

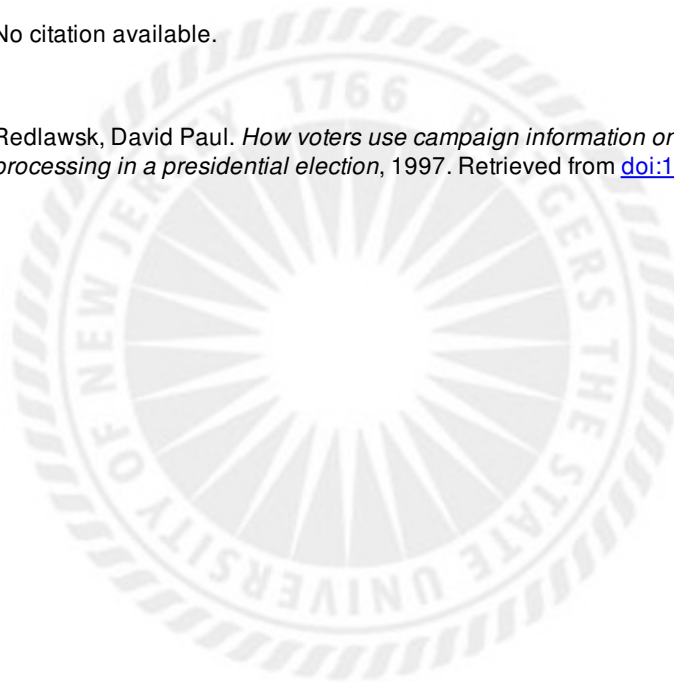
How voters use campaign information on-line versus memory-based processing in a presidential election

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HOW VOTERS USE CAMPAIGN INFORMATION
ON-LINE VERSUS MEMORY-BASED PROCESSING
IN A PRESIDENTIAL ELECTION

by

DAVID PAUL REDLAWSK

A Dissertation submitted to the
Graduate School -- New Brunswick
Rutgers, The State University of New Jersey
in partial fulfillment of the requirements

for the degree of

Doctor of Philosophy

Graduate Program in Political Science

written under the direction of

Professor Richard R. Lau

and approved by

New Brunswick, New Jersey

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ABSTRACT OF THE DISSERTATION

How Voters Use Campaign Information

On-Line Versus Memory-Based Processing In A Presidential Election

by DAVID PAUL REDLAWSK

Dissertation Director:

Professor Richard R. Lau

Voting research has historically focused primarily on predicting the outcome of elections, with the implicit assumption that if the antecedents of the outcome are understood then the process by which a voting decision is made must also have been revealed. Since voters have appeared to be unable to actually give many reasons for their vote decision, this has led to a widespread belief that voters use very little information in order to make a choice. Recently, some researchers have argued voters may be taking into account more information than has been previously believed. These proponents of an on-line model of voting have attempted to show that voters evaluate candidates on-line; that is, by updating candidate evaluations with every new piece of information as it is encountered, and thus may be using more information than they can recall. This occurs only the evaluation itself must be retained in memory; the information which informed the evaluation can be discarded and may not be available for recall when voters are asked to explain their decisions. If this on-line model is accurate, the view of voters as lacking information may be incorrect. The model has been tested, and strongly supported, in a

series of experiments led by Milton Lodge. None of Lodge's studies, however, test the model in a campaign environment. This project uses a computer-based presidential election simulation to compare the on-line to traditional views of voter decision-making. The results contradict the on-line model, in that memory is found to be a significant factor in the accuracy with which voters make decisions, while most of the implications of the on-line model itself fail to be supported by the data. The variance between this study and previous studies is explained by the difference in this new computer methodology which takes into account the dynamic, comparative nature of an election campaign. The computer simulation used in this study more accurately represents the environment found in a political campaign, in which information comes and goes, there are multiple candidates, and much more information is available than can be fully incorporated in voter decisions.

Acknowledgments

As is the case with any significant project, I am indebted to a number of people who provided guidance, support, and help along the way, as well as those who participated actively as research assistants or lent their voices to the campaign commercials that had to be produced. In particular, I would like to thank Liz Felter, who worked diligently on scheduling subjects, a job that never turned out to be as easy as we thought it might. Liz also took a turn as an experimenter. Along with Liz, Paul Babbitt and Jill Locke were responsible as research assistants for running many of the subjects through the experiment, a job that took a lot of time and patience, especially when dealing with some of the older subjects who had little experience in front of the computer. Gail Shirazi, Elizabeth Williams, and Rachelle Brooks spent many hours transcribing the tapes created as part of the debriefing of every subject, and then coding the information on those tapes in order to develop measures of the on-line evaluation.

As alluded to above, a number of campaign commercials were created for this project, in order to give subjects a more realistic experience. These commercials were adapted from real campaign commercials on videotapes provided by Ross Baker, Montague Kern, Kim Downing, and Adam Simon, who graciously lent me copies of various congressional and presidential campaign ads. The ads used in this study were created by taking video from these tapes and adding newly written voice-overs. Those who lent their voices to this effort, and are thus immortalized in computer-based video files, were George Bruce Morgan, Jack Levy, Ed Rhodes, Michael Shafer, Michael Cripps, Paul Babbitt, Gerry Pomper, and Rick Lau.

Rick Lau served as well in that all-important position as my dissertation advisor. As such, he seemed to understand the balance between beating me over the head when I was making very little progress, and slowing me down when I was ready to jump to conclusions clearly not quite warranted by the data I had in front of me. In particular, Rick seemed to understand the joys and trials of doing this project, while simultaneously attempting to have a life outside of the dissertation. It is Rick who also encouraged me to apply for the NSF grant that ultimately allowed this project to go forward. Without his little push, I would never have gotten around to it. I will always appreciate the serendipity that had the two of us arrive at Rutgers at the same time. I came to Rutgers very uncertain as to what I would be doing; without Rick I might still be trying to figure out how to come up with a dissertation topic! The remainder of my dissertation committee, Gerry Pomper, Jane Junn, and Milt Lodge, were always helpful, supportive, and provided good advice. I owe Gerry a special thanks, I suppose. When I was deciding whether to come back to school as I approached 30, Gerry pointed out that the risk was minimal, and I could always quit. On that note, I decided to take a shot at it. Also, a note of thanks to Alan Kornberg, of Duke University, who was really my first mentor in political science when I was an undergraduate student there in the 1970's. I took numerous courses from him, and he always encouraged me to reach a little further in my research efforts. When I learned that he, too, had returned to school to seek a Ph.D. after many years away, that solidified my decision to follow this path.

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far more than I had originally expected to make this project what I hope is a valuable addition to the literature on voting behavior.

And of course, I must acknowledge the support of my family throughout this odyssey. My sons, Andrew and Greg, were never quite certain what it was I was doing, except that they knew I didn't hold a "real" job like the dads of their friends. On the other hand, this has allowed me the luxury of being with my children as they've grown from ruggats to eight and ten years old, spending far more time with them than most fathers are able to in our society. If I get nothing else out of this project, that opportunity has been worth it! At the same time, Andrew and Greg have been amazingly patient with me on those many weekends when instead of spending time with them at their activities, I was slaving away at the computer in my basement office. I also have to acknowledge the help of my father, Bernie Redlawsk, and my in-laws, George Morgan and Wanda Howell, for taking care of the boys from time to time and providing emotional support when it was needed. And, of course, to my wife, Aletia Morgan, I owe a debt I can never repay. For seven years (after I promised it would only be four!) she has put up with my not-so-normal lifestyle for a middle-class family living in the suburbs of New Jersey. My schedule has been odd, my moods have shifted depending on the success or failure of a particular attempt to develop a line of argument, and overall I have been unavailable at times when her own schedule was quite complicated. Through it all, Aletia not only put up with me, but really provided the solid rock that I needed in order to face the uncertainty inherent in any major research project.

David P. Redlawsk

January 31, 1997

Hillsborough, New Jersey

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Introduction

For many years the Holy Grail of voting behavior study has been accurately predicting election outcomes. Beginning with the Columbia studies (Lazarsfeld, Berelson, and Gaudet, 1948; Berelson, Lazarsfeld, and McPhee, 1954) through the Michigan model (Campbell, Converse, Miller, and Stokes, 1960) and its disciples, continuing with Downsian rational choice (Downs, 1957) and on to the present day, political scientists have searched far and wide for models which would explain why voters make the choices that they do. Some findings over the years have shown us the power of group affiliations and developed the concept of the “cross-pressured” voter (Lazarsfeld, *et al.*, 1948). Other efforts have focused on the importance of party identification and its function as a “perceptual screen” (Campbell, *et al.*, 1960). Still another school of thought has focused on voters as rational calculators, seeking to maximize the value of their vote (Downs, 1957). There is no question that these efforts to find the antecedents of the vote have been successful. Many models can claim great accuracy in predicting vote results, often correctly classifying upwards of 90% of the survey sample used to test them (Lau, 1986). Unlike the unfortunate Sir Galahad, we political scientists appear to have come quite close to completing the Quest.

Even so, our quest has often been troubling. The early researchers started out with the belief that they would find well-informed voters who paid careful attention to the information available to them during the election campaign. A democracy such as ours was presumed to rest, at least in part, on the linkage between votes cast and policy decisions made. Voters who paid attention to what their officials did could express their

pleasure or displeasure at the voting booth, each time an election cycle appeared. In doing so, the ultimate power would continue to rest with the people, through their representatives. Unfortunately for theory, researchers found that voters could not be counted upon to articulate clear, meaningful reasons for their vote decisions. In fact, many Americans appeared to have little conception of what politics was about and what their candidates stood for. The authors of *The American Voter*, in their hierarchical “levels of conceptualization” saw the vast majority of the public as less than aware of the issues of the day, and therefore unable to cast votes based on those issues. From that time on, with a few exceptions, most views of voters have been relatively uncharitable. Political scientists have become convinced that because voters can not easily articulate the reasons for their vote, and because they often seem unable to place candidates on the various issue scales, that the public is just not capable of paying a lot of attention to politics. These two key factors -- inability to verbalize about political subjects and lack of issue constraint -- have been taken to indicate that many voters are making voting decisions based on something less reasonable than an educated understanding of the political environment.¹

¹ Converse (1964) went so far as to suggest that not only did voters show little issue constraint, but that the opinions of the vast majority as expressed on surveys represented “non-attitudes,” that people were essentially guessing in response to the questions. A small group, to be sure, held true attitudes, according to Converse, but these represented a tiny portion of the population, and were masked by the random fluctuations of those with non-attitudes. This seems a particularly negative view of the ability of citizens to participate in the civic world. Zaller (1992) may have a theory which at least partially rehabilitates citizens: answers to survey questions may appear somewhat less than stable due to how an ever changing political environment is reflected in public opinion. Zaller’s model argues that survey responses are a factor of whatever “considerations” are at the top of a respondent’s head when questioned. Which considerations are evaluated during the response process is a factor of political communications that have been received by the respondent in the recent past. Thus, shifting attitudes may simply represent non-valence issues which generate multiple positions competing for prominence. In this view, voters are not acting randomly in answering questions; instead they are giving consideration to multiple sides of a question, expressing preference based on a mixture of their own beliefs and information received from the media.

This view may be doing a disservice to the American electorate. It stems both from a belief that politics is important enough that people ought to follow it closely and from the particular methodology usually used to study voting. Political scientists treat elections very much as if they were static events, happening at a particular point in time. In other words, we usually focus on "the vote" which does occur at a particular place and time, and presume that all of what led up to the vote is encapsulated in the memories voters bring to the voting booth. To capture these memories, we use a survey-based methodology wherein people are asked to indicate their policy preferences, their interest in the various candidates, and their vote choice. From this we develop linear models of the vote which are capable of great predictive accuracy. In so doing we make some very important assumptions. First, we assume that respondents have maintained a reasonable representation in memory of the information to which they were exposed. Second, we assume that they search that memory in order to answer our questions. Third, we assume that when we ask why a particular vote was cast, respondents can really report reasons, not rationalizations of the decision after it has been made. Perhaps someone for whom politics is an important part of their life might, in fact, meet these assumptions. However, for most people, most of the time -- even during elections -- politics is just not that important. Research in political cognition has shown that people are limited information processors (Simon, 1956;1985) who cannot devote the mental time and energy needed to learn about candidates in detail and to store all of the knowledge gained for later accurate recall when voting. Further, most people do not have the well developed cognitive structures that would facilitate the incorporation and recall of large amounts of information about political candidates (Fiske & Taylor, 1991.) People must make voting

decisions the way they make other decisions: with limited information, limited time to process that information, and a limited ability to store and recall the information.

During election campaigns voters are exposed to large amounts of information about candidates. In some cases voters can choose whether to pay attention, while in other cases the information is so ubiquitous that voters can hardly avoid it. But in all cases, the flow of information is dynamic -- one day information on a candidate's position on an issue is readily available; the next day it can hardly be found. Yet, nearly all of the studies that form the basis of our view of voters have relied on survey research as the methodology of choice, despite the fact that surveys can capture only one moment in time. Even panel studies give us a snapshot of only a few moments in an ongoing, dynamic campaign. So we are forced to rely on respondents' memories of what they have seen and which campaign information affected them. The election's dynamic nature is missing. It should not be a surprise that voters who are asked to reconstruct the campaign in response to post-election surveys are less than perfect in articulating their reasons for supporting candidates or in placing themselves and candidates on 7-point issue scales. One important result of this mismatch is that while we can make good predictions of the outcome of an election, we do not do nearly as good a job describing how voters actually make their choice. That is, we may be able to model the *behavior*, but in doing so, we do not necessarily understand the *process*.

The purpose of the present research is to focus on the process of voting in order to more fully understand how voters make their decisions. I begin by accepting that work in the traditional survey-research based approach has been quite successful in developing models of the vote with excellent predictive power. Lau (1986) notes that accurate

prediction of more than 90% of the respondents of a survey is not unusual. Even so, many important elections are won by margins small enough so that those voters who cannot be easily predicted may hold the key to the outcome. This project is designed to go beyond prediction of the election marginals to an understanding of how voters use campaign information in order to inform their vote choice. In particular, this project contrasts the basic assumptions implicit in traditional voting models that voters use information they have retained in memory during a campaign in order to make the vote choice, with an information processing perspective which suggests that memories of candidate information may not be very important in the vote choice. This somewhat radical idea comes from the prevailing psychological view of humans as efficient information processors -- cognitive misers (Fiske & Taylor, 1991) -- who use their mental resources wisely in making all manner of daily decisions. This psychological view of information processing has been brought into the realm of candidate evaluation through a series of experiments carried out by Lodge and his colleagues at SUNY-Stony Brook. (See Lodge, McGraw and Stroh, 1989, for the initial description of this work.) They suggest that memory may be completely unimportant in the process used by voters to make decisions. If so, then a reliance on what voters tell researchers during surveys may be a reliance not on the true reasons for the vote, but on rationalizations and partial memories (Rahn, Krosnick, & Breuning, 1992.)

The implications of Lodge's position are significant enough to warrant extensive testing in an environment that allows researchers to track the process of acquiring and using information during a political campaign. That is what the project detailed in the following chapters attempts to do. Chapter 1 recounts the voting literature from early

approaches focusing on the sociology of voting through the addition of psychological constructs and to current research focusing on voting as a decision-making process.

Chapter 2 describes the Stony Brook on-line model and the research supporting it, as well as current critiques of the model. In Chapter 3, the implications of Lodge's model are expanded upon, and contrasted with standard voting approaches. A number of hypotheses are then generated for examination in later chapters. The process tracing methodology used in this study is described in Chapter 4. Through process tracing techniques, the researcher can follow subjects as they make a decision in an experimental setting, rather than relying on the memories voters bring to the survey researchers asking why a certain choice was made. In this case the experimental setting is a mock presidential primary election in which subjects were given the opportunity to learn information about multiple presidential candidates during a simulated campaign season. Chapter 5 then examines the results of the simulation in light of the hypotheses discussed in Chapter 3, focusing especially on information processing differences between subjects who presumably processed the campaign according to Lodge's model, and other subjects who were placed into a more memory-oriented condition. The links between the use of memory by voters and the quality of the decisions that they make are explored in Chapter 6. While the vast majority of research on voting has focused on the vote choice -- which candidate or party is selected -- the information processing perspective shifts the question to one of decision quality. Given the availability of information during a political campaign, are voters able to use that information to find the candidate who best represents their interests, defined broadly? To what degree does having accurate memories about the campaign improve the likelihood of voting correctly? Chapter 6 explores these questions while attempting to

assess the reasonableness of the Stony Brook insistence that memory for campaign information is irrelevant to the on-line voting model. Finally, Chapter 7 provides the opportunity to draw some conclusions about the reasonableness of the on-line voting model within the realm of contested elections.

While this project certainly has its roots in the tradition of voting studies reaching back decades, its approach is one which takes it far beyond those studies. The purpose in this attempt to recast the debate from “who do voters choose?” to “how well do voters do, and how do they manage to do well?” is to focus on the stark fact that most voters go to the polls unable to generate more than a few memories of the candidates, parties, and issues of the election. Yet they pull the lever regardless; those who go to the polls do end up making a choice. The question we must ask is whether that choice represents the capriciousness of decision-making without information, as traditional survey-based approaches would suggest, or something more. Are voters making choices that show a lack of understanding, or are they, through the use of information processing techniques that occur largely unconsciously, able to cut through large amounts of campaign information to find and use data which allows both efficient and accurate decision-making?

Chapter 1 Models of Voting

In his reflective moments even the most experienced politician senses a nagging curiosity about why people vote as they do. His power and his position depend upon the outcome of the mysterious rites we perform as opposing candidates harangue the multitudes who finally march to the polls to prolong the rule of their champion, to thrust him, ungratefully, back into the void of private life, or to raise to eminence a new tribune of the people. ...

Scholars, though they have less at stake than do politicians, also have an abiding curiosity about why voters act as they do.

-- *V.O. Key (1966, p. 1)*

The American political environment has always fascinated both its practitioners and its observers. Americans established a unique form of government which included regular elections, institutionalized conflict between the major bodies of government, and the development of parties along the fault lines of the political system. These major features of the American system guaranteed that elections would be exciting opportunities for partisans of various points of view not only to have their say but to attempt to convince others of the righteousness of their cause. Numerous elections at all levels of government occur annually, and voters in large numbers troop to the polls to register their preferences. Few, if any, citizens of other countries go to the polls as often as do Americans.² Naturally, as the idea of applying scientific methods to studying social environments developed, an interest in studying American elections and government arose as well.

² In New Jersey, for example, most citizens have opportunities to vote in a primary election, a school budget and board member election, and a general election every year. In addition, in communities which have created special districts, like fire districts, citizens go to the polls to vote for Commissioners and budgets for the special districts.

Some of the earliest efforts to examine the American political environment from a social scientific perspective were undertaken by the Lynds, in their groundbreaking studies of Middletown (1929, 1937.) As part of a larger project, these studies examined the government of Middletown and the social forces that conspired to place voters into either the Republican or Democratic camps. The electorate was almost equally split between the two major parties in 1925 and in 1935 -- in fact, there had been little change during the years between the two studies, despite the upheavals of the depression and the landslide election of Roosevelt in 1932. The Lynds suggested that partisanship, and therefore the vote itself, was primarily a factor of social class. They found a distinct "cleft between business class and working class in their votes for the two major candidates" (1929, p. 360.) This focus on social class as explanatory vehicle for voting was natural to the Lynds, who were trained as sociologists.³

The Columbia Studies

The view of voting as a social phenomenon was greatly strengthened by the first voting studies carried out using survey research. Collectively, the studies by Berelson, Lazarsfeld, and colleagues (Lazarsfeld, Berelson, and Gaudet, 1944; Berelson, Lazarsfeld, and McPhee, 1954) established the "Columbia School" of voting research. This school was defined by its interest in individual vote choice and the factors that could be said to cause a particular voter to choose a particular candidate. The factors

³ While the sociological model that finds its earliest expression in the Middletown works is distinctly out of style among political scientists, sociologists have continued to examine its possibilities. A comprehensive sociological follow-up to the Middletown studies was undertaken in the late 1970's. One result of interest to political science was an article by Guterbock (1980) arguing that class-based voting patterns continued to be evident in Middletown some fifty years after the Lynd's original findings.

considered most closely, especially in the first report, *The Peoples' Choice*, were primarily sociological in nature. The Columbia researchers began their study of Erie County, OH, during the 1940 election intending to develop an understanding of the role of the mass media. They assumed that a careful study, using modern scientific techniques, would result in the ability to delineate a clear role for the media in influencing voter opinions. But they found little evidence of a strong direct influence of the media. What appeared to matter instead were several demographic factors which were combined into an Index of Political Predisposition (IPP). The IPP measured the extent to which a particular respondent was inclined toward either the Democratic or Republican party. The factors that comprised the IPP -- socioeconomic status, religious affiliation, and whether the respondent lived in a rural or urban area -- allowed for a variety of combinations, such as an urban Catholic who was poor. That lower income urban Catholic was found to have a tendency to vote Democratic, and was assigned a score of seven -- the most Democratic score. At the opposite end a wealthy Protestant, living in a rural area, was found to be the most Republican, and received a score of one. Within the sample selected from Erie County, the researchers found that social status was akin to the vote. The IPP related closely to stated vote intentions, with a high percentage of those rated seven in fact intending to vote Democratic, while the vast majority of those at one on the scale expressed their intent to vote for the Republican.

The use of survey research in *The People's Choice* represented a significant change from field study approaches to examining politics. While the Lynds spent a great deal of time actually in Middletown interviewing residents and observing the environment, the very nature of field studies limited how systematically they could

examine politics in Middletown. Survey research provided a means for the Columbia researchers to scientifically sample the population of interest, ask questions designed to examine the areas of interest to the researchers, and then generalize the results to the whole population. With surveys, many more interviews could be carried out in a shorter time than could be completed in a field study. While the Lynds were able to develop a more in-depth examination of particular social organizations within the community, their findings were influenced by their method. The immersion typical of a lengthy field study such as that carried out by the Lynds may well tend to focus results through a particular lens. In the case of *Middletown*, the lens was that of social class. The Columbia study went beyond social class as the defining group and was able to examine many other group affiliations via survey questions.

More importantly, however, *The People's Choice* not only pioneered the use of the survey instrument in voting studies, but also developed the concept of the panel study. A seven-wave panel was used in order to capture the nuances of change over time. Given the initial research agenda -- to examine whether there were media effects during an election -- a panel study was an appropriate vehicle to provide the researchers an opportunity to look for effects of political campaigns as it progressed. If campaigns mean anything at all, the reasoning went, surely some direct change in support for the parties over the course of the panel would be visible. The clear lack of evidence for change, using a methodology that was specifically designed to capture it, led the researchers to their social group explanation. Voters were not undecided blank slates waiting to be written upon by a campaign. Instead voters were set in their ways by their social

environment: “a person thinks, politically, as he is, socially. Social characteristics determine political preference” (Lazarsfeld, Berelson & Gaudet, 1944, p. 27.)

Recognizing some of the limitations of their initial study -- they were criticized particularly for being too "journalistic" and failing to move towards developing general "laws" of voting that could be applied outside of the particularities of a single election in a single place (Rossi, 1959) -- the Columbia researchers embarked on a second study, during the 1948 election season. The resulting book, *Voting: A Study of Opinion Formation in Presidential Campaigns* (Berelson, Lazarsfeld, and McPhee, 1954), rapidly became one of the most acclaimed voting studies of its day (Berns, 1962.) Four interviews were carried out with about 1,000 residents of Elmira, New York, who comprised a panel that was followed throughout the election cycle. The major focus of the Columbia work continued to be the influence of group affiliation on the formation and implementation of voting preferences. In particular, the authors looked quite closely at the role of political discussion within primary social groups. The question was the degree to which such discussions would cause voters to change their intended vote. They found some evidence that political discussion can act as a catalyst towards change -- particularly if the discussion takes place with people who hold opposing party preferences. A critical factor was found to be the amount of social support provided by group affiliations. Voters whose affiliations were generally in line with their voting preferences -- that is, they were not under "cross pressures" between two groups like religion and class -- tended to be quite stable in their vote preferences over time. But those voters who were affiliated with multiple groups which did not share a common perspective would often end up discussing politics with people who were not of like

mind. These voters might be less fixed in their positions because of the competing group affiliations, and might find the discussions influencing preferences. Even so, it was not so much the content of political discussions that the Columbia researchers saw influencing decisions as it was the nature of the groups to which a voter belonged. A wealthy Catholic was at cross-pressure; he or she would be likely to vote Republican on class but Democrat on religion. Belonging to these two groups, such a voter would routinely come into contact with other voters who did not hold the same preferences. Over time, this might result in preference change for the wealthy Catholic voter. But a working-class Catholic would not be cross-pressured, because other members of his social groups would most likely hold the same (Democratic) preferences, reinforcing, rather than challenging, that voter's own beliefs.

