable of finding a sleeper effect in persuasion. Publishing only successes creates the illusion of an established effect.

2. **Valuable information is lost.** The calibration loop provides valuable data on just when and how an effect can occur. Null results can be used to: (1) build and modify theory and (2) create a taxonomy of settings for theory application. Unfortunately the information obtained from the calibration loop is often neglected.

3. **Attention is diverted away from certain classes of problems.** The theory confirming approach emphasizes the causal relationships between two or more variables. The process of deriving an observation from a theory is usually stated in terms of, if X then Y should occur. This is an important class of problems. However, other worthy goals may be neglected such as the prediction of null events and theories that are primarily categorical or descriptive in nature.

4. **Crucial test experiments are valued.** The theory confirming approach places a premium on finding the "right" theory. One means of determining the right theory is the crucial test experiment where the derived observations of one theory are pitted against the observations of another. The experiment declares one theory a winner (effect obtained) and one a loser (null result). The calibration loop suggests that winners and losers may be determined by the skill of an investigator for producing one type of an effect over another. Since another investigator can "recalibrate" the study and produce the effect, accepting null results in this case may be unwarranted.

### The Design Approach

A description of the design approach. Recently Greenwald et al. (1984) have advocated the design approach as a research strategy for dealing with null findings. In this approach, an effect is designed or engineered just like it was a new rocket or solar powered home. It differs from the theory confirming approach in the way it
deals with the disconfirmation dilemma. Instead of throwing away the information obtained in the calibration loop, it uses the insights to construct and modify theory and research practice.

Figure 3 presents an outline of the design strategy. It begins by establishing a goal. This goal could be of practical value (such as designing a new microcomputer) or producing a laboratory effect (such as a positive correlation between attitude and learning measures). Next, a relevant theory is specified to design procedures capable of obtaining the effect. Since there may be numerous theories that can produce the goal, the selection of any given theory is left up to the taste of the researcher. In this early stage, exploratory and pretest studies serve to discover the characteristics of design materials, just as pilot tests in engineering uncover information about the strength, weight, malleability, etc. of building materials.

The design approach differs radically from the theory confirming strategy after the empirical observations have been made. Regardless of the results, the design approach encourages the investigator to learn from the data. In cases of null results, the investigator searches the study for clues and suggestions as to why the goal was not obtained. Theory and procedures are modified and developed. The calibration loop is replaced by a theory construction loop.

In some cases a goal can never be obtained. For example, Henry Cavendish tried to produce phlogiston -- a substance believed to be present in everything that burns. Despite repeatedly pouring various acids over different metals, he never achieved the goal. However, his efforts did lead to the discovery of hydrogen and a new theory of combustion and chemistry (see Kuhn, 1970 for a description of this paradigm shift).
Figure 3: The design approach
In summary, the design approach makes three assumptions.

1. *Social effects are rarely main effects.* This is especially true in cases where a research finding has a history of null results. Empirical confrontation is one way to explicate the interactions (context).

2. *Many social effects have multiple determinants.* Thus there may be more than one way of producing an effect. This assumption directly opposes the assumption behind crucial test that there is one "correct" theory behind each effect.

3. *Theory and method should be sufficient to produce a desired effect.* If not, theory and method should be developed and modified. If it still cannot produce the effect, it may be time to change the scientific paradigm.

Philosophical basis of the design approach. McGuire's (in press) contextualist theory of knowledge provides a philosophical framework for the design approach. The contextualist theory can be contrasted with the logical positivist philosophy that serves as the basis for the theory confirming approach. Like the logical positivism viewpoint, contextualism advocates that theory should precede and guide empirical observation and that science requires empirical confrontation. However, the two approaches disagree on two concerns.

First, the logical positivist assumes that one theory is correct or better. The contextualist maintains that all theories (even mutually contradictory ones) are right and thus all are false. Since a theory is like any other knowledge structure, it is an oversimplification and distorted representation of a given situation. As a simplification it can be both useful and misleading.

Second, logical positivism believes that the role of empirical observation is to test a theory. For the contextualist the purpose of empirical observation is to discover and make clear the meaning of the hypothesis and disclose its hidden assumptions. Through a program of research a theory can be elaborated and modified to provide a
useful guide in a wide range of contexts.

The important tenets of contextualism can be summarized in three sentences. The meaning of a theory develops in *interaction* with empirical observations. The empirical process *constructs* rather than tests a theory. A theory is true in some *contexts* but not others.
To solve the attitude and selective learning puzzle, the research in this dissertation adopts a social cognition perspective (see Wyer & Srull, in press). This perspective relies on an individual's cognitions about an object (variously termed schemas, frames, scripts, heuristics, themes, ideology, perceptual Gestalten, etc.) as the unit of explanation. These cognitive entities develop in interaction with a social world and in turn guide action in this world. Attitudes are a social cognition, that is, attitudes often have a cognitive representation.

A heuristic is one example of a social cognition. It can be defined as a simple strategy for solving a problem. For example, if the applicant has a long vita, hire or if the results are positive, publish. A heuristic can be contrasted with an algorithm or a detailed set of steps or procedures for solving a problem. Tversky and Kahneman (1974) have demonstrated how such heuristics as representativeness and availability (accessibility) can influence judgments and decisions. In this chapter we first define another type of heuristic -- the attitude heuristic -- and then review evidence for its existence.
The Attitude Heuristic Defined

An attitudinal heuristic is a heuristic that uses the evaluative relationship as a cue in the problem solving strategy. According to Greenwald and Pratkanis (1984), attitudes are used to assign objects to a favorable class (for which strategies of favoring, approaching, and protecting are appropriate) or to an unfavorable class (for which strategies of disfavoring, avoiding, neglecting, and harming are used). Attitude heuristics used to guide cognitive processes results in strategies of selective interpretation, attribution, imagination and retrieval. For example, I hate Catholics, therefore I conclude that they must be the cause of trouble in Ireland or I voted for Reagan, therefore I believe that he is the reason for the economic upswing.

Balance theory (Heider, 1958; Zajonc and Burnstein, 1965) summarizes how attitudes can be used as a heuristic in cognitive processing. Figure 4 presents an individual who holds a negative opinion of Martin Luther King, Jr. and who believes that flunking out of college after a year and a half is undesirable. The individual is asked, "Did King drop out of college after a year and a half?" In other words, "What sign should replace the question mark in the Figure?" According to balance theory, a stable relationship would be obtained by replacing the question mark with a positive sign -- "Yes, King was a college drop out." Conversely, an individual who holds Dr. King in high esteem would replace the question mark with a negative sign. In this case the use of an attitude as a heuristic would produce a selectivity in the recall of past events.

The notion of an attitude heuristic can be viewed as a way of integrating previous treatments of the cognitive functions of an attitude. Lippmann (1922) viewed public opinion as an economical simplifier of a complex world. Smith, Bruner and White (1957) posited that opinions serve an object appraisal function or as they state:
Figure 4: The relationship between dropping out of college, Martin Luther King and an individual with a negative opinion of Dr. King.
"The holding of an attitude provides a ready aid in 'sizing up' objects and events in the environment from the point of view of one's major interests and going concerns." (p. 41). Katz (1960) has suggested that attitudes satisfy a knowledge function providing adequate structure to the social world. McGuire (1968) notes that attitudes serve as "a simplified and practical manual of appropriate behavior toward specific objects." (p. 158). Over the past 50 years, numerous studies investigating a wide variety of social behaviors have demonstrated that attitudes can serve as heuristics.

Evidence for the Attitude Heuristic

**Information error technique.** The information error technique was first introduced by Hammond (1948) as an indirect measure of attitudes. It has subsequently been validated by Kreman (1949), Kubany (1953), Parrish (1948) and Weschler (1950a, 1950b). In this technique, respondents are asked, under the guise of an information survey, to select which of two statements is true. In reality both responses are incorrect -- for example, (taken from Weschler, 1950a): "During the strike wave of April 1948, the percentage of estimated working time lost was (1) 1.1% or (2) 2.2%?" (The correct answer is 1.6%). A consistent finding is that respondents frequently chose the error that agrees with their attitudes. In the example given, lost working time is viewed as negative. An individual with a pro business attitude would achieve a balanced relationship by saying the strike produced considerable downtime, whereas the pro labor supporter would attribute less lost time to the strikes.

**Selective interpretation.** Attitudes can be used as a heuristic to interpret controversial materials. Edwards (1941) found that an ambiguous message on the New Deal was interpreted as favorable to the New Deal by those supporting Roosevelt's plan and as anti-New Deal by those opposing this policy. Cooper and Jahoda (1947) and
Kendall and Wolf (1949) have found that prejudiced individuals frequently misunderstand cartoons presenting a bigoted person in an unfavorable light. Hastorf and Cantril (1954) found that interpretations of a Princeton/Dartmouth football game varied as a function of support for the two opponents. For additional studies demonstrating that attitudes can selectively influence inferences and attributions see Allport and Postman (1947), Gruesser (1950), Lord, Ross and Lepper (1979), Manis (1960, 1961a, 1961b), Proshansky (1943). Regan, Straus, and Fazio (1974), Smith (1947), and Waly and Cook (1965).

**Syllogistic reasoning.** Numerous studies have shown that attitudes about the conclusion of a syllogism influences the ability to determine if the syllogism is logical (for example: Evans, Barston, and Pollard, 1983; Feather, 1964; Gordon, 1953; Janis and Frick, 1943; Lefford, 1946; Morgan, 1945; Morgan and Morton, 1943; 1944; Shelley and Davis, 1959 and Thistlewaite, 1950). For example, Thistlewaite (1950) asked respondents to state whether syllogisms such as the following were valid or invalid:

- **Given:** If production is important, then peaceful industrial relations are desirable. If production is important then it is a mistake to have Negroes for foreman and leaders over Whites.

- **Therefore:** If peaceful industrial relations are desirable, then it is a mistake to have Negroes for foreman and leaders over Whites.

For this syllogism, prejudiced individuals (who agree with the conclusion) are more likely to indicate (incorrectly) that the logic is valid whereas a pro Negro subject would be more likely to indicate that the logic is invalid.

**Attitude similarity and attraction.** Byrne (1971) has repeatedly found that individuals find others with similar attitudes to be attractive. In a typical experiment,
students are told that they are taking part in a study of interpersonal judgment. They are then given information about others' attitudes. Attitude similarity is manipulated by varying the proportion of shared attitudes between the subject and a stimulus person. The more shared attitudes, the more attractive the subject rates the stimulus person.

**Recall of personal behavior.** Attitude can be used as a heuristic in the recall of personal behavior. For example, Bem and McConnell (1970) changed subjects' attitudes on the topic of student control of their university using a typical counterattitudinal essay writing procedure. They found that subjects could not correctly recall their premanipulation attitudes (as assessed earlier by Bem and McConnell). Subjects erred by estimating that their preexperimental attitudes were similar to their current attitudes. Although there has been some disagreement over the psychological mechanisms involved, this finding has been replicated by Aderman and Brehm (1976), Goethals and Reckman (1973), Ross and Shulman (1973) and Shaffer (1973, 1975).

Ross, McFarland and Fletcher (1981) have provided another example of the use of attitudes in the recall of personal behavior. In their studies, subjects received persuasive messages that either derogated or promoted daily toothbrushing and frequent bathing. They found that those who heard the anti-toothbrushing and anti-bathing messages estimated that they toothbrushed and bathed less often than those who heard the pro messages. Ross, McFarland, Conway and Zanna (1983) have recently replicated this finding.

**Recall of news events.** Attitudes can also influence the recall of past events. On May 30, 1937 a crowd of striking employees of Republic Steel Co. fought with police resulting in the death of ten strikers. Two and a half years later, Eberhart and Bauer (1941) assessed memory for this event using a three item multiple choice test.
They found that subjects with a pro-labor attitude were more likely to remember that the crowd was unarmed and that the police brutally shot peaceful citizens whereas anti-labor subjects remembered the opposite. Although Eberhart and Bauer note that this effect may be due to selective exposure to information, they point out that their results occurred regardless of the subjects' newspaper reading habits.

**Selective generation of arguments.** Feather (1969a, 1969b, 1969c, 1970) has repeatedly found what can be termed an attitude and selective generation effect — subjects generate more arguments that agree rather than disagree with their attitudes. For example, Feather (1969a) asked subjects to list all the arguments they could think of in favor of and opposed to American intervention in South Vietnam. Subjects supporting U.S. involvement generated more arguments in support of their position whereas the reverse relationship held for those opposed to the policy. This result is consistent with the Ostrom and Upshaw (1968) finding that subjects state it is easier to generate statements that agree with their own position.

**A Summary**

This review demonstrates that attitudes are often used to determine the strategy to be taken with a social object. These strategies (or heuristics) are described by balance theory. A positive attitude evokes a favoring strategy whereas a negative attitude leads to the reverse. The review has show that the use of attitudes can influence a variety of cognitive processes including inferences, attributions, decision making, reasoning, perception, and remembering. The next study uses the attitude as heuristic to produce a selectivity of recall of past events.
Chapter 4

Experiment 1:

The Attitude Heuristic and Selectivity of Memory

The previous chapter demonstrated that attitudes can be used in a strategy for making inferences and attributions about a social object. According to reconstructive theories of memory (c.f. Bartlett, 1932; Greenwald, 1980; Loftus & Loftus, 1980; Read & Rosson, 1982 and Sulin & Dooling, 1972), memory for an event is constructed from general knowledge and cues. Memory is an inference about the past. As Bartlett states:

Remembering is not the re-excitation of innumerable fixed, lifeless and fragmentary traces. It is an imaginative reconstruction, or construction, built out of the relation of our attitude towards a whole mass of organised reactions or experience, and to a little outstanding detail which commonly appears in image or language form. It is thus hardly ever really exact, even in the most rudimentary cases of rote recapitualation, and it is not at all important that it should be so. (Bartlett, 1932, p. 213).

Attitudes can serve as a cue in the reconstructive memory strategy. For example, consider this choice of facts:

a. Ted Kennedy was caught cheating while attending Harvard University.

b. Ted Kennedy never engaged in cheating during his college career.
An individual with a pro-Kennedy attitude would use this attitude to construct a history favorable to Kennedy. For example, the individual may think, "Kennedy is basically good, hard-working and trustworthy. I choose B -- no cheating". An individual with a negative attitude constructs a different, unfavorable story, "Yeah, I never trusted him. A is correct". Both the pro- and anti-Kennedy answers are reconstructions. In this case, however, the reconstruction of the anti-Kennedy individual is correct.

The purpose of this first study was to demonstrate the selective influence of attitudes on the recall of past events (as opposed to recall of stimulus items presented in an experimental setting as with the attitude and selective learning effect). Experiment 1 uses a variant of the tasks employed in the information error technique and in the Eberhart and Bauer (1941) study. A questionnaire was constructed that contained items similar to the Kennedy question. (In fact this was one of the test items).

Each item consisted of a pair of statements -- one favorable and one unfavorable towards a noted personality. One of the statements in each pair was true. A selective recall effect would occur if subjects used their attitudes to identify the correct statement. Subjects with favorable attitudes towards the personality should select favorable events as true. The reverse should occur for subjects with unfavorable attitudes. An accurate "memory of the event" occurs when subjects' attitudinal strategy happens to coincide with actuality.

To encourage the use of attitudes in the task, the statements in each pair were highly similar except for the evaluative difference. This reduced the possibility of using other cues in selecting a correct item. One possible design problem is that subjects do not need to use their attitudes to infer the past -- they already have
accurate memories that need no reconstruction. To assess this possibility a confidence in memory measure was also taken.

Method

Procedures. Upon reporting to a large classroom, subjects (in groups of 10 to 20) independently completed a "Mass Media Survey" (given in Appendix B). This survey consisted of five parts (given in the following order): (1) an introduction presenting an overview of the task and informed consent materials, (2) a knowledge test consisting of 16 pairs of statements, (3) an attitude survey assessing subjects' attitudes towards each of the 16 personalities in the knowledge test, (4) a rating of the desirability of each true statement in the knowledge test, and (5) debriefing materials. For half of the subjects the attitude survey preceded the knowledge test.

Knowledge test. The knowledge test consisted of 16 pairs of statements about famous personalities. Personalities were selected so that both conservatives (for example, Ronald Reagan, James Rhodes and Henry Kissinger) and liberals (for example, Andrew Young, Gloria Steinhem, and George McGovern) were represented. For each personality, a true fact was obtained from such sources as T.V. news shows, national magazines, newspaper reports, biographies, etc. The fact for each personality could be either evaluatively favorable or unfavorable. (True favorable and unfavorable statements were divided equally among liberal and conservative personalities). For each fact, a negation was created to serve as its foil. Two examples of items from the knowledge test are (the correct answer is b in both cases):

a. Ronald Reagan maintained an 'A' average at Eureka College.
b. Ronald Reagan never achieved above a 'C' average at Eureka College.
a. Andrew Young (former U.N. ambassador and civil rights leader) denounced Iran's Ayatollah Khomeini as a fraud.
b. Andrew Young once stated that one day Iran's Ayatollah Khomeini would be considered a saint.

The order of presentation of statement pairs along with the location of the correct statement in each pair was arbitrarily determined. The subjects' tasks for each pair of statements was (1) to indicate which statement they believed to be true and (2) to rate their confidence in this judgment on a 1 to 5 scale (with 1 = not very sure and 5 = very sure).

Subjects. Sixty subjects enrolled in an introductory psychology course participated for course credit.

Summary of design. Attitudes toward the 16 personalities were assessed on a 1 to 5 scale (with 1 = very unfavorable and 5 = very favorable). In a forced choice task, subjects selected which of two statements about each personality they thought to be fact and rated their confidence in this judgment. Finally, the desirability of each of the 16 true statements was rated on a 1 to 5 scale (with 1 = very undesirable and 5 = very desirable).

Results

Statement desirability check. The desirability rating is an indication that the true statements were perceived as being differentially favorable. The mean desirability rating was below the scale midpoint of three for all eight unfavorable true statements. The mean desirability rating was above the scale midpoint for 7 of the 8 true favorable statements. (The item "receives a limited salary for preaching" was given a mean rating of 2.6 -- just slightly below the midpoint). The overall mean desirability rating for unfavorable statements (1.59) was significantly below the mean desirability rating for favorable statements (3.84, t(59) = 32.70, p < .01).
Memory data. Table 2 and Figure 5 presents the percentage of correctly identified facts in the forced-choice memory task. The percentage of correct identifications is classified by attitude level (combined across personalities) and whether the unfavorable or favorable statement was true. Also given in Table 2 is the number of observations in each cell. (Two observations are missing for the unfavorable statements and one observation for the favorable statements due to subject omissions).

Table 2

<table>
<thead>
<tr>
<th>Attitude Towards the Personality</th>
<th>Negative</th>
<th>Positive</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>8 True Unfavorable statements:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Percent Correct (obs.)</td>
<td>83.6 (73)</td>
<td>76.1 (92)</td>
<td>67.5 (157)</td>
</tr>
<tr>
<td><strong>8 True Favorable statements:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Percent Correct (obs.)</td>
<td>40.7 (54)</td>
<td>62.6 (99)</td>
<td>68.5 (159)</td>
</tr>
<tr>
<td><strong>Total:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Percent Correct (obs.)</td>
<td>65.3 (127)</td>
<td>69.1 (191)</td>
<td>68.0 (316)</td>
</tr>
</tbody>
</table>

As can be seen attitude selectively influenced identification of the facts. Subjects who held a positive attitude towards the personality recognized a higher percentage of favorable statements as true than did subjects with a more negative
Figure 5: Percentage of correctly identified statements as a function of attitude (Experiment 1).
The reverse pattern was obtained for the unfavorable statements. A hierarchical multiple regression was performed to confirm this pattern of results. In this regression, identification of the facts served as the dependent variable (scored 0 for incorrect and 1 for correct identification). Predictor variables were the subjects' attitudes toward each personality, a dummy-coded variable carrying information about whether the true statement was favorable or unfavorable and their interaction. Main effect variables were entered in the first step of the regression followed by the variable carrying the interaction term entered in the second step. The significance test used a pooled error term (subject variance pooled with error variance) as described in Appendix I. Neither the main effects for favorability of the true statement ($F(1, 59) = .30$) nor for attitude towards the personality ($F(1, 59) = 2.69$) were significant. However the interaction was highly significant ($F(1, 59) = 42.49, p < .01$) confirming the selective influence of attitude on memory.

Confidence rating. The confidence rating was originally included in the design to assess the possibility that subjects had accurate memories and did not need to reconstruct the event. It appears, however, that subjects were using their attitudes in making their confidence ratings. Table 3 presents the mean confidence rating for each level of attitude and for favorable and unfavorable statements. A hierarchical regression similar to the one performed on the memory data was performed using the confidence rating as the dependent variable. A significant effect due to the favorability of the statement was obtained: subjects were more confident in their memory for unfavorable statements (3.01) than for favorable statements (2.78; $F(1, 59) = 6.82, p < .05$). No other significant effect was found.

However of more interest is the overall pattern for the confidence rating (the bottom row of Table 3). Subjects were most confident in their memory judgments when their attitude towards the personality was extreme (that is, they gave a 1 or a 5
attitude rating as opposed to one in the middle range of the scale). To confirm this pattern, a trend test was conducted using regression analyses described in Appendix I and Cohen and Cohen (1975). In the first step of this analysis the confidence rating was predicted by the attitude score to test for a linear trend. The second step added the square of the attitude score to test for the quadratic component. This quadratic component was highly significant ($t(59) = 7.05, p < .01$) confirming a U shaped relationship between attitude and confidence in memory.

**Table 3**

**Confidence Rating as a Function of Attitude (Experiment 1)**

| Attitude Toward the Personality | Negative 1 2 3 4 5 |  |
|---|---|---|---|---|---|---|
| 8 True Unfavorable statements: | 3.38 3.08 2.72 3.04 3.23 | 3.01 |
| 8 True Favorable statements: | 3.31 2.70 2.22 3.08 3.45 | 2.78 |
| Total: | 3.35 2.88 2.47 3.06 3.35 | 2.89 |

A higher number represents more confidence in the judgment.

**Summary**

Experiment 1 demonstrates how the use of an attitude as a memory heuristic can produce selective recall of facts. Provided with favorable (or unfavorable) facts about
liked (or disliked) personalities, subjects demonstrated a tendency to remember as true events that were most consistent with their attitudes towards the personality. That is, favorable events were more likely to be identified as true when the actor was liked whereas unfavorable events were attributed to disliked personalities. This resulted in a selective effect of attitude on recall: superior memory for facts when their veracity happened to agree with one's attitude.

As with many other single studies, alternative explanations are available. A plausible alternative to the attitude-guided retrieval interpretation is one based on selective exposure and attention. According to this hypothesis, attitudes are used as guides for information acquisition. Subjects may be showing a selectivity in memory because they earlier encountered (or paid attention to) news accounts that agreed with their attitude (see Freedman and Sears, 1965). This explanation should not be considered in opposition to the retrieval hypothesis since both processes may be working in conjunction to produce the effect.

The pattern of results from the confidence rating tasks suggests that a retrieval explanation may be the most appropriate in this case. Selective exposure and attention explanations stipulate that subjects have an accurate memory trace for those facts that agree with their attitudes. Thus subjects should feel most confident about memories where the correct answer agrees with their attitude (resulting in an interaction paralleling the pattern obtained with the memory test). This result was not obtained. In fact it appears that subjects used their attitudes as a heuristic to estimate confidence in memory. The stronger the attitude the more confidence expressed in the memory.
Chapter 5

Exploratory Investigations of Attitudes

One possible reason for the attitude heuristic effects reviewed in Chapter 3 and obtained in Chapter 4 is that knowledge structures may differ with an individual's location on the attitude continuum. Individuals with different evaluations of an object may possess different information about the object. For example, a welfare advocate may know (in the strongest case) only those arguments in favor of the position or may exclusively know certain facts not possessed by the anti-welfare agent. These different knowledge structures could then be used to reconstruct quite different version of an event. Attitudes could bestow a differential learning advantage for messages constructed with content that varied in popularity as a function of attitude. In other words, an attitude and selective learning effect could be obtained with messages that were differentially familiar to individuals with different attitudes.

This chapter reports on three data collections that attempted to obtain arguments that differed in familiarity as a function of attitude. The first two data collections used unstructured thought-listing techniques such as those developed by McGuire and McGuire (1982) to study the self-concept, Greenwald (1968) to study persuasion and Ericsson and Simon (1980) to investigate problem solving. With these techniques, subjects are asked to think aloud as they work or to tell the experimenter about some object of interest.
In the first data collection, subjects were asked to list arguments for and against a given topic. In the second data collection, subjects were asked to list the "first thing that comes to mind when you think about a given topic." The third data collection surveyed public sources for their arguments on various topics. In design approach terms, these exploratory investigations serve to discover the characteristics of materials needed to engineer the attitude and selective learning effect.

The three data collections of this chapter served three additional purposes. First, a replication of Feather's (1969a) attitude and selective generation effect was conducted using 10 different topics. Second, a survey of opinions provided information in selecting experimental topics for which subjects with differing attitudes were represented in the population. Finally, the data collection established a pool of arguments to be used in constructing learning materials.

1. Generated Persuasive Arguments

The purpose of this data collection was fourfold: (1) to assess the contents of subjects' attitude concepts, (2) to conduct a replication of the attitude and selective generation effect, (3) to select topics for which subjects' attitudes were evenly distributed along the evaluative continuum and (4) to collect persuasive arguments on the various topics.

Method

In an unrelated experiment, 400 introductory psychology students completed two tasks in return for course credit. First, subjects completed a 20-item attitude survey (given in Appendix C). This survey assessed opinions on the ten topics of Table 4 (with two opinion items per topic). Second, subjects were asked to generate, "as many reasons as you can for and against" one of the ten topics. Appendix D contains a
model response sheet for this generation task. For half of the topics, the request for pro arguments appeared at the top of the page, whereas for half of the topics the request for con arguments appeared at the top.

**Results**

**Attitude survey.** The two items for each topic were summed (with the score of one of the items reversed) so that a higher score reflected a pro position. Table 4 shows the distribution of subjects' attitude score for each topic. Four topics -- welfare, nuclear power, defense spending, and the draft -- appeared to meet the requirement of having subjects' attitudes distributed across the attitude continuum.

**Generation task.** Table 5 gives the mean number of pro and con arguments generated at each level of attitude (combined across all 10 topics). The attitude and selective generation effect was successfully replicated. Subjects generated more arguments that agreed rather than disagreed with their attitudes. A hierarchical multiple regression was conducted to assess the statistical significance of this pattern of data. The dependent variable was the total number of pro and con arguments generated by each subject. The predictor variables were the attitude score for each topic and a dummy-coded variable carrying information about whether the generated arguments were favorable or unfavorable towards the issue. The number of arguments generated did not vary with attitude ($F(1,392) = 0.75$) nor with valence of the generate argument ($F(1,392) = 2.82$). However, the interaction was highly significant ($F(1,392) = 67.41, \ p < .01$) to confirm the selective generation effect.

Appendix D contains a listing of the gist of each argument provided by pro (an attitude score of 8 - 10), con (an attitude score of 2 - 4) and neutral (an attitude score of 5 - 7) subjects. Although subjects generated more arguments that were
Table 4

Distribution of Subjects' Attitudes on Ten Topics

Attitude Towards the Topic

<table>
<thead>
<tr>
<th></th>
<th>Con</th>
<th>Neutral</th>
<th>Pro</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Legalized Abortion:</td>
<td>10.2</td>
<td>3.7</td>
<td>4.2</td>
</tr>
<tr>
<td></td>
<td>5.5</td>
<td>11.8</td>
<td>7.8</td>
</tr>
<tr>
<td>Death Penalty for Certain Crimes:</td>
<td>5.7</td>
<td>1.0</td>
<td>2.7</td>
</tr>
<tr>
<td></td>
<td>1.7</td>
<td>12.7</td>
<td>9.0</td>
</tr>
<tr>
<td>Increased Defense Spending:</td>
<td>10.7</td>
<td>9.2</td>
<td>15.5</td>
</tr>
<tr>
<td></td>
<td>11.0</td>
<td>20.5</td>
<td>10.5</td>
</tr>
<tr>
<td>Draft Registration:</td>
<td>11.5</td>
<td>6.2</td>
<td>10.5</td>
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<tr>
<td></td>
<td>10.7</td>
<td>7.2</td>
<td>17.0</td>
</tr>
<tr>
<td></td>
<td>10.5</td>
<td>19.0</td>
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</tr>
<tr>
<td></td>
<td>5.3</td>
<td>10.5</td>
<td></td>
</tr>
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<td>Gun Control</td>
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<td>4.0</td>
</tr>
<tr>
<td></td>
<td>3.8</td>
<td>13.8</td>
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<td>15.6</td>
<td></td>
<td>9.3</td>
</tr>
<tr>
<td></td>
<td>39.7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Legalized Marijuana:</td>
<td>22.0</td>
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<td>12.7</td>
</tr>
<tr>
<td></td>
<td>15.0</td>
<td>19.3</td>
<td>6.0</td>
</tr>
<tr>
<td>The Use of Nuclear Power:</td>
<td>14.7</td>
<td>4.5</td>
<td>11.3</td>
</tr>
<tr>
<td></td>
<td>5.5</td>
<td>24.5</td>
<td>8.0</td>
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<tr>
<td>Reagan's Economics Policies:</td>
<td>3.7</td>
<td>3.2</td>
<td>5.8</td>
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<tr>
<td></td>
<td>13.3</td>
<td>30.0</td>
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</tr>
<tr>
<td></td>
<td>30.0</td>
<td>17.0</td>
<td>7.8</td>
</tr>
<tr>
<td></td>
<td>8.3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Voluntary Prayer in Public Schools:</td>
<td>4.2</td>
<td>2.2</td>
<td>5.5</td>
</tr>
<tr>
<td></td>
<td>9.3</td>
<td>15.7</td>
<td>13.7</td>
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<tr>
<td></td>
<td>14.2</td>
<td>11.0</td>
<td>24.0</td>
</tr>
<tr>
<td>Increase in Welfare Programs:</td>
<td>9.0</td>
<td>9.0</td>
<td>17.0</td>
</tr>
<tr>
<td></td>
<td>13.2</td>
<td>18.2</td>
<td>14.5</td>
</tr>
<tr>
<td></td>
<td>9.0</td>
<td>5.0</td>
<td>5.0</td>
</tr>
</tbody>
</table>

Numbers represent the percentage of 400 subjects providing each attitudinal response for each topic.
Table 5

Mean Number of Arguments Generated as a Function of Attitude

<table>
<thead>
<tr>
<th>Attitude Towards the Topic</th>
<th>Con</th>
<th>Neutral</th>
<th>Pro</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>8</td>
<td>9</td>
<td>10</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Generated Statement:

Con | 3.29 | 2.89 | 2.78 | 2.66 | 2.48 | 2.63 | 2.37 | 1.32 | 1.96 | 2.43 |
Pro | 1.37 | 1.79 | 1.83 | 2.04 | 2.25 | 2.33 | 2.55 | 2.42 | 2.75 | 2.25 |
N   | 37   | 19   | 42   | 24   | 74   | 36   | 56   | 31   | 77   | 396  |

Higher attitude score represents more favorable attitudes. Numbers indicate the mean number of arguments generated. Four subjects were lost due to subject omissions.

consistent with their attitudes, the themes of their generated arguments did not differ substantially as a function of attitude position. For example, consider those individuals supporting and opposing the use of nuclear power. Looked at in the aggregate, the reasons for and against nuclear power given by both types of subjects were very similar. Both types of subjects listed such arguments as economy, efficiency and availability as reasons for nuclear power. Both types of subjects listed the problems of safety, accidents, meltdowns, radiation and waste disposal as reasons against nuclear power. An informal analysis of the other topics suggests that subjects listed similar themes regardless of attitude position. Thus, it appears that the simple hypothesis of differential content as a function of attitude cannot be used to design an attitude and selective learning effect -- at least using these topics and this subject population.
2. An Attitude Thought Listing

Method

Forty-three introductory psychology students first completed the 20-item attitude survey found in Appendix C and then a thought generation task found in Appendix E. The thought generation task asked subjects to list "the first things that come into your mind when you think about" each of the ten topics.

Results

Appendix E contains a verbatim listing of pro, con, and neutral subjects' thoughts on the topics of welfare, nuclear power and defense spending. (These three topics were chosen of the four possible ones to be used in the upcoming studies.) Each thought was scored by the author as being favorable, unfavorable or neutral towards the topic. Favorable thoughts were defined as arguments for the issue (a welfare example, "Too much starvation and poverty in this world.") or a positively toned word (a defense spending example, "safety"). Unfavorable thoughts were defined as arguments against the issue (a nuclear power example, "Its gonna kill us.") or a negatively toned word (a welfare example, "Crooks"). Neutral thoughts were those that could not be clearly classified or were ambivalent (for example on nuclear power, "Doing fine" and "50/50").

Table 6 presents the mean number of favorable, unfavorable and neutral thoughts listed for each level of attitude (combined across all 10 topics). As can be seen, subjects with pro attitudes listed more favorable thoughts whereas con subjects listed more unfavorable thoughts. The number of neutral statements listed did not vary with attitude. A hierarchical regression was conducted to assess the statistical significance of this finding. In this regression, the total number of favorable and unfavorable
thoughts listed for each topic by each subject served as the dependent variable. The predictor variables were the subjects' attitude score for each topic and a dummy coded variable carrying information about whether the listed thoughts were favorable or unfavorable toward the topic. No main effect was obtained for attitude ($F(1,42) = .49$). A marginal effect was obtained for valence of thoughts ($F(1,42) = 3.78, p < .1$) showing that more unfavorable than favorable thoughts were listed. The interaction confirming the attitude and selective generation finding was highly significant ($F(1,42) = 85.52, p < .01$).

**Table 6**

Mean Number of Thoughts Listed as a Function of Attitude

<table>
<thead>
<tr>
<th>Attitude Towards the Topic</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Con</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>8</td>
<td>9</td>
<td>10</td>
<td>Total</td>
</tr>
<tr>
<td>Unfavorable Thoughts:</td>
<td></td>
<td>0.10</td>
<td>0.00</td>
<td>0.52</td>
<td>0.38</td>
<td>0.57</td>
<td>0.94</td>
<td>1.32</td>
<td>1.00</td>
<td>2.33</td>
<td>0.73</td>
</tr>
<tr>
<td>Favorable Thoughts:</td>
<td></td>
<td>2.10</td>
<td>1.62</td>
<td>1.33</td>
<td>1.48</td>
<td>0.63</td>
<td>0.76</td>
<td>0.21</td>
<td>0.50</td>
<td>0.00</td>
<td>0.98</td>
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<tr>
<td>Neutral Thoughts:</td>
<td></td>
<td>0.00</td>
<td>0.63</td>
<td>0.66</td>
<td>0.14</td>
<td>0.52</td>
<td>0.35</td>
<td>0.42</td>
<td>0.25</td>
<td>0.16</td>
<td>0.38</td>
</tr>
<tr>
<td>Total:</td>
<td></td>
<td>2.20</td>
<td>2.25</td>
<td>2.52</td>
<td>2.00</td>
<td>1.73</td>
<td>2.06</td>
<td>1.94</td>
<td>1.75</td>
<td>2.50</td>
<td>2.08</td>
</tr>
</tbody>
</table>

Higher attitude score represents more favorable attitudes. Numbers indicate the mean number of thoughts generated.
3. Survey of Organizations and Media

A third data collection was performed to obtain additional arguments from public sources on the topics listed in Table 4. A letter was sent to various political action groups, lobbyists, and propaganda organizations asking for their "best arguments" in support of their position on a given issue. For example, "The Military Order of the World Wars" provided arguments in support of increased defense spending and "The Coalition for a New Foreign and Military Policy" provided arguments against increasing defense spending. The names and addresses of these groups were obtained from lobbyist registers, political catalogues, and advertisements. Most of the groups responded with professionally prepared pamphlets and brochures. In addition to these sources, popular mass-circulated news magazines were culled for articles on the various topics listed in Table 4.

Summary

Both the generated persuasive arguments and attitude thought listing tasks demonstrated the attitude and selective generation effect. When subjects were asked to provide their thoughts on an issue, they readily gave attitude-consistent information. Although subjects usually provided attitude-consistent information, they were capable of giving arguments opposing their position. In the generate arguments task, the types of themes presented in the arguments did not differ as a function of attitude. In addition, 82.7% of the subjects could generate at least one argument on both sides of the issue. (This compared to 16.3% of the subjects in the thought listing task who gave both a favorable and unfavorable thought). Thus it appears that attitude-consistent material is most readily accessible, but attitude-inconsistent material is also available.
Chapter 6
Experiment 2:
No Attitude and Selective Learning Effect

The exploratory investigations of Chapter 5 showed that although attitude-consistent information was more easily generated, attitude-inconsistent information was also available. The argument generation task failed to identify any message themes that were differentially generated as a function of attitude. Thus, it will be difficult to obtain an attitude and selective learning effect using messages that differ in familiarity.

However, the attitude and selective generation effect can be used in the design of an attitude and selective learning effect. One popular model of recall is a "generate and recognize" model such as Anderson and Bower's (1973) HAM. In this model of recall, the first step is to generate potential stimulus candidates for recognition. Obviously attitude-consistent material would have an advantage at this stage. The second step is recognition of the generated item as one that was presented in the experiment. Recognition can be dependent on either the strength (familiarity) of the memory trace (c.f. Wicklegren & Norman, 1966) or the number of associates between the to-be-remembered material and contextual elements stored in memory (c.f. Anderson & Bower, 1973). Given the ease with which attitude-consistent material is generated, this material should be represented by a stronger memory trace and thus be likely to be recognized.
Thus, an attitude and selective learning effect should occur with a procedure that induces subjects to use their attitudes to generate potential stimulus items and when these generated items have a high degree of overlap with the actual presented materials. According to this formulation one of the key ingredients for producing an attitude and selective learning effect is message familiarity. Although subjects with both favorable and unfavorable attitudes are familiar with the message, the attitude serves as a retrieval heuristic for selectively generating the message. It should be noted that Weldon and Malpass (1980) produced an attitude and selective learning effect with their familiar message, but not with their unfamiliar one. The following procedures were used to induce subjects to use their attitudes to selectively generate and recall the persuasive materials.

1. The materials were presented in a message-dense environment to create associative interference (see Baumgardner et al., 1983). This reduces the ability of the subject to use context cues other than an attitude to reconstruct presented items.

2. Subjects evaluated (on a scale of agreement) each persuasive statement on first encounter. It was hoped that an opinion judgment would encourage the use of attitudes in encoding (and perhaps in retrieval).

3. Stimulus items were similar to each other. Each item consisted of a topic (sentence subject) linked to an argument (predicate). The similarity of item structure was designed to create additional associative interference. In addition, by placing the topic as sentence subject, subjects could use the topic as a cue to generate arguments.

4. The stimulus items were familiar to the subject population. (They were derived from the arguments generated in the exploratory investigations of Chapter 5). Thus, if subjects relied on their attitudes to regenerate presented materials, the probability of producing an experimental item is increased.

If attitude-consistent material is easily generated and attitudes are used to generate and recognize stimulus items, then the following effects should occur.
1. Information that agrees with one's attitude should be better recalled (the attitude and selective learning effect). Attitude-consistent material is easily generated and results in superior memory to the extent that the generations overlap with presented material.

2. A higher hit and false alarm rate should be obtained for material that agrees with one's attitude. Since attitude-consistent material is familiar, both presented and unpresented items should be recognized more frequently. In signal detection terms (Banks, 1970; Swets, 1964; Swets, Tanner, & Birdsall, 1961), $d'$ should decrease with item agreement and $\beta$ should remain constant. The measure $d'$ represents the sensitivity of the operator to distinguish signal (presented item) from noise (distractors). The strength of the signal for both presented and unpresented agreed-with statements should be strong making it hard to discriminate between the two. The measure $\beta$ is an indicator of the motivation for reporting a signal. Report criterion should not vary with attitude, although this remains an empirical question.

3. Recall intrusions should be consistent with the subjects' attitude. Some generated statements may not match presented materials.

4. The ease of accessibility of attitude-consistent material should result in faster encoding and retrieval latencies for this material.

**Method**

The computer system. The equipment used in this experiment included: (a) a Data General Nova 1220 mini-computer, (b) two disk drives for storage of messages and subjects' responses, (c) four video display monitors functioning independently at separate subject stations, (d) response keyboards at each subject station with which subjects could provide numerical responses or other requested information and (e) an experimenter's console for initiating and monitoring the experiment. Most of the computer's work during the experiment consisted of locating and displaying text and recording subject's responses. Up to four subjects could participate at any given time. The operation of the computer was governed by Experimental Command Interpreter software developed by Greenwald et al. (1983).

Procedure. Upon arriving for the experiment, a subject was seated in one of the
four subject stations. After receiving brief orienting instructions from the experimenter, each subject worked through the materials presented on the video display at their own pace. The experiment consisted of seven parts as shown in Figure 6. Appendix F contains the instructions for this experiment.

The first phase of the experiment consisted of general instructions. These instructions included displays that presented an overview of the experimental task, informed consent, and practice with the operation of the response panel. Next, in a survey of opinions, subjects stated their agreement with 27 controversial and noncontroversial statements. This agreement rating was given on a 1 to 5 scale with 1 = strongly disagree and 5 = strongly agree. The statements were on the topics of welfare, nuclear power and defense spending and are given in Appendix G.

The opinion survey was followed by a 5 minute filler task to disrupt short term memory. In this task, subjects were instructed to study 10 of the 20 trivia questions (given in Appendix H) in anticipation of a future memory test. The fourth task was to recall the statements presented in the opinion survey. The subjects were given five minutes to write down all the statements that they could recall. Subjects recorded their recalled items in three page booklets (one for each topic). Each page in the booklet consisted of a topic given at the top of the sheet plus 20 blank lines to write each recalled statement. The order of the topic answer sheets was arbitrarily assigned to each subject.

The next task was a recognition measure. Subjects indicated their confidence in previously seeing various statements. Each statement was either presented earlier in the survey portion of the experiment or was a foil item. Confidence ratings were taken on a 1 (I am very sure I did not see the statement) to 7 (I am very sure I did see the statement) scale. The sixth task was a second survey. In this task, subjects
Figure 6: Outline of procedures used in Experiment 2.

- Instructions and keyboard practice
- Display monitor
- To computer
- Response keyboard
- Debriefing instructions
- Survey (part 2)
- Recognition
- Recall
- Filler task
- Survey (part 1)
indicated their agreement with each of the foil statements as in the first opinion survey. Finally, subjects were debriefed as to the goals of the study and received the opportunity to discuss the study with the experimenter. They also attempted to recall the answers to the trivia questions.

Opinion statements. Appendix G contains the 90 statements used in the study. For each topic there are 30 statements -- 10 pro or favorable statements, 10 con or unfavorable statements, and 10 neutral or nonevaluative statements. Statements were constructed by pairing one of the three experimental topics (as the subject of the sentence) with an argument (as the predicate). Each argument presented a different theme about the topic. The pro and con arguments were taken from the data collections described in Chapter 5. The nonevaluative facts were taken from textbooks and other information sources. Some of the nonevaluative facts were falsified. The following are examples of pro, con, and neutral statements for each topic:

Welfare helps keep America strong.
Welfare is unfair to those who work.
Welfare began in 1601 with the Elizabethan Poor Houses.

Nuclear power produces minimum pollution compared to coal or oil.
Nuclear power plants have a high risk of accidental meltdown.
Nuclear power plants must be built by a river.

A military spending increase gives Americans a feeling of security.
A military spending increase raises the potential of nuclear war.
A military spending increase requires the approval of Congress.

During the course of the experiment, each subject viewed a total of 54 out of the possible 90 statements (18 out of the 30 statements on each topic). Half of the statements (27 total or 9 per topic) were viewed in the first opinion survey (a presented item) and the other half were used as foils in the recognition task. For the 18 statements given on each topic, six were pro, six were con and six were neutral
(with an equal number of each type of statement appearing as presented and foil items). The selection of the 54 statements given each subject was accomplished by a counterbalancing routine that presented each statement six times for every 10 subjects (three times as a presented item and three times as a foil item). The order of presentation of statements within each task was independently randomized for each subject.

Numerous researchers have noted the possibility of an underlying ideological foundation of attitudes (see for example, Bluhm, 1974; Campbell et al., 1964; and Murphy & Likert, 1938). Often certain attitude endorsements tend to cluster together. For example, liberals support increased welfare spending, but tend to oppose nuclear power or more defense spending. To capture this dimension each statement was reclassified as either liberal (pro-welfare, anti-nuclear power and anti-defense spending), conservative (anti-welfare, pro-nuclear power and pro-defense spending) or neutral (the nonevaluative items).

Subjects. Subjects were 30 introductory psychology students who participated for course credit.

Summary of design. Subjects rated political statements in a 3 (statement polarity: liberal, conservative or neutral) X 3 (topic: welfare, nuclear power or defense spending) X 7 (statement agreement: a 1 to 5 opinion rating of each statement) design. Two memory measures were obtained: recall (scored 0 or 1 for not recalled or recalled) and recognition confidence (a 1 to 7 rating). Opinion judgment and recognition latencies were also recorded for each statement presentation. Latency, recorded in tenths of seconds, was operationalized as the time between the appearance of the statement on the video screen and the time when the subject completed the rating and pressed the appropriate button to go on to the next display.
Results

Recall scoring. Recall was scored using a gist criterion. Two judges attempted to match each recalled item with the predicate of one of the stimulus items. If the recalled item contained the gist or main theme of one of the stimulus items the statement was scored as recalled. Judges agreed on 99% of their decisions. All disagreements were worked out between judges. Other more stringent coding criteria were applied (such as near perfect reproduction) with essentially the same pattern of results obtained.

Regression analyses. Two types of regression analyses were typically performed -- a hierarchical regression and trend analyses. Four different dependent variables were used: statement recall, recognition, and judgment and recognition latencies. Four independent variables were used: the agreement rating given each statement, attitude towards the topic (described below), topic (either welfare, nuclear power, or defense spending represented by two dummy-coded variables) and statement polarity (either liberal, conservative or neutral represented by two dummy-coded variables). In the hierarchical regressions, predictor variables were entered in steps -- main effects in the first step and interactions in subsequent steps. A pooled error term (subject pooled with error variance) was used for all significance tests. In trend tests, the dependent variable was predicted by a single variable to test for linear trends or the square of that variable to test for quadratic trends. Cohen and Cohen (1975) provides more information on the use of pooled error terms in within-subjects designs and testing for quadratic effects using regression. Appendix I describes these and additional regression analyses.
Recall Analyses.

Statement agreement and recall. Table 7 gives the percentage of recalled items by statement polarity and agreement. Also included in Table 7 is the number of observations in each cell. An attitude and selective learning effect would be indicated by a significant positive correlation between recall and agreement — the more agreement with the statement the greater the recall. The simple correlation between recall and statement agreement is -.03 overall and -.04 with only liberal and conservative statements (both nonsignificant). A hierarchical multiple regression (predicting recall from topic, statement polarity and agreement plus their interactions) revealed no significant effect due to any predictor variable or interaction. The results of this regression are presented in Table 8. A second regression using the same model but including only the data for the liberal and conservative statements, also failed to detect a significant effect. The entire model accounted for only 2.6% of the total portion of variance in recall.

Attitude extremity and recall. An attitude-extremity effect is indicated by a higher percentage of recall for statements rated at the extremes of the agreement scale. Judd and Kulik (1980) tested for (and found) an attitude-extremity effect by predicting recall from the squared value of an opinion rating. Table 9 presents the results of a similar regression analysis for the present study. Overall, there was a slight quadratic trend indicating that items rated at the extremes of the attitude scale were best remembered ($t(29) = 1.53, p < .13$). Further tests revealed that this effect occurred primarily with the neutral statements ($t(29) = 2.40, p < .05$). For liberal and conservative statements no significant linear or quadratic trends were obtained.

Attitude towards the topic and recall. Another method of testing for an attitude and selective learning effect is to use subjects' attitude toward the topic as a predictor
Table 7

Percentage of Recalled Statements as a Function of Statement Agreement (Experiment 2)

<table>
<thead>
<tr>
<th>Agreement with the Statement</th>
<th>Disagree</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Liberal</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(obs.)</td>
<td>30.0</td>
<td>36.3</td>
<td>24.0</td>
<td>41.4</td>
<td>20.0</td>
<td>32.2</td>
<td></td>
</tr>
<tr>
<td>Neutral</td>
<td>48.6</td>
<td>41.5</td>
<td>23.8</td>
<td>41.9</td>
<td>39.1</td>
<td>35.2</td>
<td></td>
</tr>
<tr>
<td>(obs.)</td>
<td>35.0</td>
<td>41.0</td>
<td>109.0</td>
<td>62.0</td>
<td>23.0</td>
<td>27.0</td>
<td></td>
</tr>
<tr>
<td>Conservative</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(obs.)</td>
<td>51.4</td>
<td>30.5</td>
<td>30.0</td>
<td>35.3</td>
<td>31.7</td>
<td>34.8</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>41.7</td>
<td>35.5</td>
<td>25.3</td>
<td>39.2</td>
<td>29.8</td>
<td>34.1</td>
<td></td>
</tr>
<tr>
<td>(obs.)</td>
<td>120.0</td>
<td>166.0</td>
<td>213.0</td>
<td>217.0</td>
<td>94.0</td>
<td>810.0</td>
<td></td>
</tr>
</tbody>
</table>

Numbers represent the percentage of statements recalled as a function of statement agreement and polarity.

variable. To create a topic attitude score, subjects' statement agreement scores on the liberal and conservative statements were summed to create an index for each topic. The agreement ratings were combined so that higher numbers indicated a more conservative attitude. This procedure created an index with an empirical range of 18 to 60 out of a possible range of 12 to 60.

Figure 7 presents the best fitting regression line for liberal and conservative statements using topic attitude as the predictor variable. (The quadratic component was
Table 8

Hierarchical Multiple Regression on Recall
Using Statement Agreement (Experiment 2)

<table>
<thead>
<tr>
<th>Factor</th>
<th>Step</th>
<th>d.f.</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Statement Agreement (A)</td>
<td>1</td>
<td>(1,29)</td>
<td>2.31</td>
</tr>
<tr>
<td>Topic (B)</td>
<td>1</td>
<td>(2,58)</td>
<td>2.03</td>
</tr>
<tr>
<td>Statement Polarity (C)</td>
<td>1</td>
<td>(2,58)</td>
<td>0.41</td>
</tr>
<tr>
<td>A * B</td>
<td>2</td>
<td>(2,58)</td>
<td>0.79</td>
</tr>
<tr>
<td>A * C</td>
<td>2</td>
<td>(2,58)</td>
<td>0.36</td>
</tr>
<tr>
<td>B * C</td>
<td>2</td>
<td>(4,116)</td>
<td>1.37</td>
</tr>
<tr>
<td>A * B * C</td>
<td>3</td>
<td>(4,116)</td>
<td>1.94</td>
</tr>
</tbody>
</table>

not significant for any of the statement types). An attitude and selective learning effect is indicated by an interaction: liberal subjects recall more liberal than conservative material and conservative subjects recalling the opposite. As can be seen this pattern of data was not obtained. In fact there was a trend in the opposite direction. The interaction between statement polarity and attitude was not significant ($F(1,29) = 2.12, p < .15$).

The results of a hierarchical multiple regression predicting recall from topic attitude, topic, statement polarity and their interactions are given in Table 10. There was only one effect -- an attitude by topic interaction. Briefly, this interaction indicates that liberals recalled more welfare statements, conservatives more nuclear statements and liberals and conservatives recalled the defense statements equally well. One final test sought to determine if the attitude and selective learning effect occurred with any of the topics. A series of regressions were performed for each topic. No attitude and selective learning effect was obtained.
Table 9

Regression Equations for Estimating Recall Using Statement Agreement (Experiment 2)

<table>
<thead>
<tr>
<th></th>
<th>y-intercept</th>
<th>$\beta$(lin)</th>
<th>$\beta$(quad)</th>
<th>$t$(lin)</th>
<th>$t$(quad)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Liberal statements:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>linear</td>
<td>0.33</td>
<td>-.003</td>
<td>---</td>
<td>-0.14</td>
<td>---</td>
</tr>
<tr>
<td>quadratic</td>
<td>0.22</td>
<td>.091</td>
<td>-.016</td>
<td>---</td>
<td>-0.87</td>
</tr>
<tr>
<td>Neutral statements:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>linear</td>
<td>0.40</td>
<td>-.017</td>
<td>---</td>
<td>-0.68</td>
<td>---</td>
</tr>
<tr>
<td>quadratic</td>
<td>0.73</td>
<td>-.286</td>
<td>.046</td>
<td>---</td>
<td>2.40*</td>
</tr>
<tr>
<td>Conservative statements:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>linear</td>
<td>0.43</td>
<td>-.025</td>
<td>---</td>
<td>-1.12</td>
<td>---</td>
</tr>
<tr>
<td>quadratic</td>
<td>0.97</td>
<td>-.049</td>
<td>.002</td>
<td>---</td>
<td>0.12</td>
</tr>
<tr>
<td>All statements:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>linear</td>
<td>0.38</td>
<td>-.014</td>
<td>---</td>
<td>-1.06</td>
<td>---</td>
</tr>
<tr>
<td>quadratic</td>
<td>0.50</td>
<td>-.112</td>
<td>.017</td>
<td>---</td>
<td>1.53</td>
</tr>
</tbody>
</table>

Notes: * p < .05; d.f for all tests = 29; lin = linear; quad = quadratic

**Intrusions.** An intrusion is a production that was not part of the presented stimulus set. Each intrusion was independently classified by two judges (who conferred on all disagreements) into one of three categories: liberal (pro-welfare, anti-nuclear power and anti-defense spending), conservative (anti-welfare, pro-nuclear power, and pro defense spending) or neutral (neither liberal or conservative, a fragment or unrecognizable item). Table 11 presents the number of intrusions given by liberal, conservative and neutral subjects. (Subject classification was determined by a tertiary split of the attitude continuum such that 10 subjects fell into each category for each topic.)
Figure 7: Recall of statements as a function of attitude towards the topic. Lines represent the best fitting regression equations predicting recall from attitude (Experiment 2).
Table 10
Hierarchical Multiple Regression on Recall Using Topic Attitude and Evaluative Statements Only (Experiment 2)

<table>
<thead>
<tr>
<th>Factor</th>
<th>Step</th>
<th>d.f.</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Topic Attitude (A)</td>
<td>1</td>
<td>(1,29)</td>
<td>0.54</td>
</tr>
<tr>
<td>Topic (B)</td>
<td>1</td>
<td>(2,58)</td>
<td>1.17</td>
</tr>
<tr>
<td>Statement Polarity (C)</td>
<td>1</td>
<td>(1,29)</td>
<td>0.41</td>
</tr>
<tr>
<td>A * B</td>
<td>2</td>
<td>(2,58)</td>
<td>4.09*</td>
</tr>
<tr>
<td>A * C</td>
<td>2</td>
<td>(1,29)</td>
<td>2.12</td>
</tr>
<tr>
<td>B * C</td>
<td>2</td>
<td>(2,58)</td>
<td>1.44</td>
</tr>
<tr>
<td>A * B * C</td>
<td>3</td>
<td>(2,58)</td>
<td>0.41</td>
</tr>
</tbody>
</table>

Notes: * p < .05

There were 1.9 intrusions per subject. More of the intrusions (43.8%) occurred for the topic of nuclear power than any other topic. Most of the intrusion (47.3%) were conservative in nature. Liberal and conservative subjects generated 82.4% of the intrusions -- more than the expected two-thirds. The expectation that subjects would generate more attitude-consistent intrusions was not met. Liberals always generated more conservative than liberal intrusions. Conservatives generated slightly more conservative intrusions -- but not as many as the liberals.