Social Psychology and Voting

While the Columbia researchers continued to focus on the sociology of voting behavior, researchers at the University of Michigan were beginning an effort that would eventually change the way political scientists studied the vote. *The Voter Decides* (Campbell, Gurin, & Miller, 1954) was the first major study to come out of a national probability sample during a presidential election. The Columbia efforts had focused on two specific cities, making it difficult to use their results to explain the outcome of presidential elections. The new work was national in scope, providing the opportunity to draw statistical inferences about national elections and voting behavior.

Not only did *The Voter Decides* broaden the base of the data used in voting analysis, but it also began the move away from sociology and towards a more psychologically oriented view of voter decision-making.

If the authors of *The People's Choice* are sociologically oriented -- that is, if the variables they introduce into their questionnaires and then correlate with the vote are sociological in character ... the authors of *The Voter Decides* are psychologically oriented. ... They argue, in effect, that a causal relationship between socioeconomic status and vote cannot be demonstrated ... once the proper psychological variables are identified and held constant. (Berns, 1962, p. 12.)

Three factors in particular were studied with care -- party identification, issue orientation, and candidate orientation -- with the intention of understanding how they related to both the likelihood of voting and the direction of the vote. The authors were interested in why more people voted in 1952 than in 1948 and why there was a strong Republican shift in the vote. They concluded that as a voter felt motivated by an increasing number of these factors, the likelihood of turning out to vote would increase. Thus, potential voters who felt strong affinities for their parties, were focused on particular issues, and liked the candidate would be most likely to cast a ballot. As to the question of why those that voted went Republican, *The Voter Decides* authors suggested that an affinity for Eisenhower as a candidate was the overriding factor.

Yet, even as *The Voter Decides* somewhat successfully attempted to expand analysis beyond the social group perspective of the earlier studies much of the general research focus remained what Berns called "the demography of the vote, [which] however interesting as a form of sociological recordkeeping, cannot be the primary concern of the social scientist [who must] move beyond these findings to attempt to establish scientific laws of voting behavior" (1962, p. 6.) An effort to do exactly this, to find more general laws of voting, propelled the authors of *The American Voter* (Campbell, Converse, Miller, & Stokes, 1960) to create what has become the most enduring survey research project in voting behavior. The survey research studies begun

by scholars at the Survey Research Center (SRC) at the University of Michigan during the 1948 presidential election have continued to the present day as the American National Election Studies, providing a continuous set of data over nearly 50 years.

Campbell, *et al.*, believed that it was necessary to go beyond simply describing the factors that influenced voters to try to establish some set of “laws” which governed voting behavior. Their major theoretical device was a “funnel of causality” which had at its narrow end the election itself and which showed the flow of time during the election campaign. Six forces were said to act upon the voter through the funnel, including the personal attributes of each the two candidates, the effects of groups in politics, foreign policy, domestic policy, and the incumbent party’s record in governing. The authors recognized that each factor was itself caused by other factors;

[e]ach such event is, in its turn, responsible for multiple effects as well, but our focus of interest narrows as we approach the dependent behavior. We progressively eliminate those effects that do not continue to have any relevance for the political act. Since we are forced to take all partial causes as relevant at any juncture, relevant effects are therefore many fewer in number than relevant causes (p. 24.)⁴

Where the sociological approaches had conceived of partisanship as being solely identified by the actual vote choice, in *The American Voter* partisanship had a very different meaning. Party identification was measured not by the vote, but by answers to a series of questions about whether respondents considered themselves to belong to one party or another. While the concept of group attachment remained, the attachment was defined by a psychological sense of belonging, not by a behavioral act. Partisanship was

⁴ The six-factor model is more completely detailed in Stokes, Campbell, and Miller (1958) rather than in *The American Voter* itself.

seen to color everything about the election, acting as a perceptual screen interacting with and influencing each of the six forces acting on the voter.

In their quest to discover laws of voting behavior, Campbell and colleagues had to describe the American voter. In particular, it was necessary to understand how Americans viewed politics and politicians. To do this they developed their famous “levels of conceptualization” which placed respondents into one of four broad categories, based upon the content of answers given to open-ended prompts. At the top of what was clearly a hierarchy were the voters showing issue constraint. These “Level A” voters were a small minority, at most 11 1/2% of the population. These voters understood the issues of the campaign, could discuss the issues clearly, and held well defined views on each of them. Most importantly, their views on various issues coincided -- if a liberal position was taken on one issue, it was taken on all of the issues. Not all Level A voters were equal -- two categories existed, with a small share (2 1/2% of the total population) reaching the heights,

reserved for persons whose comments imply the kinds of conception of politics assumed by ideological interpretations of political behavior and political change.

...

The second category within Level A [ideologues] includes people who employ concepts of some ideological flavor but who, for one reason or another, do not apply them in a manner that seems to qualify them as “ideologues” (p. 227.)

The next level of voters (Level B) were those who perceived politics within the bounds of group benefits. Group benefits voters might perceive group conflict as driving politics (14%), be motivated by a single group interest (17%), or view the political environment only “shallowly” through groups.

The third level of conceptualization was reserved for those whose responses appeared to indicate a view of politics that flowed with the “nature of the times.” “Level C” voters (24% of the population) were viewed as lacking any sense of issue structure in their answers, as well as failing to perceive politics in group terms. In fact, the authors noted that “these interviews escape classification in Level D by virtue of some reference, however nebulous or fragmentary, to a subject of controversy over public policy” (p. 240.) Essentially, these voters associated politics with whether the times were good or bad. Respondents in this level gave answers that referred to the good of the people, or the badness of war.

The final (and lowest) level was reserved for those with no issue content at all. These “Level D” voters failed to provide any comments related to issues, groups, or public policy. Some did show party oriented views -- always voting for one party, for example, and some gave views that related strictly to the candidates and their personal traits. Some had simply “no content” at all. Overall this final group made up 22 1/2% of the population.

While only a small part of the full Michigan study, the levels of conceptualization provided strong support to those who argued that voters made their choices uninformed about the campaign, issues, candidates, or the consequences of their vote. If voters must grasp the issues facing the country and act upon them in order to exercise control over their leaders, how could this occur when just one-tenth of all voters appeared to conceive of politics in terms of issues? Coming in addition to the findings by the Columbia School that voters did not seem well versed in the issues of the day (Berelson, Lazarsfeld, and McPhee, 1954, p. 308) the *American Voter* simply confirmed what had often been

assumed. Voters were just not very good at what they did. While a few scholars like Key who suggested a “perverse and unorthodox argument ... that voters are not fools” (1966) and Lane (1962), whose approach to ideology included detailed interviews with voters who appeared to have some significant coherence to their understanding of politics, appeared to believe otherwise, the clear majority of political scientists accepted the idea that most citizens failed to carry out their duties according to a (usually unspecified) democratic ideal.⁵

An Economic View

In addition to the contributions by sociologists and social-psychologists, economists offered a third perspective on voting; the conception of the voter as a rational actor. The rational actor, according to Downs’ (1957) reading of Arrow (1951),

is one who behaves as follows: (1) he can always make a decision when confronted with a range of alternatives; (2) he ranks all the alternatives facing him in order of his preference in such a way that each is either preferred to, indifferent to, or inferior to each other; (3) his preference ranking is transitive; (4) he always chooses from among the possible alternatives that which ranks highest in his preference ordering; and (5) he always makes the same decision each time he is confronted with the same alternatives (p. 6.)

It is important to note that the rationality of an actor’s *means* is considered under this approach, not the rationality of the *ends* achieved nor the preferences upon which those

⁵ What this democratic ideal is has not been subject to very much debate within the confines of voting behavior studies. It is routinely assumed that a voter must have a certain amount of accurate information and act on that information in order to properly carry out his or her duties. Berelson, *et al.*, noted that few of the voters they studied met this standard (Berelson, Lazarsfeld & McPhee, 1954, p. 308) without any specific defense of why this is the correct standard. Easton’s (1965) political system relied on citizens making demands on the system and having those demands satisfied. This would lead to system specific support, which could be given only if something was actually known about the inputs and outputs of the system. Thus, citizens were required to have a certain amount of political knowledge. Bartels (1996, p. 195, note 1) in discussing whether voters really need information accepts that there is a “classical ideal of informed democratic citizenship” while noting that Pateman (1970, Chapter 1) challenges the ideal as not belonging to any particular theorist or school, while recognizing that the ideal is all but universally accepted.

ends are based. That is, whether the resulting actions appear to be rational or irrational to an observer, if the actor used the means specified to reach those ends, then he or she acted rationally, in the economic sense.

However, Downs' *homo politicus* was not quite the all-knowing, all-seeing *homo economicus* of the traditional rational economic models specified by Arrow. The political actor, whether politician or voter, faced an uncertain world in which all possible alternatives could not be known, the outcomes of choosing any particular alternative were not necessarily certain, and political information was costly. Thus, rational actors in politics, according to Downs, would acquire only a limited amount of information before making choices. This would be especially true for the voter, for whom the act of voting may have little direct benefit, given the lack of obvious impact that one vote out of millions must have. Thus, if the return on the investment of voting seems low, then the incentive to search for information to inform the act of voting is limited as well. Rational actors would not spend more than they gained on gathering information to make decisions. So, Downs was confronted with the question of why people vote at all. After all, what are the odds that any single voter will be the one that determines the election? Downs' answer left the realm of economics when he posited that “[r]ational men in a democracy are motivated to some extent by a sense of social responsibility relatively independent of their own short-run gains and losses” (p. 267.) If this sense of social responsibility -- the feeling that there is an inherent “good” in casting a vote as a member of a free society -- was factored into the returns gained by voting, Downs suggested that

it might be possible that for some rational actors the total gains of voting would outweigh the costs.⁶

Downs' analysis provided two important contributions worth noting here. First, he suggested a means for determining whether or not a voter made a good choice, by defining "good" as a choice led to by rational action. Regardless of what the actual choice was -- including if the choice was to abstain from voting -- it would be a good one if the individual sought information that allowed an assessment of the alternatives, up to the expected cost of information acquisition and voting. While, in many ways, this provides a less than satisfying assessment of whether a citizen has fulfilled any democratic responsibility, it does provide a way to begin to assess whether voters even need to meet the standards of *The American Voter* in order to hold politicians accountable. Given the costs of information, it is not rational for any one citizen to try to become fully knowledgeable about every issue facing the electorate during an election campaign. Thus, to require that voters reach the standards of the Michigan ideologue who not only talks about the issues but holds consistent views on all of them, may be asking far too much. It may be adequate if voters focus on those few issues that appear important to them for their own reasons, based on their own goals, and then vote accordingly. Certainly, Downs argued that such behavior is perfectly rational.

⁶ Down's attempt to solve the problem of turnout by factoring in a collective good of social responsibility has been criticized by a number of researchers. Riker and Ordeshook (1968) attempted to specify a set of fixed benefits that attach to voting in addition to the costs previously determined. These benefits might include a sense of civic duty to which a voter has been socialized. Fulfilling that duty generates a good feeling which may outweigh the costs of voting. Fiorina (1976) expanded on this to suggest that voting has both instrumental aspects -- the desire to see particular policies carried out, for example -- and expressive aspects, such as partisan support. More recently, Aldrich (1993) argued that the turnout question is not particularly problematic, as it is a low cost decision (with low benefits) and therefore the decision to vote may be easily affected by minor forces and by the activities of "strategic politicians" (p. 274.)

Second, while Downs did not use the language of decision-making processes in describing his models, he did in fact provide an outline that proposed to summarize how rational voters would make a decision (p. 271-272.) Downs described a set of rules that would have to be followed, beginning with an initial assessment of the cost of voting, the return on participation, the number of other voters, and the expected party differential.⁷ The potential voter would then compute a fairly complex calculus that differs depending on whether the party differential is zero or non-zero. In the case of no expected difference between parties, an assessment must be made of the utility of changing parties in power along with a factor describing the long-term satisfaction gained by voting -- called "long-run participation returns" -- against the costs of voting. If the returns outweigh costs, and change is favored, the out-of-power party will get the nod. If change is not favored, the incumbent party is supported. If costs outweigh benefits, no vote is cast at all. If the party differential is non-zero, a discount is applied for the expected closeness of the election. If the discounted differential plus long run participation returns still outweigh voting costs, a vote will be cast for the favored party, otherwise no vote will be cast at all. Finally, in an important last point, Downs noted that the rational citizen would acquire additional information throughout the process as long as the costs of the new information did not exceed its expected value.

Even though Downs provided an outline of the decision-making process used by a rational voter, most other mainstream research during this time shared a paradigm primarily defined by an interest in predicting aggregate election outcomes. The focus

⁷ The party differential is simply the difference in utility that a voter believes will be received from each party. This is a prospective measure, assessed based on beliefs about what each party will do in office. (Downs, 1957, p. 39-40.)

remained clearly on the antecedents of the vote and on the effort to develop scientific models that could readily take these theorized determinants as operationalized by survey research and predict election outcomes, either before or after the fact. The static nature of this research -- essentially required by the focus on survey research -- meant that while excellent predictive models of the vote choice could be built, there was little effort to expound on the *process* that voters used to arrive at their choice. This lack of focus on process did not seem to very important when studies routinely showed that party identification was the single most important factor in the vote choice, and partisanship itself was assumed to be a relatively stable psychological attachment formed early in one's political socialization. The process of voting seemed quite obvious and simple: one would filter information from the media about the candidates through one's political predispositions, while perhaps modifying views based on discussions within various social groups. Self-interest might be factored in, with some evaluation of which party's policies would make one better off. Ultimately, though, one would probably cast a party-line vote.

Computer Simulations of the Vote Decision

Efforts to rectify the inherently static nature of the models presented in most voting studies began quite early. With the use of computer simulations several research projects attempted to understand how changing certain parameters within voting models would change the outcome. That is, they adopted a dynamic view of the election -- that change in any one factor might well have repercussions throughout the model. The Simulmatics Project (Pool and Abelson; 1960) was the first designed to test propositions arising out of sociological models which suggested that various identifiable social and

economic categories influenced the vote choice. The computer simulations used data from a number of national surveys taken before presidential elections from 1952 to 1960. A total of 130,000 survey responses were included in the data. Respondents were classified into 480 voter types, according to demographic and social characteristics. For each voter type a total of 52 groups of issue attitudes were tabulated. The data were then used to simulate the outcome of the 1960 presidential election, using the concept of cross-pressured voters (Lazarsfeld, Berelson, & Gaudet, 1944) based on party identification and religion. Ultimately, the computer program made predictions about the vote swing of various groups of partisans -- Republican, Democrats, and Independents, and determined that the outcome of the 1960 election was primarily a factor of religion and partisanship; with issue attitudes adding little to the simulation.

Contemporaneously with the Simulmatics Project, McPhee (1961) developed a computer simulation to examine the social-psychological model of the vote, as expounded in *The American Voter*. McPhee focused on how individual decision-making might proceed within the context of social groups. That is, group membership was not itself seen as determining the vote. Instead, McPhee modeled how interactions between individuals within groups might influence the decision. Using the computer, the researchers were also able to do some “what-if” type analysis. They could modify certain parameters of the campaign environment -- like the strength of the farm issue presented by Humphrey in the Wisconsin primary -- and estimate how the outcome of the election might have changed.

Both of these studies focused to some degree on voting models which posited the importance of group interactions. However, neither really moved past identifying weights

attached to various social factors and examining to what degree such weights changed as the election environment was modified; nor did they consider actions by individual voters. A more recent computer study by Shaffer (1972) moved further towards studying voting as a process by ignoring the issue of group dynamics and focusing on the simulation of individual behavior. After explicating the various standard voting models - the sociological, social-psychological, and psychological approaches -- Shaffer developed computer simulations of the two models then most in vogue; Downs' rational actor model and the Michigan six-component model. His explicit intent was to simulate the process by which voters reached their decisions and to determine which of the two models best represented this process. His findings led him to accept the Downsian notion of utility as a central element in the decision-making process while rejecting Downs' cost of information parameter as irrelevant given the ease with which voters could acquire campaign information. Shaffer also incorporated a number of Michigan factors in his model, as well. Most importantly, he found it necessary to add partisan attachment to the formulation of the Downsian model in order to establish a reasonable predictive ability in the model. Finally, Shaffer argued that interactions within a voter's primary groups was important in helping a voter either reinforce his or her own dispositions or to eliminate uncertainty and minimize ambivalence. Shaffer's work is noteworthy here primarily because he chose not to use multivariate techniques to simply determine the relative weights of various antecedents to voting. Instead he focused on examining the process voters actually employ when using campaign information to make a decision. Yet the effort was hampered by a reliance only on data generated by the 1964 American National

Election Study, which was clearly better suited towards modeling the vote decision than it was the vote process.

Shaffer's idea of investigating the *process* of individual voting decision-making, rather than the static determinants of the vote seems to have been received with a complete lack of interest. Perhaps it was his (then) esoteric use of computers on which he ran his model simulations. Or, perhaps it was the lack of data other than survey research from which to build process-oriented models. In any case, political scientists did not appear to be very interested in moving beyond the paradigm set down by the *American Voter* tradition. Meanwhile, in the world of real presidential elections, changes were occurring with rapidity. Partisanship, once the bulwark of voting models, began to decline -- more and more people were less willing to profess an attachment to one of the two major parties. The process of electing a president began to be seen more as a process of "selling" a president.⁸ These changes in the political environment, while not necessarily the driving forces of a shift in approaches to the study of voting, occurred about the same time as a new type of voting research began to be developed. New approaches began to take into account the dynamic nature of elections; to try to understand not only the questions of "why" voters make the choices they do, but also the question of "how" voters come to their decisions.

One of the results of this shift was an increasing move away from partisanship as *the* explanatory vehicle, and an accompanying increasing examination of other factors, including the importance of issues (which, of course, had been debated since soon after

⁸ The idea that presidential campaigns are a lot like marketing consumer products was advanced in some detail in McGinniss (1969.)

the appearance of *The American Voter*) and candidate specific factors.⁹ Even so, researchers in this vein still focused primarily on predicting the aggregate vote and trying to determine the relative importance of the various factors that had been found to correlate with voting choices. Debates raged over whether the electorate had changed, whether the *American Voter* paradigm was time-bound, and whether issues mattered at all.¹⁰ These debates began with the premise that voters did not necessarily do a very good job. As early as the Elmira study by Berelson and colleagues (1954), the ability of the average citizen to live up to supposed classical demands of democracy was being questioned. Berelson, Lazarsfeld, and McPhee found that their respondents were not well informed on campaign issues and clouded their judgments with emotional responses to the candidates. The Michigan studies categorized voters and showed that very few had the kind of issue constraint that was assumed to be required in order to use issues as the basis for a decision. As noted earlier, the vast majority of voters were found to be either group oriented, candidate oriented, or simply unable to provide any real basis for their vote at all. When combined with the inability of large numbers of survey respondents to answer many questions, and the apparent lack of basic knowledge about the political system that was frequently exhibited, voting studies seemed invariably to lead to the

⁹ See, in particular, the July 1975 special issue of *American Politics Quarterly* (3:3) which included a number of articles discussing the apparent sea-change in voting behavior witnessed in the late 1960's and early 1970's (Reprinted in Kirkpatrick, 1976.)

¹⁰ Beginning in the late 1960's, a large amount of space in professional journals was devoted to the question of whether voters had become more issue-oriented in the elections of 1964 and 1968, when compared to earlier elections. The question was whether these elections evidenced a public better able to carry out its civic obligations, through greater knowledge of the issues. While this controversy continued for several years, it seems clear that those arguing that the 1960's elections did not represent some great shift towards issue-oriented voters prevailed, and the political science view of voters did not change very much. For some of the considerations on both sides of the issue, see Pomper, (1972); Nie and Anderson, (1974); Achen, (1975); Nie, Verba, and Petrocik, (1976),

conclusion that voters could not come very close to using the political system to exert their preferences, let alone act “rationally.”

Modeling Voting as a Process

While traditional voting behavior researchers debated the rise and fall of issues, party, and candidate factors in the vote decision, and whether voters could even make adequate decisions, another perspective was developing, significantly informed by psychological approaches to human behavior. This focus presented voters as interacting with their political environment, rather than as vessels into which the environment flowed. It recognized that elections occur over time, that voters are exposed to information about candidates which they seek to put into a perspective, but which changes as the campaign continues. Some consideration began to be given to how voters could process the information they received, how the contents and organization of political memory might affect the decision process, and the ways in which voters might keep track of the mass of information prevalent during a typical presidential campaign.

Kelley and Mirer (1974) proposed a very simple process oriented model of voter decision-making. While they did not attempt to specify how voters received information, or the means by which political information might be filtered and stored in memory, their contribution was to develop a model by which voters might retrieve and use information to make a vote decision. In particular, their model could be detailed in just one paragraph:

The voter canvasses his likes and dislikes of the leading candidates and major parties involved in an election. Weighing each like and dislike equally, he votes

especially Chapter 10; Converse and Markus, (1979); and Smith, (1989) among many others. A rather detailed list of earlier studies on issue voting appears in the first footnote of Kessel (1972.)

for the candidate towards whom he has the greatest net number of favorable attitudes, if there is such a candidate. If no candidate has such an advantage, the voter votes consistently with his party affiliation, if he has one. If his attitudes do not incline him toward one candidate more than toward another, and if he does not identify with one of the major parties, the voter reaches a null decision (1974, p. 574.)

The process described by Kelley and Mirer can be characterized as a “moment-of-decision” model. That is, the choice is made at a particular point in time, when the voter is called upon for a decision. Until then, no choice has been made. When the decision point comes, a voter presumably uses whatever is stored in memory in order to assess the set of likes and dislikes. Thus, the model is also “memory-based.”

The “Voter’s Decision Rule” was a response to Kelley and Mirer’s belief that previous research had failed to take into account how a vote decision was arrived at -- in particular they argued that models like those established in *The American Voter* could only describe the vote result after actual voting had taken place. They argued that such models could not be used to predict the vote, because multiple regression techniques such as those employed in the Michigan studies require knowledge of the actual value of the dependent variable. In particular, because the weights assigned by regression techniques to the various indicators of the vote changed from election to election, Kelley and Mirer argued that such models could not be predictive (p. 573.) Nor did they believe that an ability to predict the outcome of an election after it happened was tantamount to explaining why a voter made the choice that he or she did. Their “Rule” was a statement of how voters might use campaign information, but it did not say anything about the mechanism by which voters would make the comparisons called for in the “Rule”. While voters were presumed to recall information and determine likes and dislikes, no specification was made of how those likes and dislikes come into being. Nor was there an

attempt to determine how campaign memories are received, stored, processed, and retrieved. Even so, Kelley and Mirer's "Rule" proved a significant early effort to model voting as a decision-making process.

While Kelley and Mirer proposed a very simple model to mimic the process of voter decision-making, Markus and Converse (1979) developed a much more complex simultaneous equation model to explicate how voters determine candidate preferences. They noted they were attempting to formulate "a model which is verisimilar to the dynamic cognitive process underlying citizen's electoral decision-making" rather than attempting either predictive accuracy or the determination of the relative importance of various predictors (p. 1055.) Using the 1972-1976 American National Election Study panel, which interviewed the same group of voters five times -- before and after both the 1972 and 1976 presidential elections, and after the 1974 midterm election -- Markus and Converse specified a set of equations which explicitly took into account the interrelationships between party identification, candidate evaluation, perceptions of candidate personality, and issue positions. By using a simultaneous equation model they were able to estimate the impact of voter behavior in one election on the direction of the vote in the next. They found that partisanship was very stable across elections, but that those voters who voted over time against their professed party identification would be more likely to change party in the future. Further, they were able to specify more exactly the ways in which partisanship influences the final vote choice. While the party identification terms may not have been the strongest in any particular stage of the model, they "keep coming back as determinants while the vote decision unrolls" (p. 1069.) Thus, reactions to candidate issue positions, perceptions of candidate personality traits,

and candidate evaluations themselves, were shown to be heavily influenced by prior partisanship. This finding, of course, provided confirmation of the basic Michigan model assertion of the importance of partisanship as a perceptual screen influencing the way in which voters viewed candidates and issues.

It might be useful to note here that Markus and Converse also confirmed the importance of the candidates in American presidential elections. Across their various equations, it was the candidate evaluations which became the major factor in vote choice. They note that “policy considerations and even partisan orientations affect[] the vote either exclusively or largely through the way they help to shape feelings toward the presidential rivals” (p. 1067.) Thus, it is ultimately the choice between two candidate evaluations that determines the direction of the vote most immediately, with partisanship playing a direct role that diminishes as the gap between the evaluations of candidates widens. Party has direct effects only when evaluations of the two candidates are quite similar, otherwise, its importance is relegated to its screening role.