Recognition Analysis

The recognition rating given each statement showed a bimodal distribution. Most of the statements (88.0%) were rated at the extremes (either a 1 or a 7). Due to this distribution, the recognition rating was categorized as follows: a hit (a recognition rating of 5, 6, or 7 for a presented item), a miss (a recognition rating of 1, 2, 3, or
### Table 11

**Number of Recall Intrusions (Experiment 2)**

<table>
<thead>
<tr>
<th>Attitude Towards the Topic</th>
<th>Liberal</th>
<th>Neutral</th>
<th>Conservative</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Type of Intrusion:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Welfare</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>liberal</td>
<td>0</td>
<td>2</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>neutral</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>conservative</td>
<td>3</td>
<td>1</td>
<td>2</td>
<td>6</td>
</tr>
<tr>
<td>total</td>
<td>4</td>
<td>4</td>
<td>7</td>
<td>15</td>
</tr>
<tr>
<td>Nuclear Power</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>liberal</td>
<td>4</td>
<td>1</td>
<td>3</td>
<td>8</td>
</tr>
<tr>
<td>neutral</td>
<td>0</td>
<td>2</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>conservative</td>
<td>6</td>
<td>3</td>
<td>4</td>
<td>13</td>
</tr>
<tr>
<td>total</td>
<td>10</td>
<td>6</td>
<td>9</td>
<td>25</td>
</tr>
<tr>
<td>Defense Spending</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>liberal</td>
<td>1</td>
<td>0</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>neutral</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>conservative</td>
<td>5</td>
<td>0</td>
<td>7</td>
<td>12</td>
</tr>
<tr>
<td>total</td>
<td>6</td>
<td>0</td>
<td>11</td>
<td>17</td>
</tr>
<tr>
<td>All Topics</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>liberal</td>
<td>5</td>
<td>3</td>
<td>9</td>
<td>17</td>
</tr>
<tr>
<td>neutral</td>
<td>1</td>
<td>3</td>
<td>5</td>
<td>9</td>
</tr>
<tr>
<td>conservative</td>
<td>14</td>
<td>4</td>
<td>13</td>
<td>31</td>
</tr>
<tr>
<td>total</td>
<td>20</td>
<td>10</td>
<td>27</td>
<td>57</td>
</tr>
</tbody>
</table>

Numbers represent the number of intrusions.
4 for a presented item), a correct rejection (a recognition rating of 1, 2, or 3 for foil items) or a false alarm (a recognition rating of 4, 5, 6, or 7 for foil items). False alarms and misses were scored as 0 whereas hits and correct rejections were scored as 1 in the regression analyses.

Overall, a high percentage (90.2) of the recognition judgments were correct. Table 12 presents (for each level of statement polarity and agreement) the hit and false alarm rate plus the corresponding $d'$, $\beta$ and number of observations per cell. (The measures $d'$ and $\beta$ were calculated on combined data to provide enough observations to obtain stable estimates). Table 13 presents the results of two hierarchical regressions on recognition accuracy (one conducted on the presented items and one on the foil items).

Of the recognition effects hypothesized at the beginning of this chapter, only a false alarm effect approached significance ($F(1,29) = 3.46, p < .1$). There was a slight trend for agreed-with foil statements to be mistakenly recognized a previous presented (represented by a decreasing $d'$ with more statement agreement). Conservative statements showed this trend most prominently. This effect parallels the false alarm effect obtained by Rogers, Rogers, and Kuiper (1979) and Breckler (1981) with the self as an attitude object.

The only other finding of note is the significant effect (for both presented and foil items) statement polarity on recognition accuracy. This effect is due to the superior recognition accuracy for the neutral statements. The most likely interpretation of this finding is that the stimulus properties of neutral statements differed from those of the evaluate statements. Neutral statements were perhaps more unusual and distinctive compared to the other types.
Table 12

Recognition Accuracy as a Function of Statement Agreement (Experiment 2)

Agreement with the Statement

<table>
<thead>
<tr>
<th></th>
<th>Disagree</th>
<th>Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Liberal</td>
<td></td>
<td></td>
</tr>
<tr>
<td>hits</td>
<td>96.0</td>
<td>90.9</td>
</tr>
<tr>
<td>(obs)</td>
<td>(50)</td>
<td>(66)</td>
</tr>
<tr>
<td>false alarms</td>
<td>7.7</td>
<td>8.3</td>
</tr>
<tr>
<td>(obs)</td>
<td>(52)</td>
<td>(73)</td>
</tr>
<tr>
<td>d'</td>
<td>2.48</td>
<td>2.74</td>
</tr>
<tr>
<td>β</td>
<td>1.55</td>
<td>1.07</td>
</tr>
<tr>
<td>Neutral</td>
<td></td>
<td></td>
</tr>
<tr>
<td>hits</td>
<td>97.1</td>
<td>95.1</td>
</tr>
<tr>
<td>(obs)</td>
<td>(35)</td>
<td>(41)</td>
</tr>
<tr>
<td>false alarms</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>(obs)</td>
<td>(36)</td>
<td>(24)</td>
</tr>
<tr>
<td>d'</td>
<td>----</td>
<td>----</td>
</tr>
<tr>
<td>β</td>
<td>----</td>
<td>----</td>
</tr>
<tr>
<td>Conservative</td>
<td></td>
<td></td>
</tr>
<tr>
<td>hits</td>
<td>94.2</td>
<td>88.1</td>
</tr>
<tr>
<td>(obs)</td>
<td>(35)</td>
<td>(59)</td>
</tr>
<tr>
<td>false alarms</td>
<td>4.4</td>
<td>6.0</td>
</tr>
<tr>
<td>(obs)</td>
<td>(23)</td>
<td>(50)</td>
</tr>
<tr>
<td>d'</td>
<td>3.30</td>
<td>2.72</td>
</tr>
<tr>
<td>β</td>
<td>1.57</td>
<td>1.67</td>
</tr>
<tr>
<td>All statements</td>
<td></td>
<td></td>
</tr>
<tr>
<td>hits</td>
<td>91.7</td>
<td>90.9</td>
</tr>
<tr>
<td>(obs)</td>
<td>(120)</td>
<td>(166)</td>
</tr>
<tr>
<td>false alarms</td>
<td>4.6</td>
<td>6.2</td>
</tr>
<tr>
<td>(obs)</td>
<td>(111)</td>
<td>(147)</td>
</tr>
<tr>
<td>d'</td>
<td>3.04</td>
<td>2.89</td>
</tr>
<tr>
<td>β</td>
<td>1.60</td>
<td>1.37</td>
</tr>
</tbody>
</table>

Numbers in rows labeled hits and false alarms represent the percentage of statements recognized.
Table 13

Hierarchical Multiple Regression on Recognition Accuracy Using Statement Agreement (Experiment 2)

<table>
<thead>
<tr>
<th>Factor</th>
<th>Step</th>
<th>d.f.</th>
<th>F(presented)</th>
<th>F(foils)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Statement Agreement (A)</td>
<td>1</td>
<td>(1,29)</td>
<td>0.99</td>
<td>3.46</td>
</tr>
<tr>
<td>Topic (B)</td>
<td>1</td>
<td>(2,58)</td>
<td>1.06</td>
<td>0.76</td>
</tr>
<tr>
<td>Statement Polarity (C)</td>
<td>1</td>
<td>(2,58)</td>
<td>6.37**</td>
<td>3.89*</td>
</tr>
<tr>
<td>A * B</td>
<td>2</td>
<td>(2,58)</td>
<td>1.11</td>
<td>0.05</td>
</tr>
<tr>
<td>A * C</td>
<td>2</td>
<td>(2,58)</td>
<td>3.40*</td>
<td>0.70</td>
</tr>
<tr>
<td>B * C</td>
<td>2</td>
<td>(4,116)</td>
<td>1.08</td>
<td>3.65</td>
</tr>
<tr>
<td>A * B * C</td>
<td>3</td>
<td>(4,116)</td>
<td>0.13</td>
<td>1.56</td>
</tr>
</tbody>
</table>

Notes: presented and foil refers to F ratios obtained in a regression on each set of items.
* P < .05; ** P < .01.

Opinion Judgment Latency

According to the hypotheses outlined at the beginning of the chapter, opinion judgment latencies should be faster for statements that were agreeable. A simple regression using opinion judgment latency as the dependent variable and statement agreement as the predictor variable found no significant linear relationship between the two factors. If anything a positive beta weight (y-intercept = 6.22 seconds and a slope of 0.11 seconds, 1(29) = 1.44, p < .2) indicates that subjects were slower in identifying attitude-consistent materials.

Judd and Kulik (1980) found that extreme opinion ratings were given faster than mid-range responses. To test for this quadratic effect a regression was performed that predicted opinion judgment latency using the square of statement agreement. Although
the trend was in the expected direction (a negative beta for squared opinion indicating faster response times at the extremes), it was not significant ($t(29) = 1.60, p < .15$).

**Recognition latency.** Srull (in press) has suggested that recognition latency is an indicator of the strength of the underlying memory trace accessed in a recognition task. One assumption frequently made in signal detection theory applied to recognition is that memory traces are stronger for those items rated at the extremes of the recognition confidence scale. Thus extreme judgments should be made faster than those in the middle. To test this assumption in the present study, recognition latency was predicted by the square of recognition confidence (the 1 to 7 rating) for each statement. Although a strong linear effect was obtained (indicating faster "did not see it" judgments, $t(29) = 11.06, p < .01$), the quadratic effect was opposite to the assumption and nonsignificant ($t(29) = 1.47, p < .2$). It should be noted, however, that the bimodal distribution of recognition scores were not well suited for this analysis.

Another possibility is that subjects used their attitudes in making the recognition judgment. In this case, strongly held attitudes are represented by stronger memory traces and thus result in faster reaction times. To test this assumption, recognition latency was predicted by the square of statement agreement. This time the linear effect was not significant ($t(29) = .81, n.s.$). However, there was a significant effect for the quadratic term ($y$-intercept = 6.97 seconds with a slope of 2.09 seconds for the linear and -0.34 seconds for the quadratic terms, $t(29) = 3.87, p < .01$). The negative beta weight for the quadratic term indicates that subjects were faster recognition judgments if the item had been given an extreme agreement rating. Separate regressions indicated that this effect was confined to the evaluative statements (conservative statements $t(29) = 3.32, p < .01$ and liberal statement $t(29) = 3.57, p < .01$). It did not occur with the neutral statements which showed a nonsignificant ($t =$
Summary of Findings

Summary of effects. The following effects were obtained in this study.

1. A false alarm effect (similar to one found in self research) was obtained such that agreed-with foils were more likely to be falsely recognized as having been previously presented.

2. Recognition latency was faster for statements that were given an agreement rating.

3. Judd and Kulik (1980) found that opinion judgment latency was faster for items rated at the extremes of the scale of agreement. Although this same pattern was found in the present study, it was not significant. One possible difference between the present study and the Judd and Kulik study was the size of the judgment scale. Judd and Kulik used a 7-point scale whereas the present study employed a 5-point scale. Attitudes may be more useful when discriminations are made difficult by a larger scale.

4. The attitude-extremity recall effect of Judd and Kulik (1980) was also obtained (even though the effect was marginal). However, this effect occurred only with the neutral statements. It is possible that this finding may not be an attitude effect. The rating of a factual statement can change the response scale from an evaluative one to a truth rating. For example, in rating a factual statement, strongly agree may mean "yes, it is true", disagree may mean "no, it is false", and the midpoint may mean "I am uncertain". Thus subjects are recalling those statements that they know are true or false and forgetting those they are uncertain about.

Summary of null results. The following predicted effects of attitude were not obtained in this study.

1. There was no relationship between attitudes and type of recall intrusions. Subjects were able to generate both attitude consonant and dissonant intrusions.

2. Subjects were neither faster in judging opinion statements nor in recognizing statements as a linear function of agreement.

3. Recognition of previously presented statements did not differ as a function of agreement.

4. No attitude and selective learning effect was found.
Of all the effects hypothesized at the beginning of this chapter, only an attitude/false alarm effect was obtained (and this effect was of marginal significance). When attitude effects did occur, they were bidirectional in nature (attitude-extremity effect for recall and recognition and judgment latencies). This suggests that subjects are using their attitudes in the various experimental tasks, but not in a manner likely to produce an attitude and selective learning effect. The next study (Experiment 3) attempted to design conditions that will force subjects to use their attitudes in a unidirectional manner.
Chapter 7

Experiment 3:

Still No Attitude and Selective Learning Effect

The literature review of Chapter 1 identified one potential moderator of the attitude and selective learning effect -- message length. For example, studies by Edwards (1941), Levine and Murphy (1943), Malpass (1969) and Weldon and Malpass (1981) used long text messages and found the effect. Studies by Waly and Cook (1966), Greenwald and Sakumara (1967), Smith and Jamieson (1972) and Eiser and Monk (1978) used single sentences and failed to produce the effect. Only the studies by Jones and Aneshansel (1956) and Jones and Kohler (1958) used short statements and obtained an effect.

Procedural differences in long and short message studies may elicit different retrieval processes to produce these divergent learning results. Typically in studies using long messages (for example, Levine and Murphy, 1943), subjects read a well-structured, one-sided message and are asked to recall it before going on to other research tasks. In studies that used short statements (for example, Experiment 2 and those by Waly and Cook, 1966), subjects read intermixed pro and con statements and were asked to recall all of these statements at the same time.
In long message studies, a one-sided or biased message can serve as a cue to use an attitude in the recall of a message. When recalling a biased message, the subject identifies the bias and attempts to generate information that is consistent with the bias. Subjects with attitudes congenial to the bias should find this task easier and be more successful. An attitude and selective learning effect should result, as hypothesized in Experiment 2, when the generations overlap with the presented materials.

The next study used the same procedures as Experiment 2 with one exception. Statements were presented in a biased format. Instead of presenting an equal number of liberal, conservative, and neutral statements, a biased presentational format was created for some topics by presenting a majority of statements on one side of the issue. Experiment 3 maintained the other features of Experiment 2 (message-dense environment, familiar opinion statements; an agreement rating, etc.) to induce subjects to use their attitudes in the learning and recall of the persuasive materials.

Method

Equipment, procedures and materials. The same equipment, procedures and materials used in Experiment 2 were employed in the present study with two exceptions. First, since subjects were not using the middle values of the recognition confidence scale, it was reduced from a 1 to 7 to a 1 to 4 point scale (with 1 = I am very sure I did not see the statement and 4 = I am very sure I did see the statement).

The second change was in the manner of statement presentation. Subjects still viewed 54 of the 90 statements (with 18 statements per topic) given in Appendix G. However, they did not always receive an equal number of pro, con, and neutral statements for each topic. Each subject received statements for one pro-bias topic, one
con-bias topic and one no-bias topic. A biased topic (either pro or con) was created by presenting (in the first opinion survey) five statements of one valence (either pro or con), three neutral statements and one statement that had a valence opposite to the majority. Thus a pro-bias topic would consist of five pro statements, three neutral statements and one con statement. A con-bias topic consists of five con statements, three neutral statements, and one pro statement. A no-bias topics consists of an equal number of each type of statements (three pro, con and neutral). The recognition task always used three pro, con and neutral statements as foils regardless of the topic bias created in the first part of the experiment.

Therefore each statement could be presented in either an unbiased or biased format. To simplify analysis, statements were classified as being in one of three categories. Unbiased presentation consisted of topics for which an equal number of all types of statements (liberal, conservative, and neutral) were presented. This category corresponds to the presentation format of Experiment 2. Statements in a biased presentation format could be of two types. Statements could be consistent-with-the-bias, that is their valence agrees with the bias of the presentation format or statements could be inconsistent-with-the-bias, that is their valence disagrees with the bias of the presentation format. The consistent-with-the-bias format was designed to correspond to the long message studies obtaining an attitude and selective learning effect. In addition to analyses performed on the entire data set, each type of presentation format was analyzed separately.

Liberal and conservative statements were selected for presentation by a counterbalancing routine that presented each statement to 36 of the 60 subjects. A statement was placed in the consistent-with bias category 16 times (10 times as a target and six times as foil), 12 times in the no-bias category (six times as a target and six times as a foil) and in the inconsistent-with bias category eight times (twice as
a target and six times as a foil). The neutral statements were selected by a counterbalancing routine that presented each statement to 36 of the 60 subjects.

Subjects. Subjects were 60 students enrolled in an introductory psychology course who participated for course credit.

Results

Scoring and analyses. Recall was scored using the gist criterion employed in Experiment 2. The two judges agreed on 99% of the decisions. Regression analyses were similar to those used with the Experiment 2 data (plus additional analyses for each presentation format). As in Experiment 2, statements were classified as either liberal, conservative or neutral.

Recall Analyses

Statement agreement and recall. Table 14 gives the percentage of statements correctly recalled as a function of statement polarity and agreement. As in the previous study, recall was not linearly related to statement agreement. The simple correlation between recall and statement agreement is .02 overall and .04 including only the liberal and conservative statements (both nonsignificant). As in Experiment 2, no attitude and selective learning effect occurred.

A hierarchical multiple regression predicting recall from the agreement rating, topic and statement polarity (plus their interactions) confirmed the lack of a linear relationship between statement agreement and recall. The results of this analysis are given in Table 15. Only one factor had a significant effect on recall -- statement polarity. (Neutral statements were recalled best). The entire regression model accounted for only 2.3% of the variance in recall. The data were also analyzed
Table 14

Percentage of Recalled Statements as a Function of Statement Agreement (Experiment 3)

Attitude Towards the Statements

<table>
<thead>
<tr>
<th>Disagree</th>
<th>Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Statement Polarity:</td>
<td></td>
</tr>
<tr>
<td>Liberal</td>
<td>26.8</td>
</tr>
<tr>
<td>(obs.)</td>
<td>(67)</td>
</tr>
<tr>
<td>Neutral</td>
<td>61.2</td>
</tr>
<tr>
<td>(obs.)</td>
<td>(49)</td>
</tr>
<tr>
<td>Conservative</td>
<td>41.6</td>
</tr>
<tr>
<td>(obs.)</td>
<td>(36)</td>
</tr>
<tr>
<td>Total</td>
<td>41.4</td>
</tr>
<tr>
<td>(obs.)</td>
<td>(152)</td>
</tr>
</tbody>
</table>

Numbers represent the percentage of statements recalled as a function statement polarity and agreement.

separately for each presentation format. The results were the same -- no linear relationship between agreement with a statement and recall.

Attitude extremity and recall. Table 16 presents the regression equations for predicting recall from statement agreement and its squared value (the linear and quadratic trend tests). As in Experiment 2 an attitude-extremity effect (better recall for statements rated at the extremes) was obtained (t(59) = 2.65, p < .05). Separate regressions for each type of statement indicated that this effect occurred once again with the neutral statements (a significant quadratic, t(59) = 3.15, p < .01) The effect
Table 15

Hierarchical Regression on Recall Using Statement Agreement (Experiment 3)

<table>
<thead>
<tr>
<th>Factor</th>
<th>Step</th>
<th>d.f.</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Statement Agreement (A)</td>
<td>1</td>
<td>(1,59)</td>
<td>0.21</td>
</tr>
<tr>
<td>Topic (B)</td>
<td>1</td>
<td>(2,118)</td>
<td>1.02</td>
</tr>
<tr>
<td>Statement Polarity (C)</td>
<td>1</td>
<td>(2,118)</td>
<td>10.41**</td>
</tr>
<tr>
<td>A * B</td>
<td>2</td>
<td>(2,118)</td>
<td>0.29</td>
</tr>
<tr>
<td>A * C</td>
<td>2</td>
<td>(2,118)</td>
<td>1.20</td>
</tr>
<tr>
<td>B * C</td>
<td>2</td>
<td>(4,236)</td>
<td>1.91</td>
</tr>
<tr>
<td>A * B * C</td>
<td>3</td>
<td>(4,236)</td>
<td>0.71</td>
</tr>
</tbody>
</table>

Notes: ** p < .01

was not significant for the liberal and conservative statements.

Attitude toward the topic and recall. An attitude score for each topic was created as in Experiment 2. Agreement ratings of liberal and conservative statements were summed such that a higher score indicated a conservative attitude towards the topic. In Experiment 3, this attitude score empirically ranged from 18 to 57 (out of a possible range of 12 to 60).

A series of hierarchical multiple regressions were performed to predict recall using attitude towards the topic, topic, and statement polarity plus all interactions. Table 17 presents the results of the regression for the complete data set and for each presentation format. An attitude and selective learning effect would be indicated by a significant attitude by statement polarity interaction. As can be seen, this interaction was not significant in any of the regressions. Figures 7 - 9 present the best fitting regression lines using attitudes to predict recall of liberal and conservative statements.
Table 16

Regression Equations for Estimating Recall Using Statement Agreement (Experiment 3)

<table>
<thead>
<tr>
<th>y-intercept</th>
<th>β(lin)</th>
<th>β(quad)</th>
<th>t(lin)</th>
<th>t(quad)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Liberal statements:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>linear</td>
<td>0.23</td>
<td>0.031</td>
<td>---</td>
<td>1.91</td>
</tr>
<tr>
<td>quadratic</td>
<td>0.34</td>
<td>-0.062</td>
<td>0.016</td>
<td>1.07</td>
</tr>
<tr>
<td>Neutral statements:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>linear</td>
<td>0.49</td>
<td>-0.012</td>
<td>---</td>
<td>-0.58</td>
</tr>
<tr>
<td>quadratic</td>
<td>0.86</td>
<td>-0.297</td>
<td>0.048</td>
<td>3.15**</td>
</tr>
<tr>
<td>Conservative statements:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>linear</td>
<td>0.41</td>
<td>-0.009</td>
<td>---</td>
<td>-0.53</td>
</tr>
<tr>
<td>quadratic</td>
<td>0.61</td>
<td>-0.159</td>
<td>0.024</td>
<td>1.49</td>
</tr>
<tr>
<td>All statements:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>linear</td>
<td>0.36</td>
<td>0.007</td>
<td>---</td>
<td>0.69</td>
</tr>
<tr>
<td>quadratic</td>
<td>0.55</td>
<td>-0.134</td>
<td>0.023</td>
<td>2.65*</td>
</tr>
</tbody>
</table>

Notes: * p < .05; ** p < .01; lin = linear; quad = quadratic term; d.f. for all tests = 59.

in each presentation format.

The recall results for the statements given in the unbiased presentation are presented in Figure 8. This treatment corresponds most closely to the conditions of Experiment 2 -- that is, an equal number of each type of statement. In Experiment 2 there was a slight trend for liberal statements to be better recalled by conservative than liberal subjects with the opposite occurring for conservative statements. This trend did not occur in the present study.

The results for statements that had a valence consistent with the bias of the presentation are given in Figure 9. This presentation format was designed to
Table 17

Hierarchical Regression on Recall Using Topic Attitude and Evaluative Statements Only (Experiment 3)

<table>
<thead>
<tr>
<th>Factor</th>
<th>Step</th>
<th>d.f.</th>
<th>F(all)</th>
<th>F(const)</th>
<th>F(inct)</th>
<th>F(none)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Topic Attitude (A)</td>
<td>1</td>
<td>(1,59)</td>
<td>0.03</td>
<td>0.36</td>
<td>0.39</td>
<td>0.37</td>
</tr>
<tr>
<td>Topic (B)</td>
<td>1</td>
<td>(2,118)</td>
<td>0.45</td>
<td>0.43</td>
<td>1.36</td>
<td>1.67</td>
</tr>
<tr>
<td>Statement Polarity (C)</td>
<td>1</td>
<td>(1,59)</td>
<td>4.70*</td>
<td>2.71</td>
<td>2.42</td>
<td>0.52</td>
</tr>
<tr>
<td>A * B</td>
<td>2</td>
<td>(2,118)</td>
<td>0.84</td>
<td>0.48</td>
<td>0.91</td>
<td>1.51</td>
</tr>
<tr>
<td>A * C</td>
<td>2</td>
<td>(1,59)</td>
<td>0.95</td>
<td>1.07</td>
<td>0.40</td>
<td>0.04</td>
</tr>
<tr>
<td>B * C</td>
<td>2</td>
<td>(2,118)</td>
<td>4.67*</td>
<td>0.37</td>
<td>0.27</td>
<td>2.86</td>
</tr>
<tr>
<td>A * B * C</td>
<td>3</td>
<td>(2,118)</td>
<td>0.40</td>
<td>0.29</td>
<td>1.27</td>
<td>0.43</td>
</tr>
</tbody>
</table>

Notes: * p < .05; F(all) = F ratio for the total data set; F(const) = F ratio for statements consistent with the bias of the presentation; F(inct) = F ratio for statements inconsistent with the bias of the presentation; F(none) = F ratio for statements given in an unbiased presentation.

correspond to previous studies that used long, one-sided messages. It was hypothesized to have the most opportunity for producing an attitude and selective learning effect. As can be seen an opposite pattern of data was obtained: liberal subjects exhibited better memory for conservative statements than did conservative subjects with the opposite pattern occurring with the liberal statements. The interaction between attitude and statement polarity was not significant. Although this reverse attitude and selective learning effect is surprising, it is not novel. Experiment 2 also obtained this pattern as did Malpass (1969) in a learning treatment.

Figure 10 presents the results for statements that had a valence that was inconsistent with the bias of the topic presentation. As can be seen there was a partial attitude and selective learning effect: conservative statements were better recalled by conservative subjects than by liberal subjects. However, the attitude by statement
Figure 8: Recall of statements given in an unbiased presentation. Lines represent best fitting regression equations predicting recall from attitude.
Figure 9: Recall for statements given in a biased presentation. Data only for those statements that agreed with the overall bias. Lines represent best fitting regression equations predicting recall from attitude.
Figure 10: Recall for statements given in a biased presentation: II. Data only for those statements that disagreed with the overall bias. Lines represent best fitting regression equations predicting recall from attitude.
polarity interaction was not significant, \( F < 1 \). The lack of a significant effect may seem surprising since the magnitude of differences appear larger than in the other two treatments. Two points are worth noting. First, each regression line is based on only 60 observations — one-fifth the number of observations in the other biased presentation. Thus statistical power is reduced and sample estimates may be unstable. Second, the full model (with topic, attitude, statement polarity and their interactions) did not predict a significant portion of the variance in recall in any of the presentation formats. Thus it is perhaps best to treat any significant effect on recall as spurious.

**Intrusions.** Intrusions were scored as in Experiment 2 — this time using only one judge to determine polarity. Subjects were also classified as in Experiment 2. Table 18 presents the number of liberal, conservative, and neutral intrusions for each type of message bias. Intrusions averaged 2.0 per subject. Most of the intrusions were liberal in nature (39.2%). This stands in contrast to Experiment 2 where most of the intrusions were conservative. Liberal and conservative subjects generated 73.3% of the intrusions — more than the expected two-thirds.

The bias of the topic presentation (liberal or conservative) appears to induce intrusions that are consistent with the overall bias. Liberal intrusion rates were higher than expected for liberal-bias topics whereas conservative intrusions were lower than expected for the same topics. The reverse pattern was found for the conservative-bias topics. This pattern was significant \( (\chi^2(1) = 4.24, p < .05) \).

Overall, a partial attitude and generated intrusion effect was obtained. Conservative subjects generated the same number of liberal and conservative intrusions. However, liberal subjects generated more liberal than conservative intrusions. This effect was marginally significant \( (\chi^2(1) = 3.29, p < .1) \).
Table 18

Number of Intrusions as a Function of Topic Bias

<table>
<thead>
<tr>
<th>Type of Intrusions</th>
<th>Liberal</th>
<th>Neutral</th>
<th>Conservative</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Liberal-bias topics</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>liberal</td>
<td>15</td>
<td>2</td>
<td>5</td>
<td>22</td>
</tr>
<tr>
<td>neutral</td>
<td>4</td>
<td>2</td>
<td>2</td>
<td>8</td>
</tr>
<tr>
<td>conservative</td>
<td>3</td>
<td>3</td>
<td>5</td>
<td>11</td>
</tr>
<tr>
<td>total</td>
<td>22</td>
<td>7</td>
<td>12</td>
<td>41</td>
</tr>
<tr>
<td><strong>No-bias topics</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>liberal</td>
<td>7</td>
<td>7</td>
<td>9</td>
<td>23</td>
</tr>
<tr>
<td>neutral</td>
<td>2</td>
<td>4</td>
<td>2</td>
<td>8</td>
</tr>
<tr>
<td>conservative</td>
<td>1</td>
<td>6</td>
<td>7</td>
<td>14</td>
</tr>
<tr>
<td>total</td>
<td>10</td>
<td>17</td>
<td>18</td>
<td>45</td>
</tr>
<tr>
<td><strong>Conservative-bias topics</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>liberal</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>9</td>
</tr>
<tr>
<td>neutral</td>
<td>6</td>
<td>2</td>
<td>3</td>
<td>11</td>
</tr>
<tr>
<td>conservative</td>
<td>6</td>
<td>3</td>
<td>5</td>
<td>14</td>
</tr>
<tr>
<td>total</td>
<td>15</td>
<td>8</td>
<td>11</td>
<td>34</td>
</tr>
<tr>
<td><strong>All topics</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>liberal</td>
<td>25</td>
<td>12</td>
<td>17</td>
<td>54</td>
</tr>
<tr>
<td>neutral</td>
<td>12</td>
<td>8</td>
<td>7</td>
<td>27</td>
</tr>
<tr>
<td>conservative</td>
<td>10</td>
<td>12</td>
<td>17</td>
<td>39</td>
</tr>
<tr>
<td>total</td>
<td>47</td>
<td>32</td>
<td>41</td>
<td>120</td>
</tr>
</tbody>
</table>

Numbers represent the number of intrusions.

Recognition Analyses

As in the previous study, most of the recognition ratings (91.7%) were at the extremes confidence scale (a score of 1 or 4). Thus the recognition scale was collapsed into two categories: a score of 1 or 2 indicated that the subject did not
recognize the item and a score of 3 or 4 indicated recognition. Overall a high percentage (93.4%) of recognition judgments were correct.

Table 19 presents (for each level of statement agreement and polarity) the hit and false alarm rate along with the corresponding $d'$, $\beta$, and number of observations for the recognition data. Table 20 presents the results of two hierarchical regressions on recognition accuracy (one conducted on the presented items and one on the foil items).

Experiment 2 found a marginal false alarm effect -- more false recognition of agreeable items. As can be seen this pattern did not replicate in the present study. However, a marginal effect of statement agreement on hit rate was obtained. Presented statements that were agreeable were more likely to be recognized than disagreeable items. This effect did not occur in Experiment 2. One recognition finding consistently obtained in Experiments 2 and 3 is that subjects demonstrate superior recognition accuracy of the neutral statements (a significant effect due to statement polarity). Separate hierarchical regressions were performed for each presentation format. These subsequent regressions failed to detect additional effects of statement agreement on recognition memory.

**Opinion Judgment Latency**

Opinion judgment latencies were analyzed separately for each presentation format. Since similar results were obtained in each format, a combined analysis is reported. Experiment 2 found that subjects were slower to provide an opinion rating for agreeable statements -- albeit of marginal significance. A simple regression predicting opinion judgment latency from statement agreement found a similar pattern. A positive beta weight ($y$-intercept = 6.02 seconds and a slope of 0.11 seconds, $t(59) = 1.86$, p
Table 19

Recognition Accuracy as a Function of Statement Agreement (Experiment 3)

<table>
<thead>
<tr>
<th>Agreement with the Statement</th>
<th>Disagree</th>
<th>Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Liberal statements:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hits (obs)</td>
<td>86.5</td>
<td>88.8</td>
</tr>
<tr>
<td>False Alarms (obs)</td>
<td>7.2</td>
<td>4.8</td>
</tr>
<tr>
<td>d'</td>
<td>2.55</td>
<td>2.87</td>
</tr>
<tr>
<td>β</td>
<td>1.58</td>
<td>1.88</td>
</tr>
<tr>
<td>Neutral statements:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hits (obs)</td>
<td>97.9</td>
<td>94.1</td>
</tr>
<tr>
<td>False Alarms (obs)</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>d'</td>
<td>----</td>
<td>----</td>
</tr>
<tr>
<td>β</td>
<td>----</td>
<td>----</td>
</tr>
<tr>
<td>Conservative statements:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hits (obs)</td>
<td>97.2</td>
<td>87.6</td>
</tr>
<tr>
<td>False alarms (obs)</td>
<td>10.6</td>
<td>5.9</td>
</tr>
<tr>
<td>d'</td>
<td>3.11</td>
<td>2.72</td>
</tr>
<tr>
<td>β</td>
<td>0.79</td>
<td>1.72</td>
</tr>
<tr>
<td>All statements:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hits (obs)</td>
<td>92.7</td>
<td>89.6</td>
</tr>
<tr>
<td>False alarms (obs)</td>
<td>5.9</td>
<td>4.2</td>
</tr>
<tr>
<td>d'</td>
<td>2.94</td>
<td>3.03</td>
</tr>
<tr>
<td>β</td>
<td>1.17</td>
<td>2.02</td>
</tr>
</tbody>
</table>

Numbers in rows labeled hits and false alarms represent the percentage of statements recognized.
Table 20

Hierarchical Multiple Regression on Recognition Accuracy Using Statement Agreement (Experiment 3)

<table>
<thead>
<tr>
<th>Factor</th>
<th>Step</th>
<th>d.f.</th>
<th>F(present)</th>
<th>F(foil)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Statement Agreement (A)</td>
<td>1</td>
<td>(1,59)</td>
<td>4.13*</td>
<td>1.34</td>
</tr>
<tr>
<td>Topic (B)</td>
<td>1</td>
<td>(2,118)</td>
<td>1.07</td>
<td>0.49</td>
</tr>
<tr>
<td>Statement Polarity (C)</td>
<td>1</td>
<td>(2,118)</td>
<td>5.85**</td>
<td>9.90**</td>
</tr>
<tr>
<td>A * B</td>
<td>2</td>
<td>(2,118)</td>
<td>0.03</td>
<td>0.85</td>
</tr>
<tr>
<td>A * C</td>
<td>2</td>
<td>(2,118)</td>
<td>0.85</td>
<td>0.04</td>
</tr>
<tr>
<td>B * C</td>
<td>2</td>
<td>(4,236)</td>
<td>0.26</td>
<td>1.40</td>
</tr>
<tr>
<td>A * B * C</td>
<td>3</td>
<td>(4,236)</td>
<td>1.17</td>
<td>0.39</td>
</tr>
</tbody>
</table>

Notes: * p < .05; ** p < .01; present and foil refer to the F ratio for presented and foil items.

< .1) indicates that subjects were slower in providing an opinion of attitude-consistent materials.

The test for the Judd and Kulik (1980) effect of extremity of opinion rating on judgment latency produced results similar to those of Experiment 2. A negative beta weight for the square of statement agreement indicates that subjects were quicker in rating a statement at the extremes as opposed to the middle range of the scale. However, as in Experiment 2, this trend was only marginally significant (t(59) = 1.75, p < .1).

Recognition Latency

The recognition latencies were analyzed separately for each presentation format. Since the same results were obtained in all formats, a combined analysis is reported. The attitude extremity effect (faster recognition latencies for statements given extreme
agreement ratings) found in Experiment 2 was replicated. The test for the linear trend of agreement on recognition was not significant (t(59) = 0.59). The test for the quadratic trend yielded a negative beta weight that was significant (t(59) = 4.04, p < .01). Separate regressions indicated that the effect was strongest with the evaluative statements (conservative statements, t(59) = 2.93 and liberal statements, t(59) = 5.95, both significant at the .01 level) but also occurred with neutral statements (t(59) = 2.20, p < .05).

Summary of Findings

Unreplicated effects. One finding from Experiment 2 did not replicate in the present study.
1. No attitude false alarm effect was observed in the recognition task.

Replicated effects. The following findings replicated from the first study.
1. Recognition judgment latency was faster for statements rated at the extremes of the agreement scale.
2. Subjects were slightly (though not significantly) faster in judging statements at the extremes of the agreement scale.
3. The attitude-extremity effect (superior recall of those statements rated at the extremes) was also obtained. As in the first study, the effect occurred most strongly with the neutral statements.

Consistent null results. The two studies presented in Chapters 6 and 7 produced the following null results.
1. Subjects were neither faster in judging opinion statements nor in recognizing these statements as a linear function of statement agreement.
2. There was no relationship between attitude and types of intrusions.
3. Recognition accuracy did not consistently differ (in Experiments 2 and 3) as a function of statement agreement.
4. No attitude and selective learning effect was obtained.
The biased presentation format had as its goal to induce subjects to generate more unidirectional material. Presumably, subjects for whom the bias was consistent with their attitude could perform this task better and demonstrate superior learning and memory effects. The intrusion results indicated that the biased presentation did elicit more bias-consistent material. However, this did not translate into attitude and memory effects. Separate regressions on statements classified into each of the three biased presentation formats consistently failed to find any differences that were not obtained in the overall analysis.

It is indeed surprising, given the robustness of the attitude and selective generation effect, that two studies using operations to promote selective generation could not obtain an attitude and selective learning effect. Although attitudes can function as heuristics, they appear to have other functions. For example, the only consistent findings of Experiments 2 and 3 were not unidirectional effects of attitude, but attitude-extremity effects. The next chapter presents a theory of attitude structure constructed from the pattern of results obtained in the previous studies. This theory is then used in Chapter 9 to successfully design an attitude and selective learning effect.
Chapter 8
Attitude Structure: Unipolar and Bipolar Attitudes

In general the attitude effects obtained in the previous studies have been bidirectional in nature, that is occurring at the extremes of an attitude scale. (Only Experiment 1 has produced a unidirectional effect). These extremity effects can be termed bipolar effects since they occur at the two ends of attitude scale. Examples of bipolar effects include:

- Faster recognition for opinion items rated at the extremes of the agreement scale.
- Faster opinion judgment latencies for items rated at the extremes of the agreement scale.
- Superior memory for items rated at the extremes of the agreement scale (the attitude-extremity effect on recall first obtained by Judd and Kulik, 1980).
- Subjects (regardless of their attitude) generated recall intrusions that both agreed and disagreed with their attitudes.
- Subjects (regardless of their attitude) generated arguments that appeared similar in theme and content on both sides of an issue.

In this chapter, we develop a simple theory of the knowledge structures supporting attitudes to account for these findings and the general lack of unidirectional effect of attitude in a learning task.
Definitions of Knowledge Structure. Bartlett (1932) was one of the first to describe the role of knowledge structures (which he called schemas) in learning and memory. Neisser (1976) has recently defined schema as:

"A schema is like a format in a computer language. Formats specify that information must be of a certain sort if it is to be interpreted coherently... A schema is not merely like a format; it also functions as a plan... Perceptual schemata are plans for finding out about objects and events, for obtaining more information to fill in the format." (Neisser, 1976, p. 55).

Lingle and Ostrom (1981) noting the importance of the organization of knowledge for social cognition, have extended the schema notion to attitudes. They claim that attitudes serve as thematic framework. They define themes as:

"A subset of existing knowledge, based upon prior experience and relevant to a limited domain, that people use as a framework to guide their observation, organization, and retrieval from memory of perceived events." (Lingle and Ostrom, 1981, p. 401).

Evaluative Organization of Knowledge. Knowledge can be organized in a variety of ways. Some suggested formats include temporal or linear (for example the scripts of Schank & Abelson, 1977), hierarchical (Collins & Quillian, 1969), in a prototypical fashion (Rosch, 1978) or around a central object such as a person (Ostrom, Pryor & Simpson, 1981). Knowledge can also be organized along an evaluative continuum. An attitudinal schema is an organization of evaluative knowledge. Two types of attitudinal schemas can be distinguished. A bipolar attitude is an organization of knowledge that contains both favorable and unfavorable information about an object. Individuals often have bipolar attitudes on controversial topics such as welfare, nuclear power, and defense spending. Conversely, a unipolar attitude contains information on only one side of an issue. People often possess unipolar attitudes in noncontroversial domains such as the knowledge structure of the avid sports fan, the music impresario,
or the infatuated young lover. Other examples of unipolar attitudes may be the gender role attitudes of young children (see for example, Liben & Signorella, in press) and group membership attitudes (such as those investigated by Zillig, 1928 and Gustafson, 1957).

Figure 11 presents a graphic representation of a possible bipolar knowledge structure for an ardent supporter of nuclear power. Both supporting arguments and opposing information are present in memory (along with some general facts). The knowledge structure for a critic of nuclear power would be very similar. It could also contain information on both sides of the issue. Information differs from belief. A person may know how a meltdown occurs in a nuclear power plant and may know that some believe it is a problem. However, this is different from actually believing that a meltdown will occur or that it is an important problem in deciding the issue of nuclear power.

Figure 12 presents a possible portion of a knowledge structure from an "avid sports fan". The structure is unipolar in nature. It contains information supporting a positive attitude towards sports, such as information on teams, player status, strategy, etc. The non-sports fan has a quite different knowledge structure. Although it may contain information about some teams and a few facts (such as most football games go into extra innings thus postponing the evening T.V. line-up), it is a quite limited knowledge structure.

Judd and Kulik (1980) were the first to note that controversial attitudes may be represented by a bipolar schema. In their study, two attitude-extremity effects were obtained: Subjects were faster rating extreme statements and demonstrated superior memory for these same type of statements. Judd and Kulik argue that these results are due to the facilitating effect of a bipolar schema. Extreme statements fit easily into
Figure 11: Hypothetical bipolar knowledge structure for a nuclear power supporter.

- **Pro-Nuclear**
  - Minimum pollution
  - Conserve fossil fuels
  - Cheaper
  - Limitless energy

- **Anti-Nuclear**
  - Radiation
  - Meltdown
  - Leads to nuclear war
  - Waste problem
  - Small fuel pellets
  - Split-atom
  - 3-Mile Island
  - E.P.A. regulation
  - Keep pace with Soviets

GENERAL FACTS

E.P.A. regulation

Keep pace with Soviets

3-Mile Island

Waste problem

Small fuel pellets

Split-atom

Meltdown

Radiation

Leads to nuclear war

Waste problem

3-Mile Island

E.P.A. regulation

Keep pace with Soviets

Cheaper

Limitless energy

Conserve fossil fuels

Minimum pollution
Figure 12: Hypothetical unipolar knowledge structure for a sports fan.
the bipolar schema. The same process could also account for the attitude-extremity effect on recognition latency found in Experiments 2 and 3. The ability of subjects to generate attitude-consistent and inconsistent recall intrusions and arguments provides additional evidence of a bipolar structure for controversial topics. Recently, Johnson and Judd (in press) have demonstrated how bipolar schemas can be used in learning schema congruent and incongruent information.

**Attitude and the development of a knowledge structure.** Some knowledge structures are enriched whereas others are impoverished. A knowledge structure can vary in the amount of information it contains, the strength of its associations, and the differentiation of its elements. With unipolar attitudes, the development of a knowledge structure varies as a function of attitude. Individuals with favorable, unipolar attitudes possess enriched knowledge structures. The knowledge structures for individuals with nonsupporting unipolar attitudes are impoverished. The implied mechanism is that positive, unipolar attitudes lead to interest and experience with the domain. A superior knowledge of the topic results. Various studies have noted the role of experience in the development of attitudes (see for example, Bréslaw, 1938; Hess & Torney, 1969 and Horowitz & Horowitz, 1937).

In contrast, the development of a bipolar knowledge structure does not necessarily vary with location on the attitude continuum. Individuals with pro, anti, and neutral attitudes can show equal interest and experience and thus equal knowledge of a bipolar domain. Individuals may vary in the quality of their bipolar knowledge, but this is not a systematic function of attitude.

**Empirical referents of unipolar and bipolar attitudes.** How can unipolar and bipolar attitudes be distinguished? One direct technique is to ask subjects to "dump memory" in a thought listing exercise like the ones described in Chapter 5. There are
other indirect indicators of attitude structure.

- With a bipolar topic a pool of arguments must exist on both sides of the issue. One indicator of this is the presence of advocacy groups. For example, there are numerous political action committees and lobbyists supporting and denouncing bipolar attitude topics such as welfare, nuclear power, and increases in defense spending. However, there are only supporters of unipolar topics — for example, the National Football League, Olympic committees, Little League baseball, etc. for sports.

- The range of the attitude continuum differs for unipolar and bipolar attitudes. The bipolar attitude continuum ranges from support to non-support (the zero point) to opposition. The unipolar continuum (by definition) ranges from support to non-support. Therefore, a unipolar topic domain would be indicated by a low frequency of endorsement of statements opposing the attitude object.

- Finally, with unipolar domains, knowledge structures increase in quality with the favorability of the attitude. Therefore there should be a positive linear correlation between attitude measures and measures of the development of the knowledge structure (such as measures of domain interest, experience, and knowledge). No apriori relationship between location on the attitude continuum and development of knowledge structure can be specified for bipolar domains.

Attitude structure and learning. A frequent finding in learning research is that a pre-existing knowledge structure facilitates learning of material related to its domain. Voss and colleagues frequently find that experts (individuals with well developed knowledge structures) demonstrate superior memory abilities for terms related to their area of expertise (see for example, Chiesi, Spillich, & Voss, 1979; Spillich, Vesonder, Chiesi, & Voss, 1979; Voss, Vesonder & Spilich, 1980). A consistent finding in self and memory research is that information linked to the self (a well-differentiated knowledge structure for most people) is well remembered (see for example, Rogers, Kuiper & Kirker, 1977; Kuiper & Rogers, 1979; Greenwald, et al., 1981).

The facilitation of learning by pre-existing knowledge structures on learning is most probably a multiply determined effect. For example, Taylor and Crocker (1981) list these functions of schemas, all of which can contribute to superior
memory: schemas lend structure to experience, determine what information will be encoded and retrieved from memory, fill in missing data from an input stimulus, and provide the basis for problem solving. In a nutshell, a pre-existing knowledge structure can aid at encoding (by encouraging encoding elaborations and by aiding interpretation and understanding) and at retrieval (by providing internal cues that serve as covert mnemonics for recall and by guiding the reconstruction of an event).

Given that pre-existing knowledge structures facilitate learning, there should be a positive relationship between attitude and recall of words related to a unipolar domain. The individual with a positive, unipolar attitude possesses a well developed knowledge structure to use in learning and retrieval. Thus, it is possible to obtain an attitude and selective learning effect using stimulus material from a unipolar domain. (This effect would be similar to the gender role and memory effect described in Chapter 1. In these studies, children either did or did not possess gender role knowledge structures). The relationship between attitude and recall of words related to a bipolar domain is more complex. Since there is a varying relationship between attitude and the development of a knowledge structure, almost any relationship between attitude and recall can be expected. However, as with the unipolar attitudes learning should be positively related to measures of the knowledge structure. The relationship between attitudes and recall of bipolar materials should be predicted by the relationship between attitudes and knowledge measures.
The distinction between unipolar and bipolar attitudes suggest that attitudes can selectively influence learning in unipolar domains and when an attitude structure is used to process information. The following procedures were designed to create these conditions.

1. Three topics (sports, music, and religion) were selected as possible unipolar domains. Stimulus words and phrases were taken from books and pamphlets on these topics. These words can be classified as favorable (supporting) towards each topic.

2. A modification of an experimental task used in self-reference research (see for example, Rogers, Kuiper and Kirker, 1977; Kuiper and Rogers, 1979) was employed to ensure that subjects linked each term with an attitude category. Subjects were asked to categorize each term as topic-related by answering the question, "Does this word or phrase relate to (one of six topics) -- yes or no?"

3. As in previous studies, it was desired that subjects not use context cues other than their attitudes in performing the experimental tasks. The stimulus materials were once again presented in a message-dense environment.
In addition to attitude measures, indicators of the quality of subjects' knowledge structures were also taken. Two popular indirect measures of the development of a knowledge structure are experience and interest (see Markus, 1977 for one example). Experience refers to the amount of previous contact or familiarity an individual has with a domain. Interest refers to how important or entertaining the topic is for the subject. In some cases the quality of the knowledge structure would not be measured by experience and interest measures alone. For example, an individual could develop a knowledge structure from past involvement (as opposed to current interest) or developed a knowledge structure from being with others who think the topic is important. Measures were included in the design to assess this possibility.

The following effects should be observed in Experiment 4.

1. The more experience and interest in a domain, the better the recall performance. Attitude should be related to recall as a function of the relationship between experience and interest measures and the attitude measure. Since the knowledge and attitude measure are positively related to attitude for unipolar domains, an attitude and selective learning effect should occur.

2. It was suggested in the previous chapter that a well-developed knowledge structure would lead to more associations in a domain. One indicator of this is the categorization of more terms as related to the attitude domain. In other words, subjects with more experience and interest should respond with more yes responses to the term categorization question.

Method

Procedure: Subjects were seated at the same computer-controlled video display and response panel used in Experiments 2 and 3. The experiment consisted of six parts as shown in Figure 13. Appendix J contains the instructions for this study.

The first part of the experiment consisted of general instructions. These instructions included displays presenting an overview of the experiment, informed
Figure 13: Outline of the procedures for Experiment 4.

- Display monitor
- Instructions and keyboard practice
- Relationship judgment
- Filler task
- Recall
- Survey
- Debriefing instructions

To computer

Response keyboard
consent, and practice with the response panel. Subjects were told that their task would be to indicate, "whether you see a relationship between various words or phrases and a given topic" and to "make each judgment carefully, but as quickly as possible". Next subjects performed the relationship task. In this task words were paired with the stem: Is this word or phrase related to (one of the topics)? Subjects responded with a 1 for yes or a 2 for no. The words were objectively related to one of the six topics of welfare, nuclear power, defense spending, religion, sports or music.

This was followed by a filler task to disrupt short term memory. This task consisted of thinking about the 20 trivia questions used in Experiments 2 and 3 and given in Appendix H. The fourth task was to recall the words shown in the relationship task. Subjects were given 10 minutes to write down all the words or phrases that they could recall. The recall answer sheets consisted of three pages each with 25 blank lines.

The purpose of the next task was to survey subjects' attitudes and knowledge on each of the six topics. Subjects gave an agreement rating on a 5-point scale for each of the 63 survey items given in Appendix L. The experiment concluded with debriefing information and a recall of the trivia answers.

Stimulus words. The 12 stimulus words for each topic are given in Appendix K. Words for the bipolar topics of welfare, nuclear power, and defense spending were taken from the data collections described in Chapter 5 and from persuasive materials used in Experiments 2 and 3. An attempt was made to select an equal number of words with positive and negative connotations. However, this was not entirely possible, since the evaluative nature of some words (such as breeder for nuclear power) vary with the context. Examples of bipolar terms are handouts, case and loafers for welfare; NRC, leaks and fallout for nuclear power; and freeze, domino and pentagon
for defense spending. Words for the unipolar topics of religion, sports and music were selected from books and pamphlets on these topics. Examples of unipolar terms are screen, touchdown, and forward for sports; jazz, refrain, and jam for music; and prayer, PTL, and flood for religion.

Each subject viewed all 72 stimulus words -- 12 on each topic. The relationship judgment was created by pairing the question stem "Is this word or phrase related to (one of the topics)?" with one of the 72 items. For 42 of the 72 terms, the topic given in the question matched the topic of the item (termed a matched category). For example, "Is the word shortstop related to sports?" The other 30 terms were paired such that each of five remaining items for a topic was paired with one of the other five topics (termed an unmatched category). Terms were counterbalanced such that for every 12 subjects each item was paired with its correct topic seven times and once with each of the other five topics. The order of presentation of the 72 items was separately randomized for each subject.

**Attitude and knowledge measures.** Appendix L lists 63 survey items (10 for each of the three bipolar topics and 11 for each of the three unipolar topics) used to assess attitudes and knowledge structures. For bipolar topics, attitudes were assessed by two items each worded in an opposite direction. (For example, I support the use of nuclear power as an energy source and I oppose the use of nuclear power as an energy source). For unipolar topics, attitudes were assessed by three items -- a positive item (for example, I am a big sports fan), a neutral item (for example, I am not a particularly big sports fan), and a negative item (for example, I hate sports). The positive and neutral items served as the attitude measure for unipolar topics. The negative item served as a check on the unipolarity of the topic.

Topic knowledge was measured by 48 items (eight per topic) that asked about a
subject’s experience, interest, and past association with a topic and the importance of the topic for significant others. Experience was assessed by 12 items (two per topic) asking about the subjects’ familiarity and experience with the topic. (For example, I’ve had a lot of experience with the issue of welfare). Interest was assessed by 24 items (four per topic) asking about interest, time spent in participation and the personal importance of the topic. (For example, Sports are very important to me and I really don’t care about religion [a reversed item]). Prior associations were measured by six items (one per topic) asking if the topic was previously important. (For example, Religion was once important to me, but is no longer). The importance of the topic for significant others was also assessed by six items (one per topic) asking how important the topic was to family and friends. (For example, People who are important to me [such as family and friends] consider the issue of military spending to be very important).

Subjects rated each survey item on a 5-point scale of agreement (with 1 = to strongly disagree and 5 = strongly agree). Scales were reversed as needed so that a high score always indicates more (that is, a more favorable attitude, more experience, interest, etc.). As in Experiment 2 and 3, a high attitude score for the bipolar topics indicates a more conservative attitude. The order of presentation of survey items was separately randomized for each subject.

Subjects. Thirty-six subjects were recruited through an advertisement in the Ohio State University student newspaper. Each subject was paid $4.00 for participation.

Summary of design. Subjects determined if there was a relationship between 72 terms and six topic categories. Later they were asked to recall the 72 terms. Independent variables included: subjects’ judgment of a relationship (yes or no), whether the judged word and topic were objectively related (matched or unmatched
category) and subjects' attitudes and knowledge of the topic. The dependent variable was recall of the terms.

Results

Evidence for Unipolar and Bipolar Structures

**Endorsement of negative statements.** One indicator of unipolarity is a low rate of endorsement of negative, one-sided statements (such as I hate music). The frequency of endorsing these negative statements (either giving a 4 or 5 rating) for the unipolar topics was: 4 subjects (11.1%) for religion, 3 subjects (8.3%) for sports and 1 subject (2.7%) for music. In contrast the frequency of endorsing the "I oppose" statements for the bipolar topics was: 9 subjects (25.0%) for welfare, 8 subjects (22.2%) for nuclear power and 21 subjects (58.3%) for defense spending. A chi-square test comparing the frequency of one-sided endorsements for unipolar and bipolar topics indicates that there were significantly less endorsements of one-sided statements for the unipolar as opposed to bipolar topics ($X^2 (1) = 24.84, p < .01$).

**Influences other than experience and interest on knowledge.** Prior associations and the beliefs of significant others can both influence the development of a knowledge structure independent of current experiences and interests. Prior associations were determined by six items asking if the subject considered each one of the six topics to previously be important, but of no current interest. The endorsement of these items was below 15% of the subjects for all topics with the exception of religion. Ten subjects (27.7%) stated that they were no longer interested in religion.

Six other survey items asked if people who are important to the subject (such as family and friends) considered each of the 6 topics to be important. These items were significantly correlated with both knowledge measures (the experience and interest
scores) for all topics except religion. For religion the item was correlated with the interest measure ($r = .52$ ($p < .01$), but not with the experience measure ($r = .16$, n.s.).

**Correlations among measures.** Table 21 presents matrices of correlations among attitude, experience and interest measures separately for each topic. There is a highly significant correlation between experience and interest for every topic with the exception of religion. As stated previously, one indicator of a unipolar attitude is a high positive correlation between knowledge measures (such as experience and interest) and attitudes. This pattern was found for the unipolar topics of music and sports, but not for the bipolar topics of welfare, nuclear power, and defense spending. Once again religion did not show a pattern consistent with the other topics that were expected to have a unipolar structure.

**Summary.** The survey indicates that two of the topics have a unipolar structure—sports and music. For both of these topics (1) few subjects endorsed statements on the negative side of the continuum, (2) few subjects lost their previous interest in the topic, (3) the beliefs of significant others were positively correlated with interest and experience measures and (4) knowledge measures (experience and interest) correlated with attitude.