The Markus and Converse study represents a fairly sophisticated mathematical attempt to model decision-making processes during an election. While it cannot address the question of how voters process the information that comes over the course of a campaign, its use of a panel study provides much greater insight into the dynamic nature of the election. Yet “dynamic” as used by Markus and Converse really means the way in which their various equations influence each other, rather than the way a campaign itself ebbs and flows. While they proposed a model of cognitive processing related to voting, in truth what Markus and Converse actually modeled appears to be closely tied to the relative importance of various parameters at the time a decision has to be made. Given

the use of a 4-wave panel, there was little opportunity to gather data on the ways voters use the campaign over time to inform their final decisions. Further, as Markus and Converse note, they could not run their equations in true simultaneous form, as missing data would have reduced their available cases quite precipitously (p. 1060.) Still, the idea of trying to model a process rather than simply establishing the relative importance of various parameters of the vote provides a precursor to the research project to be discussed herein.

Using Information Boards to Understand Process

Modeling a decision-making process, while not at all routine in political science, has long been established in consumer behavior studies. Researchers trying to understand how consumers choose grocery products, for example, have found it convenient to array products on an “information board.” Such a device allows the placement of names of products generally across the top of the board with a listing of attributes down one side. Within the resulting product-by-attribute matrix are index cards containing bits of information pertaining to the intersection of each product and attribute. Jacoby and colleagues (Jacoby, Kohn, & Speller, 1974; Jacoby, Speller, & Berning, 1974) used this classic approach in two studies to determine the effects of increasing information availability on the ability of consumers to choose from among detergents, rice, or prepared dinners. In the case of detergents, a varying number of detergent brands were placed across the top of the board, and specific attributes were listed down the side. Subjects chose the product-attribute pairs of interest and read the information on cards which described, for example, the whitening ability of a particular detergent brand. In another example of information board approaches, Payne (1980) had college students

choose from between 2 to 12 hypothetical apartments represented on an information board. While making their choice, subjects were told to “think aloud” as they decided. This verbal protocol was recorded and used to supplement the decision process information gained directly from observation of the use of the information board.

The use of information boards in consumer decision-making seems natural. For many products, the process of making a decision entails examining the products as they are arranged on a grocery shelf, perhaps picking up some of them to read their labels. While political campaigns do not proceed in such an organized, easy to use fashion, the process of information gathering during the campaign could be simulated on an information board. Herstein (1981) carried out just such a project. His information board, instead of listing consumer products, provided subjects a chance to compare presidential candidates on an array of attributes. Two hypothetical candidates were created with 45 attributes established for each candidate. Attributes included candidate positions on issues, personal information, and party identification. Subjects stood in front of the information board and chose from index cards for each candidate. The cards were labeled on the visible side with a tag indicating which attribute the card contained. On the reverse was the actual information. Subjects were instructed to examine as much or as little information as they desired and allowed to spend as much time as they wished making their decision. Herstein recorded the items subjects examined along with the order in which the attributes were chosen. In addition, subjects were instructed to talk aloud as they made their decision to express what they were thinking verbally. The comments they made were recorded as part of the procedure (p. 848.)

The goal of Herstein's project was to develop a truly process-oriented model of the vote which would define not only what information was considered in order to make a vote decision, but the order in which it was considered and the ongoing evaluations made by voters during the process of information acquisition. In the resulting model voters select pieces of information, evaluate the information, and make candidate comparisons on various attributes, much as they would do so for any consumer product. Among the findings was that subjects sought more information when the campaign consisted of two middle-of-the-road candidates who were quite similar in their positions when compared to a race between two clearly distinct ideologues. This finding seems to make sense and is probably applicable outside of the lab. If one is faced with a more difficult decision in choosing between two candidates, it is a reasonable approach to gather more information until the differences become clearer. Herstein also found that his subjects made relatively few verbal comparisons between the two candidates as they examined information. Instead of indicating a general evaluation on an ongoing basis, subjects tended to focus their evaluations on the particular item being examined at the moment. This seems to argue that voters wait until a particular "moment-of-decision" in order to make their overall comparison between the candidates, much as Kelley and Mirer (1974) posit. Yet the Kelley and Mirer "Rule" failed to do a very good job of predicting subject's ultimate choice (p. 852, Table 3.) Further, in an interesting anomaly, Herstein also claimed that party identification did not seem to matter much to his subjects. As evidence he noted that the party attribute was chosen far less often than might be expected, and typically appeared to be chosen much later in the decision

process than would be anticipated given the supposed importance of party in American presidential elections.

Herstein's results exhibit a number of features which may well be artifacts of the information board itself and the easy accessibility of all types of information. Presidential elections do not proceed in an ordered fashion, with all information about the candidates always available for examination. In addition, voters do not always have as much time as they like to learn about the candidates. Thus, particular findings that depend on the easy access of information are suspect unless confirmed by an approach that better mimics an election. In particular, the finding that the party of the candidates in the simulation did not matter much seems likely to be attributable to the artificial nature of the information board. In a real general election party matters because it is an heuristic summarizing a large amount of information that few voters have the time or inclination to learn.¹¹ In Herstein's static information board there were no constraints on the ability of subjects to learn as much as they wished about the candidates, and thus no need to use a party identification heuristic. Further, the unimportance of party identification also appears because of a choice made in analyzing the data. Herstein made the inaccurate assumption that a subject would choose party identification for both candidates, in the same way that one would look at an issue stand for both to get all necessary information. However, unlike issue positions, once a subject chose party for one candidate, the party of the other was automatically known, creating no need to choose the party card for the other candidate. Because of the way Herstein counted accesses of information, party then

¹¹ See Fiorina (1981) on this point.

appeared to be much less important, since it was not accessed across both candidates on a regular basis.

Richard Lau and I (1992; forthcoming), in reaction to the shortcomings of the static information board used by Herstein, have proposed a new methodology to develop process tracing models of the vote. In an ongoing series of experiments, we have developed a dynamic information board which mimics the flow of a presidential campaign over time.¹² Using a computer program, subjects experience a presidential primary and general election over a relatively short period of time. Like an information board, subjects have the ability to choose from various types of information presented on the screen in order to learn about candidates. Unlike Herstein's approach, however, the availability of information varies according to the timing of the election. Only a small subset of all available campaign information is available to the subject at any given point in time. For example, early in the primary season there is less information about issue stands and more personal material. Later, various issue positions become available as candidates begin to express their stands.¹³ Further, all information flows down the screen, so that as a subject chooses one item, he or she forgoes choosing another, which may no longer be available in the future. Thus, there is a cost to information acquisition in the our system. In order to better mimic the time pressures of a campaign -- after all, the election falls on a particular date and cannot be postponed -- subjects using this

¹² This dynamic information board methodology was used in the current project as the primary means of data collection, and as such, will be described in detail in Chapter 4.

¹³ A study by Lau (1992) was used as the basis for determining the likelihood of any particular type of information appearing at any point in time. Lau examined newspaper accounts of the 1988 presidential election and categorized each account according to the type of information -- issue, personality, party, endorsements, polls -- it contained. The ratios of the various information types were used to establish the initial likelihood for each type in the computer simulation.

system have generally been limited in the total amount of time they may spend examining information.

We have used our methodology to develop an initial model of how information is used in a political campaign. Unlike most previous models of voting, however, the ultimate dependent variable is not the direction of the vote, but rather the quality of the vote. That is, we are interested in whether voters are able to sort through the large amounts of information available during a campaign to find the candidate closest on whatever attributes are salient to the voter.¹⁴ Thus, our process model (forthcoming, Figures 1 & 2) moves beyond the question of what factors cause a vote for a Republican compared to a vote for a Democrat to the issue of what factors in the information flow and decision environment allow voters to cast a correct vote. The initial model specifies that the difficulty of the decision -- its "task demands" -- combines with the expertise of the voter to determine the nature of the decision task. This will differ for each voter, bringing as they do, different levels of interest and expertise in politics, as well as different preferences. The nature of the decision task then influences the manner in which voters acquire information. Some voters will focus on a single candidate for a period of time, and then switch to another. Others will search to make direct comparisons between candidates. Still others will try to examine each issue they can find in detail. Many voters appear to use a myriad of shortcuts. In any case, the methods that voters use to acquire information then combine with the amount and type of information they maintain in memory in order to determine the quality of the decision. We have found significant support for much of this model. Voters who are more expert do seem to use different

information acquisition strategies and then make better decisions under time pressure (1992.) Further, those who show more accurate memories about the election campaign also appear to do a better job in voting (forthcoming; Lau 1995; Redlawsk, 1995; 1996.) Finally, in campaigns where the candidates are distinct, voters can do a much better job of discriminating between candidates and finding the “correct” one for whom to vote (1992; forthcoming.)¹⁵

Voters and Democratic Standards

Even as the focus on voting studies has moved from social groups to the relative impact of various antecedents of the vote to an examination of the decision-making process, the same basic current continues to underlie nearly all but the most recent research programs. Simply stated, studies find American citizens sorely lacking in their ability to meet standards of democratic participation. Survey research established very early that American voters do not seem able to live up to the democratic ideals of knowledge and interest that are supposed to be required in order to provide stability to the American system.¹⁶ In order to constrain politicians who will make any promise to get elected, a fully informed electorate must make decisions based on a careful consideration of the positions put forth by the various candidates and parties. Ultimately, of course, the voters must then be aware of the policies enacted and be able to hold

¹⁴ See, in particular, Lau and Redlawsk, 1996, for a definition and defense of one view of accurate voter decision-making.

¹⁵ In those of our studies which have focused on general elections (forthcoming; 1992; Lau, 1995) we also find that party identification matters to a much greater degree than Herstein suggested. Subjects have been generally quite quick to seek out party information, and in listing their memories of the candidates and in debriefings subjects often mention the party of the candidates as important to their decision.

accountable those who enacted them. But, with the notable exception of Key's (1966) famous dictum and Lane's in depth interviews (1960), the vast majority of the early voting literature viewed voters as unable or unwilling to follow an election closely and completely lacking ideology, leaving them slaves to party predilections or candidate images. Attempts to rehabilitate voters, to suggest that the original *American Voter* perspective was a function of the politically quiet times in which it was based and of the lack of ideological distinctiveness on the part of presidential candidates were only partially successful. Accepted wisdom has become a belief that because of the lack of centrality of politics to most peoples' lives, the unwillingness of voters to work very hard to learn about candidates, and the complexity of the modern political environment, most voters most of the time cast their ballots based on very little solid information.¹⁷

This notion is based primarily on the many years of survey research during which respondents have been generally unable to adequately articulate the reasons for the decisions they make. Most researchers, though not all, have taken this as an indicator of the inability of voters to use issues to cast a vote. If respondents can not remember very many reasons for their vote when asked by the survey researcher, how could the positions taken by candidates be important in the vote decision? Add to this the uncertainty of the benefit of casting a single vote in an election where millions voted, and even very low costs of information might conspire to limit the amount of attention paid to the issues

¹⁶ For example, an analysis of the 1956, 1958, 1960 National Election Study (Converse, 1964) showed that respondents were inconsistent in their responses to survey questions, casting doubt on whether citizens were paying attention to the issues with any significant level of understanding.

¹⁷ In a somewhat extreme fashion, this argument was made by Converse (1964) when he posited a "black and white" model to explain the variation in attitudes from time 1 to time 2 in panel studies. Converse suggested that there might be two populations included in studies -- those who are very aware of issues and consistently hold the same position on an issue across time, and those who are

surrounding an election. How could a voter act rationally? How could a voter make good decisions?

This view that voters are uninformed has been driven in part by the particular methodology used to establish voter information levels. Most of the major approaches to voting behavior have relied on the series of open-ended like-dislike questions pioneered in the National Election Studies. These questions prompt a respondent to provide in his or her own words what is liked or disliked about political parties and individual candidates. The resulting responses are coded by content, providing a set of data which purport to describe a significant subset of the information that went into the voting decision. Given the strong reliance on open-ended memory recall data as the basis for developing voting models, it should not be surprising that such models tend to be “memory-based” in that they implicitly (*e.g.* Columbia, Michigan) or explicitly (*e.g.* Kelly & Mirer, 1974) require the voter to maintain information about the campaign in memory and then to access and use that information at the moment of decision in order to evaluate candidates and make a choice. These respondents' reports have been assumed to come from reasonably accurate memories of factors that motivated the vote decision. The models may differ in how the evaluation itself is calculated; for example, spatial models (*e.g.* Enelow and Hinich, 1984) argue that voters use a complex calculus to find the issue loss for each candidate (the spatial distance between the candidate and the voter aggregated across issues) and choose the candidate with the least loss; while Kelly and Mirer (1974) suggest the comparison is a simple matter of adding up the things the voter likes and dislikes about each candidate, and choosing the one with the highest score, and

essentially giving random responses to survey questions. This latter group so outnumbers the former

the Michigan model (e.g. Markus and Converse, 1979) sees party identification as a mediating variable, with other information focused through its lens, when encountered and when recalled. But all have in common the assumption that voters search the contents of their memories at the time the choice is to be made. Kelley & Mirer probably provide the clearest example. They propose that as voters encounter campaign information it is stored in memory. When the time comes to vote, the memories for each candidate are recalled and the likes and dislikes that they represent are added up. The candidate who emerges with the highest affective score is then chosen. If there is a tie, party affiliation becomes the tie-breaker.

If voters do work from memory, then we can be relatively sanguine about our ability to tap the "true" reasons for the vote choice through survey research and the use of linear models based on survey data. We can also be comfortable that an assessment of whether a voter is informed or not can be made from memory-based responses to NES questions. If making a vote choice is a matter of searching memory, then polling the voter at the appropriate time, *i.e.* close to the decision point, should allow us to tap the same memories used in making the vote choice. If those memories can be tapped, then it is reasonable to have faith that existing voting models that rely on a memory-based process are not only *predicting* the vote with accuracy (as we must concede they are), but *explaining* the vote as well. And we can be comfortable that when we ask the voter for reasons behind a vote choice, or we ask the voter to locate candidates on an issue continuum, we are asking them merely to recall information the voter already has readily available. If the information is not available it must be because it was never available for use in casting a vote in the first place.

that there is a great amount of instability in survey response as a whole.

It is this view of voters as memory-based processors, combined with the obvious normative implications of respondents' inability to express the underlying reasons for their votes that has spawned a line of research suggesting that whether people have access to large amounts of information when making a voting decision is not particularly material. Rather than worry about whether citizens can recite the economic positions of each of six candidates in the Republican primary, some political scientists are willing to accept that voters have little information, while arguing that a little information is probably enough. Two recent studies (Popkin, 1991; Sniderman, Brody, & Tetlock, 1991) use this approach in an attempt to recast the argument about whether voters meet democratic standards. One possible answer to the question of whether voters actually can cast rational votes with little information has been posited by Popkin (1991) who sees voters as users of "low information" rationality. That is, they use a limited amount of available information to make their decisions. The reason the amount of information is limited is simple -- the costs of acquiring a larger amount of information are greater than the perceived benefits. So, instead of engaging in the presumed purposeful search that rational choice theories require of "good" voters, voters instead engage in a limited information search. Popkin argues that people process in accordance with their limitations and that the limitations in acquiring data are significant. Politics doesn't matter much to most people most of the time. On the other hand, information that comes to people as part of their daily life is easy to acquire, and therefore is easy to use. This "low cost" information, then, is what voters are most likely to use in making decisions. In addition, in a perfectly reasonable way, voters project their own positions onto candidates, giving them the benefit of the doubt. Campaigns work to lower projection effects, by making it clearer where

candidates stand on the issues. Ultimately, voters make reasonably good decisions, says Popkin, both by going beyond the data and by going without the data. People go beyond the data by combining the framing of issues that are presented to them with cognitions that are readily available to them to create narratives about the issues. These narratives are further bolstered by the representativeness heuristic (Kahneman and Tversky, 1973) which acts to create links between similar events, so that if things are similar in one way, they are presumed to be alike in others. The use of these heuristics then allows voters to make inferences that go beyond what limited information they have acquired. And, when data are not available, people show a willingness to go without it, falling back on default values in their political schemata, filling in the blanks. The American political system has one default value readily available to almost everyone -- party identification. Thus, even without specific candidate issue positions available, people will make inferences about candidates in an election, based on their understanding of the political parties involved.

Popkin's approach defines a voting decision process where voters have access to very little information -- passively accepting whatever comes their way, rather than engaging in an active effort to learn about candidates. In this process, the lack of information is not necessarily a detriment, as long as the political environment is reasonably predictable. To go without data or beyond the data, one must make inferences based on previous information. In a predictable political world these inferences will not only be reasonably accurate, but will provide useful shortcuts that make the whole process of decision-making easier. Popkin thus defines his low information rationality. The key assumption here, of course, is that voters make decisions with very little

information, an assumption Popkin accepts as well proven throughout the history of voting studies. But, where many previous studies have suggested the lack of information means an inability to carry out the responsibilities of democratic citizenship, Popkin finds a way to merge the requirements of democracy and rationality with the limits of information that appears in so much of the literature.

Sniderman and colleagues have made a similar argument about the use of heuristic based shortcuts (Sniderman, Brody & Tetlock, 1991.) In particular, they argue that group affiliations provide a very important heuristic for some voters. This “likeability” heuristic is defined by a two stage approach. A voter, feeling affinity towards a particular group, can rely on a decision by that group as to which presidential candidate to support. Presumably, if there is a sense of group affiliation, the voter will trust that the group has done all of the necessary homework in order to determine whether the candidates meet the group’s requirements. The likeability heuristic provides a seemingly sensible shortcut to deciding what to be for and what to be against. But, importantly, to be able to use this heuristic correctly a voter must have a certain level of political sophistication. Sniderman, *et al.*, point out that voters, at a minimum, must know that to be in favor of one position means to be against another. Thus, this heuristic is not available to those with little or no political sophistication who do not at least recognize that opposing positions have been taken by political actors. And, Sniderman also notes that for those with a great deal of sophistication, the heuristic may be unnecessary. Instead, these voters may use the underlying information about candidate positions to directly assess the candidates. But, for those voters in the middle, neither lacking political understanding, nor acting as political junkies, likeability can be a

significant shortcut that allows reasonably good choices without greater than necessary cognitive effort.

Why do Sniderman, Popkin, and others say voters do a pretty good job? The primary reason is that the heuristics voters appear to use seem to be pretty good -- that is, the political world is generally organized so that the inferences voters draw and the shortcuts they take work most of the time.¹⁸ In a reasonable world, people can make good choice even under suboptimal conditions, as Simon's (1956) thought experiment on how an organism should search for food and water revealed. Simon argued that an environment provides clues to an organism that guide it on its search and eliminate the rational choice requirement that all options be examined and that choice maximize utility.¹⁹ Since politics is not central to most voters most of the time, it would not be reasonable to expect them to meet the requirements of the economic rational model in order to make a reasonable choice from the available options. In Simon's terms, voters may be willing to satisfice, to find the best choice, given the circumstances, rather than the best choice overall.

Whether voters do, in fact, make reasonably good decisions using the various heuristics and low information rationality as has been suggested is, of course, an empirical question. Most researchers, however, appear to be willing to make the assertion

¹⁸ See, for example, Redlawsk (1996, 1995), Redlawsk and Lau (1995), Lau and Redlawsk (1992; forthcoming), and Lau (1995) for a series of studies which, among other things, find that the use of heuristics appears to improve the accuracy of the vote decision. A number of other researchers have recently asserted that voters can use various cues (Brady and Sniderman, 1985; McKelvey and Ordeshook, 1986; Page and Shapiro, 1992) to infer policy stands, candidate personalities, and even the voters' own issue stands.

¹⁹ In Simon's hypothetical environment, the search is for paths that lead to food. However, the general point made is applicable to searches necessary to make any type of choice, including, in this case, information searches.

without attempting to test its validity.²⁰ As Bartels (1996) points out in response to McKelvey and Ordeshook's (1986) statement that cues work given "appropriate assumptions,"

The obvious question is whether these "appropriate assumptions" reflect real political conditions. It is easier to assume than to demonstrate that cues and shortcuts do, in fact, allow relatively uninformed voters to behave *as if* they were fully informed. The assumption that cues and shortcuts work is especially seductive because it allows analysts to proceed to the (arguably) more tractable question of *how* they work, which in turn seems to provide indirect support for the unsupported claims that they do, in fact, work (1996, p. 198, emphasis in original.)

Bartels argues that researchers must test the proposition that voters do a good job, rather than simply asserting it. Using the open-ended questions on the American National Election Study, he compares voters who appear to have little political information with those who appear to be nearly fully informed. Based on the reported level of political information for each respondent as recorded by the ANES interviewers, Bartels creates a five point scale of information sophistication. Using a probit analysis to estimate the likelihood of a Republican vote (and dropping Perot voters in 1992), the analysis proceeds to establish that there are systematic differences between voters assessed as informed compared to those who are not. For example, female voters who are less informed appear to be more likely to vote Republican when compared to females considered more informed (p. 212, Figure 1.) Increased information thus appears, among other things, to lead to a gender gap.

²⁰ However, Richard Lau and I (1992, 1996) have begun to look at the question of whether voters who are fully enlightened as to candidate positions after they have voted for a candidate in a mock presidential election are willing to change their choice, once they have seen all the information that was available during the campaign, much of which they were unable to access during the campaign itself. This operationalization of voter accuracy in decision-making relies directly on voters to determine if they made the right choice.

The more important question addressed by Bartels, however, is whether voters with less information vote differently than they would if they had more information. Bartels establishes a theoretical “fully informed” vote probability for each respondent in the 1992 election as a function of the individual’s background characteristics -- such as race, age, religion, and the like -- and parameters estimated for each characteristic. He then compares the actual voting behavior of the respondent with what might be expected with full information. Doing so shows a significant average deviation from a fully informed vote for each of the elections from 1972 to 1992. The conclusion drawn by Bartels is that voters do not act *as if* they were fully informed. That is, if they are using heuristics and cues while working with less than full information, voters may well be misled away from the choices they would make if they were fully informed.

Bartels’ analysis is important if only for the fact that it represents a first effort to establish whether or not less informed voters make accurate decisions, if we are willing to define accurate based on the decisions made by voters who are in some way more fully informed. Yet, to draw the conclusion that voters’ use of shortcuts may mislead them is to go beyond the data Bartels has available. While it is clear that those voters assessed as less informed by the ANES interviewers appear to vote somewhat differently, it is not clear whether the differences are important to the larger question of whether voters need to be fully informed. Bartels himself notes that the deviations between fully informed and less informed voters are not necessarily large, especially when aggregated across the voting public as a whole. While he shows that less informed voters appear to be more likely to vote Democratic and more likely to support incumbents (p. 218), it is not clear if these variations actually make a difference in elections. In fact, Bartels himself points out

the need to investigate whether these differences matter. Further, Bartels notes that even less informed voters do significantly better than chance in making their vote choices. But it is not clear that he can either credit or discredit heuristics and cues as instruments of the deviations he finds. There is no analysis provided of the actual use of heuristics by voters, and no evidence that fully informed voters did not use heuristics while less informed voters did. Recall that Sniderman's likeability heuristic requires some medium level of political sophistication, something that cannot be teased out of Bartels' analysis. If Bartels had the ability to stratify his data based on usage of such shortcuts, then similar results would be far more compelling.

While Bartels' approach suggests that greater use of information leads to a more accurate vote decision, this connection is made by assessing the amount of information voters are able to give to an interviewer. Throughout the course of the ANES surveys it has been clear that respondents can rarely talk in great detail about politics. Rather than give long coherent treatises about the various candidate positions on the myriad of issues, most respondents provide fairly simplistic answers to the ANES open-ended questions. Further, a great number are also unable to place candidates on the traditional seven point scales for a surprising number of issues, and quite often get the factual questions wrong as well. These various survey approaches are believed to tap the memories of voters, making the assumption that whatever is in the contents of respondents memories must be causally related to the vote decision. Voters should be expected to be attentive to campaign information, process large amounts of it during the election season, and store whatever information they might later need in order to make a decision. What starts off as a prescription for good voter citizenship -- attentiveness and retention of information --

turns into a descriptive model of how political information processing must actually work.