The topic of religion—originally suggested to possess a unipolar structure—appears to be more complex. Although a small number of subjects endorsed the extremely negative statement on religion it was found that: (1) 27.7% of the subjects had lost their interest in the subject, (2) the beliefs of significant others were not related to the experience measure, (3) experience with religion was not significantly related to current interest in religion and (4) experience was not related to attitude. It is possible that religion is multi-polar with sub-topics (such as Catholic,
### Table 21

**Correlation Matrix for Attitude, Experience and Interest Measures for each Topic**

**Welfare:**

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Attitude</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Experience</td>
<td>-.23</td>
<td></td>
</tr>
<tr>
<td>3. Interest</td>
<td>-.39*</td>
<td>.75**</td>
</tr>
</tbody>
</table>

**Nuclear Power:**

<table>
<thead>
<tr>
<th></th>
<th>1</th>
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</tr>
</thead>
<tbody>
<tr>
<td>1. Attitude</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Experience</td>
<td>.05</td>
<td></td>
</tr>
<tr>
<td>3. Interest</td>
<td>.19</td>
<td>.74**</td>
</tr>
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</table>

**Defense Spending:**

<table>
<thead>
<tr>
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<th>2</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Attitude</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Experience</td>
<td>.15</td>
<td></td>
</tr>
<tr>
<td>3. Interest</td>
<td>.04</td>
<td>.79**</td>
</tr>
</tbody>
</table>

**Religion:**

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Attitude</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Experience</td>
<td>.28</td>
<td></td>
</tr>
<tr>
<td>3. Interest</td>
<td>.91**</td>
<td>.29</td>
</tr>
</tbody>
</table>

**Sports:**

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Attitude</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Experience</td>
<td>.75**</td>
<td></td>
</tr>
<tr>
<td>3. Interest</td>
<td>.90**</td>
<td>.82**</td>
</tr>
</tbody>
</table>

**Music:**

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Attitude</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Experience</td>
<td>.58**</td>
<td></td>
</tr>
<tr>
<td>3. Interest</td>
<td>.76**</td>
<td>.73**</td>
</tr>
</tbody>
</table>

Numbers refer to correlation coefficients. * p < .05; ** p < .01. Correlations are based on 36 observations.
Mennonite, Buddhist, etc.) each having a unipolar structure. Unlike sports and music which also have sub-topics (for example, baseball, football, jazz, rock and roll, etc.), the sub-topics of religion may be mutually exclusive. The sports fan is likely to enjoy both football and baseball. The Mennonite is not a Catholic, even though both may be considered religious. There appears to be a complex cognitive structure supporting the religious attitude. For this reason, the data on the topic of religion were analyzed separately.

The survey measure provided more evidence for the bipolarity of the welfare, nuclear power, and defense spending topics. These topics evidenced the following characteristics of a bipolar topic: (1) subjects' attitudes were spread across an evaluative continuum that ranged from con to neutral to pro, (2) experience and interest in the domain and the beliefs of significant others were all highly correlated and (3) no consistent linear relationship of attitude with either the experience or interest measures was obtained.

**Relationship Between Attitude and Knowledge Structures**

Table 22 presents the results of a regression predicting either experience or interest from attitude (linear trend) or the square of attitude (quadratic trend). For unipolar attitudes, there was a significant, positive linear relationship between attitude and the interest and experience measures. (The quadratic effect obtained in predicting interest from attitude indicates that the function is asymptotic not parabolic). Thus for the two unipolar attitudes, recall of topic-related words should increase with the favorability of attitude (as well as experience and interest).

For the topic of religion, no clear relationship between attitude and the experience or interest measures were obtained. The attitude and interest measures
showed a positive linear relation. The attitude and experience measures were unrelated. Therefore, no prediction was made about the relationship of attitude and recall of religious words.

For the bipolar topics, a quadratic trend for both interest and experience measures was obtained. This indicated that subjects with extreme attitudes possessed higher quality knowledge structures. Therefore, we should expect an upright U relationship between attitude and recall for the bipolar topics (as suggested by the significant quadratic component). Because of the negative linear trend (in the quadratic equation), this U may be "tilted" so that subjects with a liberal attitude should demonstrate superior recall.

**Recall Analyses**

**Regression analyses.** A series of regressions were conducted on recall. For trend tests recall was predicted by either the attitude, experience or interest measures. In multiple regressions, the independent variables were either attitude, experience, or interest measures plus a dummy-coded variable carrying information about whether a subject responded yes or no to the question, a dummy-coded variable carrying information about whether the term/question categories matched (a matched vs. unmatched categorization), and two dummy-coded variables carrying information about the type of attitude structure (unipolar, bipolar or religion).

Recall was scored 0 for not recalled and 1 for recalled. In other analyses recall was scored as the total number of words recalled by each subject in each condition (for example, the number of recalled religious words that the subject said yes to in an unmatched category). These two types of analyses obtained the same pattern of results. The regressions using the 0 or 1 scoring was chosen for presentation
Table 22

Regression Equations Predicting Experience or Interest from Attitude (Experiment 4)

<table>
<thead>
<tr>
<th></th>
<th>y-intercept</th>
<th>$\beta$(lin)</th>
<th>$\beta$(quad)</th>
<th>$t$(lin)</th>
<th>$t$(quad)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Equations predicting experience:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unipolar topics</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Linear</td>
<td>2.42</td>
<td>.612</td>
<td></td>
<td>8.39**</td>
<td></td>
</tr>
<tr>
<td>Quadratic</td>
<td>1.67</td>
<td>.893</td>
<td>-.021</td>
<td>0.14</td>
<td>2.09*</td>
</tr>
<tr>
<td>Bipolar topics</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Linear</td>
<td>5.28</td>
<td>.011</td>
<td></td>
<td>1.71</td>
<td></td>
</tr>
<tr>
<td>Quadratic</td>
<td>7.10</td>
<td>-.783</td>
<td>.071</td>
<td>0.02</td>
<td>3.54*</td>
</tr>
<tr>
<td>Religion</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Linear</td>
<td>5.65</td>
<td>.215</td>
<td></td>
<td>1.34</td>
<td></td>
</tr>
<tr>
<td>Quadratic</td>
<td>6.66</td>
<td>-.255</td>
<td>.043</td>
<td>0.34</td>
<td></td>
</tr>
<tr>
<td><strong>Equations predicting interest:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unipolar topics</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Linear</td>
<td>3.93</td>
<td>1.486</td>
<td></td>
<td>14.75**</td>
<td></td>
</tr>
<tr>
<td>Quadratic</td>
<td>.07</td>
<td>2.903</td>
<td>-.110</td>
<td>0.01</td>
<td>-2.60*</td>
</tr>
<tr>
<td>Bipolar</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Linear</td>
<td>12.94</td>
<td>.001</td>
<td></td>
<td>0.01</td>
<td></td>
</tr>
<tr>
<td>Quadratic</td>
<td>17.97</td>
<td>-2.203</td>
<td>.198</td>
<td>0.02</td>
<td></td>
</tr>
<tr>
<td>Religion</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Linear</td>
<td>5.11</td>
<td>1.34</td>
<td></td>
<td>12.48**</td>
<td></td>
</tr>
<tr>
<td>Quadratic</td>
<td>5.14</td>
<td>1.32</td>
<td>.001</td>
<td>0.02</td>
<td></td>
</tr>
</tbody>
</table>

Notes: * p < .05; ** p < .01;
lin refers to the linear component;
quad refers to quadratic component;
all tests used d.f. = 35
because of its flexibility (as explained in Appendix I).

**Attitude and recall.** Figure 14 shows the relationship between the attitude measure and recall of topic-related words for each type of attitude structure. Each line represents the best fitting regression equation predicting recall from attitude. Table 23 presents the results of the hierarchical regression on recall using attitude as one of the independent variables. A significant type of attitude structure (unipolar, bipolar or religion) by attitude interaction ($F(2, 70) = 5.11, p < .01$) indicates a different relationship between attitude and recall for each type of attitude structure.

For unipolar attitudes, the more favorable the attitude the more topic-related words recalled. This linear increase is significant ($t(35) = 2.48, p < .05$). In other words, the long sought after attitude and selective learning effect is finally obtained.

For bipolar domains, a simple regression indicated a negative relationship between recall and attitude — that is, liberals recalled more items than conservatives ($y$-intercept = .336 with a slope of -.154, $t(35) = 3.03, p < .01$). The test for a quadratic trend showed a marginal attitude-extremity effect ($t(35) = 1.53, p < .15$). This pattern is shown in Figure 14. The regression of both experience and interest measures on attitude predicted a U relationship between attitude and recall for the bipolar topics with the U tilted to favor liberal subjects. This pattern of data was obtained, but it was not significant at conventional levels.

For religion there appears to be no consistent relationship between attitude and recall. Neither the linear ($t(35) = 0.17$) nor the quadratic trends ($t(35) = -0.06$) were significant.

**Experience and recall.** Figure 15 shows the relationship between the experience measure and recall of topic-related terms for each type of attitude structure. Each
Figure 14: Percentage of recalled attitude-related words predicted from attitude. Lines represent the best fitting regression equation.
Table 23

Hierarchical Regression on Recall Using Attitude as a Predictor (Experiment 4)

<table>
<thead>
<tr>
<th>Factor</th>
<th>Step</th>
<th>d.f.</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attitude Structure (A)</td>
<td>1</td>
<td>(2,70)</td>
<td>4.02*</td>
</tr>
<tr>
<td>Category Match (B)</td>
<td>1</td>
<td>(1,35)</td>
<td>7.35**</td>
</tr>
<tr>
<td>Yes/no (C)</td>
<td>1</td>
<td>(1,35)</td>
<td>83.68**</td>
</tr>
<tr>
<td>Attitude (D)</td>
<td>1</td>
<td>(1,35)</td>
<td>0.01</td>
</tr>
<tr>
<td>A * B</td>
<td>2</td>
<td>(2,70)</td>
<td>1.86</td>
</tr>
<tr>
<td>A * C</td>
<td>2</td>
<td>(2,70)</td>
<td>1.87</td>
</tr>
<tr>
<td>A * D</td>
<td>2</td>
<td>(2,70)</td>
<td>5.11*</td>
</tr>
<tr>
<td>B * C</td>
<td>2</td>
<td>(1,35)</td>
<td>1.50</td>
</tr>
<tr>
<td>B * D</td>
<td>2</td>
<td>(1,35)</td>
<td>0.06</td>
</tr>
<tr>
<td>C * D</td>
<td>2</td>
<td>(1,35)</td>
<td>0.07</td>
</tr>
<tr>
<td>A * B * C</td>
<td>3</td>
<td>(2,70)</td>
<td>0.50</td>
</tr>
<tr>
<td>A * B * D</td>
<td>3</td>
<td>(2,70)</td>
<td>0.08</td>
</tr>
<tr>
<td>A * C * D</td>
<td>3</td>
<td>(2,70)</td>
<td>0.30</td>
</tr>
<tr>
<td>B * C * D</td>
<td>3</td>
<td>(1,35)</td>
<td>0.41</td>
</tr>
<tr>
<td>A * B * C * D</td>
<td>4</td>
<td>(2,70)</td>
<td>1.78</td>
</tr>
</tbody>
</table>

Notes: * p < .05; ** p < .01

line represents the best fitting regression line predicting recall from experience. As can be seen, the more experience with the domain the more topic related words recalled for unipolar and bipolar topics, but not for religion. This linear increase was significant for unipolar ($t(35) = 3.11, p < .01$) and bipolar attitudes ($t(35) = 3.59, p < .01$), but not for religion ($t(35) = -0.05, n.s.$).

Table 24 presents the hierarchical regression on recall using experience as one of the independent variables. The effect of experience on recall was confirmed in this regression. However, experience interacts with category match indicating that experience aided recall the most when the term/question categories match.
Figure 15: Percentage of recalled attitude-related words predicted from experience.
### Table 24

Hierarchical Regression on Recall Using Experience as a Predictor (Experiment 4)

<table>
<thead>
<tr>
<th>Factor</th>
<th>Step</th>
<th>d.f.</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attitude Statement (A)</td>
<td>1</td>
<td>(2,70)</td>
<td>0.95</td>
</tr>
<tr>
<td>Category Match (B)</td>
<td>1</td>
<td>(1,35)</td>
<td>8.33**</td>
</tr>
<tr>
<td>Yes/no (C)</td>
<td>1</td>
<td>(1,35)</td>
<td>76.68**</td>
</tr>
<tr>
<td>Experience (D)</td>
<td>1</td>
<td>(1,35)</td>
<td>14.14**</td>
</tr>
<tr>
<td>A * B</td>
<td>2</td>
<td>(2,70)</td>
<td>2.44</td>
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<tr>
<td>A * C</td>
<td>2</td>
<td>(2,70)</td>
<td>1.79</td>
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<td>A * D</td>
<td>2</td>
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<td>2.05</td>
</tr>
<tr>
<td>B * C</td>
<td>2</td>
<td>(1,35)</td>
<td>0.55</td>
</tr>
<tr>
<td>B * D</td>
<td>2</td>
<td>(1,35)</td>
<td>5.38*</td>
</tr>
<tr>
<td>C * D</td>
<td>2</td>
<td>(1,35)</td>
<td>0.32</td>
</tr>
<tr>
<td>A * B * C</td>
<td>3</td>
<td>(2,70)</td>
<td>0.68</td>
</tr>
<tr>
<td>A * B * D</td>
<td>3</td>
<td>(2,70)</td>
<td>0.99</td>
</tr>
<tr>
<td>A * C * D</td>
<td>3</td>
<td>(2,70)</td>
<td>0.94</td>
</tr>
<tr>
<td>B * C * D</td>
<td>3</td>
<td>(1,35)</td>
<td>2.56</td>
</tr>
<tr>
<td>A * B * C * D</td>
<td>4</td>
<td>(2,70)</td>
<td>0.37</td>
</tr>
</tbody>
</table>

**Notes:** * p < .05; ** p < .01

**Interest and recall.** Figure 16 shows the relationship between the interest measure and recall of topic-related words for each type of attitude structure. Each line represents the best fitting regression line predicting recall from interest. As with experience, the more interest in the attitude topic, the more topic-related words recalled for unipolar and bipolar domains, but not for religion. The linear increase was significant for both unipolar (t(35) = 2.32, p < .05) and bipolar (t(35) = 2.46, p < .05) attitudes, but not for religion (t = -0.19, n.s.). Table 25 presents the hierarchical regression on recall using the interest measure as one of the predictors. This regression confirms the significant effect of interest on recall.
Figure 16: Percentage of recalled attitude-related words predicted from interest.
Table 25

Hierarchical Regression on Recall Using Interest as a Predictor (Experiment 4)

<table>
<thead>
<tr>
<th>Factor</th>
<th>Step</th>
<th>d.f.</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attitude Structure (A)</td>
<td>1</td>
<td>(2,70)</td>
<td>3.11</td>
</tr>
<tr>
<td>Category Match (B)</td>
<td>1</td>
<td>(1,35)</td>
<td>7.66**</td>
</tr>
<tr>
<td>Yes/no (C)</td>
<td>1</td>
<td>(1,35)</td>
<td>82.38**</td>
</tr>
<tr>
<td>Interest (D)</td>
<td>1</td>
<td>(1,35)</td>
<td>7.91*</td>
</tr>
<tr>
<td>A * B</td>
<td>2</td>
<td>(2,70)</td>
<td>2.26</td>
</tr>
<tr>
<td>A * C</td>
<td>2</td>
<td>(2,70)</td>
<td>2.15</td>
</tr>
<tr>
<td>A * D</td>
<td>2</td>
<td>(2,70)</td>
<td>0.98</td>
</tr>
<tr>
<td>B * C</td>
<td>2</td>
<td>(1,35)</td>
<td>1.25</td>
</tr>
<tr>
<td>B * D</td>
<td>2</td>
<td>(1,35)</td>
<td>1.88</td>
</tr>
<tr>
<td>C * D</td>
<td>2</td>
<td>(1,35)</td>
<td>2.33</td>
</tr>
<tr>
<td>A * B * C</td>
<td>3</td>
<td>(2,70)</td>
<td>0.64</td>
</tr>
<tr>
<td>A * B * D</td>
<td>3</td>
<td>(2,70)</td>
<td>0.05</td>
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<tr>
<td>A * C * D</td>
<td>3</td>
<td>(2,70)</td>
<td>0.16</td>
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<tr>
<td>B * C * D</td>
<td>3</td>
<td>(1,35)</td>
<td>1.03</td>
</tr>
<tr>
<td>A * B * C * D</td>
<td>4</td>
<td>(2,70)</td>
<td>0.49</td>
</tr>
</tbody>
</table>

Notes: * $P < .05$; ** $P < .01$

Other recall findings. Three other effects on recall were observed. Subjects were better at recalling words embedded in question to which they responded yes (as opposed to no). Out of 1445 yes responses, 37.2% of the words were recalled. Out of 1147 no responses, only 14.5% of the words were recalled. Second, subjects were better at recalling terms from topics that matched the question category (34.4% recalled for matched categories and only 17.0% for unmatched categories). Finally, subjects found the bipolar words harder to recall. Subjects recalled less bipolar terms (only 25.0%) than religious terms (28.5%) and unipolar words (29.7%).
In all three hierarchical regressions (using either attitude, experience and interest) the factor of yes/no (whether subjects gave a yes or a no to the relationship question) did not interact with any other independent variable. In other words, the effects of attitude, interest and experience were the same regardless of responding yes or no to the categorization question. This may seem surprising given that self-reference studies frequently find yes/no interactions. Unlike those studies, Experiment 4 had 6 categories (as opposed to 1) with all words related to one of the categories. Subjects can categorize each word into one of the 6 six topics. Thus, for example, a question, "Is opera related to welfare?" would be answered no and the experienced subject would recognize that opera applies to music and gain a recall advantage.

Seeing a relationship

A hypothesis suggested at the beginning of the chapter is that knowledge of a domain would lead to seeing more relationships among the elements of the domain. Separate regressions were conducted using the experience and interest measures to predict the rate of saying yes or no. For both of these measures a significant main effect was obtained -- the more experience ($t(35) = 3.88, p < .01$) and interest ($t(35) = 1.69, p < .1$) the more likely to see the term related to the category. This pattern was obtained regardless of whether the term/question category did or did not match.

Summary of Findings

The present study obtained the following results.

- For the topic of religion there was no simple relationship among attitude, experience, and interest measures and recall of religious words. This suggests that the knowledge domain for religion may be complex in content and organization.

- For the topics of sports and music, attitude, interest and experience measures were all linearly correlated. For these unipolar topics the more positive the attitude and the more experience and interest in the topic (1)
the better the recall of topic-related words, and (2) the more terms were seen as topic-related.

- For the topics of welfare, nuclear power, and defense spending the interest and experience measures were positively related. However the attitude and experience measures were curvilinearly related. For these topics, the more experience and interest the better the recall of topic-related words. Extreme attitudes resulted in slightly better recall terms related to bipolar topics. The relationship between experience, interest and attitude and perceiving a relationship followed the same pattern as the recall results.

This study succeeded in designing a positive correlation between attitude and learning measures with unipolar topics. This effect is based on a facilitating influence of a pre-existing knowledge structure for the learning and recall of topic-related information. In Experiment 4, the possession of a pre-existing knowledge structure results in more elaborate encodings (seeing more relations) and provides internal retrieval cues to aid recall. The effect of pre-existing knowledge structures were translated into a selective influence of attitudes on recall when there was a positive correlation between attitude and knowledge measures.

The attitude and selective learning effect obtained in Experiment 4 differs from the typical effect obtained in the studies reviewed in Chapter 1. Most of these studies used persuasive materials as the learning stimulus. Although the learning materials of Experiment 4 can be viewed as information in support of an attitude, they lack this persuasive quality. Given this and the role of knowledge structures in producing the Experiment 4 effect, it can perhaps be better termed an attitude-reference effect -- after a similar effect with the self obtained by Rogers, Kuiper, and Kirker (1977) and Kuiper and Rogers, (1979). An attitude-reference effect can be defined as superior recall of materials related to an attitude structure. In Experiment 4, an attitude-reference effect was demonstrated by a positive correlation between the experience and interest measures and recall of topic-related words for both unipolar and bipolar attitudes.
Chapter 10
Conclusions

Summary of the research. A literature review showed that previous research on attitudes and memory has been far from conclusive. Various attitude and memory effects have been obtained. However, the attitude and selective learning effect has attracted the most research attention. First found in the 1940s by Levine and Murphy and generally accepted in the 1950s, contemporary researchers have been unable to consistently produce the effect. This dissertation employed a novel research strategy -- the design approach -- for engineering the attitude and selective learning effect.

The design approach begins with a specification of a desired effect and then applies theory towards the production of this effect. Experiment 1 demonstrated how attitudes can serve as a heuristic (for retrieval and generation of attitude-consistent material) to produce a selective influence of attitudes on memory for past events. In this study, subjects were more likely to recall favorable facts about a personality when they had a favorable attitude and identify unfavorable facts when they disliked the personality.
However, the attitude as heuristic idea was not complete enough to design an attitude and selective learning effect with experimental materials. Neither Experiments 2 nor 3 could produce an attitude and selective learning effect based on operations designed to promote the use of an attitude as a retrieval heuristic. However both studies did show bipolar effects of attitudes -- superior recall and faster recognition and judgment latencies with extreme attitudes.

A theory of knowledge structures supporting an attitude was constructed as a supplement to the attitude as heuristic notion. A distinction was drawn between bipolar attitudes (a knowledge structure containing information on both sides of an issue) and unipolar attitudes (a knowledge structure containing information on only one side of an issue). This distinction was used in Experiment 4 to engineer a positive correlation between attitude and learning measures within a unipolar domain. This effect is best termed an attitude-reference effect. One remaining step in the design approach is to summarize what has been learned about the influence of attitudes on learning and memory.

Heuristic and Schematic Functions of Attitudes

Attitude theorists have often noted that attitudes serve a variety of functions (see for example the Chapter 3 review). The empirical work of this dissertation has identified two classes of attitude functions: heuristic and schematic. After briefly describing these functions, we discuss the cognitive representation of attitudes needed to perform them.

Attitudes can serve a heuristic function. An attitude (the evaluative relationship between an individual and a social object) is used as a cue in a problem solving strategy. Chapter 3 reviewed how an attitude can be used in providing direction in reasoning, decision making, evaluation, inference, attribution, and recall among other
cognitive processes. Experiment 1 showed how an attitude could be used as a cue to selectively reconstruct the past. Balance theory summarizes how an attitude can be used as a heuristic in cognitive processing. Individuals with favorable attitudes adopt favoring strategies (such as making positive inferences or imagining pleasant thoughts). Individuals with unfavorable attitudes adopt the opposite strategy.

Attitudes can also serve a schematic function. Schemas have also been shown to influence cognitive processes such as inference, attribution, reasoning, etc. (see Taylor & Crocker, 1981 for a comprehensive list). Although schemas influence the same cognitive processes as heuristics, they do so in a different manner. Whereas heuristics use a simple cue (in this case an attitude), schematic processing involves an entire organization of knowledge. The schematic function uses the knowledge structure supporting an attitude and not just the evaluative cue. For example, the individual with a favorable attitude towards sports (and a unipolar structure) can use this knowledge to infer what happened in the previous inning, to make gambling decisions, or to fill in the details of a boxscore. Experiment 4 demonstrates how unipolar attitudinal schemas function to improve memory for topic related information. Bipolar attitudes also perform cognitive functions such as creating expectations about a persuasive communication and aiding in the learning of materials on either side of an issue.

The representation of attitudes in memory. The two functions of attitudes suggest that the representation of attitudes in memory consists of two constituents. One part is a simple evaluative cue—a summary statistic describing a given object as good or bad. (This is the part used in heuristic processing). The second constituent is a schema or organization of knowledge about the attitude domain. (This is the part used in schematic processing). It may contain supporting, as well as derogating information, along with general facts about the attitude object. This information can
be organized in a variety of manners including an evaluative organization (unipolar and bipolar attitudes).

The distinction between the evaluative and knowledge constituents of an attitude is frequently made by attitude theorists. Smith, Bruner and White (1956) note that an attitude consists of both affective tone and information support. Fishbein and Ajzen (1975) define attitudes as the sum of the subjective belief that an attitude object possesses a given attribute times the evaluation of that attribute. For Rosenberg (1960) attitudes consist of affective and cognitive structures. Schlegel and DiTecco (1982) label the two constituents attitude and attitude structure. The two constituent model of attitudes is similar to models of person memory that suggest that persons are represented in memory by a general impression and facts (see for example, Anderson & Hubert, 1963; Carlston, 1980; and Ebbesen, 1981).

A variety of arrangements are possible for the two constituents of an attitude. The evaluative component may be readily accessible or may be recomputed at each request. The organization of knowledge can range the entire evaluative continuum (bipolar), only half of the continuum (unipolar) or be limited in content (the underdeveloped attitudes typically possessed by subjects in laboratory persuasion research) or even be nonexistent (a cultural truism).

The History of Attitude and Memory Research in Retrospect

Producing an attitude and selective learning effect with persuasive materials. Experiment 4 produced an attitude and selective learning effect with unipolar attitudes. However, this finding differed from the typical effect (reviewed in Chapter 1) by using topic-related terms as opposed to persuasive materials as the learning materials. Can an attitude and selective learning effect be designed using persuasive materials? According to Experiment 4, an attitude and selective learning effect is most likely to
occur with unipolar attitudes. (It appears that the learning of experimental stimuli is most influenced by the schematic constituent). Persuasive materials could be constructed from the unipolar terms used in Experiment 4. For example, "Music is great when there is dissonance" or "Baseball is exciting because of the suicide squeeze and the knuckler". An attitude and selective learning effect could also be produced with persuasive messages that appeal to specialized knowledge. For example, "The Rocky Horror Picture show is great. You'll love the rice." or persuasive messages that argue with terminology understood by only a select few.

Reconciling previous conflicting results. The history of research on the attitude and selective learning effect has been notably inconclusive. This dissertation has identified two reasons for this history. First, the theory confirming approach of much previous work leads to a neglect of null results and selective interpretation of findings. Second, past research has treated the attitude concept as unitary ignoring the polarity of attitude structure and the function of the constituents of an attitude in learning. The neglect of these concerns suggests five classes of explanations for the vissicitudes of attitude and memory research.

1. Researchers' selective attention and Type I errors. During the second period of research on the attitude and selective learning effect (acceptance), researchers often used multiple measures, messages and subject types. Results were rarely consistent across all aspects of a study. The recognition results of Experiments 2 and 3 parallel this history. Experiment 2 found an attitude false alarm effect. Experiment 3 could not replicate this effect, but did obtain an effect of attitudes on recognition hit rate. Selective attention to (perhaps) chance findings, reinforces the perception of a reliable effect. The performance of a calibration loop (repeating an experimental test until it comes out right) increases the opportunity of a chance effect.
2. **Subject characteristics.** Bipolarity of an attitude domain can refer to either the characteristics of the topic (the existence of arguments on both sides of an issue) or the individual (personal knowledge of both sides of an issue). Just because a topic is bipolar, there is no guarantee that individuals possess this structure. They may have little or no knowledge of the issue or know only one side (as in the case of a dogmatic extremist). Without specifying the distribution of knowledge in a population, almost any pattern can be produced.

3. **Historical changes.** The potential for an individual to possess a bipolar attitude structure is determined by the social environment (for example, the existence of advocacy groups on both sides of an issue). Since the environment is frequently changing an attitude domain may be bipolar in one epoch and unipolar in another (depending on the rise and fall of advocacy groups). The political activity of the 1960s may have turned racial issues into bipolar (from unipolar) topics, thus accounting for Waly and Cook's (1966) failure to replicate the Jones and Kohler (1958) study.

4. **Message characteristics.** Often, the important characteristics of a message for learning are either unknown or left to the intuition of the researcher. For example, it may be that some of the attitude and selective learning effects reviewed in Chapter 1 were obtained with messages from unipolar domains. Topics such as the self (c.f. Wallen, 1942; Suinn et al., 1962), the contribution of ethnic groups (c.f. Zillig, 1928; Gustafson, 1957) and gender role schema in children (c.f. Liben & Signorella, in press) are strong candidates for having a unipolar knowledge structure.

5. **Multiple determinants of a social effect.** A basic assumption of the design approach is that any given effect can have multiple determinants. This dissertation has indicated that the pre-existing knowledge structure supporting an
attitude is important for determining learning. However, attitude and selective learning effects may be produced using other mechanisms. For example, the review of the attitude and selective learning literature suggested that utility may encourage the learning of persuasive materials. By designing a study that covaries message utility with attitude (such as, instructing subjects that they will later argue for their positions) an attitude and selective learning effect may be engineered.

Conclusion. In contrast to past research, this dissertation employed a different research strategy -- the design approach. This approach uses null, as well as positive results to construct theory. The first three experiments produced conflicting attitude and memory results. Experiment 1 demonstrated a selective influence of attitude on recall. Experiments 2 and 3 could not produce a similar effect with experimental materials. A theory of attitude structure and function was constructed from this pattern of results that (1) identified two functions of attitudes and (2) distinguished two types of organization of knowledge structure supporting an attitude. This theory was used to design Experiment 4 which demonstrated the influence of pre-existing attitudinal knowledge on learning. The theory of attitude structure and function serves as a beginning theory to resolve the previous "unambiguously inconclusive" research on attitude and memory.
References


Gustafson, L. (1957). Relationship between ethnic group membership and the retention of selected facts pertaining to American history and culture. *Journal of Educational Sociology, 31*, 49-56.


Kreman, E. O. (1949). An attempt to ameliorate hostility toward the Negro through role playing. Unpublished master's thesis, The Ohio State University, Columbus, OH.


Parrish, J. A. (1948). The direct and indirect assessment of attitudes as influenced by propagandized radio transcripts. Unpublished master's thesis, The Ohio State University, Columbus, OH.


Appendix A: Definition of Terms

Attitude. An evaluative relationship between any object and an individual. The evaluative relationship is often expressed by words such as: like/dislike, love/hate, support/oppose, agree/disagree, approve/disapprove, etc. The evaluative relationship can be expressed in one of three ways: cognitively, behaviorally, and affectively.

Attitude extremity effect. Superior memory for communication content that is rated at the extremes of the evaluative continuum. (First obtained by Judd and Kulik, 1980).

Attitude reference effect. Superior memory for topic-related materials linked to an attitude knowledge structure.

Attitude and selective generation effect. Superior generation of arguments that agree with one's attitude. (First obtained by Feather, 1969).

Attitude and selective learning effect. Superior memory for learned communication content that agrees with one's attitude. (First obtained by Levine and Murphy, 1943).

Attitudinal heuristic. The use of an evaluative relationship as a cue in the strategy for solving a problem.

Attitudinal schema. A schema or organization of knowledge about a topic domain that is evaluative in nature.
Bipolar attitude. An attitudinal schema or organization of knowledge that contains both favorable and unfavorable information about an object.

Design approach. A research strategy for dealing with null results by designing and constructing procedures to obtain an effect.

Heuristic. A simple strategy for solving a problem. It can be contrasted with an algorithm which is a detailed set of steps or procedures for solving a problem.

Null result. The absence of a relationship between two variables. In an experiment, a null result means the failure of the independent variable to influence the dependent variable.

Schema. An organization of knowledge that consists of both content (information in the schema and its arrangement) and process (the usage of that information in knowing).

Unipolar attitude. An attitudinal schema or organization of knowledge that contains only one-sided (usually favorable) information about an object.
Appendix B: Mass Media Survey

Contents:

1. General instructions (page 1)

2. Attitude survey (pages 2 - 3)

3. Knowledge test (pages 4 - 6) (Note correct answers are circled).

4. Manipulation check (pages 7 - 8)

5. Debriefing materials (page 9)
Mass Media Survey

Today's experiment is part of a larger project surveying the beliefs and opinions of students at the Ohio State University. We are interested in the effects of the mass media (such as television, radio, newspapers and magazines) on what people know and feel about leading figures in the news.

Please follow the instructions printed at the top of each page of the questionnaire. All your responses will be held strictly confidential. Please work independently of others around you and at your own pace.

In case you have not been previously informed, you should know that all human subjects in any research at the Ohio State University are at liberty to terminate their participation at any time they so desire.

THANK YOU FOR YOUR PARTICIPATION
Please indicate your feelings toward each of the following personalities by circling the number that most agrees with your opinion. Note: 1 refers to an extremely negative feeling, (for example, you do not like the individual, you find him/her weak, untrustworthy, or unattractive) whereas a 5 refers to an extremely positive feeling (for example, you like the individual, you find him/her trustworthy or attractive). The number 3 should be circled only if you are neutral or have no feelings one way or another toward the individual.

Remember this is not a test. People differ in their feelings. Please indicate your own opinion for each personality.

Andrew Young
 strongly negative 1 2 3 4 5 positive

Nancy Reagan
 strongly negative 1 2 3 4 5 positive

Gerald Ford
 strongly negative 1 2 3 4 5 positive

Martin Luther King, Jr.
 strongly negative 1 2 3 4 5 positive

Phil Donahue
 strongly negative 1 2 3 4 5 positive

Gov. James Rhodes
 strongly negative 1 2 3 4 5 positive

Ronald Reagan
 strongly negative 1 2 3 4 5 positive
Rev. Jerry Falwell
strongly negative 1 . . . 2 . . . 3 . . . 4 . . . 5 positive

Rev. Billy Graham
strongly negative 1 . . . 2 . . . 3 . . . 4 . . . 5 positive

Ted Kennedy
strongly negative 1 . . . 2 . . . 3 . . . 4 . . . 5 positive

George McGovern
strongly negative 1 . . . 2 . . . 3 . . . 4 . . . 5 positive

Mayor Tom Moody
strongly negative 1 . . . 2 . . . 3 . . . 4 . . . 5 positive

Gloria Steinhem
strongly negative 1 . . . 2 . . . 3 . . . 4 . . . 5 positive

Henry Kissinger
strongly negative 1 . . . 2 . . . 3 . . . 4 . . . 5 positive

Jerry Brown
strongly negative 1 . . . 2 . . . 3 . . . 4 . . . 5 positive

Jimmy Carter
strongly negative 1 . . . 2 . . . 3 . . . 4 . . . 5 positive
Below are pairs of true and false statements about famous personalities — in all cases one member of each pair is true. Please indicate which statement you believe to be true by circling the corresponding letter (A or B). Please provide an answer for each pair of statements. If you are uncertain which is true, then just provide your best possible answer. Next indicate how certain you are about your choice by circling the appropriate number on the scales provided. An example is given.

Example! (You believe that Statement A is true but are slightly uncertain).

A. John Glenn was not the first astronaut to go into outer space.
B. John Glenn was the first astronaut to go into outer space.

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<td>5</td>
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1. A. Ted Kennedy was caught cheating while attending Harvard University.
B. Ted Kennedy never engaged in cheating during his college career.

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2. A. Phil Donahue is still married to his first wife.
B. Phil Donahue divorced his first wife.

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B. Ronald Reagan never achieved above a 'C' average at Eureka College.

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4. A. Reverend Jerry Falwell is being sued for back taxes.
B. Reverend Jerry Falwell has always paid his taxes.

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<td>5</td>
<td>certain</td>
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5. A. While governor of California, Jerry Brown used the state expense account to throw lavish "Hollywood" style parties. 
B. To help save taxpayers' money, Jerry Brown refused to live in the governor's mansion or use the limousine while governor.

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6. A. Andrew Young (former U.N. ambassador and civil rights leader) denounced Iran's Ayatollah Khomeini as a fraud.
B. Andrew Young once stated that one day Iran's Ayatollah Khomeini would be considered a saint.

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7. A. Nancy Reagan turned down a request to appear on national television against drug abuse.
B. Nancy Reagan recently voiced her opposition to drug abuse on a nationally viewed morning talk show.

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8. A. The National Guard was sent to the Kent State demonstrations without Governor Rhodes' knowledge.
B. Governor Rhodes directly ordered the National Guard to monitor the anti-war demonstrations at Kent State.

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9. A. Gerald Ford publicly supports the Boy Scouts of America.
B. Gerald Ford refused a request by the Boy Scouts to support their organization at a fund raiser.

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10. A. During Carter's presidency the rate of inflation increased.
B. Carter was able to keep the rate of inflation steady at the same level as when he became president.

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11. A. George McGovern graduated in the top 10% of his high school class.
   B. George McGovern graduated near the bottom of his high school class.

   completely    absolutely
   uncertain 1 . . . 2 . . . 3 . . . 4 . . . 5 certain

12. A. Martin Luther King, Jr. dropped out of college after a year and a half.
    B. Martin Luther King, Jr. went on to earn a doctoral degree.

   completely    absolutely
   uncertain 1 . . . 2 . . . 3 . . . 4 . . . 5 certain

13. A. Henry Kissinger was a Harvard professor before engaging in politics.
    B. Henry Kissinger never went beyond his undergraduate degree.

   completely    absolutely
   uncertain 1 . . . 2 . . . 3 . . . 4 . . . 5 certain

14. A. After being involved in an accident, Mayor Tom Moody was accused of drinking and driving.
    B. After being involved in an accident, a sobriety test showed that Mayor Tom Moody was not drinking and driving.

   completely    absolutely
   uncertain 1 . . . 2 . . . 3 . . . 4 . . . 5 certain

15. A. Billy Graham receives a limited salary.
    B. Billy Graham receives a salary plus a portion of the collection.

   completely    absolutely
   uncertain 1 . . . 2 . . . 3 . . . 4 . . . 5 certain

16. A. Gloria Steinem was a magna cum laude graduate of Smith College.
    B. Gloria Steinem nearly flunked out of Smith College.

   completely    absolutely
   uncertain 1 . . . 2 . . . 3 . . . 4 . . . 5 certain
Please indicate (by circling the appropriate number) how desirable you consider each of the following events and behaviors to be.

1. Being sued for back taxes.
   extremely undesirable 1 2 3 4 5 desirable

2. Graduating magna cum laude from college.
   extremely undesirable 1 2 3 4 5 desirable

   extremely undesirable 1 2 3 4 5 desirable

4. Never achieving above a 'C' average in college.
   extremely undesirable 1 2 3 4 5 desirable

5. Supporting the Boy Scouts of America.
   extremely undesirable 1 2 3 4 5 desirable

6. Calling the Ayatollah Khomeini a saint.
   extremely undesirable 1 2 3 4 5 desirable

7. Sending in the national guard to Kent State.
   extremely undesirable 1 2 3 4 5 desirable

8. Being a Harvard professor
   extremely undesirable 1 2 3 4 5 desirable
9. Having an accident and being accused of driving while drinking.

extremely undesirable 1 2 3 4 5 desirable

10. Getting a divorce.

extremely undesirable 1 2 3 4 5 desirable

11. Earning a doctoral degree.

extremely undesirable 1 2 3 4 5 desirable

12. Trying to save taxpayers' money.

extremely undesirable 1 2 3 4 5 desirable

13. Having a high rate of inflation as a U.S. President

extremely undesirable 1 2 3 4 5 desirable


extremely undesirable 1 2 3 4 5 desirable

15. Graduating in the top 10% of your high school class.

extremely undesirable 1 2 3 4 5 desirable

16. Receiving a limited salary for preaching (with no bonus for performance).

extremely undesirable 1 2 3 4 5 desirable
This completes the study. Thank you for your participation. Since some of your classmates will be participating in this research and it is important that all subjects have equal knowledge of the study before participating we request that you do not discuss this study for the next two weeks.

This study was designed to look at how attitudes influence the recall of the past. Our hypothesis was that most people will be able to recall well known events. However for less well known events you may rely on your feelings towards the person involved to help guide (reconstruct in Loftus's terms) your memory of events. For example if you were uncertain about an event and disliked the person involved you may be more likely to recall negative information about the individual.

A short questionnaire given by the Department of Psychology appears on the next page. The questionnaire is given to insure that you were fairly treated in this study. After filling it out please return this booklet to the experimenter (quietly, so as not to disturb other subjects). The experimenter will then sign your card.

THANK YOU
Appendix C: Attitude Survey

Contents:

Twenty attitude survey statements (pages 1 - 2)
The current laws regulating the use of marijuana (pot) are just and wise.

<table>
<thead>
<tr>
<th>Level of Agreement</th>
<th>Strongly Agree</th>
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I favor capital punishment for serious crimes.

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Funding of welfare programs for the poor needs to be increased.

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The courts were right in banning school prayer.

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I am opposed to the death penalty for any crime.

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Abortion should not be legal.

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I favor the use of nuclear power.

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We should enact legislation requiring the registration of handguns.

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The government should not conduct a draft registration in times of peace.

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The state spends too much money on welfare for the poor.

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The use of marijuana (pot) should be legalized.

Strongly Disagree 1 . . . 2 . . . 3 . . . 4 . . . 5 Strongly Agree

Overall the Reagan economic policy is helping the U.S. economy.

Strongly Disagree 1 . . . 2 . . . 3 . . . 4 . . . 5 Strongly Agree

I oppose legislation that requires the regulation of handguns (gun control).

Strongly Disagree 1 . . . 2 . . . 3 . . . 4 . . . 5 Strongly Agree

The U.S. should increase its military spending.

Strongly Disagree 1 . . . 2 . . . 3 . . . 4 . . . 5 Strongly Agree

Voluntary prayer should be allowed in the public schools.

Strongly Disagree 1 . . . 2 . . . 3 . . . 4 . . . 5 Strongly Agree

It is a woman's right to choose an abortion if she so desires.

Strongly Disagree 1 . . . 2 . . . 3 . . . 4 . . . 5 Strongly Agree

I support the current registration for the draft.

Strongly Disagree 1 . . . 2 . . . 3 . . . 4 . . . 5 Strongly Agree

The economic policies of the Reagan administration should be discontinued.

Strongly Disagree 1 . . . 2 . . . 3 . . . 4 . . . 5 Strongly Agree

The U.S. already spends too much money on the military.

Strongly Disagree 1 . . . 2 . . . 3 . . . 4 . . . 5 Strongly Agree

I am opposed to the use of nuclear power.

Strongly Disagree 1 . . . 2 . . . 3 . . . 4 . . . 5 Strongly Agree
Appendix D: Generated Evaluative Arguments

Contents:

1. Instructions and sample materials (page 1)

2. Gist of Verbal protocols for 10 topics (pages 2 - 31) The numbers in parentheses (beside each argument) represents the number of times that theme was generated.
In the space provided list all the different reasons that you know about for and against the given issue. State each reason in a short sentence. Give as many reasons as you can but make sure each reason is different. Work at this task until you can come up with no more reasons.

In this space write all the reasons against: One of the Topics

In this space write all the reasons in favor of: One of the Topics
ABORTION

Subjects supporting legalized abortion (N = 19)

Reasons for abortion:

The mother may not want to spend 9 months carrying a baby. (2)
The mother's life may be in danger. (7)
The mother may be too old.
The mother may be too young. (4)
A person has the right to decide. (9)
Having a child is expensive. (4)
Abortion saves a lot of sorrow.
Abortion reduces population of unwanted children. (6)
In the case of rape or incest. (6)
The fetus is not human until after six months. (2)
It would still happen illegally. (2)
Sometimes it is necessary.
If the child was to have a deformity. (2)
Not enough orphanages.
Legality makes abortion safer. (3)
Government should help people who need the service.
Child would have hard time dealing with not being wanted. (2)
Baby won't have to know what it is missing.
Decrease in child abuse.
Decrease in welfare.
Less divorces from "have to" marriages.
People could have one and not feel guilty.

Reasons against abortion:

Abortion kills human life. (15)
Abortion could hurt the mother. (4)
Someone else may want the baby. (2)
Abortion is against my religion.
Free clinics cost governments too much money. (2)
People won't think anything of it.
A child has the right to live. (3)
Without abortion, premarital sex will decrease.
Abortion gives promiscuous teenagers a way out.
The father may never know of possible parenting.
Abortion is immoral.
Abortion will become the new birth control. (2)
Abortion is a breech of medical ethics.
It's the girl's fault and she should consider adoption.
Subjects neutral on legalized Abortion (N = 10)

Reasons for abortion:

In cases of rape, (7)
Freedom to control one's body, (2)
Danger to woman's body, (7)
If baby is deformed,
Legal abortion is safer, (2)
Will keep the crooks out of the business,
Will keep some control on the issue,
If family cannot afford to raise a child, (2)
If the baby was not wanted,
Would reduce the cost,
Less teenagers would get pregnant, (2)
So a teenager won't get into trouble with her parents.
If you don't want to carry baby for 9 months,
People would have it anyway, even if illegal,
Abortion is a means of population control,
Rids mother of unwanted pregnancy.

Reasons against abortion:

Kills human life, (9)
Everyone has a right to live, (4)
Legitimizes killing babies, but not adults or children.
Freedom of sex without caution among young people, (2)
Used as birth control too much, (2)
Against my religion.
Legitimation makes a bad thing easier, (3)
Government should not pay for mistakes of a man and a woman.
The babies don't always die,
Abortions are dangerous operations, (2)
They would become popular.
Morals would be confused.
People's high ideals would go down.
Can leave bad effects on the mother.
Man cannot play God.
Abortion is immoral.
Subjects against legalized abortion (N = 9)

Reasons for abortions:
- When the mother's life is in danger. (5)
- Gets rid of incestual or rape conceived baby. (5)
- Mother can proceed with a normal life.
- Mother won't have to worry about care.
- Mother won't be interrupted by birth.
- Abortion is the woman's right. (2)
- Abortion solves problem of unwanted pregnancy.
- If the baby is sick and will die regardless.
- Prevents unwanted children from coming into a world of poverty.
- Helps control a population explosion.

Reasons against abortion:
- Abortion kills human life. (3)
- Abortion is an easy way out of a bad situation.
- Abortion has bad psychological effects.
- Abortion is against my religion.
- Abortion is a disgusting process.
- Abortion is expensive.
- Abortion can be harmful to the woman. (2)
- Abortion is a choice only God can make.
- No one should not be allowed to live. (3)
- An unwanted child should be given up for adoption. (2)
- Proper birth control should have been used.
- Abortion is cruel.
- Abortion is not a means of birth control.
- Legalizing abortion just makes it more popular.
DEATH PENALTY

Subjects supporting the death penalty (N = 25)

Reasons for the death penalty:

Eliminates the "bad apples" of society, (4)
It reduces the prison population, (10)
A quick, easy way to kill,
One who kills should be killed, (13)
It acts as a deterrent, (12)
Real rehabilitation is rare, (6)
It would be used justly, not as a tool to discriminate.
Reduce the number of criminals on the streets, (5)
It is not cruel punishment,
It saves U.S. money, (8)

Reasons against the death penalty:

It is against some people's religion, (5)
No crime is that serious to bring death to another, (4)
Rehabilitation is possible, (3)
An innocent person could be put to death, (14)
The individual may not have been totally responsible for his actions, (5)
Death is final,
No one has the right to take another's life, (6)
What is the dividing line between a long sentence or death?
Executions are expensive, (2)
Executions are inhumane, (5)
It has not been proven as a deterrent,
There may have been extenuating circumstances to crime,
Who has the right to decide,
Subjects neutral on the death penalty (N = 10)

Reasons for the death penalty:

It may deter future crimes. (3)
It is just punishment. (5)
It keeps prison populations lower, thus reducing cost. (5)
It would reduce the number of criminals. (5)
It would save money. (2)

Reasons against the death penalty:

It is a cruel procedure. (3)
It is morally wrong. (4)
It is not a deterrent. (2)
It is a senseless waste of human usefulness.
It may involve an innocent person. (4)
The person may have been insane at the time.
It may be abused.
It is a sin. (3)
It is a pessimistic view of rehabilitation. (2)
The guidelines will be too difficult to determine. (3)
Who has the right to decide? (3)
There are other alternatives.
Subjects against the death penalty (N = 5)

Reasons for the death penalty:
People should pay for their crimes. (3)
It may keep the crime rate down.
It will protect society.
Reduce the prison populations.

Reasons against the death penalty:
No one has the right to take another's life. (3)
Death does not bring back the victim.
It is too severe.
It is against some people's religions. (2)
You are committing the same crime as the criminal. (2)
An innocent person may be involved. (2)
Rehabilitation is possible.
Killing is wrong. (2)
DRAFT REGISTRATION

Subjects supporting draft registration (N = 22)

Reasons for draft registration:

We should be able to defend ourselves. (11)
Many countries are unstable.
A country never knows when it might need military forces. (4)
It wouldn't take much time to form military forces. (9)
The draft increases the number of trained personnel. (4)
The draft increases the number of people signing during a crisis. (3)
The draft would save money.
Registering for the draft is patriotic. (7)
Registering does not equal being killed. (3)
It lets other countries know that we are on our toes. (3)
It may catch those that try and go to Canada.
The draft gives people a sense of security.
Helps the government keep a count of the number of able men.
The draft keeps America strong.
The draft will teach discipline to youth.
The draft gives the government the right to take men of 18.

Reasons against draft registration:

The draft is a hassle.
The draft inhibits freedom. (7)
Discriminates against women.
The draft goes against religious beliefs. (5)
Failure to register results in a prison term.
The draft makes Americans feel uneasy. (2)
The war may interrupt one's education.
Registering for the draft may mean killing someone.
It's a bother to go to the post office to register.
It costs the government extra money.
The draft may be used for police actions.
Eighteen year olds are too young. (3)
We are not at war. (2)
If you're not old enough to drink, then you're not old enough to fight.
I don't want to fight in something I don't believe in.
The draft could provoke war.
The draft could impair people mentally.
The draft gives the government too much power.
We could have another Viet Nam. (2)
I do not want to protect someone I don't know.
The draft breaks up families.
If there's an only child.
Subjects neutral on draft registration (N = 8)

Reasons for draft registration:

We should be able to defend ourselves. (6)
The draft is patriotic. (5)
Pre-registration would help get the army organized. (1)
The draft ensures that all registers have an equal chance of being drafted.
The draft threatens other countries.
The draft gives the government a count of how many men they have.
Most men in the service are underqualified.
Registering does not equal fighting.
The U.S. must protect democracy.

Reasons against draft registration:

The draft inhibits freedom. (3)
The draft goes against religious freedom. (4)
If a person isn't old enough to drink, why should he have to register? (2)
Should not draft in time of peace.
Nuclear weapons will kill us all anyway.
We would be less inclined to kill if manpower was not there.
The cost of prosecuting evaders is too immense.
The conflict will probably be too great before we can even get there.
Women should be drafted too.
Eighteen year olds are too young to die.
Subjects opposed to draft registration (N = 10)

Reasons for draft registration:

- We should be prepared for war. (3)
- Keeps the military strong. (3)
- Gives the government an idea of the number of men. (2)
- Useful when done during the right time.
- Assesses public opinion of war.
- Draft registration is required by the government.
- Enables us to use size as a scare tactic.
- Registering builds one's self worth.

Reasons against draft registration:

- The draft could cause another Viet Nam.
- The draft goes against religious beliefs. (5)
- The draft goes against political beliefs.
- The draft forces people to join the army. (6)
- Government may misuse the power of the draft. (2)
- Draft registration is a waste of time. (3)
- Draft registration is a waste of money.
- The draft affects people mentally. (2)
- People get killed in war.
- The draft inhibits freedom.
- We are not at war. (2)
- We already have a big volunteer army.
GUN CONTROL

Subjects supporting gun control (N = 29)

Reasons for gun control:

- Government knows who has guns, (8)
- Limits the number of guns, (5)
- If criminals do not register guns then they are breaking another law, (2)
- Murders would decrease, (5)
- Reduce the number of illegal gun owners,
- If a minor is found with a gun, owner would be responsible,
- Crime would decrease, (15)
- Keep guns away from the insane, (3)
- Keep guns away from potential criminals, (12)
- Guns would be more difficult to obtain, (4)
- Accidental deaths within the home would decrease, (7)
- People would feel safer, (5)
- Government would make money from gun registration,
- The cost of gun registration would decrease the number of gun owners.
- Only those people who legitimately need guns could buy them.
- Registration may inform the owner how to use the gun properly.

Reasons against gun control:

- Even with a law people won't register their guns.
- Gun control will create business for underground crime, (3)
- Even with a law people will get guns illegally, (7)
- Increase the number of street gangs,
- With the law people would not be able to protect themselves, (7)
- The law would restrict the freedom of hunters, (2)
- People have a right to lawfully purchase and own a gun, (5)
- Gun owner records may be misleading.
- More law abiding citizens own guns than hardened criminals.
- Law would cause anger which would lead people to crime.
- It would be difficult to control gun possession because too many people own them, (2)
- Law would cause unnecessary government involvement (red tape), (2)
- Law would cause people to have a greater desire to use guns, (2)
- Owning a gun is too dangerous.
Subjects neutral on gun control (N = 8)

Reasons for gun control:

The law would keep guns out of the hands of young children. (3)
Guns would only be available to those who legitimately need them.
Keep guns away from potential criminals. (3)
The government would have a record of gun ownership. (2)
Guns are too dangerous. (2)
The law would decrease accidental deaths due to guns. (4)
Gun control would make life safer. (2)
Gun control would eliminate the misuse of guns.
Decrease the number of novices using guns.
Gun control would decrease the number of murders.

Reasons against gun control:

Even with the law people would be able to get guns illegally. (2)
The law would hurt those with an honest intent to protect themselves.
Gun salesmen would eventually go out of business.
People have a right to protect themselves. (2)
A subject against gun control (N = 1)

Reasons for gun control:
Too many people are killed by guns.
Guns are too easy to get.

A reason against gun control:
People have a right to own whatever they want.
MILITARY SPENDING

Subjects supporting an increase in military spending (N = 8)

Reasons for increased military spending:

Russia's military is liable to become more advanced than ours. (5)
The threat of more weapons might stop another war. (4)
Militarily we are behind some of the major powers. (3)
It is good for our country. (3)
It may help protect us better. (7)
A strong military is necessary to force others to talk in good faith.
Unilateral U.S. disarming would do nothing.
Would be able to increase the salary of service employees.
It may help people feel more secure.

Reasons against increased military spending:

We don't have enough money. (3)
Spending without reform may inhibit necessary reductions in military waste.
Studies have shown that money is less productive in the military sector.
We already have too many weapons.
It would promote a race among countries for the best equipment.
It is a waste of money.
It reduces money available for social programs.
Subjects neutral on increasing military spending (N = 20)

Reasons for increased military spending:

So the U.S. will be ready in an emergency. (11)
To show our strength to other countries. (6)
To prove that we are still a world power. (3)
We can avoid future price increases if we buy now.
It will enable us to have the best equipment (10).
It will unite our country by making Americans feel strong,
It will keep others from bad-mouthing the U.S.
It will reduce the chance of anyone wanting to attack us. (2)
It will enable us to keep up with the Russians. (4)
It will enable us to train our soldiers. (3)
It will create jobs.
To prevent the loss of democracy and spread of communism.
The military enables people to get an otherwise unobtainable education.
Military scientists have made findings applicable to other areas.

Reasons against increased military spending:

It only adds to our huge federal deficit. (5)
Our present equipment will become useless.
No one wins in a nuclear war. (4)
Increasing military power directly supports war. (5)
Creates a superficial sense of power.
Other countries may consider it a challenge.
Reduces money available for other programs. (13)
Causes animosity with Russia. (2)
There is always the temptation to display power.
Enough money is already being spent. (2)
We are in peace. (2)
Many people are against it.
The government abuses its power with the threat of weapons.
War solves nothing.
They may want me! in a larger army.
We already have enough power.
Subjects against an increase in military spending (N = 10)

Reasons for increased military spending:

We must be able to defend ourselves. (7)
We must always be on guard.
We must be ready to attack.
It will increase the prestige of the U.S. (3)
It will enable us to be ahead of competitors. (6)
It will enable us to have a more knowledgeable staff.

Reasons against increased military spending:

Reduces the money available for other programs. (6)
A waste of money. (5)
It will raise taxes. (2)
There is no need for so much arms build up.
The machinery they are building is deficient.
The commanders use the air force for their own convenience.
Accidental killings of minorities.
We have enough military equipment now. (5)
Creates more war and peace problems.
Leads to unnecessary competition between the U.S. and Russia. (2)
Leads to a nuclear war scare.
Loss of freedom.
The arms race is getting out of hand. (2)
It affects business trade negatively.
NUCLEAR POWER

Subjects supporting the use of nuclear power (N = 10)

Reasons for nuclear power:

- It is the thing of the future. (2)
- We must keep up with other countries.
- Nuclear power plants can put out a lot of power. (2)
- Keeps the world in peace because everyone is afraid of nuclear power.
- Provides an alternative source of energy. (6)
- There have been no fatal accidents.
- It is economically feasible in the long run. (5)
- Human negligence, not the reactors, have been the cause of the problems.
- Nuclear power is efficient.
- Minimal pollution.
- Limitless supply. (4)
- Creates jobs.
- Decreases dependence on foreign countries for energy.

Reasons against nuclear power:

- Methods are not yet safe. (6)
- Accidents have occurred. (2)
- People can die from a "leak" in the nuclear plant. (3)
- Nuclear power is bad for the environment.
- A lot of money must be spent on nuclear power. (4)
- A nuclear war would destroy much of the world.
- Wastes cannot be disposed of properly. (5)
- Diseases are caused from the radiation poisoning. (2)
- Wastes can be stolen and used against us as nuclear weapons.
- The possibility of a fallout from a meltdown.
- Nuclear power has potential for misuse.
- All the implications are not understood.
- A lot of risks are involved.
Subjects neutral on the use of nuclear power (N = 17)

Reasons for nuclear power:

We must expand our knowledge.
We have to keep up with foreigners. (5)
We cannot fall behind the Soviets.
It is the wave of the future.
Many precautions are taken to make it safe.
Less men will have to go to war.
An alternative energy source. (6)
Could be used to further human welfare.
Can be used as a threat in war.
Good source for the military. (2)
It is economically feasible. (2)
A major component of advanced technology.
Minimal environmental problems.
Nuclear power is efficient.
Abundant supply. (2)
Creates jobs.