If, however, we turn to the psychology literature, of which information processing has been a significant part for many years, we quickly find that psychologists are generally agreed that people just do not and cannot process information this way. While long term memory appears to be limitless, short term memory -- the working memory where people actually process information -- is extremely limited, perhaps to as little as 7 +/- 2 chunks of information at any given time (Miller, 1956.) It is in this working memory bottleneck that all conscious processing occurs, requiring retrieval of appropriate memories from long term memory before they can be used. Moving memories from short to long term, and back again, is time consuming and requires additional processing effort. These limitations suggest that, at best, if voting is a memory-based process, it can not be based on very many memories. Add to this the fact that politics is not very important to most people most of the time -- even during a presidential election -- and it becomes even less likely that voters will routinely make the processing effort necessary to support memory-based models of the vote. So, while political scientists have been developing models which require a significant investment of cognitive energy, psychologists have become convinced that people act as cognitive misers (Taylor, 1981; Fiske & Taylor, 1991.)

The Cognitive Miser and Open-Ended Questions

A cognitive miser uses mental resources efficiently. This efficiency translates into decision-making processes that do not conform to the memory-based models that

political scientists have favored. Wyer and Srull (1980) discuss the mechanisms by which people make social judgments, suggesting that,

[O]nce a judgment is made of a person, this judgment rather than the information on which it was based is more likely to be recalled and used as the basis for subsequent judgments and decisions involving the person (p. 228.)

By implication, if an evaluation of any person -- including a political candidate -- has already been made, it is less likely that the evaluator will be able to recall the reasons that went into the judgment in the first place. There will be no problem recalling the judgment itself, nor in using the prior judgment as a starting point for future evaluations of the same person. But, the information that went into the judgment may not be accessible after the decision, which is precisely when voters are usually asked to recount the reasons for their vote. The operating mechanism, according to Wyer and Srull, appears to be the observer's processing objectives (p. 229.) They note that "information is usually processed in order to obtain some objective" (p. 232) and posit that different objectives are likely to affect the storage in long-term memory and subsequent ability to retrieve varying amounts of the original information.

Hastie and Park (1986) expand upon the question of processing objectives in studying whether the memories that can be recalled after a judgment is made are related to the judgment itself. They note that while many earlier studies had appeared to show a correlation between judgments and the contents of memory after the judgment, these findings were often contradicted in other, quite similar studies.²¹ These "puzzling" (p.

²¹ Among the studies which appear to support a correlation between memory and judgment cited by Hastie and Park (1986, p. 258) are Tversky and Kahneman (1973), Beyth-Marom and Fischhoff (1977), and Gabriellek and Fazio (1984), all of which show relationships between the ease of bringing examples to mind and judgments of the frequency of words in the English language. These studies show the operation of what Tversky and Kahneman called the "availability heuristic" (Tversky & Kahneman, 1973.) Note that none of these studies test the use of memory in making an evaluation of a

259) results led them to adopt an information processing approach in order to determine under what conditions the differing results might be supported. They examined five information processing models from this perspective, using as a basic assumption that:

[W]hen a person is presented with a judgment task, either in an experimental or natural situation, evidence information is processed by a judgment operator that performs its function to generate a conclusion on which a response is based . . . The judgment operator is limited by working-memory capacities constraining the complexity of elementary information processes that can be executed at any point in time (p. 259.)²²

In other words, the cognitively efficient thing to do is to use new information to update a kind of on-line judgment counter which maintains a summary of all previous information encountered about the target. Once this counter is updated and restored to long-term memory, there is no reason for the details which informed it to be retained in memory. Some information *might* be retained, but it is completely separate from the judgment counter itself, and the retained information will be but a (potentially very small) subset of the original information that informed the judgment. Information recalled after the judgment is made on-line does not have to be related to the judgment itself, since recall will be possible only from this small store of information.

If some judgments proceed on-line, as Hastie and Park demonstrate, under what conditions does on-line processing occur? A clear distinction is made between on-line

person. Studies cited which seemed to show unclear relationships between memory and judgment include Reyes, Thompson, and Bower (1980) which found no correlation immediately after the judgment was made but a moderate relationship after a 48-hour delay, and Hastie and Kumar (1979) and Srull (1981) which found traits incongruent with the judgment of a person to be the items best recalled after the judgment was made.

²² The five models examined were: (1) Anderson and Hubert (1963; Anderson, 1981) which posited two memory systems, one for judgment and one for recall, (2) Tversky and Kahneman's (1973) availability heuristic, (3) a biased-retrieval model assuming judgment and memory-encoding occur simultaneously yet independently but that once a judgment is made it can bias memory retrieval, (4) a biased-encoding model which assumes that judgment causes memory by biasing the initial encoding of memory, and (5) an incongruity-biased encoding model (Hastie & Kumar, 1979; Srull, 1981)

judgments and memory-based processing, with Hastie and Park arguing that memory-based processes are exceedingly rare. Most judgment processing takes place on-line, although some few decisions may proceed as memory-based judgments. Therein lies the resolution of the contradictory findings of a memory-judgment link. When a judgment proceeds on-line, as most do, then there is no reason to expect a connection between memory and judgment. However in memory-based tasks, Hastie and Park argue, Tversky and Kahneman's (1973) availability model is applicable, and a direct link should be found between memory and judgment. Hastie and Park test this with an experiment in which subjects were asked to judge the suitability of a job applicant for a position as a computer programmer by listening to a five minute conversation between the applicant and another individual. One-half of subjects were told at the beginning of the experiment that they would be asked to make a judgment, and thus were presumed to process the information on-line, while the other half did not know they were to make a judgment until after viewing the conversation. This latter group was expected to use a memory-based process, since the judgment task was unexpected and therefore there was no reason for subjects to form an evaluation on-line. The findings were quite clear:

Our prediction was confirmed: The correlations between memory and judgment measures are substantial in the memory-based tasks (+.46 and +.42, $ps < .05$) but not in the on-line task (-.14 and +.14, ns). (Hastie and Park, 1981, p. 263.)

These basic findings were replicated in three additional experiments reported by Hastie and Park. They find consistent support for the separation of recall and judgment, when the judgment proceeds on-line.

suggesting person-perception is biased by information that is in opposition to the judgment that is made. (Hastie & Park, 1986, pp. 259-261.)

Gant and Davis (1984) appears to be the first published study to consider whether voters might use on-line processes in making choices. The motivation was an attempt to reconcile the problem of whether issues are at the heart of voting decisions. Working from a Downsian rational choice perspective, they argue that rational voters will mainly use policy considerations to make a vote choice and they will be motivated to gather at least some information about policy positions of the candidates. In the face of evidence that voters cannot recall very much detailed issue information, Gant and Davis suggest a “mental economy” hypothesis, citing Macaluso (1975, p. 22.):

An alternative explanation of the issue-voting paradox is that voters engage in “mental economies.” That is, “it is sometimes efficient to remember only summary evaluations [of candidates] while forgetting explicit components of those evaluations” (Gant and Davis, p. 135.)

Thus, voters can be expected to use heuristics which will allow them to minimize the information collection and processing task. In particular, Gant and Davis argue that voters have an “ideal candidate” in mind who matches their issue preferences. When encountering information, a voter need only compare the new position to the ideal, evaluate it, and then discard the details, while retaining a summary of the comparison (p. 138.) As a consequence, voters processing on-line would not be expected to recall very much detailed information.

It should be noted that simply because the objective of person evaluation appears to lead to on-line information processing, it does not automatically follow that memories are not maintained of the information that informed the evaluation. While it would appear, based on the cognitive miser concept, that maintenance of the original stimulus information is inefficient, there are other possibilities. In a classic experiment Anderson and Hubert (1963) suggested that two types of memory operate during a person

evaluation process in which subjects are read lists of descriptive words and asked to form a judgment about the person the words purport to describe. In particular, information encountered early in the lists correlated strongly with the overall evaluation of the person, a primacy effect in that first information was most diagnostic. On the other hand, the words encountered towards the end of the lists were correlated with recalled information, a recency effect (p. 387.) Anderson (1981) discusses this two memory hypothesis during impression formation tasks noting that:

As each adjective was received the valuation operation [the judgment process] extracted its implications for the task at hand. Further processing, especially the integration, was performed on these implications. The verbal material itself, no longer necessary, was transferred to a verbal memory or forgotten (p. 96.)

While psychological theories seem to point to a necessary disjuncture between evaluations and the recall of the information which led to those evaluations, there remains the problem that in much of the political science literature that has examined recall about candidates, there is a clear relationship between memory and the vote decision. Kelley, for example, uses open-ended questions which ask respondents to recall likes and dislikes about candidates to create a simple model of the vote process, arguing that,

the great majority of voters act *as if* they were using the Rule, and the accuracy with which the division of the vote is predicted shows that the Rule's predictions of individual voters are nearly unbiased, with errors canceling out (Kelley, 1983, p. 15, emphasis in original.)

But, if voting proceeds as an on-line evaluation task why is any relationship found between memory and judgment? Hastie and Park (1986) provide the foundations of an answer, arguing that recalled information may be biased by the judgment operator either

upon its original storage into long-term memory, or upon its recall. Once a judgment has been made on-line, it may become a perceptual screen which affects subsequent information as it is received or as it is recalled. As a consequence,

[C]onditions that invoke the biased-retrieval, biased-encoding, and incongruity-biased-encoding models associated with on-line tasks are quite common, making predictions of memory-judgment relationships difficult or impossible (Hastie & Park, 1986, p. 266.)

They warn that it is misleading to take any relationship found between memory and judgment as a basis for preferring a memory-based model of evaluation over an on-line model. In a different study, Carlston (1980) examined the extent to which holding an initial impression might bias the information later recalled about the person who was the target of the evaluation. Subjects were given a set of written statements about an event, with half of the subjects given an initial negative inference about the event and the other half led to an initial positive impression. In the report of his findings, Carlston notes that,

. . . subjects who initially responded to the positive interpolated judgment task later recalled more positive (and fewer negative) episodes, described those recalled episodes more positively, and reported more positive impressions than those who initially responded to the negative interpolated judgment task. These results indicate that cognitive processes occurring *after* stimulus observation can alter the information subjects have available for making later impression judgments, and consequently, can alter the impression judgments that are made. (p. 324, emphasis in original.)

Rahn, Krosnick, and Breuning (1994) expand on this point by arguing that rather than representing reasons why a particular candidate was chosen, the open-ended recall questions instead provide the opportunity for the respondent to rationalize a previously made vote decision. Relying on consistency theory (Festinger, 1957; Heider, 1958) they argue that voters are not likely to provide obviously inconsistent answers about their vote

choice. Once the decision has been made, inconsistencies between the judgment and later feelings are minimized and information recalled is filtered so that only that which is reasonably consistent with the decision is reported. Using a two-wave panel study conducted during the 1990 Ohio Governor's campaign, Rahn and colleagues asked respondents to evaluate the candidates on a feeling thermometer and to give open-ended responses to standard like-dislike questions about each candidate. The analysis of these data found significant rationalization -- the influence of the evaluations on the open-ended responses was quite strong. On the other hand, there appeared to be no discernible affect of the open-ended responses on the evaluation process. Further, they also found that the general evaluations represented by the feeling thermometers over the two waves were very stable, while a scale of net likes to dislikes was anything but fixed over both waves. Recall memory appeared to change from the first to the second wave, suggesting that the like-dislike questions were not tapping an overall evaluation, but rather the most recently available considerations, with earlier information no longer readily accessible. Both findings provide evidence against the assumption that models built on open-ended recall questions are tapping true reasons for vote decisions.

The psychologists' view of information processing leads inexorably to a series of questions with significant implications for the standard political science view of voters unable to meet democratic standards. There is no special reason to think that candidate perception is in any way significantly different from other person perception tasks. The type of information used may differ from that used to assess our friends and neighbors, but clearly making judgments about candidates is a person perception task. And just as clearly, social evaluations appear to be processed on-line. Consequently, as Gant and

Davis (1984) argue, the on-line model of person perception surely should be applicable in the political setting. If so, we must ask ourselves several questions. What if voters actually use more information in updating their on-line judgment than has been previously believed to be the case in our predominantly memory-based models of the vote? What if the reliance on the heuristics and other cognitive “tricks” posited by Popkin (1991), Sniderman (1991) and others is not as great as it appears from their theories? What if the problem is not that voters do not use information, but rather that researchers have been unable to determine what information is actually being used? If the view of evaluation processes as taking place on-line is accurate in a political campaign setting, then we are led to question whether the information recalled by voters under ANES prompting really represents the *reasons* for the vote choice. Bartels’ (1996) research purporting to show that less informed voters differ from fully informed voters rests on making a determination of informed voters from assessments recorded by ANES interviewers upon completion of the survey. Presumably this assessment is based on the overall content of the answers given to the interviewer during the process of asking questions. Many of these questions -- especially the open-ended questions which might be the most likely to influence an interviewer²³ -- would rely on whatever memories about the campaign season the respondent might be able to recall during the interview process. Thus, to rate a subject as informed or uninformed about politics would really be

²³ While there is no clear evidence that the open-ended questions have any differential effect on an interviewer’s assessment of a respondent’s store of political information, it seems reasonable to suppose that the questions which allow a respondent to answer in his or her own words might have some stronger influence on an interviewer than those which require simply indicating an answer from a set of choices. Certainly, answers to closed-ended questions also matter, as would the overall demeanor of the respondent and the ease or difficulty with which he or she appeared to answer the full range of questions. While such a hypothesis could certainly be tested, it is not the purpose of this

to rate his or her ability to recall information about a political campaign upon prompting in the form of ANES questions, rather than to understand how much information was actually evaluated in making the vote decision.

Conclusion

Why does it matter whether people function as cognitive misers? Since political scientists agree that existing models of the vote do a very good job of predicting vote choice, why should there be any concern about how people process the information which leads to their decision? If voting *behavior* can be modeled accurately, of what value is it to understand the decision *process*? A major reason has already been alluded to above -- existing research paints a negative picture of the voter as citizen. Unable to give a good account of his or her vote, and unable to tell us much in detail about politics and elections, we find voters to be almost derelict in carrying out their civic duty. Existing ways of studying voter decision-making make political scientists wonder how voters could ever manage to pick the candidate who is "right" for them. Even recent explanations for voter accuracy, such as Popkin's (1991) low information rationality, take as given that vote choices are made with very little real information.

Of course, if it were only political scientists who held a dim view of voters, this might not matter much at all. But the political science view of voters has become the conventional political wisdom -- issues don't matter, and flash is everything. The pictures that voting research paint influence how politicians view voters and how they respond to them. Further, an electorate that is truly uninformed and making vote

project to do so. The larger point is that most answers to NES questions about an election and vote choices rely on memory searches.

decisions on the flimsiest of data, is an electorate that cannot exert reasonable control over its representatives. If politicians believe that voters are not paying attention to what they do, they are likely to begin to believe that they can make decisions with impunity. The link between those who govern and those who are governed is easily broken. Years ago, V. O. Key (1966) pointed out that politicians are quite responsive to what they perceive as the public's interests in the campaign:

If politicians perceive the electorate as responsive to father images, they will give it father images. If they see voters as most certainly responsive to nonsense, they will give them nonsense. If they see voters as susceptible to delusion, they will delude them. If they see an electorate receptive to the cold, hard realities, they will give it the cold, hard realities.

In short, theories of how voters behave acquire importance not because of their effects on voters, who may proceed blithely unaware of them. They gain significance because of their effects, both potentially and in reality, on candidates and other political leaders (p. 6.)

Thus when theories suggest that voters are barely capable of taking in campaign information and using it effectively, they suggest to political elites that voters must be fed a steady diet of flash and image, with only small nuggets of substance. But, if the on-line model is an accurate description of how people process information, then voters may well be capable of taking large amounts of information into account in their evaluations of candidates -- large amounts that they cannot later regurgitate to the survey researcher. Why not? Because by processing it on-line and making evaluations on the fly, voters would have no need to keep the details in memory, once they are included in the on-line tally. The information that does end up in long term memory is but a small portion of what actually went into the decision.

Taking this to its logical conclusion there would be no reason for memory to play any role whatsoever in voter decision-making, and Kelly & Mirer (and by extension,

other models of the vote which presuppose memory processing) are simply wrong. If this is the case, then anything voters tell us after the decision has been made represents rationalizations, rather than memories. The recent work by Rahn and colleagues (1994) comes to a similar conclusion with evidence that our standard open-ended National Election Study questions elicit responses which simply do not connect with the actual vote choice, and thus cannot be counted upon to measure what we have thought they were measuring. This methodological problem, then, represents a second reason why it is important to understand how voters reach their decisions.

The bulk of voting research over the past fifty years has used survey research to try to establish the antecedents of the vote. Do issues count? Are candidate personalities important? Do campaigns make any difference at all? These attempts to predict the outcome of elections, while useful in their own right, have not led us very far towards understanding how voters process the information that is the very stuff of the political campaign. It is as if the voter has been viewed as a black box into which the various demographic, attitudinal, and informational inputs have been dumped, swirled around, and extracted, with the results an extremely accurate prediction of an event already past. Such efforts have proceeded under a basic important assumption -- that voters have in some way privileged access to their own reasons for voting. More recently, researchers have begun to question this assumption and to suggest that the accurate prediction of the vote is not necessarily the same as an understanding of how voters use information to make a choice. If the on-line model is an accurate depiction of how voters process campaign information, then its implications may lead us to rethink the basic belief in the inability of voters to conform to a democratic ideal. Voters may well be better at making

voting decisions, at holding politicians accountable, and at finding the candidate who best meets their needs than has been previously accepted. In the next chapter, I will take a look at a line of research which has begun to apply the concept of on-line person evaluation to candidate evaluation. This research program, by Milton Lodge and colleagues at SUNY-Stony Brook, has at its core the adoption of the on-line model of information processing as a more accurate descriptor of how voters use campaign information. If Lodge and his colleagues are correct in their belief that voters evaluate candidates on-line there is little reason why there should be any relationship between memory and voter decision-making. Political scientists would then have to rethink the long-held belief that voters know and use very little information when entering the voting booth, perhaps rehabilitating our view of voters as democratic citizens.

Chapter 2

An Application of On-line Decision-making to Voting

Interviewer: I'm interested in reasons why you voted for your candidate in the election. Can you talk a little about this?

Subject: I voted for him primarily because I felt I agreed with him on most of the issues that were important to me. For example, on the question of a woman's right to choose an abortion, on that question I have an impression, but I can't quote it specifically. I agreed about his concerns for people who are less fortunate in their economic condition. I think I generally agreed with his foreign policy but there again I can't recall specifics. I also had the impression that there were some things in his background that I viewed positively but once again I cannot recall the specifics.

*Partial transcript from experimental subject,
November, 1994*

Nearly all voting studies over the past fifty years have bemoaned the fact that American voters are information-poor, appearing to make their choices between political candidates with but a small store of campaign knowledge upon which to draw. As a result, voters appear to be unable to take to them the mantle of democratic citizenship, ensuring that their own policy preferences are translated into action by their elected representatives. If voters cannot explain why they choose the candidates they do, can we expect elected officials to take voter preferences seriously? Can we expect citizens to provide the necessary stability to the political system when they are unable to recall candidate positions even after an information rich political campaign?

Recall from Chapter 1 that the standard approach to determining the reasons for a voters' choice is to ask a series of open-ended questions requiring respondents to list likes and dislikes about the candidates. This questioning takes place after the election,

and for many voters, substantially after the decision has been made. Voters are expected to recall from memory reasons why they supported or opposed a candidate. But, if the psychologists (*e.g.* Hastie & Park, 1986) who argue people make most evaluations on-line are correct, these recollections do not necessarily represent the reasons that really went into the voter's decision. Considering the contents of memory as indicative of the information underlying many types of decisions has been shown to be problematic under any associative network model of memory (Fisk & Taylor, 1991, Ch. 8). It seems reasonable to suppose that these problems could occur as well in voter decision-making, casting doubt on whether open-ended statements can be relied on for the reasons underlying a vote choice. First, Fisk and Taylor note that there is no reason to expect that the contents of memory after the election will contain exactly all of the information that was encountered, or even an accurate subset of it. Instead, memory is selective and non-permanent. Memories that are retained are biased and thus non-representative of the information that went into the decision. Second, the information that does make it into long-term memory is not always readily accessible once the task of voting is complete. Once the election is over there is no reason to access the memories about the candidates, and the links that allow access begin to degrade. If this is the case, a survey researcher asking open ended questions after the election is over should not expect to hear detailed responses that meaningfully relate to the actual decision.²⁴

²⁴ Voters may not be able to respond to survey questions in a comprehensive way not because they did not pay attention to the issues, but simply because once they extracted what they needed from the information about issues in order to update their on-line tallies, they saw no reason to keep the details. Thus, the lack of consistency found in answers relating to candidates and elections may simply represent the cognitive miser at his or her best. It is important to note that the on-line model is a model of person perception. That is, it purports to describe a process by which voters evaluate a political candidate. It does not describe how people might perceive and maintain information about issues themselves. Thus, it does not negate the possibility that survey research might continue to be a good

Recently, Milton Lodge and colleagues at SUNY-Stony Brook (Lodge, McGraw, & Stroh, 1989; McGraw, Lodge, & Stroh, 1990a, 1990b; Lodge & Stroh, 1993; Lodge, 1995; Lodge, Steenbergen, & Brau, 1995) have proposed a new way of looking at how people process political information. Borrowing from social and cognitive psychology, the Stony Brook researchers argue that candidate evaluations are formed using the on-line evaluation process. In a manner similar to other evaluation tasks outside of the political realm, voters receive new information about a candidate, process that information in working memory, and use the evaluation of the new information to update the on-line tally (OL Tally) containing the global evaluation of the candidate.²⁵ The newly updated OL Tally is then returned to long term memory, and the new information *can safely be discarded*. When the time comes to vote, presumably one only needs to retrieve the tally for the candidates, compare them, and vote for the one with the higher value. There is no need to search memory for information learned about the candidates; in fact, little of the information which informed the tally can be expected to remain in memory. Lodge, *et al.*, argue that candidate evaluation during a political campaign is not much different from any other kind of person perception that involves evaluation (*c.f.* Rahn, Aldrich, Borgida & Sullivan, 1990) and thus it is reasonable to believe that the on-

way to understand where people position themselves on issues and to what extent they think about those issues. What it does suggest is that those parts of surveys dealing directly with candidates -- "Why did you vote for X?"; "Where does X stand on issue Y?"; "What do you like/dislike about X?" should be suspect, at least as valid indicators of the actual reasons that went into a vote decision.

²⁵ If there is no pre-existing tally, as would be the case for the first encounter of a new political figure, then a new tally would be created based on whatever information is first encountered. The new tally would then be stored in memory.

line processes well established for other situations would also be used for political choices.²⁶

In the initial effort to establish if and when on-line processing occurs during evaluations of politicians, Lodge, McGraw, and Stroh (1989) carried out an experiment in which subjects were asked to evaluate a fictitious Member of Congress based on policy statements that were to be included in a campaign brochure for the upcoming election. Using a non-probability sample of 422 non-student adults recruited from the Long Island, New York, area, the experiment was planned to test the proposition from Hastie and Park (1986) that the information processing goal subjects brought to their tasks would determine whether on-line or memory-based processes were used in the evaluation. Lodge, *et al.*, posited that the “critical mediating variable appears to be the individuals’ processing objective or ‘goal’ when information is initially encountered” (p. 401.) If the purpose of information acquisition is to make an evaluation, then an impression-driven on-line process is activated. Alternatively, if information is acquired under a goal to remember as much as possible, or with no particular goal in mind at all, Lodge and colleagues expect any evaluation to be based on whatever information can be recalled from memory.²⁷ Explicitly stated is the belief that citizens enter into the task of acquiring political information about candidates with the expectation that they will

²⁶ Fiorina’s (1981) model of party identification as a repository for prior evaluations of party performance in office appears to mimic an on-line tally. Partisans may not be able to tell exactly why they support a particular party, but despite this, there is a lot of information encompassed in the party attachment. Further, Fiorina envisions party identification as fluid, changing as new information is encountered about party performance.

²⁷ Although, whenever the information involves a person a certain amount of evaluation goes on implicitly, even in the absence of instructions to evaluate the person.

eventually have to make a choice, therefore activating the impression-driven on-line evaluation process (p. 415.)

Because on-line processing appears to be the default mode of processing person-perception information (Anderson and Hubert, 1963; Hastie and Park, 1986; Lichtenstein and Srull, 1987) Lodge and colleagues argue that special efforts must be made to interfere with the impression-formation process to block the formation of the on-line evaluation. To generate a group of memory-based processing subjects (approximately one-quarter of all subjects) the experimenters first had these subjects read a neutral biography of the fictitious Congressman Williams and then read a list of 40 policy statements. Rather than evaluating their political content, subjects were instructed to rate each statement in terms of readability on a five-point scale in order to help the campaign staff understand “whether the average American voter would be able to read and understand the campaign brochure” (p. 404.) Remaining subjects were divided into three impression-driven groups. In one, the Congressman was described by a non-partisan group in very positive terms in the initial biography. In the second, a negative description was given. The third group read a biography with no endorsement statement in it. All three impression-driven groups then read the list of policy statements and rated each statement in terms of how much they liked or disliked the policy position. They were also instructed to form an overall impression of Williams.