Reasons against nuclear power:

It can cause cancer. (2)
It endangers our lives. (9)
Too many accidents occur. (7)
The breeder reactor is merely theory.
Too many nuclear weapons.
Nuclear power affects the environment. (3)
A nuclear war destroys everything. (2)
Takes time and money. (3)
Hard to control. (2)
All the power makes the world uneasy.
Too much emphasis on war. (2)
Overwhelmingly powerful.
Threat of long term radiation.
Subjects against the use of nuclear power (N = 13)

Reasons for nuclear power:

Nuclear power is necessary to keep up with the changing world. (2)
Alternative energy source. (7)
Economically feasible in long run.
Equalizes strength among opponents in war (2)
Readily available.
It does the job quickly.
Efficient energy source.
Nuclear power is powerful.
It is needed to defend ourselves. (2)
Can be used as a last resort.

Reasons against nuclear power:

Use of nuclear power is not yet completely safe. (7)
Nuclear power leads to nuclear defense and war. (4)
It could destroy the world. (3)
Nuclear power is unnecessary.
Nuclear power is dangerous to all. (3)
There are other ways to go about it.
Nuclear power is inhuman.
Nuclear power is morally wrong.
Nuclear power is against my beliefs.
Too many accidents.
Nuclear power is hazardous. (2)
High cost to build and maintain. (2)
Nuclear waste cannot be disposed of properly. (2)
Nuclear accidents could cause many deaths. (3)
Nuclear plants cause the value of surrounding land to decrease.
Long term effects of meltdown are unknown.
Gives one the ability to blow up the world.
LEGALIZED MARIJUANA

Subjects supporting legalized marijuana (N = 5)

Reasons for legalized marijuana:

Pot is less harmless than other intoxicants. (3)
Pot can be used to ease the pain experienced by cancer patients.
Pot could provide money for the government. (2)
If legalized pot could reduce hostility between nations.
Pot can be used to treat insomniacs.
Pot would reduce the crime rate.
Most people use pot.
"I like pot".
Pot does not hurt anyone else.
Pot is easy to grow.
A lot of politicians smoke pot.
Pot smells good.
Pot rolls good.
Pot smokes good.
You can get a good high on pot.
Pot can be used as an aphrodisiac.
Money would be saved due to less government regulation.
People have a right to make their own decisions.

Reasons against legalized marijuana:

Pot will become more easily available to young children.
Too many people will abuse the privilege. (2)
Pot is harmful to the body. (3)
Pot could lead to the use of other drugs.
Pot is expensive.
Pot can cause accidents.
Pot may cause genetic defects in children.
Pot causes a loss of memory.
Subjects neutral on legalized marijuana (N = 12)

Reasons for legalized marijuana:

Pot is the second largest crop in the U.S.
Pot makes people feel good. (2)
Pot can help in the treatment of various diseases. (6)
Pot is cheap. (3)
Pot is easy to obtain.
Pot is easy to grow.
The number of petty crimes would reduce. (4)
If government controlled, the quality of pot would be ensured. (3)
Pot could provide the government with tax money. (3)
Pot is like cigarettes, but with a slightly different effect. (2)
It is better to use pot than to use hard drugs. (2)
The legalization of pot will decrease glamour.
There would be a feeling of goodwill among pot smokers and the police.
Less imported pot would be obtained.
The law is not going to stop it.
It's effects are not as bad as alcohol. (2)
It would stop home mixtures.
It would decrease illegal drug traffic.
Constitutional right to freedom of choice.

Reasons against legalized marijuana:

Pot becomes addicting.
Pot stinks.
Pot kills brain cells. (3)
Pot causes deformation of babies. (2)
Pot can make the user sterile.
Pot causes a loss of memory.
Pot can cause harm to the body. (3)
The use of pot impairs driving ability. (4)
The effects of pot are unpredictable. (2)
There are no good effects from pot. (2)
People who are high will not be able function around other people. (2)
Pot causes hyperactivity in users, presenting a danger to society. (2)
People will use pot anyway. No one can stop them.
Pot can become expensive if one makes a habit of it. (2)
Use of pot can lead the user to more harmful drugs. (3)
If pot is legalized than people will fight to legalize more harmful drugs.
The legalization of pot may cause it to become more expensive. (2)
It causes unnecessary governmental control.
Pot would become available to young children. (2)
Pot would be easier to get. (3)
Pot use would be public. (2)
People would revert back to alcohol, the safe drug.
The legal use of pot might increase the crime rate.
Subjects opposed to legalized marijuana (N = 22)

Reasons for legalized marijuana:

It should be allowed for health purposes. (12)
The economy would benefit. (8)
Less people would get incarcerated for possession.
It's effects are no worse than alcohol. (2)
It is futile to enforce a law nobody follows. (5)
Freedom of choice to do what one wants. (6)
It makes people feel good. (2)
Legalization would make it safer. (2)
Legalization would reduce the risk, therefore it would reduce the usage.
Legalization would allow "legal" good times.
Legalization would reduce smuggling across borders.
It could create jobs.

Reasons against legalized marijuana:

The best pot would not be available with government control.
The rate of use would increase. (8)
It isn't healthy to smoke too much. (9)
Use dulls the senses. (6)
It's use leads to other drugs. (5)
It destroys people's minds. (5)
The challenge for growers would disappear.
Pot is dope and dope kills you eventually. (5)
Young children would start using it. (3)
It is not right just because the majority do it.
Infringements on the freedom of others. (3)
People high on pot are a hazard to society. (9)
Teens would feel increased pressure.
Young teens do not understand all the consequences.
Used as an escape.
It is not used in the proper manner. (2)
It is a drug. (2)
To stop people from using it,
Pot should not be used as a replacement for alcohol.
Pot leads to decreased moral values.
Farmers would grow pot instead of other necessities.
It is stupid to do.
Legalization is no way to control the drug problem.
SCHOOL PRAYER

Subjects supporting prayer in school (N = 25)

Reasons for school prayer:

It's up to the children to do what they want.
A child should be able to pray if he so chooses, (3)
Prayer should never be forced on a child.
Not all children would have to participate, (3)
The school may be the only place for some children to hear about God.
It would give children the opportunity to decide upon a religion.
Voluntary prayer could improve people spiritually, (4)
Some feel it is essential to pray everyday.
Some feel better if they pray everyday.
The right to choose, (10)
Prayer allows children to continue what is taught at home, (3)
Prayer will give children higher morals.
If one is religious, one should pray.
It wouldn't take much time.
This is a free country, (3)
Prayer may promote closeness among classmates, (2)
Prayer would help children come closer to God, (4)
Prayer would help children understand one another, (2)
Prayer would help children feel that religion is not wrong.
Prayer gives you comfort, (2)
It's voluntary, why not? (2)
Prayer allows one time to reflect.
Prayer helps the day go better.
Children should learn prayer at an early age.

Reasons against school prayer:

Other children will be forced to pray, (12)
Prayer is private and personal.
There are too many religions to come up with a prayer okay for all, (4)
Some parents are opposed to religion, (3)
Prayer may be against a person's religion, (5)
We already have Sunday as a day of prayer.
Church and state are separate, (2)
Prayer in school would be an inconvenience.
Some people are atheists, (4)
Prayer in school would cause friction among parents, groups, and others.
Prayer should not be control.
Prayer is being used for political purposes.
One who wants to pray can always find the time and place.
Prayer in school would be a waste of class time.
Prayer would accomplish nothing.
Public schools have no religious aspect.
Subjects neutral on school prayer (N = 12)

Reasons for school prayer:

- Prayer in school allows one to practice their religion.
- Prayer can strengthen your beliefs. (2)
- Prayer would allow a break in the day for meditation.
- Freedom of religion. (6)
- Children won't have to "leave their religion at home." (2)
- Prayer in school would introduce kids to God.
- Prayer may bring children of the same faith together.
- Freedom of choice. (2)

Reasons against school prayer:

- Prayer may bother others who don't believe.
- Not everyone is religious. (2)
- There should be complete separation of Church and State. (3)
- Schools are for learning things not taught in church. (2)
- People cannot choose a school as they can a church.
- It would cost too many tax dollars to institute.
- Public schools are not religious schools. (3)
- The majority of people are of different religions. (3)
- Most people do not pray.
- Churches were made for praying.
- Religion should be held on one's own time. (2)
- Problems will arise between children of different religions.
- Prayer will take time away from study. (2)
- People of different religions pray different ways.
- Prayer in school takes up valuable time.
Subjects opposed to school prayer (N = 5)

Reasons for school prayer:
Prayer develops a spirit in people.
If learned at school, the child will associate prayer as correct.
Freedom of choice. (2)

Reasons against school prayer:
There are too many concepts of God.
One can get religious training in a religious school.
Children will be forced into praying. (2)
Children go to school to learn more important things.
Every religion should be respected.
Prayers are not important.
REAGAN ECONOMIC POLICIES

Subjects supporting Reagan economics (N = 15)

Reasons for Reagan economics:

He has cut back spending. (4)
He is trying to relieve the country of its huge deficit. (6)
They help cut down government bureaucracy.
His programs offer an incentive to investors. (2)
His programs cut down on unnecessary welfare payments. (5)
His programs cut down on unnecessary social security payments. (2)
His defense policy stimulates the economy with jobs. (2)
High military spending enables the U.S. to provide better "services."
Taxes are lower.
The rich will soon get what they deserve. (2)
The system will work with time. (3)
His policies will bring inflation down. (4)

Reasons against Reagan economics:

He spends too much money on the military. (4)
He depends too heavily on tax money.
He does not comply with the budget. (3)
His policies have created enormous unemployment. (6)
His programs don't take the needy into consideration. (3)
His programs only favor the rich. (3)
He concentrates too heavily on the future, not the present.
The Secretary of the Interior should not sell wilderness lands.
His policies are causing inflation. (2)
He has cut back on social security. (2)
He has cut back on health care.
Taxes are still too high.
More businesses are going bankrupt.
Subjects neutral on Reagan economics (N = 22)

Reasons for Reagan economics:

Nuclear arms control.
Decrease in government spending, (2)
Decrease in money for specific programs.
The amount of federal spending is adequate.
The economy has improved, (5)
Welfare fraud has decreased, (2)
He wants to give more power to the states.
His defense policy has created jobs, (2)
He has tried to cut taxes, (3)
No one could do any better, (2)
His policies proide long range goals.

Reasons against Reagan economics:

Military spending is too high, (7)
Support for higher education is too low, (4)
His policies only favor the rich, (4)
He has not done enough for the poor, (5)
His policies increase taxes for the middle class, (3)
He wastes money onother countries when ours is in need.
The value of the dollar has decreased.
Money is taken away from other programs, (4)
The deficit is too high, (3)
The trickle-down effect does not work.
Unemployment is higher than ever, (2)
Subjects opposed to Reagan economics (N = 4)

Reasons for Reagan economics:
His policies will help stabilize the nation's economy.
Helping other countries may promote a "good" image of the U.S.

Reasons against Reagan economics:
His policies will increase taxes.
Unemployment has increased.
He has cut federal aid to students. (2)
His policies hurt more people than they help. (3)
The social security system is running out.
More concern should be placed on Americans than those abroad.
Raising the minimum wage only fuels inflation.
Decreasing welfare payments hurts those unable to find work.
The budget is not balanced.
Too much military spending.
He spends too much money on the Reagan's.
WELFARE

Subjects supporting increased welfare spending (N = 6)

Reasons for welfare:

It keeps the poor living. (5)
It keeps the elderly living.
It helps teenage mothers.
It helps all to live up to our country's morals.
It helps people to stay on the right side of the law.
It helps people through rough times. (2)
The people of our country are more important than defense.
It helps provide medical care to poor.

Reasons against welfare:

The government does not have the money, why spend it? (3)
It is an easy way out of working. (3)
People receive welfare without needing it.
Subjects neutral on increased welfare spending (N = 16)

Reasons for welfare:

It gives the poor more opportunities. (9)
It helps the disabled. (2)
It would help get the poor off their feet.
It helps those temporarily unemployed. (3)
It helps those unable to find employment.
It helps provide clothing, food, housing, and medical care. (4)
We would be better equipped to find those really in need.
Some people are really in need. (4)
It is the Christian duty. (2)
To keep our nation together and satisfied.
The gap is too wide between the rich and the poor. (2)

Reasons against welfare:

Too many people get it who don’t need it. (11)
People take welfare instead of working. (9)
It is a waste of hard-earned taxpayer money.
Too much money is already being spent. (6)
There are too many poor people in the country to support.
There are government programs more important than welfare. (2)
Taxes will go up. (5)
The system only helps one part of the U.S.—the poor.
It would dampen competition.
Subjects opposed to increased welfare spending (N = 18)

Reasons for welfare:

Aids the disabled people. (2)
It aids the unemployed. (3)
It helps the poor survive. (9)
It would give food, shelter, and clothing to the poor. (2)
It would keep the U.S. morale up.
It would help keep the poverty level down.
It is a good program to fall back on when one is old.
It is good to take care of the sick/elderly.

Reasons against welfare:

There is no money to give out. (5)
Taking welfare is easier than going to work. (10)
It raises inflation, thus decreasing the wealth for everyone.
Too many people are getting what they do not deserve. (10)
The money will never be returned.
It will drag down the middle class. (3)
It will raise unemployment.
The number of recipients will increase.
It is too hard to judge the credibility of recipients. (2)
The money could be spent on other programs. (3)
Too much money is being spent. (3)
It is unfair to those that work for a living.
It will increase the fraud and deceit.
Taxes will increase. (3)
Appendix E: General Thoughts on Attitude Topics

Contents:

1. Instructions and materials (pages 1 - 2)

2. General thoughts on 3 attitude topics (pages 3 - 7)
For each of the following words, list the first things that come into your mind when you think about the word.

ABORTION

GUN CONTROL

WELFARE

MARIJUANA (POT)

PRAYER IN PUBLIC SCHOOLS
NUCLEAR POWER

DEATH PENALTY

REAGAN'S ECONOMIC POLICIES

DRAFT REGISTRATION

DEFENSE SPENDING
WELFARE SPENDING

Subjects supporting welfare (N = 12)

1. Money going to people who need help with raising children and keeping them alive.
2. Poverty, need money.
3. Better economy for all, less crime, equal distribution of wealth, equal chance for all.
4. Too much starvation and poverty in this world.
5. Unemployment, Economizing.
6. Poor people, old people.
7. Welfare should be boosted, food stamps, unemployment should be watched, but it should not be labeled sting.
8. Some people aren’t even trying to find a job, and the people who really need it are being deprived by Reaganomics.
9. I love to help people. This program should be kept on.
10. Poor receiving money.

Subjects neutral on welfare (N = 18)

1. A lot of money is spent on welfare; not everybody on welfare absolutely needs it; I’ve heard and seen many people abusing welfare program.
2. We should help those who have nothing but they should have to do some work for it not just loaf and collect welfare.
3. Too many people take advantage of it.
4. Poor, some people need help, but too many people are on welfare that could get a job.
5. Needs to be less easier to receive; provides many people with an easy way out, and they become satisfied in their jobless or depressed way of living.
6. Many programs should open up for the poor.
7. A lot of rip-offs; some lazy people; good for those who aren’t taking advantage of it.
8. The amount of money being spent for welfare.
9. Some people on it don’t really want to work.
10. Helping the unemployed.
11. Abused; for the unable to work; sometimes unnecessary.
12. Poor, need money, live in a bad area.
13. Should be scrutinized more carefully. More consideration given to those who are truly needy.
14. I agree with welfare if distributed fairly. Many people receiving welfare could work but don’t. It’s in need of a better system.
15. For the poor; needed.
16. I feel everyone has an equal chance in the beginning to make some life for themselves. Our government shouldn't be held responsible for capable people who aren't working.

17. Needy; required.

18. Too many people not working for their money. Government needs to be more selective.

Subjects opposed to welfare (N = 13)

1. Too much money is spent on welfare. The money should be used to create jobs.
2. It's not giving people enough incentive to go out and work.
3. Lazy people; people with big families and no jobs, food, or money; seeing certain people in Cadalacs and other expensive cars parking near a shack which they consider their home; bums.
4. I support the welfare system for those who need it (disabled people etc.), but there are too many very capable people who are relying on welfare as a source of income. These people are lazy and this is why I support the social cuts in Reagan's administration.
5. Crooks; lazy asses.
6. I am strongly opposed!!! They could work if they wanted to! Why should the tax payers support the lazy?
7. Dependancy! not willing to work.
8. Poor; Government; income; health; laziness.
9. Jobless and very poor! people taking advantage of the system; needs to be limited; too easy to get.
10. Rip-off; too many lazy people receive it. It's wasting our money.
11. Poor.
12. People should look for jobs; join the army if all else fails.
13. Fraudulent recipients are multiplying! I think recipients should be screened more intensely; are they completely eligable?

NUCLEAR POWER

Subjects supporting nuclear power (N = 15)

1. I favor nuclear power. If we stop producing nuclear arms and weaponry, the other powerhouses (Russia....) will continue. No nukes in the U.S. would be an incentive for the rival countries.
2. 50/50! good, easy/dangerous, expensive.
3. Potential to supply all power. Dangerous unless regulated closely.
4. Dangerous but we need it for the welfare of the country.
5. The need for energy at this time even if it could kill.
6. OK; If carefully used, all possible harm should be eliminated or shouldn’t be used to a great extent.
7. Three Mile Island.
8. Can be a positive source of power—more people would see this if they were educated and informed on nuclear “Rxus” (?).
9. A few bugs, but a possible alternative.
11. War.
12. Nuclear power should be used in order to offset the dwindling supplies of natural resources.
13. Can effect people badly; We need alternate energies; Positive outweighs negative.
14. Worries me, but we need a clean power source for the carry-over from fossil fuels to either fusion or solar power.
15. I am in favor of nuclear power. I live on the Ohio River less than ten miles from a nuclear and atomic power plant and I don’t worry in the least. The atomic plant has been there for at least ten years and I am not melted down yet.

Subjects neutral on nuclear power (N = 15)
1. Death, save money, pollution
2. I favor its use.
3. Don’t know enough about it—Harmful? Helpful? Questionable right now.
4. It helps save energy that is quickly running out.
5. Destruction, explosive.
6. War, should get rid of all types of dangerous powers.
7. We should continue our progress in nuclear power; to have a nuclear arms control would be foolish because there is no assurance other countries will do the same; However, it is life threatening if it gets out of control.
8. Killer of harmless people and the destroyer of the world.
10. The Russians are coming.
12. For it, but precautions against nuclear leaks should be taken.
13. We may need a source of power; however, since nuclear power can be so dangerous, it’s hard to say.
14. Much money shouldn’t be used for nuclear power.
15. Destructive if used wrong, I’m not that up on it, so I haven’t many comments on it.
Subjects opposing nuclear power (N = 12)

1. too much, should be restricted to isolated areas so it won't due harm to anyone
2. against -- no nukes
3. killing, radiation, accidents.
4. It is a death wish.
5. The end of the world, Russia, my Russian history teacher, space wars, my psychology buddy kevin who went to a nuclear school, the song "Face the Fire" by Dan Fogelberg, destruction, a "no-no"—untouchable.
6. Three Mile Island; dangerous.
7. Dangerous—other ways of making power should be used.
8. The end of the world; radiation is dangerous; Three Mile Island
9. The ends do not justify means; other options are available without the side effects.
10. It is gonna kill us.
11. One bomb will kill us all so why make more?
12. Too much time is being spent on nuclear arms and competition with Russia.

MILITARY SPENDING

Subjects supporting an increase in military spending (N = 7)

1. Russia and the other countries will not slack off—we need to keep an even heel with them. Defense spending is necessary; it increased, do so, but in the right areas.
2. It is needed to guard against war.
3. It is needed to keep our defense at a superior level.
4. Wars, missiles, planes, guns.
5. Should be drastically increased to match the other powers.
6. War; safety; needed.
7. Russia could be a threat—they certainly spend a lot on their military.

Subjects neutral on a military spending increase (N = 22)

1. It is hard to tell what the government does with the defense budget—my guess
2. it is for the best.
3. Too much wasted money spent on poor systems.
4. Sometimes too much; spend more money on other problems; war.
5. Slow down for a while—we have too much.
6. Should cut back; don't need to compete with the Russians.
7. Military.
8. Russia spends a lot more; we need defense; take money from marijuana tax.
9. It is dumb to overspend.
10. Overproduction—spending too much on things we are not using.
11. Prepared if war approaches; guns, machines, protection.
12. Spending too much money; need to help our country first.
13. Not familiar with the amount of spending, but believe in a strong defense.
14. We do not have the money.
15. We should spend as much as needed to keep up with Russia.
16. Too much money spent on other countries.
17. Spending too much—need to cut down.
18. Spending too much.
19. Unknowledgeable; weak; fighting; more power.
20. Out of hand—should spend more on federal aid.
21. Should spend money on defense but not all on the military.
22. O.K., if limited.

Subjects opposed to an increase in military spending (N = 14)

1. Too much money is being spent.
2. As long as we can keep defending ourselves—keep spending at that level.
3. Spending should be proportionate with other important programs.
4. Spend too much. What's the difference if we blow some country up one time or five times?
5. Spend too much on defense and not enough on our own country.
6. Totally insane. We should have cut defense spending long ago. We can already obliterate the earth several times over.
7. Should be cut down—too much waste.
8. Guns; training; going to war; not going to war; women fighting.
9. Promotes war.
10. It is there if we need it, but we should cut down a little.
11. Too much is spent on defense and not enough on the nation.
12. It means cutting down on student aid.
13. The U.S. spends too much on defense. However, it is needed to keep up with nuclear advancement. Controversial in my opinion.
14. It is outrageous to have the equipment to destroy three of our worlds. Should put money into useful research.
Appendix F: Instructions for Experiments 2 & 3

Contents:

1. Opening instructions (Displays 1 - 7)

2. Instructions for trivia questions (Display 8)

3. Instructions for recall test (Display 9)

4. Instructions for recognition task (Display 10)

5. Instructions for second opinion rating (Display 11)

6. Debriefing materials (Display 12)
WELCOME TO YOUR EXPERIMENT.
PLEASE PRESS "ENTER" ON THE
LITTLE BROWN BOX NEXT TO
THE SCREEN TO BEGIN.

TODAY'S RESEARCH IS PART OF A CONTINUING PROGRAM OF
RESEARCH INVESTIGATING HOW PEOPLE FEEL ABOUT VARIOUS TOPICS OF
CURRENT INTEREST. IN THE FIRST PART OF TODAY'S EXPERIMENT YOU
WILL BE ASKED TO STATE YOUR OPINION ABOUT VARIOUS POLITICAL
STATEMENTS. ALL YOUR RESPONSES WILL BE RECORDED BY THE COMPUTER
AND TREATED AS STRICTLY CONFIDENTIAL.

BEFORE WE BEGIN, HOWEVER, WE WOULD LIKE TO REMIND YOU OF
YOUR OPTIONS AS A PARTICIPANT IN ANY RESEARCH AT THE OHIO STATE
UNIVERSITY.

(PRESS "ENTER" FOR MORE INSTRUCTIONS.)

IN CASE YOU HAVE NOT PREVIOUSLY BEEN SO INFORMED, YOU
SHOULD KNOW THAT HUMAN SUBJECTS IN ANY RESEARCH AT THE OHIO
STATE UNIVERSITY ARE AT LIBERTY TO TERMINATE THEIR PARTICIPATION
AT ANY TIME THEY SO DESIRE. THE PRECEDING INSTRUCTIONS HAVE
DESCRIBED THE TASKS YOU WILL ENCOUNTER IN THIS EXPERIMENT. IF
FOR ANY REASON YOU PREFER NOT TO PROCEED WITH THE EXPERIMENT,
PLEASE INFORM THE EXPERIMENTER OF THIS. OTHERWISE PRESS THE
"ENTER" BUTTON TO CONTINUE.
DISPLAY 4:

WHEN YOU HAVE FINISHED LOOKING AT ANY MESSAGE YOU SHOULD PRESS "ENTER" TO PROCEED WITH THE NEXT MESSAGE.

WHEN YOUR OPINION ON AN ISSUE IS REQUESTED, YOU SHOULD RESPOND WITH A NUMBER FROM 1 TO 5 WITH 1 MEANING STRONGLY DISAGREE AND 5 MEANING STRONGLY AGREE. NUMERICAL RESPONSES CAN BE ENTERED BY PRESSING A DIGIT ON THE KEYBOARD, THEN PRESSING "ENTER" TWICE! THE FIRST TIME YOU PRESS "ENTER", OUR RESPONSE SYSTEM WILL TENTATIVELY REGISTER YOUR RESPONSE WHILE DISPLAYING IT BACK TO YOU IN THE FORM OF AN ARROW LOCATED OVER THE NUMBER YOU HAVE SELECTED. AT THIS TIME YOU MAY EITHER MAKE YOUR TENTATIVE RESPONSE FINAL BY PRESSING "ENTER" AGAIN OR YOU MAY CHANGE YOUR RESPONSE BY PRESSING A NEW NUMBER AND THEN PRESSING "ENTER" TWICE. IF YOU ARE SURE OF YOUR RESPONSE, IT IS PERFECTLY ALL RIGHT TO PRESS "ENTER" TWICE WITHOUT WAITING FOR THE INDICATOR ARROW. OUR SYSTEM WILL AUTOMATICALLY DETECT A ZERO, OR A NUMBER GREATER THAN 5 OR A NONNUMERICAL RESPONSE AS AN ERROR AND WILL GIVE YOU A MESSAGE INDICATING THAT YOU SHOULD RESPOND AGAIN.

IF YOU UNDERSTAND THE INSTRUCTIONS TO THIS POINT, PRESS "ENTER". OTHERWISE REREAD THIS PAGE BEFORE GOING ON.

DISPLAY 5:

THE NEXT DISPLAY IS INTENDED TO GIVE YOU PRACTICE IN USING THE RESPONSE PANEL. IT WOULD BE A GOOD IDEA TO PRACTICE MAKING DIFFERENT RESPONSES — BOTH CORRECT AND INCORRECT — AT THIS TIME. PLEASE MAKE SURE THAT YOU ARE COMPLETELY CLEAR ON THE USE OF THE RESPONSE PANEL BEFORE CONTINUING. REMEMBER THAT A RESPONSE IS REGISTERED ONLY BY PRESSING "ENTER" TWICE AND THAT YOU CAN CHANGE A RESPONSE AFTER PRESSING "ENTER" ONCE.

(PRESS "ENTER" TO CONTINUE.)

DISPLAY 6:

HERE IS A SAMPLE OPINION QUESTION:

THE GOVERNMENT SHOULD DEVELOP A NATIONAL HEALTH INSURANCE.
If you have any questions about the experimental task, please ask the experimenter waiting outside, now. If you have no questions press the "Enter" button to begin the first part of the experiment. Remember your task is to indicate whether you agree or disagree with each statement. You should make each judgment carefully but as quickly as possible. Today you will be evaluating statements on the topics of: nuclear power, military spending and welfare.

For the next part of the experiment we have prepared a series of 10 trivia questions and answers that many people find interesting. Please read each question and try to guess the answer before looking at the answer. At the end of the experiment you will be asked to recall these answers. However do not try to memorize the answers. Just read the question, try to guess the answer and then go on to the next display by pressing the "Enter" button.

(Press "Enter" for the trivia questions.)

The experimenter will now provide you with some recall sheets. On these sheets please write down all the statements you can recall from the first part of the experiment. Note: please write down the political statements and not the answers to the trivia questions. Write down each statement on the appropriate sheet for each topic. If you can recall only part of a statement please write down as much as you can. Take 5 minutes to complete this task. The experimenter will let you know when it is time to go on to the next task.