Upon completion of the campaign brochure task, subjects were given a distracter task completing a *Readers' Digest* vocabulary test. This served to eliminate the policy statements from short-term memory. The third stage of the experiment required subjects to evaluate the Congressman on both a global scale as well as on 24 trait adjectives from

recent NES studies. A fourth stage followed where an unexpected recall test was administered, in which subjects were asked to recall as accurately as possible the policy statements from the brochure. After this task, subjects were provided a list of items purported to come from Williams and asked to assess which actually were in the brochure and which were not. This recognition test contained 20 items that had been in the brochure (old items) and 20 that were not included (new items). Additionally, half of each old and new group of items were consistent with Williams' Republican party identification and half were inconsistent. A final questionnaire was then administered to establish subjects' political knowledge, partisanship, demographics, and attitudes.

Lodge, *et al.*, ask two basic questions. The first is about memory, the second about the relationship between memory and candidate evaluation. Clearly, they argue, it is unreasonable to expect memory to be an exact replication of the policy statements that were encountered. Given the limitations of memory processing, no subject could be expected to recognize all forty statements correctly. Their focus, instead, is on whether the information in memory is an accurate subset of what was encountered, or is biased in some systematic fashion. Analysis of the data quickly eliminated the possibility that memory is an exact replication of the information encountered. However, subjects in the impression-driven conditions were superior at recognizing accurately the policy statements after the fact, replicating a long line of research which shows that “the simple act of forming an impression facilitates memory for information” (Fisk & Taylor, 1984 [1991], cited on p. 408.) Even so, bias was present in the recollection of the policy statements, with subjects in the impression-driven conditions showing a tendency to

stereotype based on partisanship, and all subjects showing a tendency to project positions they liked onto positively evaluated candidates (p. 411.)

For the purposes of the current study, the second Lodge, *et al.* question is more significant; that is, to what degree are memory and judgment linked in the evaluation of political figures? As they expected, no relationship was found between information available in memory and the evaluation of the candidate for subjects in the various impression driven conditions (Table 5, p. 412.) A significant relationship was found, again as expected, for subjects in the memory-based condition. However, the relationship was not strong, which the researchers take as additional evidence of how difficult it is to invoke memory-based processing, given a tendency to default to an on-line approach. A measure of the on-line tally, created by summing all of the likes and dislikes for each subject across the Williams' 40 policy positions, was then used to predict candidate evaluation. While the regression coefficient for the on-line counter was significant for both memory-based and on-line subjects, it was much stronger for those in the on-line condition, again adding credence to the on-line model for candidate evaluation. Finally, in an overall model, Lodge and his colleagues demonstrated that while the measure of the on-line tally was a significant predictor of candidate evaluation, recognition memory of the "old" issues was insignificant. Thus accurate memory did not add to the ability to predict the candidate evaluation. Interestingly, however, false memories -- indicating inaccurately that one of the "new" issues had been included in the campaign brochure -- did have a small positive effect on evaluation. Apparently, impression-driven subjects projected their own policy positions into their evaluation to some small extent.

In sum, Lodge and his colleagues argue that this initial experiment provides strong support for a model of candidate evaluation in which memory has no direct role. Instead, citizens who expect to evaluate political figures proceed to process information they acquire on-line, making their evaluation on the fly and then safely discarding the details. Any remaining information actually in memory is not used when election day, or a poll taker, appears. It is much more cognitively efficient to simply query the on-line tally than it is to search memory for bits and pieces of information.

In a report on four related experiments (including the one reported in Lodge, McGraw, & Stroh, 1989) carried out at Stony Brook, McGraw, Lodge, and Stroh (1990a) replicate the prior findings and extend their argument to explain the discrepancy between laboratory findings of no relationship between recall and judgment, and the consistent survey findings in the NES that the open-ended like/dislike questions correlate strongly with vote choice. Drawing on Hastie and Park (1986), they argue first that while it is reasonable to conclude the existence of an on-line judgment process in the absence of a significant correlation between memory and judgment it is not appropriate to assume that a significant correlation is proof of memory processing. A correlation may occur either through memory-based processing, or because of biased encoding or biased retrieval of data initially processed on-line (Hastie & Park, 1986, p. 260-216.) Thus, McGraw, *et al.*, require the development of a sound theoretical perspective in order to untangle the relationship between memory and judgment.

They find the theoretical basis for concluding that on-line processing occurs even in the face of memory-judgment correlations from a particular perspective about the structural organization of memory. During on-line processing person memory is

organized in a hierarchical network containing semantic representations of information. A “person node” is initially established as the candidate is first encountered, with various pathways between the person node and attributes learned created as new information becomes known. The on-line tally is seen as a part of the person node and is updated with each new bit of information, after which that information may be stored in the long term memory network or may be discarded (McGraw, Lodge, & Stroh, 1990a, p. 3.) When a judgment is required, voters will call up the on-line tally, rather than search memory. When memory recall is requested, the voter will be able to find some memories that were, in fact, included in the on-line tally, thus potentially showing a correlation between memory and judgment.

However, this correlation will be much stronger, McGraw, *et al.*, argue, in the case of recall generated from a cue such as the affect tag included in the NES like/dislike questions because a different memory search process will be activated when compared to a truly open-ended recall question containing no affective cue.²⁸ Experimental evidence from a condition manipulating the type of recall prompt used after subjects viewed the candidate information gives strong support to this claim. Subjects presented with a cued recall prompt showed strong correlations (.58) between memories and candidate evaluation, while those in the no-cue condition had a much weaker relationship, replicating the results of Lodge, McGraw, and Stroh (1989) which used a no-cue prompt. McGraw, *et al.* conclude that something in the use of an affective tag in the recall prompt, such as is routinely used in the NES surveys, changes the memory search used

²⁸ Such a question might be in the form “recall as much as you can about the candidate” compared to a recall prompt of “recall as many of the issue statements that you disliked or disagreed with” which cues affect relating to the candidates (McGraw, Lodge, & Stroh, 1990b, p. 11.)

for response.²⁹ Apparently the use of the cue triggers a process resulting in the recall of information deemed subjectively more important by the subject than is recalled without the affective cue. They posit that the no-cue retrieval process is consistent with a spreading activation principle of memory resulting in unsystematic recall of impression-relevant attributes (Wyer & Srull, 1988.)³⁰ However, when recall is cued by an affective tag, memory activation becomes systematic, resulting in a memory search for the affective tag and the retrieval of information consistent with it. Thus, while the no-cue retrieval results in activation of both subjectively important memories as well as less important ones, cued recall generates only important consistent memories. Neither type of recall affects the on-line tally, which was generated and updated prior to the recall process. If McGraw, Lodge, and Stroh's theorizing is correct it becomes clear why consistent strong correlations can be found in the NES cued-recall process while much weaker correlations are found with recall generated without a cued prompt.

Recently, Lodge (1995; Lodge & Stroh, 1993) has extended this research on the on-line processing model to develop a more complete statement of the implications of impression-driven candidate evaluation. Given the limitations of short-term working memory which are so well established (Miller, 1956), a realistic model, in Lodge's view, recognizes that as information is encountered the on-line tally is brought into working memory along with whatever stimulus began the process and the tally is updated in an

²⁹ The alternative possibility, that those in the cued-recall condition did memory processing while those in the free-recall condition did not is readily discarded since subjects were not asked to recall until after information had been processed, and both groups received the same instructions on forming an impression and the same sets of issue statements (McGraw, Lodge, & Stroh, 199a, p 11).

³⁰ Spreading activation describes a process where as one node in memory is triggered and its triggering leads to the triggering of other nodes linked to the first spreading out throughout the entire memory structure related to the initial trigger. As the activation spreads it gets weaker, so that

averaging procedure in which prior experience counts for a lot. The tally is then returned to memory and the stimuli that informed it may also enter long-term memory either creating new attribute nodes connected to the superordinate person node, or strengthening associations with existing nodes, if similar information had been previously encountered. Because associations in memory are strengthened only by their reactivation, over time links to nodes which are not reactivated will weaken. Lodge (1995) speculates that one cause of citizen's inability to provide many campaign memories may simply be due to the fact that much information (like specific issue stances) is not encountered very many times over a campaign, while other types of information -- party, names, major themes -- are encountered over and over again.

Lodge (1995) describes seven implications of the on-line model which should be of interest to political scientists. First, the model is affect-driven. It is the affective content of messages which informs the on-line tally. In this way, the tally is a summary of likes and dislikes about a candidate's messages. Second, evaluations change in accordance with a sequential anchoring and adjustment process. The initial opinion about a candidate provides an anchor from which any movement based on new information will begin. Thus, new information carries less weight than old, as the on-line tally represents the average of all previous assessments. While an issue stand learned recently might carry the same weight as it would have had the stand been encountered earlier in the evaluation process, its effect on the on-line tally would be attenuated because the new information carries less weight than the sum of all of the previously learned information. Third, as proposed by the Stony Brook model, the candidate evaluation process is not

additional node triggering will stop either when the strength of the activation fades or when all related

comparative. That is, evaluations are made of each candidate independently, based on whatever information is at hand for them. The implication rising out of this is that there is no direct comparison issue by issue of the candidates during the impression formation process. A fourth implication arising from the Stony Brook model is that since people forget details quite rapidly unless there is reinforcement of the initial information (Lodge, Steenbergen, & Brau, 1995) relying on recall of available information which is accessible in memory would be a poor way to make a decision. If people use memory processes in something as complicated as candidate evaluation, then the likelihood exists that the quality of their decisions would be quite low. Fifth, Lodge and colleagues rely on Anderson's (1981; Anderson and Hubert, 1963) dual memory model (Lodge & Stroh, 1993) to argue that the on-line tally is maintained in an impression-driven memory process, while the attributes that informed the tally are maintained in a fashion that they can be independently recalled apart from the judgment itself. Sixth, because the study of candidate evaluation is a study of a process, it cannot be readily examined using cross-sectional methods. Thus, Lodge argues, it is necessary to approach the question of building models of evaluation through process-tracing techniques which can follow the route taken by decision-makers from start to finish. Finally, Lodge's seventh implication is simply that voters may take into account far more information than is obvious from the use of either cued or uncued recall memory. Thus, while citizens may still fall somewhat short of democratic ideals in their attention to the political arena, political scientists' existing views of voters as uninformed in making their choices are off the mark.

nodes have been triggered (*c.f.* Anderson, 1983).

While the experiments described above all point in the same direction, there is some question as to the accuracy of the model outside of the evaluation of a single political figure. Where presidential campaigns pit two or more candidates against each other in an information rich environment, the Stony Brook experiments have generally presented subjects with only one political figure and a simple list of attributes related to that person. The results of these one-figure studies have then been used to draw broad conclusions about the use of on-line processing during an election. Recognizing the need to move into a multiple candidate environment, Lodge and his colleagues have recently reported an experiment in which two candidates were presented (Lodge, Steenbergen, & Brau, 1995.) The primary purpose of this study was to investigate the connections between the contents of memory and the assessment of candidate evaluations over time. The basic experimental design was similar to that used in previous studies, with the two primary differences the use of a one-page campaign fact sheet that included information about two candidates, rather than just one political actor, and the introduction of a variable delay between exposure to the campaign information and the request for the recall of information. The campaign fact sheet was intended, according to the researchers, to provide a content-rich environment including seven complex issue position statements for each candidate, along with personal information about them (p. 313.) The issue statements included both an overview of the candidate position on each issue (the “gist”) and a more detailed description of proposed policy (the “specifiers.”) The information sheet was arranged on a single page in two columns, each headed by a candidate’s name and containing the fourteen statements. Candidate statements were thus aligned next to

each other for each issue and subjects could readily obtain the stance for both candidates on each issue at any time.

The variable delay in the memory test portion of the study was designed to test the degradation of memory over time, and especially to examine whether the memory of the evaluation (the on-line tally) degrades at a differential rate compared to memory for the specific information which informed the tally. In addition, because the messages provided were complex -- containing both “gists” and “specifiers” -- Lodge, et al., were able to test whether subjects recalled different parts of each position at different rates. As anticipated, subjects forgot information at a fairly rapid pace. In fact, few subjects could recall any specifiers even when asked to remember only one day after exposure to the information. And while more could recall a few gists, memory for the gists decayed quickly, so that within five days there was less than a 50% chance of a subject recalling even one gist. As Lodge and his colleagues note,

The conclusions to be drawn from these analyses is clear: memory for campaign messages not only fades but fades quickly, the half-life of the message typically being less than a week (p. 315.)

If any more were needed, these results could be seen to add conclusive evidence that memory-based models of the vote choice are not adequate to explain how voters process information. On the other hand, memory for the evaluation of the candidates, represented by the on-line tally, was shown to be strong whether subjects were queried one day after participating in the experiment or 31 days. Little decay in memory for the evaluation of the candidates was seen.

As the Stony Brook team points out, evidence for the validity of an on-line evaluation is not the same as evidence that voters take into account the messages they are

exposed to when making their evaluations. That is, the question of whether voters are responsive to campaign information must be addressed. If it is true that citizens cannot recall campaign information, and an on-line evaluation is being formed, we are still left with the question of whether the lack of recall is related to on-line processing or to a lack of responsiveness to the campaign information. Lodge, Steenbergen, and Brau (1995) address this question by assessing to what extent the messages in their campaign information sheet can be used to predict the evaluation of candidates. The evaluations of their Republican and Democratic candidates were regressed individually on subjects' evaluations of the seven issue positions they encountered on the information sheet, their recall of those positions, and party identification. For both candidates, the original issue positions were strongly significant, while the recall information was far less important. In fact, removal of the recall variable had no significant effect on the model, whereas removal of the original issue positions greatly reduced the fit of the model (p. 317.)³¹ It would appear that voters are, in fact, responsive to the messages they receive, whether or not they can actually recall the details. Thus, Lodge *et al.* note, it is probably not very important for theories of democratic accountability and voter participation that citizens be able to recall (for survey researchers or anyone else) the details of the campaign just past.

³¹ An additional manipulation in the experiment was inserted into the campaign information sheet. For the Republican candidate, all issue positions were stereotypic. For the Democrat, however, a mix of positions was provided, with the candidate taking typical Republican stands on the death penalty and cutting programs to balance the federal budget (p. 314.) In the analysis of the impact of the campaign information on evaluation, the campaign information variable rivaled party identification as a predictor, while for the Republican, party was quite a bit stronger (Table 2, p. 317.) Thus, in situations where the candidate is less predictable than normal, campaign information appears to play an important role.

Critiques of the Stony Brook Model

While the application of the on-line model of evaluation to political campaigns is relatively new, some researchers have questioned its appropriateness. Zaller (1992) criticizes the on-line model as "just a variant of the old notion that survey responses represent *revelations* of preexisting states of opinion, a notion that, as I have argued at length, fails to work very well" (p. 279, emphasis in original.) Writing from the perspective of attitude formation and survey response, Zaller argues that citizens do not generally have long-term political attitudes stored in memory, waiting to be probed by a survey researcher (p. 62.) Instead, attitudes are formed only when required in response to a prompt -- whether that prompt is a survey, an acquaintance talking politics, or an election -- and therefore to suggest that voters maintain some ongoing evaluation of the political environment is misguided. Zaller's argument, however, appears to rely on a conception of the on-line tally as a type of permanent underlying political attitude, where the psychologists who use the concept clearly mean it to exist within the context of a specific evaluation goal (Hastie & Park, 1986; Lodge, McGraw, & Stroh, 1989.) Thus, Zaller might well be correct when considering attitudes generated independently of a goal to evaluate political candidates. It is less likely, however, that specific reactions to presidential contenders are generated on-the-fly in response to prompting (McGraw, Lodge, & Stroh, 1990b.) Evidence is strong that when people expect to be making an evaluation, information encountered as part of that evaluation process is integrated on-line (Anderson & Hubert, 1963; Anderson, 1981; Hastie & Park, 1986) and there is little correlation between the contents of memory and the evaluation itself. Zaller does show strong relationships between political attitudes as evaluations of particular policy options

and "top-of-the-head considerations," however, he does not successfully dispose of the possibility that such considerations are *post-hoc* rationalizations (Rahn, Krosnick, & Breuning, 1994; McGraw, Lodge, & Stroh, 1990b) nor does he seem to recognize that findings in the domain of policy-based attitude formation may not apply within the context of candidate evaluation (p 63, note 13.)

The Stony Brook researchers have relied on experiments while Zaller based his conclusions on survey research. A recent study by Cook, Crigler, and Just (1995) used in-depth interviews of 48 citizens during the 1992 presidential election campaign. These respondents were interviewed four times during the campaign season with each relatively unstructured interview running from one to two hours (p. 8.) The resulting transcripts, upon coding, were used as the data to examine several implications of the on-line model. Cook and colleagues, citing Hastie and Pennington (1988), argue that a hybrid memory process may be active during a campaign. Voters may not actually make their evaluations until called upon to do so on election day, but the evaluation will be informed by inferences about the candidates generated and stored on-line when information is initially encountered. Thus, rather than maintaining an overall evaluation counter on-line, as Lodge argues, Cook, *et al.* posit that voters infer conclusions about individual candidates as they encounter new information and recall those conclusions from memory when the time comes to make an overall judgment. As a result of the interviews with their panel, Cook and colleagues found support for this intermediate model, with citizens acting neither in a clear memory-based approach as dictated by Kelley and Mirer (1974) and other traditional models, nor in a purely on-line processing mode. Instead, voters seem to

make intermediate evaluations about the candidates that relate to the ultimate overall evaluation, which itself does not appear until close to election day.

Even though the Cook, *et al.*, project appears to cast some doubt on the pure on-line model as a realistic depiction of how voters make candidate evaluations, some *caveats* must be noted. It is important to recognize that participants in the interviews were asked simply to discuss the candidates and the election in whatever terms they wished. During the bulk of the interview, the researchers provided no direction, simply probing with statements like "tell me more," rather than directive statements (p. 8.) Thus participants spoke in their own words and focused on whatever they considered important. During this process, the authors note that most people spoke "in the here-and-now" with little prospective or retrospective discussion. This suggests that even though citizens were very able to discuss candidates, there is little indication of memory processes in such discussion. The on-line model does not suggest that voters will be unable to discuss the election, simply that past considerations that factored into current evaluations will tend to be discarded in favor of simply maintaining the evaluations. Cook, *et al.*'s suggestion that the on-line model is weakened by the presence of interim evaluations is not necessarily as clear-cut as they would have it. While there is no doubt that voters hold intermediate evaluations -- such as "Bill Clinton = questionable character" or "George Bush is a competent leader" -- which themselves are products of bits of information not necessarily remembered, such evaluations could certainly co-exist with an overall judgment counter arrived at simultaneously with these evaluations. Evidence to support this is presented in Cook, *et al.*, Table 3 where they note that 10% of all considerations provided by participants were summary judgments of the candidates.

While Zaller's (1992) arguments against the on-line model appear to miss the mark, the Cook, *et al.* study leads to some questions about the applicability of the Lodge on-line model in a real-world political campaign. To date, the Stony Brook model has been developed with exclusive reliance on experimental data. While results are quite strong, some credence has to be given to a study using real voters during a real election campaign. More important, however, with the exception of one recent report (Lodge, Steenbergen, & Brau, 1995)³² the Stony Brook model has been developed using evaluations of a single political actor outside of the campaign environment. What may be applicable to the evaluation of one person may not hold when multiple evaluations must be made and then compared. It seems quite clear that in evaluating a single political figure the well established, psychologically valid, person-perception processes are activated, and if subjects are expecting to make an evaluation, they will process the information on-line. However, it seems somewhat of an unwarranted leap of faith to assume that what occurs during the evaluation of a single person necessarily holds in an environment where two (or more) people are competing for the vote, presenting information about themselves and their competitor. Voters must maintain either multiple tallies or some single comparative tally, if they are to process the information as the Stony Brook model posits.

Some additional evidence that a campaign environment matters may also be found in Lau and Redlawsk (forthcoming.) Using a computer-based simulation of a

³² As described above, this study was not designed so much to test whether the on-line model holds during a two candidate political campaign, but instead to examine further the implications of memory and the on-line model, and to establish whether on-line evaluators are influenced by the information they can no longer recall. Thus, while a two candidate environment was used, one can not use this particular experiment to insist that the on-line model holds in the dynamic environment of a multiple candidate campaign.

presidential election campaign, this study examined the process by which voters select and use campaign information such as candidate personality, issues, group endorsements, and polls. While not intended to directly confront the on-line model as Zaller and Cook, *et al.* do, our study finds that memory plays a significant role in guiding voters toward choosing the candidate who best fits their own preferences. A quick consideration of the environment of a political campaign may make clear why this is so. When information is easy to manage -- as in an experimental setting evaluating a single politician from a written list of attributes, or in a simple side-by-side comparison sheet (such as used in Lodge, Steenbergen, & Brau, 1995) -- maintaining an on-line tally is a simple, cognitively efficient way to function. But during a political campaign, there may be times when it is to the benefit of the voter to make a direct comparison on particularly salient issues across the competing candidates. Because information on issue stands rarely appears in a convenient side by side comparison during a campaign, voters who can remember particular issue positions of one candidate so they can then compare those positions to another candidate, may have an advantage in choosing the candidate closest on those issues. Thus, memory may matter during a campaign, not to the extent that voters can recall large numbers of positions after the campaign is over, but instead to facilitate candidate comparisons, which once made may then update the on-line tally.³³ To the extent that memory serves this purpose, it may lead to "better" decisions than would be possible with purely on-line processing of information.

³³ Further discussion of this argument will be provided in Chapter 6, in which the role of memory during a competitive political campaign will be examined in depth.

Conclusion

The Stony Brook on-line model has amassed an impressive array of evidence in its favor. It is psychologically sound, flowing out of many years of studies showing person-perception to proceed in a generally on-line fashion, as long as an evaluative goal is in mind. There is little doubt that voting certainly can generate evaluation as a goal. Clearly, when potential voters encounter campaign information from whatever source, it is evaluated in the context of an election and of the ultimate need to make a candidate choice (or to abstain from voting, which is of course, a choice in and of itself.) The laboratory evidence is clear. Subjects do not show significant links between the contents of their memories and the evaluations they make in the lab. If the on-line model is accurate, we can apparently breathe a sigh of relief for democracy since voters would be capable of making a choice with a much larger base of information than has been assumed to be the case in the past.

Yet, there are some problems with the model, especially in its insistence that memory has no direct influence in the decision-making process. Recent studies by Cook, *et al.* and Richard Lau and I, seem to show some role for memory, either in maintaining a set of inferences which are consolidated at the moment of decision (Cook, Crigler, & Just, 1995) or in facilitating comparisons across candidates at least on important considerations (Lau & Redlawsk, forthcoming.) This suggests the possibility that while evaluation of a single candidate in a relatively controlled environment is an on-line task, voting in a real-world election where information flows in a dynamic and disorganized way, is not. Thus, it becomes important to further investigate the Stony Brook model and to extend it beyond the single individual to a multi-candidate election environment.

While Lodge and colleagues have recently begun to do this, they continue to use the same static methodology in their experiments. The Lau and Redlawsk methodology, presenting a computer-based election simulation, is better positioned to examine the multi-candidate environment. As will be detailed in the next chapter, this election simulation is everything that the Stony Brook experiments are not -- dynamic, time constrained, and reasonably accurate in mimicking the flow of campaign information throughout an election campaign. Subjects are faced with making a vote choice, as they are in the real world, between multiple candidates espousing various positions. Thus, the simulation provides a more realistic base from which to compare the Stony Brook on-line model with its memory-based competitor.

Chapter 3

The Implications of On-line Processing in Political Campaigns

Political scientists have long noted that voters do not seem to have a lot of information about politics, and that what information they do have often appears to be confused and contradictory. The Columbia studies (Lazarsfeld, Berelson & Gaudet, 1944; Berelson, Lazarsfeld & McPhee, 1954) noted that most people paid relatively little attention to politics. Campbell, et. al. (1960) found only small fraction of the public to be highly knowledgeable about the political world. Converse (1964) even went so far as to suggest that most people do not hold "true attitudes" on most political matters, and that their responses to questionnaires might be essentially random. Zaller (1992) recently argued that survey response does not represent some single deeply held underlying belief about the attitude object. Instead, it is a "top-of-the-head" reaction influenced by the intensity and direction of political communications. In other words, if voters were to execute the detailed memory searches posited by most voting models, they would find very little of substance to retrieve. Yet, the indisputable fact remains that models of the vote choice, especially those predicated on open-ended likes and dislikes about candidates, appear to have very high predictive capability (Miller, Wattenberg & Malanchuk, 1986; Kelley, 1983; Kelley & Mirer, 1974.) How can this predictive power be squared with the empirical data that voters do not seem to know much about those for whom they are voting?

More important, perhaps, is the question of squaring this predictive power with well-established human information processing limits. A long line of research has established humans as "cognitive misers" (Fiske & Taylor, 1991) with limited resources

to devote to any kind of information processing (e.g. Simon, 1956, 1985.) These resources include a very limited short- term memory in which all conscious information processing occurs, as well as an inability to pay attention to every stimulus that is present in the environment. Further, cognitive limitations are compounded by the limitations inherent in everyday life. Even in the middle of an exciting presidential election campaign, during which voters can hardly avoid being exposed to large amounts of campaign information, elections are not very important in the day-to-day lives of most people. Thus the efficient and reasonable thing to do, except perhaps for the political junkie, is to pay the least amount of attention necessary to learn whatever the voter feels is required to choose from among the candidates.

As an alternative to memory-based evaluation of political candidates, the Stony Brook on-line voting model (Lodge, McGraw, & Stroh, 1989; McGraw, Lodge, & Stroh, 1990a, 1990b; McGraw & Pinney, 1990; Lodge & Stroh, 1993; Lodge, 1995; Lodge, Steenbergen, & Brau, 1995) appears to provide an answer to the limitations of human information processing. Lodge and his colleagues, in adopting the social-psychological view of people as on-line processors (Hastie & Park, 1986), posit that evaluations of political candidates are made on an ongoing basis. As information is encountered it is used to update an on-line tally (the OL Tally) which contains a summary evaluation of the candidate. Once used in this way, the details on the information are no longer needed, and may be discarded. This model embraces the constraints of humans as limited information processors. First, the only information that must be stored in and retrieved from long term memory is the OL Tally for each candidate and some minimal information about who the candidates are. Note that this does not suggest that more

information is never kept; just that it is not necessary to do so. Second, the processing required in working memory under this model is much less than in memory-based models which posit searching the contents of memory at the moment of decision. An on-line voter, upon encountering new candidate information, need only retrieve the OL Tally, evaluate the new information and use the evaluation to update the OL Tally. Third, when the time comes to evaluate the candidate (*i.e.* to vote) the voter need only retrieve the OL Tally for each candidate under consideration and vote for the one with the highest evaluation. There is no need to retrieve memories of information previously received, no need to do complex mental gymnastics, and no need to tax the limits of working memory. The OL Tally, while an exceedingly simple piece of information to retain in memory, is in fact, the summary of all information experience by the voter.

However, the Stony Brook model can not answer as easily the question of why reported memories of candidate likes and dislikes are so powerful in predicting the vote and why models based on the standard ANES survey questions can perform well. If the on-line model is right, voters need not keep the details in memory, and we would expect that memories might correlate rather weakly with vote choices. But the opposite usually seems to be true in survey-based data; strong correlations are often found. Researchers in the survey tradition using open-ended likes/dislikes questions find consistent correspondence between the vote choice and open-ended likes and dislikes about the candidates (See Kelley, 1983, for an example.) But rather than showing that voters do use memory, Rahn, Krosnick and Breuning (1994) argue that such correspondence could come from an alternative source. Campaign memories may well be rationalizations of a decision already made. Drawing from the cognitive consistency theories of Festinger

(1957) and Heider (1958) they argue that voters may be motivated to adjust the “memories” that they report to better fit with the vote choice they have made. Thus, if the reported likes and dislikes are adjusted to reflect the choice already made, it should come as no surprise that a relationship exists between them and candidate evaluation. (see Hastie & Park, 1986.) The question then, is not why reported memories correspond with candidate choice, but instead whether that correspondence is meaningful in describing how voters make their choice.

If Lodge and colleagues are correct and the relationship is not meaningful, the potential exists to revise not only how we model the vote decision itself, but also to question whether the results of survey-based methods are useful for understanding the voting process. Voters who maintain an OL Tally are not very likely to keep much of the original information they encountered in memory. If they do not keep the information in memory it will not be available for them to recall or recognize when asked to do so by a survey researcher. Indeed, the rationalization process posited by Rahn, *et al.*, suggests that voters will simply use whatever information is available -- and the actual vote decision is a significant part of that information store -- to construct answers from the fragments of information readily available to them. Not only will these responses then come primarily from rationalizations, but the data that inform them will not represent even a reasonable subset of the information to which voters were exposed (Lodge, McGraw & Stroh, 1989.) This available subset of information exists even though voters need only maintain the OL Tally in order to vote, because some of the information and inferences from the campaign are inevitably also stored in long term memory. Once the vote has been cast, voters can retrieve the strongest associations with each candidate, if

asked to do so. But, these associations may be only fragments of the campaign.³⁴ So instead of thoughtful recollections of the real reasons for the vote choice, researchers have only these reconstructions and justifications with which to work. Inevitably, because those associations were created from information that was used initially to inform the OL Tally itself, the reported associations (whether reported as likes/dislikes, or as reasons given for the vote choice) will certainly correlate with the vote itself. However, the Stony Brook researchers and Rahn, Krosnick & Breuning (1994) argue that these relationships will be weaker than correlations between the evaluations of each item as it was seen and the vote choice. Thus, the existence of positive correlations between reported reasons for the vote and the vote itself cannot prove or disprove the use of on-line processing.

It might be useful to summarize the points made so far. First, voting models which suggest that issues must play a role in voters' decision-making (*e.g.*, Stokes, Campbell, & Miller, 1958; Kelley & Mirer, 1974; Kelley, 1983; Downs, 1957) require the commitment of significant memory resources on the part of voters. Second, standard open-ended survey questions give the impression that voters take very little real information into account when they make their decision. Respondents do not give very many responses on average to such prompts, and while the responses they do give tend to correlate fairly well with the reported vote choice, reliance on so little information to inform a vote decision leaves open the question of how good a job voters can do in making a choice. However, Lodge and his colleagues at Stony Brook have suggested that it is not the voters who are flawed, but our understanding of what they really do. If, as he

³⁴ See Boynton and Lodge, 1996, for a description of how this associative memory process operates,

argues, voters process the election in an on-line manner, then open-ended questions are eliciting rationalizations, rather than reasons. The recent study by Rahn, Krosnick & Breuning (1994) supports this interpretation of the standard like/dislike questions.

We cannot capture the necessary data from survey research and other traditional means to properly distinguish between on-line evaluation processes and memory-based decisions. It takes a methodology capable of tracking the decision-making process *as it occurs* in order to track the way in which voters actually use the information they encounter during an election campaign. To date, the Stony Brook experiments have provided some intriguing possibilities, but have done so in an environment that is nothing like a political campaign. Their studies have typically asked subjects to review written materials about a single political figure and then to evaluate that person. While their results point strongly in the direction of the on-line model, there is a need to evaluate the model within an electoral setting. In addition, the results they have reported to date have been generated from experiments in which relatively small amounts of information have been presented to subjects in an easy-to-keep-up-with (written) format. While the conclusions they reach seem strong, there is a need to more closely duplicate the free-for-all that is an election campaign.

The electoral setting is important because one can easily imagine that conditions surrounding an election differ greatly from those surrounding the experiments previously carried out. Elections are more attention-getting than the task of evaluating a Congressman's campaign literature (Lodge's basic experimental setting.) Information flow during an election can vary greatly, making it difficult for voters to keep up, and

difficult for them to find the information they wish to use to make an evaluation. And while some elections may be relatively easy to keep up with -- less information, fewer candidates; others -- particularly multi-candidate party primaries -- might be quite difficult to track. If the on-line model can continue to provide a better explanation of the processes people use during an election campaign, as it has in a single candidate situation, then we can begin the task of redefining our view of voting.

The goal of the current project is to provide an environment in which the implications of the on-line model can be tested. The environment, a process tracing methodology based on a computer simulated presidential primary election campaign, is described in the next chapter. The remainder of this chapter is devoted to explication of the implications and hypotheses arising out of the comparison of memory-based and on-line voting models.

Hypotheses

Five major implications of the on-line model for voter decision-making are examined in this study. These implications lead to a number of testable hypotheses about the ways voters using an on-line process might differ from those who could be accurately described by memory-based models.

Implication 1. Motivated Cognition: The goal influences the processing mode.

From the earliest studies (Lodge, McGraw, & Stroh, 1989,) Lodge and his colleagues have made clear that the motivation of subjects in their experiment has been crucial in determining whether subjects used an on-line or a memory-based process. In this they follow Hastie and Park (1986) who differentiate between on-line and memory-based

processing, arguing that on-line processing takes place in most evaluation tasks. The Stony Brook subjects who were given the specific goal to *evaluate* a political figure appeared to use on-line processes, while those subjects who were told to assess statements about the figure for "readability and accuracy" (to keep subjects from forming an impression of the figure) showed a greater use of memory-based processing. Recently Lodge (1995) has distinguished *evaluation* which initiates on-line processing and *justification*, which initiates a memory-based approach. This leads to:

H_{1a}: Voters who expect to be required to *explain* the reasons for their vote choice and to list what they remember about the candidates are more likely to engage in memory-based processing than are voters who do not expect to make such justifications. Thus they will show greater correlation between the contents of their memories and their vote choice.

Because political expertise should provide a voter with a more complex cognitive structure in which to maintain information about elections which should also make it easier for the expert voter to store and retrieve information, an additional hypothesis about expertise and motivation is generated:

H_{1b}: More expert voters who expect to be called upon to explain their vote will do the most memory-based processing, while less expert voters expecting to explain their vote will do somewhat less. Expertise should not have any affect on the information processing of those voters who do not expect to be tested on their recall or to have to justify their decision.

Thus, subjects who have significant political expertise and are warned about the need to justify their decision and record their memories should be able to recall specific information about the campaign reasonably successfully, while non-experts warned about the need to remember information will find it far more difficult to do so.

It is important to note that if we consider that an election campaign is by its very nature primarily an evaluation task and less so a justification task, it should follow that

voters will be using an on-line process most of the time, according to Hastie and Park (1986.) Thus, in order to test hypotheses that distinguish between on-line and memory-based processors, some effort is necessary to interrupt the natural on-line process. In Lodge, McGraw & Stroh (1989) subjects to be assigned to the memory condition were told specifically to examine a series of statements for readability while the other subjects were instructed to form evaluations of the Congressman making the statements. As described more fully in Chapter 4, the current project proceeded under the same assumption, that without some instruction to trigger a memory-based process, voters would default to on-line processing.

Implication 2. Complexity: The more complex the decision environment the more difficult is memory-based processing. Lodge has found that on-line processing proceeds even in a one candidate setting. However, it may be that in an electoral setting, a two candidate election is sufficiently simple enough to allow voters to maintain more information in memory about each candidate and to actually use those memories to determine the vote choice. On the other hand, in a multi-candidate election, the information load may quickly become too great for anyone to process efficiently, if there is a significant reliance on memory. This leads to the hypothesis:

H_{2a}: Voters faced with a multi-candidate (*i.e.* > 2) election will be more likely to engage in on-line processing than those faced with a two candidate election.

Once again, political expertise should be a factor in processing, interacting with the complexity of the election. Those with well-developed political knowledge structures are known to be able to better encode, decode, and process political information. This ability should interact with complexity to mitigate the effects of the more complex election:

H_{2b}: Voters with greater political expertise will be able to organize campaign information in a more complex fashion, at least partially mitigating the effects of the increased complexity of the multi-candidate election, allowing them to engage in more memory-based processing when compared to less expert voters.

Implication 3. Speed: On-line processing should be faster than memory based processing. It should take less time for a voter to retrieve the OL Tally for candidates than to retrieve detailed memories and make the required calculations to derive an evaluation. Thus, if on-line processing is taking place instead of memory-based processing, evidence should be found in the speed with which subjects can evaluate candidates. As a campaign goes on and more information is encountered, the memory-based model would suggest that more has to be considered, and more time will be necessary to make the evaluation. The on-line model leads to the prediction that no matter how much information has been encountered, the time required to make the evaluation will not significantly differ during the course of a campaign. Thus:

H₃: Voters who are using on-line processing will make equally fast evaluations at the beginning of the campaign and the end of the campaign. On the other hand, voters using memory-based processing will be able to make candidate evaluations significantly faster early in the campaign compared to later in the campaign. On-line voters should make faster decisions late in the campaign, even though they are likely to have viewed more information overall.

Consequently, while there may be very little difference in the speed with which on-line and memory-based processors can make evaluations early in the campaign, by the end of the campaign season voters using a memory-based process will have to spend significantly more time recalling the information on which they base their decision.

Implication 4. Voters make an evaluation as they encounter each piece of information. In the on-line model, information that is encountered is immediately evaluated within the context of an existing tally of the candidate. This immediate evaluation process means that the OL Tally is a function of all information encountered. Since the vote is a result of a comparison of OL Tallies for the candidates, the content of each individual evaluation for each item encountered should be more strongly correlated to the vote than reasons reported from memory after the vote. In addition, Lodge argues that a primacy effect is operating during on-line processing. In this, he follows Anderson and Hubert (1963) and Hastie and Park (1986) who argue that information encountered early in the decision task will create an anchoring effect, and thus will be more important to the final choice than that encountered later. Thus:

H4: For voters using an on-line process, information encountered early in the campaign will be more diagnostic in predicting the vote than will information encountered later in the campaign. For voters using memory-based processes, information encountered late in the campaign (which should be more easily remembered) will be a better predictor of the vote.

Implication 5. Decision Accuracy: On-line voters can take more information into account in making judgments. Given the well-established limits of human information processing combined with the lack of centrality that politics occupies in most people's lives, it would seem that any process that would allow judgments to be made relatively easily with large amounts of information should lead to higher quality decisions. On-line decision-making, by its nature, allows much more information to be integrated into the judgment counter than could ever be used to make a memory-based judgment. Memory judgments are constrained by the limits of working memory, so that only a few bits of

information can be integrated at any given time. Thus, in a political campaign in which there are only two candidates there might not be very much difference, but in a campaign with larger numbers of candidates, on-line processors should have an ability to sort out the greater number of alternatives much more effectively. This leads to the hypothesis:

H_{5a}: On-line voters should be more likely to vote for the correct candidate in elections where there are more than two candidates, while both on-line and memory-based processors should be equally likely to choose the correct candidate in two candidate elections.

While the definition of an accurate decision (selecting the correct candidate) is developed more fully in later chapters, this study makes the normative assumption that to vote for a correct candidate is to choose the candidate holding a combination of issue positions on salient issues closest to the positions expressed by the voter. If this hypothesis can be supported by the data then it becomes necessary to question the long held political science view of the voter as unable to carry out his or her civic duty.

Hypothesis H_{5a} should hold under typical American political conditions, where most candidates hold relatively coherent positions which come under the broad rubrics of the Republican and Democratic parties. As long as the political environment is thus reasonably predictable, on-line processors should have an edge because they can count on a logically ordered political world in which heuristics such as party identification make sense. But, in relying on a running tally, might a voter be forgoing important information? Consider that if voters use the on-line approach to decision-making they are giving up a very important capability -- the capability of comparing the positions of multiple candidates on a single issue. By definition, the on-line approach provides no opportunity to compare information on issue i encountered at time t for candidate A with candidate B 's stand on the same issue at time $t+1$. Because there is no need to store

detailed information in memory, a voter would have to be motivated to remember information from one candidate so as to compare it directly when encountering a stand on the same issue from another candidate. Who might be so motivated? And then, who might have the ability even if they are motivated? Perhaps voters who do not fit within the standard liberal-conservative spectrum of American politics, who have non-traditional ideologies. These voters might well *have* to use memory, at least on salient issues, in order to make accurate judgments relying on comparisons between candidates. In a similar manner, when the candidates themselves are counter-stereotypic, such as a Republican big-business basher or a Democrat anti-abortion candidate, voters would not be able to assume the position of candidates based on party or other heuristics -- or would be wrong, if they did -- and would need to use memory processes to make comparisons in order to find the appropriate choice. While in an ordered environment, Hypothesis H_{5a} can be expected to hold, in a non-stereotypic campaign we have:

H_{5b}: When candidates are non-stereotypic or voters hold non-traditional ideologies, on-line processing of campaign information will lead to a worse decision when compared to memory-based processing.

Conclusion

These hypotheses are designed to tease out the differences between on-line and memory-based processors. If most of these hypotheses can be supported by the data generated from this study, then we will have evidence that given a goal of candidate evaluation, voters may well be frugal with their cognitive resources, proceeding to maintain running tallies rather than extensive information about each candidate. It is important to note that Hastie and Park (1986) suggest that finding any differences at all in

an experimental setting may be quite challenging. They point out that on-line judgments occur routinely, and that:

[b]ecause so many conditions are likely to instigate perception-based on-line judgments, the difficult question for experimenters on the memory-judgment relationship is how to produce memory-based judgments . . . [S]ubjects make on-line judgments when they believe that a judgment is likely to be required at a later point in time (p. 262.)

The inherent problem in studying an election while simultaneously trying to generate memory-based judgments is that it is obvious to subjects that they will be asked to evaluate candidates and make a decision. Thus, establishing a means to test these hypotheses was a priority in this study. A number of possibilities were considered with a special set of instructions given to subjects in the memory-based experimental condition chosen as the best alternative. As described in the next chapter, the goal of the experimental design was to interrupt what should otherwise be an on-line evaluation process in order to study the implications of processing election information on-line. The relative success of this attempt will become clear when data are evaluated in Chapter 5.

Even if, however, the effort to create two subject groups -- on-line and memory-based -- is not entirely successful, the methodological approach used in this study provides great insights into how voters use campaign information. In particular, we will be able to speculate (in Chapter 6) on additional implications regarding the use of memory arising out of the on-line model. In particular, while the on-line model argues that memory should be entirely unimportant in accounting for judgments, some evidence exists (Lau and Redlawsk, forthcoming) that *accurate* memory is a crucial element in the ability of a voter to choose the candidate who best represents his or her interests from among the set of candidates available in the dynamic environment of a campaign season.

While Lodge (1995) denies any role for memory in an on-line process, the Cook, Crigler, and Just (1995) findings discussed in Chapter 2 also suggest that the Stony Brook model is underspecified. The important point here is that whether or not on-line processing takes place, a certain amount of memory-based processing may be important to decision accuracy. If so, then a complete model of voter decision-making may incorporate elements of both the traditional memory-based approaches and the perhaps more psychologically valid on-line model.

Chapter 4

Method, Design, and Variable Construction

The Stony Brook on-line model of candidate evaluation is, at its heart, a process model of the vote that purports to explain the way voters use campaign information in order to make decisions about which candidate to support. Campaigns are inherently dynamic events that occur over a certain period of time. They have a defined beginning (around the time candidates throw their hats into the ring) along with a clear ending (on election day.) Throughout the campaign season, citizens are inundated with information about the candidates, whether or not they wish to pay attention to politics.³⁵ One would have to read no newspapers or magazines, watch no television and listen to no radio, and have no contact with other people in order to avoid acquiring at least a little information about the candidates running for president. The amount of information available during a campaign varies, however, depending on the campaign cycle itself. During a contested primary season, for example, significant amounts of information are readily available, at least in those states holding primaries. On the other hand, once a candidate has locked-up the nomination by acquiring enough delegates, or by forcing all opponents out of the race, the amount of information about the campaign may drop temporarily, only to be revived during the conventions. Likewise, while the *amount* of information varies, so does the *type* of information available. Lau (1992) examined a selection of newspapers during the 1988 presidential election season and found evidence that issue-oriented

³⁵ Obviously, this is not true for every type of election. In most cases there would appear to be much more information readily available to the electorate during a presidential election campaign than, say, during most city council campaigns. As this study focuses specifically on mimicking the presidential primary election season, any comments regarding information availability are meant to refer to presidential campaigns.

information becomes much more readily available in newspaper stories about the election as campaigns progress, while candidate background information (such as family, education, prior jobs, etc.) predominates early in the primaries and then again early in the general election season. Other types of information also appeared to differ in their availability during the campaign, with what Lau calls “hoopla and horserace” (campaign events and polls) consistently declining in relative frequency until the last weeks of the campaign, when such events like final polls dominate all other information.

So campaigns are dynamic, information flows vary, and citizens can learn something about the candidates without any effort at all, or can learn much larger amounts by actively seeking out information. But how do political scientists usually study this ever-changing environment? Historically, elections have been studied using static techniques such as surveys administered before or after the election (or sometimes both.) More recently, researchers such as Cook, Crigler, and Just (1995,) with in-depth interviews, and Lodge and his colleagues, using experiments, have moved beyond surveys. But neither of these approaches is completely up to the task of understanding information acquisition and use during a campaign. In particular, as discussed in Chapter 2, the Stony Brook researchers have used an experimental design that has generally focused on the evaluation of single political figures and have always relied on subjects viewing information sheets on which all of the stands taken by the politician are listed and easily examined. Neither design comes close to collecting the type of dynamic data needed to understand a campaign. The Cook, *et al.* study, while it is based on interviews at four different points in time during an election season, cannot control for the information environment in which their respondents live. That is, the researchers have no

way to know what particular campaign information any of their respondents have been exposed to during the time between interviews. Thus, while they can perhaps draw better conclusions about how people talk about elections over the course of the campaign than can experiments or surveys, they do not have the ability to manage a crucial variable required in order to understand how voters use information.

If the on-line model accurately represents how voters process campaign information, then static methods cannot adequately capture the data necessary to understand how people use campaign information; we must go beyond reliance on the traditional cross-sectional survey techniques as well as the Stony Brook experiments which provide all available information at a single point in time. We need a methodology that can track voters as they encounter information and can record the way in which that information is accessed, examined, and used.

Fortunately, we are not limited to a repertoire of surveys, interviews, and static experiments in our quest to understand voting behavior. Psychologists and marketing researchers have long used *process tracing* methods in order to understand decision-making across many different environments. Process tracing starts with the basic assumption that decision-making in any realm is best studied by collecting data *while the decision is actually being made* (Ford, Schmitt, Schechtman, Hulst & Doherty, 1989; Jacoby, et al, 1987.) If we can find a way to collect data while a potential voter is exposed to campaign information, and if we know the content of the information to which he or she has been exposed, we then have a better method for understanding how, and under what conditions, an on-line model of candidate evaluation is operating.

Process Tracing Methods

Two major process tracing techniques have been developed: verbal protocols (Ericsson & Simon, 1980) and information boards (Payne, 1976.) With verbal protocols, subjects are asked to "think aloud" while they are making a decision. These protocols are recorded and later transcribed and coded. Information board techniques present subjects with an $m \times n$ matrix of information. (See Figure 4.1 for an example of an information board design.) Subjects then choose among several alternatives (columns of the matrix) which differ on one or more attribute (rows). This technique has been widely used in consumer research, where subjects turn over cards containing attribute labels in order to read the detailed information about that alternative-attribute pair. The researcher records the order in which items are chosen and then analyzes this protocol to determine the types of search patterns employed during the information acquisition process. The amount, type, and direction of the information searched has a direct impact on the decision made.

Insert Figure 4.1 about here

Process tracing techniques seem to be readily applied to decision-making in a number of contexts, including selecting between product brands (Bettman & Park, 1980) and choosing an apartment (Staelin & Payne, 1976.) But, while information boards have had a long and fruitful history in the study of decision-making, they have rarely been applied to making decisions between candidates. Only two studies appear to have used this technique. Herstein (1981) used a traditional information board to trace evaluation of

two candidates on a number of different attributes. In addition, he had his subjects “think aloud” as they viewed information about the candidates. The analysis of both the information search patterns and the verbal protocols provided by this information processing approach provided little evidence for standard voting models. Instead, Herstein proposed a fairly simple, yet powerful, model of the vote decision based on the cognitive abilities of his subjects. More recently, Riggle and Johnson (1995) have begun to employ a computerized information board (designed in the classic matrix form) to study age differences in political decision-making, using a senatorial election as the decision task. They have identified seven prototypical search patterns, finding that older subjects are much more likely to engage in searches within candidates, using a satisficing strategy (Simon, 1956) to determine final choices.

While both studies use process tracing techniques effectively, they rely on static information boards, with all possible candidate-attribute pairs always accessible to subjects, and where subjects can spend as much time as they wish learning about candidates with no risk of missing any information -- despite the fact that political campaigns are dynamic events, where the information environment is constantly changing. Because elections take place over a significant period of time, information about candidates comes and goes, as the media focus first on one event, and then on another. Information that is available about a candidate today might not be available tomorrow. Further, information available about one candidate may or may not be available about another.