(Note: In the experiment in chapter 6, 10 minutes were given to complete recall.)
DISPLAY 10:

FOR THE NEXT TASK YOU WILL SEE VARIOUS STATEMENTS LIKE THOSE PRESENTED IN THE FIRST PART OF THE EXPERIMENT. FOR EACH STATEMENT INDICATE HOW SURE YOU ARE THAT THE STATEMENT WAS PRESENTED IN THE FIRST PART BY INDICATING A 7 IF YOU ARE VERY SURE YOU SAW IT AND A 1 IF YOU ARE VERY SURE YOU DID NOT SEE IT. RESPOND WITH A SCORE IN THE MIDDLE IF YOU ARE LESS SURE THAT YOU HAD PREVIOUSLY SEEN THE STATEMENT. RECORDING YOUR RESPONSE IS JUST LIKE RECORDING YOUR OPINION. THAT IS, PRESS A NUMBER FROM 1 TO 7 WITH 1 MEANING "I AM VERY SURE I DID NOT SEE THE STATEMENT" AND 7 MEANING "I AM VERY SURE I DID SEE THE STATEMENT". THEN PRESS "ENTER" TWICE. YOU CAN CHANGE A RESPONSE BY PRESSING IN A NEW RESPONSE AFTER HITTING "ENTER" ONCE. AFTER PRESSING IN A NEW RESPONSE HIT "ENTER" TWICE. REMEMBER, IN THIS PART OF THE EXPERIMENT WE ARE INTERESTED IN WHETHER YOU REMEMBER SEEING THE STATEMENT IN THE FIRST PART OF THE STUDY.

(NOTE IN THE EXPERIMENT IN CHAPTER 6, A SCALE VALUE OF 7 WAS REDUCED TO 4).

DISPLAY 11:

FOR THE FINAL TASK WE WOULD LIKE YOU TO EVALUATE SOME MORE STATEMENTS LIKE THOSE IN THE FIRST PART OF THE EXPERIMENT. FOR EACH STATEMENT INDICATE WHETHER YOU AGREE OR DISAGREE WITH THE STATEMENT BY PRESSING IN A NUMBER FOR 1 TO 5 WITH 1 MEANING STRONGLY DISAGREE AND 5 MEANING STRONGLY AGREE. TO RECORD YOUR RESPONSE PRESS "ENTER" TWICE. YOU CAN CHANGE A RESPONSE AFTER PRESSING "ENTER" ONLY ONCE.

DISPLAY 12:

THE EXPERIMENT IS NOW OVER. THANK YOU FOR YOUR PARTICIPATION. SINCE SOME OF YOUR CLASSMATES WILL BE PARTICIPATING IN THIS EXPERIMENT AND IT IS IMPORTANT THAT ALL SUBJECTS HAVE EQUAL KNOWLEDGE OF THE EXPERIMENT BEFORE PARTICIPATING WE REQUEST THAT YOU DO NOT DISCUSS THE PARTICULARS OF THIS STUDY FOR THE NEXT TWO WEEKS. THIS STUDY WAS DESIGNED TO LOOK AT WHETHER YOUR ATTITUDE ON A PARTICULAR ISSUE WILL HELP YOU REMEMBER INFORMATION ON THAT TOPIC. IN PARTICULAR WE WERE INTERESTED IN SEEING IF AGREEING WITH A STATEMENT WOULD AID RECALL OF THAT STATEMENT. IF YOU HAVE ANY QUESTION ABOUT THIS RESEARCH THE EXPERIMENTER IS WAITING OUTSIDE TO ANSWER IT. THE EXPERIMENTER WILL ALSO HAVE A SHORT QUESTIONNAIRE AND THE TRIVIA QUESTIONS FOR YOU TO ANSWER. PLEASE FIND THE EXPERIMENTER NOW. THANK YOU FOR YOU PARTICIPATION.
Appendix G: Opinion Statements

Contents:

90 opinion statements (pro, anti, and neutral) on 3 topics
Ten Anti-Welfare Arguments

1. Welfare means the government supporting able bodied men and women who should get a job.

2. Welfare is a give-away of hard-earned tax money.

3. The welfare system is producing a society of loafers who becoming increasingly dependent on our aid.

4. The welfare program is expensive — draining our nation's resources.

5. Welfare is a slap in the face to the free enterprise system.

6. The welfare system consists of nothing more than fraud and deception.

7. Welfare is unfair to those who work.

8. Welfare increases the federal budget and thus increases the rate of inflation.

9. The welfare system is designed so that people can take advantage of it.

10. Welfare provides a disincentive to work and be productive.
Ten Nonevaluative Statements on Welfare

1. Welfare consists solely of direct assistance such as food stamps, relief payments and Medicaid.

2. Welfare began in 1601 with the Elizabethian Poor Houses.

3. Welfare is aid given by the federal and state governments.

4. The Welfare system grew in size during the Great Depression.

5. Welfare delivery can be divided into three types: casework, group work, and community organization.

6. Welfare is usually given by a social worker working within a government bureaucracy.

7. Welfare is given only for children under the age of 18.

8. Many of today's welfare programs were first instituted by Lyndon Johnson in his plan for "The Great Society".


10. Welfare programs are funded more by private donations rather than public taxes.
Ten Pro-Welfare Arguments

1. Welfare helps keep America strong and together.

2. Welfare programs are needed to protect the children and to keep families together.

3. Welfare programs reduce poverty and narrows the gap between rich and poor.

4. Welfare is one way of assuring a basic right to proper medical care.

5. Welfare helps bring new people (the poor) into the American mainstream.


7. Welfare payments help some to stay away from a life of crime.

8. Welfare can be a useful tool to end discrimination against the poor and oppressed.


10. Welfare is a way of fighting the effects of unemployment.
Ten Anti-Nuclear Arguments

1. Nuclear power is an expensive source of energy, the cost of which is passed on to consumers.

2. Nuclear power may lead to a nuclear war.

3. Nuclear power presents a major problem: what to do with the waste?

4. Nuclear power plants produce plutonium -- a substance that can be stolen by a would-be bombmaker.

5. With nuclear power there will always be a risk of radiation leaks as with Three-Mile Island.

6. Nuclear power plants have a high risk of accidental meltdown.

7. Nuclear power does not represent an infinite supply of energy -- the supply of uranium is limited.

8. With nuclear power all of the implications are not yet fully understood.

9. Nuclear power plants have not established safeguards such as adequate evacuation plans in the event of an emergency.

10. Nuclear power will not be able to meet our energy needs -- the breeder reactor is merely theory.
Ten Nonevaluative Statements on Nuclear Power

1. Nuclear power plants must be built by a river.

2. Nuclear power plants can be divided into two types: boiling and pressurized water reactors.

3. Nuclear power plants use fuel rods made of U-235 and U-238.

4. Nuclear power plants are now located in every state of the union.

5. Nuclear power plants were first constructed by Westinghouse in the early 1950's.

6. Nuclear power plants are based on the principles of atomic physics.

7. In a nuclear power plant, the cooling system converts fission energy to electrical energy.

8. Nuclear waste storage is regulated in the U.S. by the Environmental Protection Agency.

9. A nuclear power plant uses fuel pellets the size of the tip of your little finger.

10. In a nuclear power plant, fuel production is controlled by varying the number of fuel rods located in the core.
Ten Pro-Nuclear Power Arguments

1. Nuclear power produces minimum pollution compared to coal or oil.

2. Nuclear power will decrease our dependency on foreign countries for energy.

3. Nuclear power will allow us to conserve other forms of energy such as fossil fuels.

4. Nuclear power is needed to keep pace with the Russians.

5. Nuclear power is in limitless supply -- the breeder reactor will create new energy sources.

6. Nuclear power represents a new technology that will create new jobs.

7. Nuclear power plants have been functioning cleanly and efficiently with no fatal accidents.

8. Nuclear power is economically feasible and has many investment advantages.

9. Nuclear power development will aid in the development of other valuable services such as nuclear medicine.

10. Nuclear power can be made completely safe once the human error factor is removed.
Ten Anti Military Spending Increase Arguments

1. A military spending increase raises the potential of nuclear war.

2. A military spending increase would reduce funding for much needed social programs like education.

3. A military spending increase is absurd -- America cannot police the whole world.

4. A military spending increase would create a superficial sense of power and security.

5. A military spending increase is insane -- we already have enough weapons to overkill the world.

6. A military spending increase would just lead to more waste in the military budget.

7. A military spending increase would fuel the arms race challenging other countries to build up their arms.

8. A military spending increase would adversely affect business trade.

9. A military spending increase would bring us more problems like the MX missile project.

10. A military spending increase would increase the potential for government abuse perhaps even increasing the chances of another Vietnam.
Ten Nonevaluative Statements on Military Spending

1. Military spending in the U.S. has been more than 2 trillion dollars since World War II.

2. Military spending increases has lead to the development of "smart" missiles such as the Phoenix and Sidewinder.


4. U.S. military spending increases were halted by the SALT I agreement.

5. Military spending in the U.S. increased the most during the Eisenhower administration.

6. Military spending increases will give money for the production of the Trident and Pershing missiles and the B-1 bomber.

7. A military spending increase requires the approval of the U.S. Congress.

8. Military spending has increased more in the last 5 years than during the whole Vietnam war.

9. U.S. military spending has been used to produce over 2000 missiles.

10. U.S. military spending is used to support the world’s largest army.
Ten Pro-Military Spending Increase Arguments

1. A military spending increase is needed to ready our nation's defenses.

2. A military spending increase would create new jobs in new technologies.

3. A military spending increase is needed to keep up with the ever-growing Russian arsenal.

4. Military spending increases will improve the quality of enlisted personnel by making a military career more attractive.

5. Military spending increases will force our enemies to negotiate in good faith.

6. A military spending increase would increase the prestige of the U.S. showing that we are a world power.

7. A military spending increase would deter war -- the threat of war would prevent it.

8. A military spending increase will help America feel strong and united again.

9. A military spending increase would have many benefits since military technology can be applied in other areas.

10. A military spending increase will give Americans a feeling of security.
Appendix H: Trivia Questions

Contents:

20 trivia questions and answers
The forced resignation of former president Richard Nixon came about as a result of the Watergate break-in. What was the name of the guard who first discovered the break-in?

Frank Wills

Today Buddhism has more than 250 million followers. It's founder was given the honorary title of Buddha or the enlightened one. What was Buddha's name before he became enlightened?

Siddhartha Guatama

In 1957, the Soviet Sputnik 2 went into orbit around the world with a dog aboard. What was the name of this dog who made space history?

Laika

In 1917, the first congresswoman entered Congress from the state of Montana. Who was she?

Jeanette Rankin

"See It Now" was a popular T.V. series during the early 1950s. Who was its well known host?

Edward R. Murrow

In the late 1970s, the Mormon church lifted the ban on the ordination of black priests. Who was the first black man to become a Mormon priest?

Joseph Freeman

Everyone has heard of the San Francisco earthquake of 1906. But a far stronger and much more severe quake shook the country in 1811, and was felt over an area of two-thirds of the United States -- 200 million square miles. Where was this tremblor centered?

New Madrid, Missouri
Every four years, as the Presidential elections nears, regular T.V. programming is pre-empted for live coverage of the political conventions of the two major parties. In which year were these conventions televised for the first time?

1940

After almost six years, the weekly magazine LIFE returned as a monthly. What was the date of the issue which marked its reappearance?

Oct. 1978

In 1941, RCA presented the first commercial television program. What was it, and who sponsored it?

A time & weather program by Bulova

Every year members of the Pulitzer prize committee meet to select the awards in journalism and literature. Where does the committee traditionally meet to decide the awards?

Columbia University

The civil rights movement got its start when a tired, quiet black lady refused to give up her seat on a bus to a white man. She was arrested by the city police and Martin Luther King initiated a black boycott of the city bus system to protest the injustice of her arrest. Who was the lady?

Rosa Parks

Michael Landon plays a strong father figure and upstanding member of the community of Walnut Grove on television's "Little House on the Prairie". But as a teenager he was a monster — in a 1957 film, that is. What is the title of this movie?

I was a teenage werewolf
Mickey Mouse is an aging rodent in his fifties. He made history in 1928, when he appeared in the first animated cartoon to use sound. What was it called?

Steamboat Willie

Economics is a relatively new category in the Alfred B. Nobel prizes. While these awards date back to 1901, the first Nobel prize in economics was given in 1969. In 1976, the award was given to an American. He is the first American to have won it and is a proponent of laissez-faire capitalism. Who is he?

Milton Friedman

Legs were bared to mid-thigh, and sometimes higher, when the miniskirt craze swept the world. Who is given credit for having made the mini popular?

Mary Quant

Nathaniel Hawthorne is probably best known for his book "The Scarlet Letter". Who has to wear the scarlet letter?

Hester Prynne

Hank Aaron was the first baseball player to break Babe Ruth's home run record. How many home runs did Aaron hit by the time he retired?

755

The "Son of Sam" created terror in the hearts of many New York women through his senseless murders. Who was finally captured and identified as the "Son of Sam"?

David Berkowitz

Morris, the famous spokescat for nine lives catfood, died in Chicago in 1978. How old was he?

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Appendix I: Summary of Regression Analyses

Since attitude is treated as a quantitative predictor variable, hierarchical multiple regression was employed as the main data analysis tool. To reduce the problem of multicollinearity that can occur with quantitative variables and their interactions (suggested by Cohen and Cohen, 1975), a multi-step regression was used that first entered main effect variables followed by second order and higher order interactions in subsequent steps.

Whenever appropriate (and possible) three types of regressions were performed. The first type treated each stimulus item (either statement or term) as an independent event. In this case, for example, recall for each stimulus was scored 0 or 1 (for not recalled or recalled) and these scores served as the dependent variable. In this item analysis, a pooled error term (suggested by Cohen and Cohen, 1975) was used to circumvent the limited capacity of current computer packages to handle large within-subject designs. Normally with a within-subject design, significance tests for each factor of theoretical interest uses as an error term the subjects by factor of interest interaction. Ideally this could be accomplished by creating a set of dummy-coded variables to represent subject information. Unfortunately the number of variables needed to represent (and test) main effects and interactions often exceeds the capacity of most computers. To sidestep this problem, Cohen and Cohen (1975) recommend the use of a pooled error term (subject variance pooled with other error variance) arguing that in most cases this is acceptable. It assumes that the separate (traditional) error terms are equivalent.

The second type of analysis used as the dependent variable the summed score for
each individual (a total score analysis). For example, for recall the total number of items recalled in each treatment by a subject served as the recall index. This type of analysis is comparable to the more classic analyses such as those performed in the Levine and Murphy (1943) study.

The third type of regression was a criterion scaling analysis suggested by Pedhazer (1982) for dealing with within-subject designs. In this analysis, categorical variables (such as subjects) that require numerous dummy coded variables are represented by one criterion variable or vector. This criterion variable is usually the mean or the sum (if the N's are equal) of the dependent variable across all treatments for a given category. This criterion variable is then used, similarly to an analysis of covariance, to remove the variance in the dependent variable due to each categorical predictor variable. In the present analyses two criterion variables were created: one carrying information about subjects (for example, the sum of all recalled items, across treatments for each subject) and one carrying information about items (for example, the number of times a statement was recalled across all treatments and subjects).

Each of the three data analyses have advantages and potential pitfalls. The item analysis is most flexible allowing information about each statement or word to be included in the model, but is based on the assumption of equivalent error terms. The total score analysis is comparable to past approaches, but does not make use of information about each stimulus item. Criterion analysis makes use of subject and item information and can be used on each individual statement. However, the criterion variable may also represent variance that is related to a theoretically meaningful predictor variable (for example, subjects who recall many items because they have extreme attitudes on all topics used in the study).

Despite these differences all 3 types of regression produced essentially the same
pattern of results. Since the item analysis is most flexible and could be used for all
data analysis, this analysis will be primarily reported. This analysis also has the
advantage that resulting regression equations in units comparable to percentage recalled.

Regression analysis was also used to test trends in the data. Linear trends were
tested by simply predicting the dependent variable from the independent variable.
Quadratic trends were tested by adding (hierarchically) the square of the independent
variable. The hierarchical model was used for significance testing. The final
simultaneous model produced the model parameters using an equation of the form $y = 
\beta x + \beta^2 + A$ where $y$ is the dependent variable, $x$ the independent variable (both linear
and quadratic terms), $\beta$ the weights for each factor and $A$ the $y$-intercept when $x = 0$.

Finally a word must be said about the robustness of regression analysis. Often
when using quasi-experimental data (such as assessed as opposed to randomly assigned
attitudes) problems of multicollinearity, heteroscedasticity of variance and measurement
error exists. Bohrnstedt and Carter (1971) summarize the literature on regression
analysis and conclude that the technique is robust to many of these problems. For
example, the problem of multicollinearity can be solved by entering the variables in a
hierarchical fashion. Heteroscedasticity of variance refers to the problem of unequal
variance (of the dependent variable) depending on the level of the independent variable.
(For example, the probability of recalling a given word may be highly variable for
individuals with no domain experience but be highly consistent for those with
experience). In such cases the model parameters are unbiased. However the
significance test may err on the side of conservatism since extra variance is added to
the error term. The problem of measurement error (in the present studies) refers to
the possibility that the attitude scale may not be interval in nature, that is the distances
on the scale may vary with subject. Bohrnstedt and Carter (1971) summarize studies
that indicate that significance tests are not biased in such cases. However, the model
parameter estimates may be in error. Two potential systematic errors can be identified with attitude scales: (1) items on the extremes of the scale are seen as further apart and (2) those items close to one's own position are seen as even closer whereas those that are far from one's own position are seen as even further (the ownness bias of Sherif & Hovland, 1961). These two errors would further demonstrate the schematic and heuristic functions of attitudes.
Appendix J: Instructions for Experiment 4

Contents:

1. Question stems (Displays 1 - 6)
2. Opening instructions (Displays 7 - 15)
3. Instructions for trivia questions (Display 16)
4. Instructions for recall test (Display 17)
5. Instructions for the attitude assessment (Display 18)
6. Debriefing materials (Displays 19 - 20)
Display 1:
Is this word or phrase related to Welfare?

Display 2:
Is this word or phrase related to Nuclear Energy?

Display 3:
Is this word or phrase related to Military Spending?

Display 4:
Is this word or phrase related to Religion?

Display 5:
Is this word or phrase related to Sports?

Display 6:
Is this word or phrase related to Music?

Display 7:
Welcome to your experiment.
Please press "enter" on the little brown box next to the screen to begin.

Display 8:
Today's research is part of a continuing program of research investigating how people think about various words and topics. In the first part of today's experiment you will be asked to state whether you consider two words (such as salt and pepper) to be related or not. All your responses will be recorded by the computer and treated as strictly confidential.

Before we begin, however, we would like to remind you of your options as a participant in any research at the Ohio State University.
In case you have not previously been so informed, you should know that human subjects in any research at the Ohio State University are at liberty to terminate their participation at any time they so desire. The preceding instructions have described the tasks you will encounter in this experiment. If for any reason you prefer not to proceed with the experiment, please inform the experimenter of this. Otherwise press the "enter" button to continue.

In this part of the experiment, we would like you to indicate whether you see a relationship between various words or phrases and a given topic. For example many people see a relationship between salt and pepper (they are both common table spices) or between scarlet and gray (they are both O.S.U. team colors). However, many people consider pairs of words such as dog and onion or gun control and tennis to be unrelated.

Seeing a relationship between pairs of words is often very subjective — there is no right or wrong answer. For example some people may see a relationship between abortion and religion (since religion is a reason often given against abortion) or between the death penalty and an eye-for-an-eye (since eye-for-an-eye can be considered a reason for the death penalty).

For each judgment consider the various ways the two words can be used to discover if a relationship exists between the two words. Do not spend a lot of time on each judgment. We are most interested in your first impressions of a relationship.

Display 11:

In today's experiment you will be asked if various words or phrases are related to the following 6 topics: Sports, Nuclear Energy, Welfare, Religion, Music, and Military Spending. Remember your task is to state whether you see a relationship between the two words or phrases presented on the upcoming displays. If you believe there is a relationship respond with a yes, otherwise respond no. Do not worry about the "correctness" of your response. Many people see different relationships between different words. The next display will describe how you can record your response.
Display 12:

When you have finished looking at any display you should press "enter" to proceed with the next message.

When your judgment of a relationship is requested, you should respond with either a 1 for yes (if you see a relationship) or a 2 for no (if you think the words are unrelated). Numerical responses can be entered by pressing a digit on the keyboard, then pressing "enter" twice! The first time you press "enter", our response system will tentatively register your response while displaying it back to you in the form of an arrow located under the response you chose. At this time you may either make your tentative response final by pressing "enter" again or you may change your response by pressing in a new number and then pressing "enter" twice. If you are sure of your response, it is perfectly all right to press "enter" twice without waiting for the indicator arrow. Our system will automatically detect a zero, a number greater than 2, or a nonnumerical response as an error and will give you a message indicating that you should respond again.

If you understand the instructions to this point, press "enter". Otherwise reread this page before going on.

Display 13:

The next display is intended to give you practice in using the response panel. It would be a good idea to practice making different responses -- both correct and incorrect -- at this time. Please make sure that you are completely clear on the use of the response panel before continuing. Remember that a response is registered only by pressing "enter" twice and that you can change a response after pressing "enter" once.

Display 14:

Here is a sample relationship judgment:

Is this word or phrase related to gun control?

MICROCHIP
If you have any questions about the experimental task, please ask the experimenter waiting outside, now. If you have no questions press the "enter" button to begin the experiment. Remember your task is to indicate whether the given word or phrase is related to the topic. You should make each judgment carefully but as quickly as possible.

For the next part of the experiment we have prepared a series of trivia questions and answers that many people find interesting. Please read each question and try to guess the answer before looking at the answer. At the end of the experiment you will be asked to recall these answers. However, do not try to memorize the answers. Just read the question, try to guess the answer and then go on to the next display by pressing the "enter" button.

(Press "enter" for the trivia questions.)

The experimenter will now provide you with some recall sheets. On these sheets please write down all the words or phrases from the relationship judgment task that you can recall. Note: Please write down the words judged in the first part of the experiment and not the answers to the trivia questions. Take 10 minutes to complete this task. The experimenter will let you know when it is time to go on to the next task. Remember recall the words judged in the first part of the experiment and not the trivia answers.

For the final task of the experiment, we would like you to indicate whether you agree or disagree with each of the following statements. To record your response, press in a number between 1 and 5 with 1 meaning strongly disagree and 5 meaning strongly agree. Then press "enter" twice as you did in the previous task. You may change a response by pressing in a new number after hitting "enter" just once and then pressing "enter" twice.

There are no right and wrong answers to the following questions. We are interested in how you feel about them. Remember your task is to indicate whether you agree or disagree with each statement. You should make your judgment carefully but as quickly as possible. Please press "enter" to begin the final task.
The experiment is now over. Thank you for your participation. Since some of your classmates may be in this experiment and it is important that all subjects have equal knowledge of the experiment before participating, we request that you do not discuss the particulars of this study for the next two weeks.

This study was designed to look at whether your attitude on a particular topic will help you remember information on that topic. In particular, we were interested in seeing if individuals who feel strongly about an issue will remember information about that topic better than others.

If you have any questions about this research, the experimenter is waiting outside to answer them. The experimenter will also have the trivia questions for you to answer. Please press enter one more time.

Please find the experimenter waiting outside, now.
Appendix K: Attitude Words used in Experiment 4

Contents:

72 attitude related words on 6 different topics
WELFARE TERMS

CASE
LOAFERS
RELIEF
CADILLACS
AFDC
HANDOUTS
UNEMPLOYED
DOLE
DISCRIMINATION
DISINCENTIVE
REDISTRIBUTION
FREE ENTERPRISE

NUCLEAR POWER TERMS

NRC
FISSION
MELTDOWN
DISPOSAL
BREEDER
URANIUM
FALLOUT
SILKWOOD
ENRICHMENT
RADIATION
REPROCESSING
LEAKS

MILITARY SPENDING TERMS

SECURITY
DOMINO
FREEZE
ARMS RACE
SOVIETS
START
OVERRUNS
DISARMAMENT
PENTAGON
SALT
INTERVENTIONIST
DETERRENT
RELIGIOUS TERMS

TESTAMENT
FLOOD
PRAYER
LAMB
APOSTLE
PTL
CHAPEL
THORNS
PENTECOST
SCRIBE
MINISTER
PROPITIATION

SPORTS TERMS

TOUCHDOWN
SKYHOOK
PUNT
KNUCKLER
DRIBBLE
LATERAL
UMPIRE
SCREEN
SHORTSTOP
FORWARD
ERA
PRESS

MUSIC TERMS

REFRAIN
SONATA
ASCAP
WALTZ
JAM
TENOR
SIGNATURE
OPERA
CHAMBER
JAZZ
DISSONANCE
SYMPHONY
Appendix L: Attitude Scales for Experiment 4

Contents:

Welfare: attitude items # 1 and 2; experience items # 7 and 10; interest items # 3, 4, 5 and 6; prior association item # 9 and significant others' knowledge item # 8.

Nuclear power: attitude items # 1 and 2; experience items # 7 and 10; interest items # 3, 4, 5, and 6; prior association item # 9 and significant others' knowledge item # 8.

Military Spending: attitude items # 1 and 2; experience items # 7 and 10; interest items # 3, 4, 5, and 6; prior association item # 9 and significant others' knowledge item # 8.

Religion: attitude items # 1, 2, and 3; experience items # 8 and 11; interest items # 4, 5, 6, and 7; prior association item # 10 and significant others' knowledge item # 9.

Sports: attitude items # 1, 2, and 3; experience items # 8 and 11; interest items # 4, 5, 6, and 7; prior association item # 10 and significant others' knowledge item # 9.

Music: attitude items # 1, 2, and 3; experience items # 8 and 11; interest items # 4, 5, 6, and 7; prior association item # 10 and significant others' knowledge item # 9.
WELFARE
1. I support spending money on welfare.
2. I oppose spending money on welfare.
3. The issue of welfare is very important to me.
4. I find the issue of welfare very interesting.
5. I spend more time than most people thinking about welfare.
6. I really don’t care about the welfare issue.
7. I am very familiar with the issue of welfare.
8. People who are important to me (such as family and friends) consider the issue of welfare to be very important.
9. The issue of welfare was once important to me, but is no longer.
10. I’ve had a lot of experience with the issue of welfare.

NUCLEAR POWER
1. I support the use of nuclear power as an energy source.
2. I oppose the use of nuclear power as an energy source.
3. The issue of nuclear power is very important to me.
4. I find the issue of nuclear power very interesting.
5. I spend more time than most people thinking about nuclear power.
6. I really don’t care about nuclear power issue.
7. I am very familiar with the issue of nuclear power.
8. People who are important to me (such as family and friends) consider the issue of nuclear power to be very important.
9. The issue of nuclear power was once important to me, but is no longer.
10. I’ve had a lot of experience with the issue of nuclear power.

MILITARY SPENDING
1. I support an increase in military spending.
2. I oppose an increase in military spending.
3. The issue of military spending is very important to me.
4. I find the issue of military spending very interesting.
5. I spend more time than most people thinking about military spending.
6. I really don’t care about the military spending issue.
7. I am very familiar with the issue of military spending.
8. People who are important to me (such as family and friends) consider the issue of military spending to be very important.
9. The issue of military spending was once important to me, but is no longer.
10. I’ve had a lot of experience with the issue of military spending.
RELIGION

1. I am a religious person.
2. I am not a particularly religious person.
3. I hate religion.
4. Religion is very important to me.
5. I find the topic of religion very interesting.
6. I spend more time than most people participating in religion.
7. I really don't care about religion.
8. I am very familiar with the topic of religion.
9. People who are important to me (such as family and friends) consider religion to be very important.
10. Religion was once important to me, but is no longer.
11. I've had a lot of experience with religion.

SPORTS

1. I am a big sports fan.
2. I am not a particularly big sports fan.
3. I hate sports.
4. Sports are very important to me.
5. I find sports to be very interesting.
6. I spend more time than most people participating in sports.
7. I really don't care about sports.
8. I am very familiar with sports topics.
9. People who are important to me (such as family and friends) consider sports to be very important.
10. Sports were once important to me, but is no longer.
11. I've had a lot of experience with sports.

MUSIC

1. I am a big music fan.
2. I am not a particularly big fan of music.
3. I hate music.
4. Music is very important to me.
5. I find the topic of music very interesting.
6. I spend more time than most people thinking about music.
7. I really don't care about music.
8. I am very familiar with music.
9. People who are important to me (such as family and friends) consider music to be very important.
10. Music was once important to me, but is no longer.
11. I've had a lot of experience with music.