Most people learn about political candidates through the mass media. In some types of media -- generally print media -- the information "flow" is primarily under the

control of the voter. That is, the reader can choose to read some stories, ignore others, and skim still others. While the occasional large photo, or headline, might be viewed almost involuntarily, readers still have most of their information acquisition options fully under their own control. The electronic media, on the other hand, is far less under that control. Where it is easy to jump around in a print story, skipping a part and paying attention to another part, it is generally impossible to do so with television and radio. Likewise, one may store print materials and read them at another time, while few people tape the news on television to do the same. However, all media share the same feature of transience. That is, stories that appear one day as "news" will often not appear the next, unless there is an ongoing story. But even stories which run over several days eventually die out. Thus, the voter who is not paying attention while the media cover allegations of misdirected campaign funds, for example, will find it hard to get that information once the story is over. Clearly, a static information board approach to studying campaigns fails to take into account this transience. Yet, survey research can do little better. What is needed is a process tracing methodology that can model the dynamic flow of electoral information. Process tracing has proven itself as a good way to understand complex decision-making. And, from a political science point of view, voter choice during a political campaign is certainly a complex decision.

In order to better understand this complex process, Richard Lau and I have revised the traditional static information board, modifying it into a dynamic, ever changing design, which better mimics the flow of information during a presidential campaign season (Redlawsk, 1992; Lau and Redlawsk, 1992; Redlawsk and Lau, 1995; Lau and Redlawsk, forthcoming.) Where the static board allows subjects to have access

to all available information at all times, the revised dynamic board emulates the ebb and flow of a political campaign over time. The essential feature of the static information board -- the ability to trace the decision-making process as it happens -- is retained while information about candidates comes and goes. Early in the mock campaign, for example, information about the character of candidates, and hoopla and horserace features might be more available than issue positions, while later on, issues might predominate. Where standard information boards are static and easily managed by the subject, we believe that election campaigns are dynamic and unmanageable. Thus, our election simulation overwhelms subjects with information. Where standard information boards allow all information to be available whenever a subject wants it, information during a real election campaign contains a "here today; gone tomorrow" quality, as does our simulation. And, where the standard information board would make all types of information, from positions on arcane issues to party identification, equally accessible, our simulation models the relative ease or difficulty of finding certain kinds of information at different times during a campaign.

We accomplished these goals by designing a radically revised information board in which the information (or rather, the attribute labels) "scrolls" down a computer screen, rather than remaining fixed in place. (See Figure 4.2 for an example of the screen.) There are only a limited number of attribute labels visible on the computer screen at any one time. Most include a candidate's name and the particular information that would be revealed if this label were accessed (e.g. "Martin's stand on Star Wars.") The rate of scrolling is such that most people can read two or three labels before the position changes. Subjects access the information behind the label by using a mouse to

click on the label. The scrolling continues in the background while the detailed information is read, creating a "cost" in terms of missed information and mimicking the dynamic nature of election information flow. This scrolling format allows only a small subset of a very large database of information to be available at any one time, and it makes the task of processing campaign information much less manageable for the subject. In addition, the relative likelihood of any particular piece of information becoming available is controlled, so that some information (like party identification) is much easier to get (appears much more often) than other types of information (such as an obscure policy position.)

Insert Figure 4.2 about here

A Dynamic Information Board

The dynamic information board is the most reasonable way to track a political campaign short of trying to follow voters during a real election cycle. The dynamic board allows the experimenter to establish any one of a number of experimental conditions and randomly assigns subjects to those conditions. As designed, the system used in this experiment -- which focused only on a primary election campaign with multiple candidates in each political party -- can be used to study a complete primary and general

election campaign cycle as well. Further, the number of candidates can be varied, as can the amount of time available, along with other attributes of the campaign.³⁶

Information is presented to the subject on a computer screen, and the subject uses a computer mouse to make selections from whatever is currently available on screen. There are four distinct areas on the screen. The central area contains the six information boxes, which continuously move down the screen, with the box at the bottom disappearing, and a new information box appearing at the top of the stack. This is the area that subjects click on in order to learn more details about issues, candidate personality, polls, endorsements, candidate backgrounds, and any other information the experimenter makes available. Clicking on one of the boxes presents a new screen containing written information relating to the label in the box; for example, a detailed description of a candidate's position on welfare. When the subject finishes reading the information, another click of the mouse returns to the main screen in Figure 4.2. The computer is continually recording the information boxes which are presented to the subject, the order and time in which they are presented, and which ones have been selected by the subject. As a subject makes a selection the time is recorded when the selection is made and when the subject finishes reading the details and returns to the main screen. Thus, the amount of time spent examining each piece of information is recorded.

At the top of this screen is a box in which "newspaper headlines" appear and disappear from time to time. These headlines represent the type of information a voter

³⁶ The dynamic information board was written in a computer language called Toolbook and run on IBM-compatible personal computers. For details on the technical aspects of the system design, see Redlawsk, 1992; 1995.

would get by simply passing by a newsstand and scanning the newspaper. There is no additional information "behind" the headlines themselves, unlike the information boxes in the center of the screen. However, the experimenter can link specific headlines to specific pieces of information that will then appear on the screen in the information boxes after the headline disappears. Directly below the headlines and above the information boxes is a small area which informs the subject what the current "calendar month" is during the election cycle. For the primary election, the subjects begins in February and ends in April, when the New Jersey primary election is held³⁷. As the campaign continues, the month label changes appropriately. Information boxes are keyed to the month, so that the "Gallup Poll for early April" shows up when the month is April. This provides a significant amount of realism to the experiment.

Finally, the fourth area on the screen, to the left of the information boxes and the month, includes a timer and an indication of whether the subject is in the early, middle, or late part of the primary election. The timer counts down in real time the number of minutes remaining in the simulation. This was added in order to give subjects a sense of the pacing of the campaign, and to help them realize when they must make a decision. While the timeframe is dramatically shorter -- 20 minutes in the present experiment -- the effect is to remind subjects that they vote on a certain date, just as they do in a real New Jersey primary election.

³⁷ In the real world outside of the lab, the New Jersey primary is actually held in June and is one of the last primaries. The result is that New Jersey's presidential primary is usually meaningless, with the nomination having been determined earlier in the year. For the simulation, subjects were told that in 1996 the primary would be held earlier, as part of a "Super-Duper Tuesday" string of primaries which would undoubtedly determine the nominees of the two parties.

In addition to the main screen shown in Figure 4.2, and the detailed information screen that is reached by clicking on an information box, the system has several other screens. Most important is the campaign video screen. At appropriate intervals during the campaign the system can present recorded campaign commercials, with both video and audio. These are designed to "take over" the main screen so that when it is time for a campaign ad to air, the information boxes are completely covered over by the video, interrupting the scrolling boxes and allowing a subject to do nothing else while the video is showing. Once the ad finishes running, the original screen reappears and the subject can continue to examine additional text-based information until the next campaign commercial. Thus, the system is designed to mimic both of the major ways in which voters receive significant campaign information -- through newspapers and through television.

The system contains a number of other screens, including a screen on which subjects click on a thermometer scaled from 0 to 100 in order to assess their feelings for the candidates. As the assessment is made, the computer records the value of the assessment and the amount of time required to make it. The voting screen presents the candidates from whom the subject may choose when the campaign is over. The subject simply clicks on a candidate name and the vote is recorded, along with the amount of time required to make the choice. Finally, there are a number of information screens which provide subjects with instructions and the scenario.

Experimental Design

An experiment using the dynamic process tracing methodology described above was designed to examine the implications of on-line processing during a political campaign and the hypotheses detailed in Chapter 3. The experiment had at its heart the simulation of a presidential primary election campaign, presented on a computer screen over a twenty minute time period. Subjects participated in this mock primary election by viewing labels describing information about the candidates, and using a computer mouse to select labels of interest. These labels scrolled down the screen at a fairly high rate of speed, creating an environment in which a great deal of information was available. Behind each label was a more detailed statement about the candidate. There were six candidates in the primary election, split between the two parties. Subjects had to register for one of the parties prior to the election, and then could only vote for the candidates from within the chosen party.

The six candidates were designed to be very realistic and were dispersed along the ideological lines appropriate for their party. However no candidate seemed too much like an existing "real-world" candidate. By creating mock candidates crucial control was retained over the differences between subjects in prior knowledge of actual politicians. No subject knew anything about any of the candidates before the mock campaign began.

Three manipulations were embedded in the primary election, in a 2 x 2 x 3 design, in order to test the hypotheses about processing modes and memory. The first manipulation was designed to place subjects into one of the two processing modes, either memory-based or on-line. One half of subjects were randomly assigned to each condition. Research has clearly shown that on-line processing is the default method by

which people evaluate most social information (Hastie & Park, 1986; Lodge, McGraw and Stroh, 1989; Lodge 1995.) Given that all subjects knew they had to vote for one candidate, the incentive to form an evaluation and thus presumably process on-line was strong. To attempt to counter this, subjects in the memory-based condition were instructed that they would be required to list everything they could remember from the campaign once the election was over. Further, they were also instructed that they would have to justify their vote choice to the experimenter (Lodge, 1995.) These instructions, embedded in the general instructions subjects read at the beginning of the primary election simulation, were intended to create a barrier to on-line processing, and to force these subjects to operate in a memory-based mode. Subjects in the on-line condition were given the same set of general instructions without the specific paragraph describing the recall and justification requirement. (See Appendix A for the full set of instructions and the election scenario encountered by subjects.)

The second manipulation varied the number of candidates subjects faced during the primary election. One half of subjects were presented with four candidates in their party's primary (and two in the other party), while the other subjects had only two candidates to choose from in their party (and four in the other party.) This manipulation was added to vary the difficulty of the choice, presuming that a four candidate primary would be more difficult than a two candidate one, particularly since the two candidates were made ideologically distinct.

Finally, a third manipulation was designed to force subjects to make evaluations at different points in the campaign. One-third of subjects were forced to select a candidate in a "Gallup Poll" that came just over 6 minutes into the simulation (about one-

third of the way through the campaign). The second third answered the poll at about 13 minutes. The final third were never polled, and thus made their only evaluation at the end of the campaign by voting. This manipulation was intended to serve as a means to test arguments derived from the on-line model that suggest choice is simply a matter of recalling tallies, rather than searching contents of memory. Recalling the OL Tally should take no greater time whether done early or later in the campaign, whereas searching the contents of memory could be expected to require more time as the campaign progressed and more information about candidates was acquired.

Subjects

A total of 102 subjects were recruited from within central New Jersey. Subjects were recruited primarily through organizations that were invited to provide members to participate in the study. For each member provided, an organization received a payment of \$20. A wide range of organizations participated, including a YMCA, an American Legion post, and a Jewish community center, among others. Of the initial 102 subjects, three could not complete the study due to either fatigue or inability to operate the computer. Thus, 99 subjects were available for analysis. With the exception that nearly two-thirds of the remaining subjects were female, they were broadly representative of residents of Central New Jersey, although no specific attempt was made to be representative. The average age of subjects was 49.2 years, with the youngest 18 and the oldest 82 years of age. Overall, 22% of subjects were 65 or over.³⁸ The subject pool was relatively well off, with 25% earning more than \$75,000 per year, while 13% has

household incomes under \$25,000. The racial mix included only 7% non-white, somewhat lower than the surrounding area. Finally, partisanship was distributed (assigning "leaners" to their party) as 57% Democrat, 7% pure independent, and 36% Republican.

Experimental Procedure

The experiment was run from October through December 1994, using laboratory facilities available at the Political Science Department at Rutgers University. Upon arrival, subjects were given a consent form to read and sign, and the basic outline of the process was explained. The session began with a standard political attitudes questionnaire, but with a twist. After four open-ended questions which simply asked subjects to list on a sheet of paper everything they could about four political figures,³⁹ subjects self-administered the rest of the questionnaire on the computer. This served to simplify data coding for the experimenters and to familiarize subjects with the use of the computer and mouse. In addition, the data collected by the questionnaire was used to assess the closeness between each candidate and the subject on a number of dimensions. On-line collection of the information allowed the computer to automatically calculate an assessment of whether a subject voted for the correct candidate, as well as to determine the difficulty of the choice made by each subject.⁴⁰ Upon completing the questionnaire,

³⁸ Even though a significant number of subjects were senior citizens, there was no evidence that they had special difficulty using the computer. The training provided for subjects along with the design of the system meant that age was not a factor of importance in any of the analyses.

³⁹ The four figures were President Clinton, former President Bush, H. Ross Perot, and Jesse Jackson. Data from this portion of the questionnaire were coded in order to assess the political "chronicities" of each of the subjects following Lau (1989). Chronicity scores measure the tendency of citizens to view politics through one of four lenses -- partisanship, group affiliations, candidate attributes, or issues.

⁴⁰ See the discussion on decision quality below for details on how this assessment was calculated.

subjects were then randomly assigned by the computer to one of the twelve (2 x 2 x 3) experimental conditions for the mock presidential primary election.

Before beginning the primary election simulation, subjects were given up to seven minutes to practice with the system, in order to become comfortable using it.⁴¹ The practice session, simulating the 1988 general election campaign between George Bush and Michael Dukakis, contained all of the features that would appear during the actual experiment. These included a mix of information types -- issues, endorsements, polls, candidate attributes, and the like -- along with video campaign ads which appeared from time to time, interrupting the flow of text on the screen. During the practice session, the experimenter sat next to the subject and described what the subject was viewing, answered any questions about the system, and provided advice on how to use the mouse, if needed. When the subject indicated she or he felt comfortable using the system the practice session was ended and the subject was given a final opportunity to ask questions of the experimenter.

Upon expressing comfort to the experimenter, subjects were told that no questions could be answered during the campaign and allowed to begin the experiment. Before the campaign began, subjects read a detailed description of how the system worked, in order to reinforce what they had learned during the practice session. The manipulation intended to create memory-based processing in some subjects was imbedded in this set of

⁴¹ While the practice session was designed to run as long as seven minutes, no subjects used the full practice time.

instructions. Following the instructions, subjects read a scenario which explained why neither President Clinton nor Vice-president Gore were running for president.⁴²

During the campaign simulation statements about candidate's issue positions, personal traits, group endorsements, and polls were available to subjects. Subjects used the computer mouse to choose the information they wanted to examine. In addition, from time to time, campaign ads which were not under the subject's control appeared on the screen. As noted above, the videos cover the information boxes, and subjects could not choose any other information during the course of the 20 second campaign ad. Six or eight ads were presented in all during the campaign, four of which were for candidates in the subject's own party. These videos contained information on candidates' positions on various issues, as well as generic information about their political party.⁴³ In addition to the videos, headlines simulating walking past a newsstand also appeared and disappeared with regularity, and were not under the control of subjects. Over the course of the campaign, the type of information available to subjects changed according to rules established within the system. Early in the election personal background information about candidates, endorsements, and polls made up the majority of the information available to subjects. As the campaign continued, the mix changed, to reflect changes in

⁴² The scenario placed subjects in early 1996, and explained that President Clinton had decided that he had accomplished what he set out to do and was planning to retire and concentrate on playing the saxophone. Vice-president Gore, although appearing to be the logical choice to become the nominee had tragically injured himself in a nightclub, attempting to dance the "bugaloo" and was therefore unable to run. While these were not terribly realistic reasons, subjects appeared to enjoy the small attempt at humor they represented.

⁴³ Subjects who had two candidates in their own party, and four in the other party, saw eight videos. Of these eight, there were two for each of the two in-party candidates, and one for each of the four out-party candidates. Subjects who had four candidates in their party saw only six videos, with one for each of the candidates within their party, and one for each of the out-party candidates. The information in each video was unique to the candidate for whom the video ran. The information presented in the

media coverage over the course of the campaign. Specific issues stands became more available midway through, while the candidate personality items and background became less available.⁴⁴ Upon completion of a twenty minute election campaign simulation, subjects voted, evaluated the candidates, and took a memory test (unexpected for those in the on-line condition.) The memory test consisted of six pages, each headed by the name of a candidate. The order in which the pages were presented to the subject was randomized. Subjects were instructed to list everything they could remember about each candidate, no matter how trivial. They were then given a separate sheet of paper and asked to list everything they liked and disliked about their most preferred candidate. The experimenter then read each listed memory to the subject and asked for an assessment of whether the memory made the subject “feel good, bad, or neutral” about the candidate, coding the answer on the memory form.

At this point an extensive debriefing began. Subjects were shown the script of all information chosen during the campaign. The experimenter went through the script step by step asking the subject to recall what he or she was thinking while reading the information. This detailed debriefing is a modification of the Ericsson and Simon (1980) "think-aloud" protocols, which provided critical data on the nature of the ongoing

video was included in calculations of what types of campaign information subjects accessed, since all subjects saw the videos.

⁴⁴ To establish the probability of different types of information becoming available throughout the course of the campaign and the order in which the information was presented, this experiment relies on a study by Lau (1992) in which an elaborate effort was made to establish the prevalence of different types of campaign information in several national and local newspapers during the 1988 presidential election campaign. The dynamic information board system was programmed with the probability and order information which then controlled when various issues, polls, endorsements, and so on, appeared on the screen for subjects to access.

evaluations.⁴⁵ This approach was chosen to minimize its intrusiveness, while still retaining the ability to collect data on subjects' thoughts as they processed information. By using a cued recall process an accurate recollection of subjects' attribute by attribute evaluations can be developed. Subjects were also asked to evaluate the information they viewed as positive, neutral, or negative. This debriefing was tape recorded to ensure accuracy. Finally, the purposes of the study were explained and subjects allowed to ask questions. The total time required for each subject was about 2 1/4 hours.

Coding and Key Variable Construction

A note about the construction of key variables is in order. The analysis to be described later relies heavily on four measures: decision quality, contents of memory, memory accuracy, and a measure of the OL Tally. The construction of these variables is sufficiently complex to warrant extended discussion.

Decision Quality: The purpose of the decision quality measure is to assess whether or not subjects managed to find the "correct" candidate in their primary election. Each party had four candidates available, from which either two or four were selected by the computer, depending on the task demand manipulation to be faced by the subject. When subjects faced four candidates in their party, the four were arrayed across the party spectrum, including one "extreme" candidate (very conservative Republican or very liberal Democrat), one "modal" candidate (to look like a typical Republican or Democrat), one "moderate" candidate (a liberal Republican or a conservative Democrat)

⁴⁵ While there is a potentially rich set of data available from this debriefing scripts, they were not systematically analyzed in depth for this study. Impressionistic results from the debriefings are used to

and a “crossover” candidate (taking positions on both sides of the political spectrum).

When faced with only two candidates in her party, a subject saw only the “extreme” and the “moderate” candidates from her party.

For any given subject it is possible to use various models to construct an indicator of the distance between the subject and each of the candidates in the subject’s party. For this analysis I chose the directional model (Rabinowitz & MacDonald, 1989)⁴⁶ in order to determine the issue distance between candidates and subjects. However, issues are not the only information available to subjects -- and for many, issues might not be terribly important at all. Accordingly, the calculation of distance between subject and candidates included issue distance, group endorsements, and candidate traits. Since the focus was on a primary election, party was constant across the set of candidates from which a subject could choose, and therefore was not included in the calculation.

Figure 4.3 shows how each of these factors was computed. Two versions of each measure were developed. In the first, the normative assumption from the rational voting literature that voters should examine all of the information of importance for all of the candidates before making a decision was employed. Each distance was calculated assuming that subjects should have looked at all available information. This is the “full information” version. Alternatively, and more realistically given time and information processing capacity limitations, distances could be assessed based on the information subjects actually examined during the campaign. That is, the calculations could use the

help understand some of the findings in Chapters 5 & 6.

⁴⁶ Analyses were initially computed with both the Directional Model and the Spatial Model (Enelow & Hinnich, 1984.) While there were few differences between the two approaches, the Directional Model appeared stronger. A review of the justifications for the directional approach as put forth by Rabinowitz and MacDonald appear quite compelling.

subjects own “revealed preferences” to determine closeness to each candidate. In this latter configuration, only information actually viewed for at least one candidate was included in calculating issue, group, and trait distances.

Insert Figure 4.3 about here

After computing the distances between subject and candidates (and standardizing the results across subjects) the resulting values must be combined into a single measure of distance between subject and each candidate. Again, multiple approaches are available. One is to simply combine the three separate measures by giving equal weight to each. However, a more reasonable approach is to weight each measure by the subject’s own assessment of importance. As part of the pre-experiment questionnaire, subjects were asked to indicate their most important, next most important, and least important reasons for their presidential vote choice in the 1992 election. A list of ten reasons was presented. Included were reasons corresponding to issues, group endorsements, and candidate traits. The values subjects placed on each of these were then used to weight the relative importance of each distance measure.

Once a score was attained for each pairing of candidate and subject, the final measure of decision accuracy was created by using a variant of the quality assessment measure developed by Riggle and Johnson (1996) from Payne’s (1993) decision outcome index. This "Optimal Vote" measure compares the distance between the subject and the preferred candidate to the distances for the remaining candidates, resulting in a decision quality score from 0 to 1. Subjects with a score of one chose the "correct" candidate

based on their own stated preferences. Those scoring less than one made a suboptimal decision. The closer to zero the further away from the most optimal candidate the subject moved.⁴⁷ This measure was then used to carry out all analysis relating to decision quality. These analyses on decision quality were completed on both the “full information” measure of accuracy and the “revealed preferences” measure.

Memory Affect and Accuracy: In order to determine the contents of memory after the election campaign, subjects listed everything they could remember about each of the six candidates (including those within the subject’s party and those from the other party). The memories were counted for each candidate for each subject. In addition, coders assessed whether each memory could be considered to show issue, group, party, hoopla (polls and “horserace” information), or trait content, and labeled each accordingly. Memories that could not be assessed for content were included in an “other” category. In order to determine whether memories of the candidates were accurate or inaccurate, a comparison of each memory was made to the information from which it appeared to have come. Most memories could be easily scored as accurate or inaccurate. Those that could not were ignored for this measure. In addition to scoring the accuracy of the memories

⁴⁷ Mathematically, the optimal vote measure is calculated by subtracting the distance measure of the candidate furthest from the subject from the distance measure for the selected candidate. The resulting difference was then divided by the difference between the distance measure for the closest candidate minus the score for the most distant candidate. Thus,

$$\text{Opt. Vote} = (\text{Selected Candidate} - \text{Most Distant Candidate}) / (\text{Closest Candidate} - \text{Distant Candidate})$$

Supposing a subject votes for the closest candidate, the value of the first difference becomes the same as the value of the second difference since the selected candidate is also the closest candidate, and the ratio equals 1.0. Voting for the most distant candidate results in the first difference ending up at 0, since the selected candidate is the most distant candidate, and the resulting optimality score is zero. Voting for candidates in between the closest and the most distant, results in a score between zero and one.

subjects reported, a summary of the affect associated with the memories was also computed. Since subjects told their experimenter whether each memory made them "feel good, bad, or neutral" about the candidate, this summary was computed by simply subtracting the total number of negative items from the number of positive memories. Computed for each candidate for whom a subject reported memories, this "Memory Affect" score could be positive, negative, or zero, reflecting an overall good, bad, or neutral feeling about each candidate.

On-line Tally: While the Memory Affect score measures the feeling about candidates as recorded in the memories that could be recalled, the OL Tally score reflects a measure of the overall evaluation of each candidate computed as information was accessed by subjects. Where the Memory Affect score is an after-the-fact calculation, based on information provided by subjects subsequent to voting and evaluating the candidates, the OL Tally represents affect towards candidates as information was encountered, and therefore is not affected by the vote choice or final feeling thermometer evaluation, and is not dependent on memory. While there are a number of ways to conceive of the OL Tally measure, all proceed from the same basic underlying approach.⁴⁸ The Tally must represent the subjects' own evaluation of each piece of information as it is encountered. However, neither the Stony Brook model, nor previous researchers, have specified exactly what method evaluators use to compare their own position on a piece of information with that of the candidate. What is specified is that a comparison is made; what is left unsaid is exactly what formula is used to make it. In the case of this project,

⁴⁸ See Chapter 6 for a detailed comparison of multiple measures of the OL Tally.

the OL Tally must integrate evaluations of candidate stands on issues, candidate personality, group endorsements, and partisanship. For each of these subjects are presumed to compare what they learn from the campaign to their own pre-existing ideal points. These comparisons could be made, in the case of issue information, for example, in accordance with the Spatial Model (Enelow and Hinnich, 1984,) the Directional Model (Rabinowitz & MacDonald, 1989,) or some other rubric. One appealing approach is to use a simple comparison between the subject's position on an issue and the candidate's position, scoring simply as agree, disagree, or neutral. This is the approach that was ultimately selected.⁴⁹

Once again, as with the calculation of the decision quality measure, more information than simply issues must be taken into account. To do this, the OL Tally was incremented or decremented for issue agreement using the simple agree/disagree/neutral scale. For each issue encountered by the subject, an agreement value was assigned based on the known position of the candidate compared to the stated position of the subject (from the initial questionnaire.) If the absolute value of the distance between the two was greater than 2.5 points (on a 1 - 7 scale,) the subject was presumed to disagree with the candidate. Between 1.1 and 2.4 points, a neutral score was assigned. Finally, if the difference was less than 1.1 points, the subject and candidate were presumed to agree on the issue. When a subject encountered information about endorsements, the tally was incremented or decremented in accordance with the same approach used in calculating decision quality; that is, using the likeability approach (Sniderman, *et al.*, 1991) so that

⁴⁹ This approach has similarities to the rubric proposed by Kelley and Mirer (1974) where voters are presumed to simply tally up likes and dislikes about the candidates in making a judgment, rather than engaging in any complicated calculus.

an endorsement of a candidate by a group liked by the subject would add to the tally for that candidate, while an endorsement by a disliked group would reduce the endorsed candidate's tally. Likewise, candidate personality was factored into the tally as it was for decision quality. Finally, the OL Tally was also incremented or decremented by access of the party label. While subjects were required to choose a political party for the primary, not all subjects chose their own party as indicated in the pre-simulation questionnaire, and some subjects were truly independents. Thus, when party was accessed, the OL Tally for the candidate was incremented or decremented depending on whether the candidate's party was the same as the subject's. For subjects who were independents, accessing party has no effect on the OL Tally.

The final OL Tally measure really consists of measures for each of the candidates in the subject's party, rather than one overarching measure. Thus, as discussed in more detail in Chapter 6, two more decisions were needed about the Tally. First, the rule to be used to integrate information into the OL Tally had to be established as either averaging or additive. An averaging approach would suggest that initial affect towards the candidates acts as an anchor, and subsequent information has less impact as time goes on. On the other hand, it could be that as information is encountered, the Tally is updated using an additive approach, where each new feeling generated by a piece of information adds to what was there before. If this is the case, strongly affective feelings about later information are not diluted as much as they would be in an averaging approach.⁵⁰ Both

⁵⁰ As an example, if a subject has looked at five issues, and using the scoring described above, scores 1,1,0,1,-1 on those issues, the value of the Tally in an averaging approach would be 0.4, while in an additive approach the Tally would be valued at 2. Supposing a sixth item is encountered, and the affective value is 0. In the averaging approach, this neutral affect would *lower* the Tally to .333, while it would have no effect on the additive Tally. The next item encountered, assuming it carried an affective value of 1, would increase both tallies; the averaging approach to .43, and the additive Tally

approaches were assessed and the results appear to favor an additive process. When the Tally was calculated using an averaging process, it had little effect in the analysis. But when calculated using an additive approach, the Tally is a significant variable in the analysis shown in Chapter 6. Second, the role of memory in the OL Tally itself was explored, with the OL Tally for each candidate calculated both assuming memory for items already examined and no memory. In the former case, if memory is accessed during the on-line updating process to remind a voter that the information has already been counted, then re-examining the information should have no effect on the OL Tally. On the other hand, if there is no memory process used during on-line updating, then each time the information is accessed the Tally is updated, no matter how many times the information has been seen before. As will be seen in more detail in Chapter 6, it appeared to make little difference in the analysis whether memory was assumed to be operating or not.

to 3. The new item has a stronger effect on the additive tally, increasing it by 50%, while it increases the averaging Tally by only 30%.

Figure 4.1
A Traditional Information Board

Candidates ⇨ Attributes ↓	John Smith	Jane Jones				
Candidate statements on the welfare system	<table border="1"> <tr> <td data-bbox="610 506 764 541">Smith</td> </tr> <tr> <td data-bbox="610 541 980 716">Position on Welfare Reform</td> </tr> </table>	Smith	Position on Welfare Reform	<table border="1"> <tr> <td data-bbox="1013 506 1167 541">Jones</td> </tr> <tr> <td data-bbox="1013 541 1383 716">Position on Welfare Reform</td> </tr> </table>	Jones	Position on Welfare Reform
Smith						
Position on Welfare Reform						
Jones						
Position on Welfare Reform						
Candidate statements on the Balanced Budget Amendment	<table border="1"> <tr> <td data-bbox="610 804 764 840">Smith</td> </tr> <tr> <td data-bbox="610 840 980 1014">Position on Balanced Budget</td> </tr> </table>	Smith	Position on Balanced Budget	<table border="1"> <tr> <td data-bbox="1013 804 1167 840">Jones</td> </tr> <tr> <td data-bbox="1013 840 1383 1014">Position on Balanced Budget</td> </tr> </table>	Jones	Position on Balanced Budget
Smith						
Position on Balanced Budget						
Jones						
Position on Balanced Budget						
Personal Attributes: Candidates' Party ID	<table border="1"> <tr> <td data-bbox="610 1056 764 1092">Smith</td> </tr> <tr> <td data-bbox="610 1092 980 1266">Party Membership</td> </tr> </table>	Smith	Party Membership	<table border="1"> <tr> <td data-bbox="1013 1056 1167 1092">Jones</td> </tr> <tr> <td data-bbox="1013 1092 1383 1266">Party Membership</td> </tr> </table>	Jones	Party Membership
Smith						
Party Membership						
Jones						
Party Membership						
Candidate Job Experience	<table border="1"> <tr> <td data-bbox="610 1308 764 1344">Smith</td> </tr> <tr> <td data-bbox="610 1344 980 1518">Previous Political Experience</td> </tr> </table>	Smith	Previous Political Experience	<table border="1"> <tr> <td data-bbox="1013 1308 1167 1344">Jones</td> </tr> <tr> <td data-bbox="1013 1344 1383 1518">Previous Political Experience</td> </tr> </table>	Jones	Previous Political Experience
Smith						
Previous Political Experience						
Jones						
Previous Political Experience						
Endorsements	<table border="1"> <tr> <td data-bbox="610 1560 764 1596">Smith</td> </tr> <tr> <td data-bbox="610 1596 980 1770">Endorsement Statement by the AFL-CIO</td> </tr> </table>	Smith	Endorsement Statement by the AFL-CIO	<table border="1"> <tr> <td data-bbox="1013 1560 1167 1596">Jones</td> </tr> <tr> <td data-bbox="1013 1596 1383 1770">Endorsement Statement by the AFL-CIO</td> </tr> </table>	Jones	Endorsement Statement by the AFL-CIO
Smith						
Endorsement Statement by the AFL-CIO						
Jones						
Endorsement Statement by the AFL-CIO						

Figure 4.2
A Dynamic Information Board

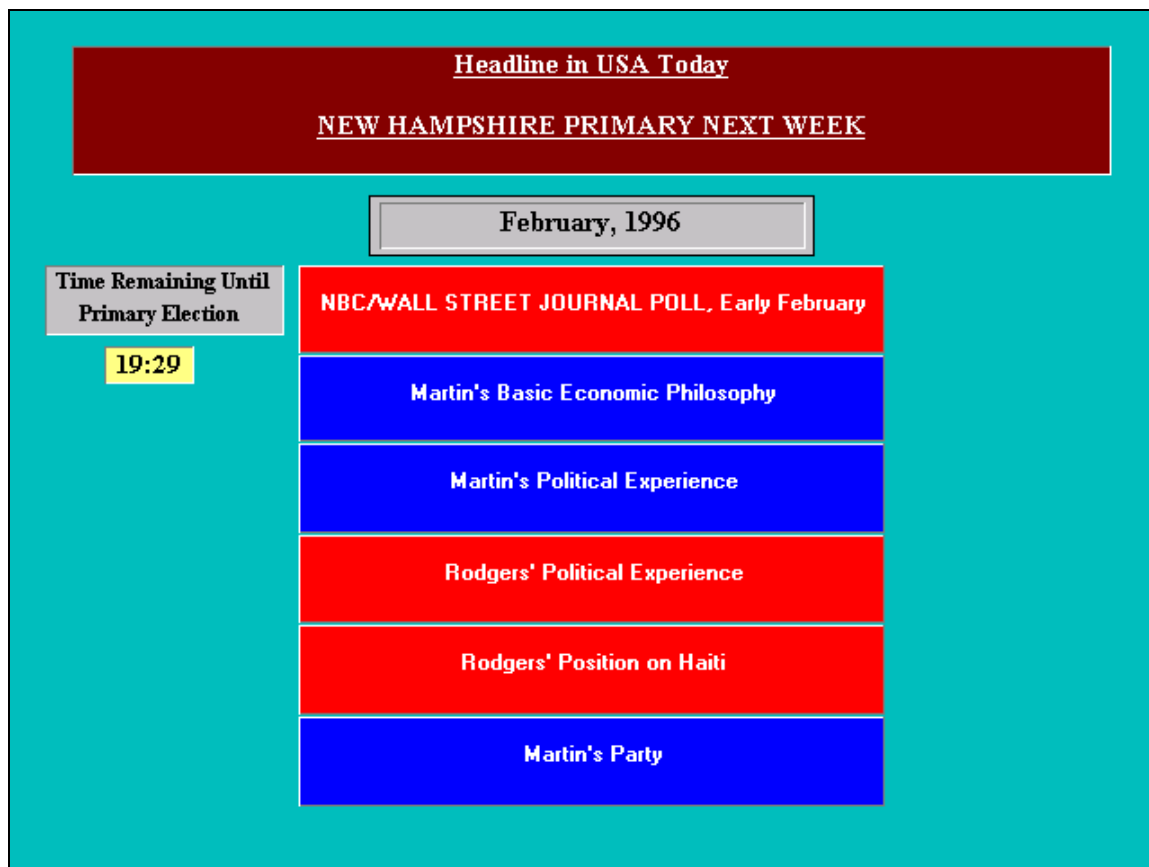


Figure 4.3
Calculation of the Accurate Vote Assessment

<i>Factor</i>	<i>Model</i>	<i>Calculation</i>
ISSUES	Directional Rabinowitz and MacDonald (1989)	Sum the direction and intensity of subject positions compared to candidate positions across each of the available issues. ⁵¹
GROUPS	Likability Sniderman, et al. (1991)	Assess subject feelings towards each group making an endorsement using feeling thermometers. Groups above the subject's own mean for all groups and above 50 on the scale are "liked". Those below the mean and below 50 are "disliked". For each endorsement of a candidate by a group liked by the subject, one point is added for that candidate. For each endorsement by a disliked group, one point is subtracted. The total score for each candidate is the group distance for that candidate.
TRAITS	Independent assessment of trait appeal.	A separate set of 67 subjects viewed candidate pictures and trait descriptions, rating the appeal of each picture and trait. Assessments were averaged across all raters, creating a score for each trait and picture which was then applied to the candidate to whom the trait or picture belonged. Candidates were designed to be equally "likable" if all personal and appearance information were accessed. Because of differential access of the trait information, however, the "impressions" that subjects had of the different candidates could have been quite varied. ⁵²

⁵¹ Candidate positions were independently assessed by five different people, who read each position and rated it on a standard seven point scale. The average of these assessments was then used as the candidate's position on the scale for each issue. Subject positions were ascertained via the pre-experiment questionnaire.

⁵² In particular, each candidate's personality was assessed by "a political opponent." These assessments, as might be expected, were fairly negative.

Chapter 5

On-line versus Memory-based Processing

Interviewer: I'm interested in reasons why you voted for your candidate in the election. Can you talk a little about this?

Subject: Basically, my major reason was I felt he was more progressive on domestic issues, including affirmative action, single payer health care, federal role in working to end homelessness, women's right to choose abortion, and stronger environmental regulations. Whereas [the other candidate] was more of a centrist on those issues. Better than some of the right-wing Republican policies over through the 80's and early 90's but not as progressive as [my candidate].

*Partial transcript from experimental subject,
November, 1994*

Even a cursory examination of the scripts produced by the debriefing process in this experiment will show a wide range of answers to the question: Why did you vote for your candidate? The segment that opens Chapter 2 shows a subject unable to recall very much specific information about her chosen candidate; talking instead about impressions that the candidate made. In contrast, the script above is from a subject who appears to remember a great deal about his candidate, and who describes his feelings in clearly ideological ways. It might be easy to classify the first subject as clearly making an impression-driven decision, while the second subject may be seen to be relying more on memory in order to make a choice. As it turns out, however, both of these subjects were in the on-line processing condition of the experiment. What accounts for the differences? This chapter examines the hypothesis set forth in Chapter 3, in order to understand the differences between subjects, especially the extent to which on-line processors and memory-based processors performed differently.

Tests of the Hypotheses

Hypotheses 1 & 2: Hypothesis 1 suggests that on-line processing of information is the default method subjects will use to integrate campaign information. Thus, in order to generate memory processing in one group of subjects, an intervention is required which interrupts on-line evaluation and forces subjects to rely more on memory. However, Hypothesis 2 argues that subjects facing a more difficult choice (4 candidates instead of just 2 in the primary) will tend towards on-line processing in any case, due to the greater complexity of the task. Thus, these two hypotheses provide manipulation checks. Did subjects who were given special instructions in order to block on-line evaluations actually process information differently from those who were not? Were the subjects with four candidates from which to choose more likely to simplify their processing? Testing these two hypotheses requires getting inside the black box, i.e., having measures of the underlying information processing that was used. I will examine four such measures: the number of memories reported, the amount of information accessed, the ability of the affective nature of the reported memories to accurately predict the vote choice, and the subjective difficulty of the decision.

Memories: At first blush we might expect subjects who were expecting to be tested on their memories to be able to remember more about the candidates than subjects who were not forewarned about the memory test. Prior research in psychology on memory would not necessarily support this naive prediction, however. A number of studies have found that subjects instructed to try to memorize a list of trait adjectives actually remembered less than subjects told to form an impression of the person described by those adjectives. Fiske and Taylor, summarizing many of these studies, note

that "people told to remember details about another person may actually remember *less* than people who are merely asked to form an impression of that person" (1991, p. 332, emphasis in original.) They ascribe these results to the formation of coherent organizational structure developed by those who are forming impressions. This structure is organized in some fashion so that the traits interconnect easily and relate to the person being evaluated. Thus, when asked to recall, evaluators have a schema they can use to retrieve stored information. Those who are told to memorize lists, however, do not usually have a simple structure into which to place the items they are memorizing. Recall of the items then becomes difficult. While the studies cited by Fiske and Taylor are based on far-simpler situations than the current experiment, they do forewarn us that instruction to memorize a set of information is not always the best way to produce the most memory. Nonetheless, any manipulation designed to produce more memory-based processing must examine memory.

After subjects had voted and evaluated the candidates in the primary election they were asked to recall as much as they could about all of them -- in-party and out-party candidates alike. An analysis of these reported memories, as anticipated, shows no differences in the number of memories reported between the information processing conditions. Subjects in the on-line condition actually reported more memories (an average of 11.59 per subject) than did those in the memory condition (10.92,) although the difference was not statistically significant. Thus, memories tell us nothing about Hypothesis 1_a. A significant difference was found in the number of memories reported by task demands condition. Subjects in the simpler two-candidate condition reported an average of nearly 13 memories each, while those in the more difficult four candidate

primary averaged only 9.57 memories each. While this would seem to provide some indication that more memory processing was occurring in the easier condition (as anticipated by Hypothesis 2_a) the studies about memory and impression formation provide some warning that this obvious relationship may not be as simple as we might expect.

Information Accessed: If subjects are expecting to be tested on their memories, they should, in general, spend a longer time studying any given bit of information and, quite possibly, re-examine the same information whenever possible to refresh their memories. Given an election campaign of a fixed length, either one of these processes should result in subjects in the memory-based processing examining fewer unique pieces of information than subjects in the on-line condition. In addition, the difficulty posed by the four candidate condition compared to the two candidate condition might also mean that subjects would spend more time examining information in the harder choice condition, in order to better differentiate between candidates.

The number of unique items accessed during the primary election was subjected to a 2 x 2 anova, where the processing manipulation (on-line vs. memory-based) and the task demands manipulation (2 vs. 4 candidates) were the two factors. The means are shown in Figure 5.1. Subjects in the on-line processing condition generally examined more information than those in the memory-based condition, as expected. The difference is especially pronounced for subjects facing four candidates: on-line processors in this more difficult condition viewed 20% *more* information than those in the memory condition. As the anova results in Table 5.1 show, the processing condition approaches

significance as predicted by Hypothesis 1_a: $F(1,98) = 2.498, p(\text{one-tailed}) < .10$.⁵³

However, the Task Difficulty manipulation (predicted by Hypothesis 2_a: $F(1,98) = .046, n.s.$) failed to independently account for any differences in the amount of information viewed.

Insert Figure 5.1 & Table 5.1 about here

The Vote Decision: Another approach to examining Hypotheses 1 and 2 is to study the relationship between the vote cast at the end of the election and the vote that would be predicted by the affect associated with reported memories. Subjects voted for their preferred candidate, evaluated all of the candidates from both parties on a feeling thermometer, and then were given the memory test wherein they were asked to list everything they could remember about the candidates. Subjects then indicated to the experimenter whether each item they remembered made them like or dislike the candidate to whom the memory pertained. We would expect a strong relationship between the affective nature of these reported memories and the vote choice for subjects in the memory condition compared with those in the on-line condition, if the manipulation was successful. In order to test this, predictions of the primary vote choice were generated from the affect associated with the reported memories. These predictions

⁵³ Unless otherwise indicated, tests of significance in this section are one-tailed. There was a clear expectation of the direction of the effects that were being tested. Thus, where the results are in the expected direction, one-tailed testing is reasonable. In those cases where the results appear in an unexpected direction, two-tailed significance tests are applied. These cases are noted in the text and tables.

were then compared with the actual vote choice. Figure 5.2 reports the proportion of correctly predicted votes using memory affect. Seventy-five percent of the votes of on-line subjects and 71% of memory subjects could be accurately predicted using reported memories. Thus the votes of subjects in the memory condition were no more likely to be accurately predicted by reported memories than were on-line subjects' votes. This clearly fails to support the basic contention of Hypothesis 1_a.

However, it is possible that differences in processing attributable to individual subject differences may be masking a significant effect. Hypothesis 1_b addresses this possibility by suggesting that differences in political expertise may generate differences in processing campaign information. Figure 5.2 shows that expertise does make some difference in whether memories and candidate evaluations predict the actual vote. In general, political experts, regardless of processing condition have stronger links between memories and the vote, than do novices. Even so, the results are counter to what we would expect. For those experts in the on-line condition, the prediction from memory is quite good, about 89% accurate. But for experts in the memory-based condition, reported memories did a poor job predicting the vote. Only 65% of the votes could be accurately determined from memories, the same as for novices in the memory condition. While memories for both experts and novices in the memory processing condition do not predict the vote very well, there is a wide difference in the on-line condition, with experts' memories far more predictive than novices. This is in direct opposition to the expectations of Hypothesis 1_b which suggested that the differences between experts and non-experts would occur only in the memory condition. Instead, both expertise and processing condition seem to have effects on the relationship between memory and the

vote. For political experts, the instructions designed to place subjects into the memory processing condition actually lowered by a large amount the strength of the relationship between memory and the vote.

Insert Figure 5.2 and Table 5.2 about here

There appears to be no simple explanation for these results, except to consider that the prospect of a memory test for those more politically knowledgeable may have caused them to focus on remembering specific information, which may or may not have been terribly important to the vote choice⁵⁴. This possibility is even stronger when the number of memories reported by each group is examined. While novices reported nearly the same number of memories whether in the on-line or memory condition, political experts differed between processing conditions. Experts in the on-line condition actually reported more memories on average (12.43 per subject) than did memory-based experts (9.45 per subject.) Thus, experts expecting the test may have been concentrating on remembering things so as to "pass" the test. If so, they may have been processing in a way similar to Anderson and Hubert's (1963) two memory model, where judgment memory differs from information gathering memory.

While it is somewhat difficult to determine if the processing manipulation had its intended effect, the task demand manipulation should be more straightforward. In order

⁵⁴ Similar odd results are reported in Lau and Redlawsk (1992.) Our expert subjects who used a static information board and were given as much time as they wished to make a decision, performed noticeably worse in making their decision than did novices on the static board or experts on the more difficult dynamic information board. We theorized that given so much time, experts tried to learn everything about every candidate, and ended up becoming confused, while novices used information shortcuts to simplify their world.

to create a more complex decision environment, half of all subjects were randomly assigned to vote in a primary election with four candidates, while remaining subjects faced only two candidates in the primary. Hypothesis 2_a suggests that, all other things equal, on-line processing should be more likely to be used in a multi-candidate environment than in a simple two-candidate race. A very simple test -- the number of memories reported -- is consistent with this hypothesis. Subjects with two candidates from which to choose reported more memories overall (12.94) than those in the four candidate condition (9.57) which might be seen as evidence that less memory processing was used by candidates in the more complex situation. However, Figure 5.3 shows that there is no difference between task demand conditions in the accuracy with which the actual vote can be predicted by reported memories. Whether subjects faced two candidates or four candidates in the primary, just about 72% of votes are predicted correctly by the reported memories. Given these contradictory data, where the number of memories reported appears consistent with Hypothesis 2_a, but the power of those memories to predict the vote is inconsistent, support for the hypothesis is tentative at best.

As before, perhaps individual differences are hiding more interesting results. Hypothesis 2_b argues that political experts should be expected to engage in more memory processing when compared to less expert voters, especially in the more demanding conditions (i.e., with four candidates in the primary.) The relationship between memory affect and the vote choice for experts and novices reported in Figure 5.3 support this hypothesis. Experts in the four candidate condition show a much stronger relationship between reported memories and the actual vote than do novices in the same condition. On

the other hand, in the simpler condition, experts show more evidence of on-line processing, while novices appear to have a stronger link between memory and the vote.

Insert Figure 5.3 and Table 5.3 about here

Decision Difficulty: Immediately following the vote decision and evaluation of the candidates, subjects were asked two questions designed to get at the issue of decision difficulty. The first question asked the degree to which subjects felt their decision was a difficult one. The second question asked how confident they were that they had chosen the correct candidate in their party's primary. A third measure of decision difficulty is also available, if we consider that the amount of time it takes to make a choice may be a measure of how difficult that choice is. All three of these indicators can be combined to give an overall measure of the choice difficulty faced by subjects.

Given that memory-based processing requires subjects to recall from memory information about the candidates in order to make a choice, while on-line processing requires the simple recall of the OL Tally, it is reasonable to hypothesize that on-line processors should report that making a decision is easier, and that they are more confident in their choice. Further, on-line decision-making should be quicker than a process requiring access to numerous stored memories. As Table 5.4 reports, all three measures individually point in the expected direction. Two of them -- the measures of reported difficulty and the time required to make a decision -- are marginally significant using a one-tailed test. The combined measure, which, as it uses multiple indicators of the underlying construct, is a more appropriate measure of overall decision difficulty, is

statistically and substantively significant in the expected direction. Subjects in the on-line condition find their decision to be easier overall, than do subjects in the memory condition. This result adds strength to the argument that the on-line/memory-based manipulation worked as anticipated, despite the mixed findings of the other manipulation checks.

Insert Table 5.4 about here

Hypothesis 3: Given the difficulties of peering into a subject's mind and really knowing whether on-line or memory processing is under way, a more direct test of the two processing types would be welcome. Hypothesis 3 anticipated that the speed with which a voter could make a decision would give insight as to whether on-line or memory based processing was being used. In short, it was expected that an on-line processor would take no longer to make a decision at the end of an election campaign than at the beginning. If such a voter simply queries the contents of the OL Tally in order to make a vote decision, the time required to make this query should not differ much whether a little information or a great deal of information has been encountered. The Tally is a simple item readily available in memory; recalling it should be fairly easy. Thus, on-line processors could be expected to make decisions faster than memory processors, who are presumably scouring the contents of memory in order to compare candidates and make a choice. For memory processors, the longer the campaign has continued, the more

campaign information might be in memory, and the longer it ought to take to retrieve the information and make a choice.

Support for Hypothesis 3, then, can be taken as direct evidence that the two experimental groups were processing differently. Further, if Hypothesis 3 is borne out in the data, then we also have evidence for the ease of recall of the OL Tally. To facilitate testing this hypothesis, the time subjects required to make their decision between candidates was recorded by the computer. For a random one-third of all subjects, a choice was made one-third of the way through the campaign, when a poll taker from the Gallup Poll "called" the subject and asked for a vote preference. For another third of the subjects, the poll occurred two-thirds of the way through the campaign. The computer recorded the amount of time required from the initial showing of the poll choice screen to the click of the computer mouse by the subject on the preferred candidate's name. The final third of all subjects was never interrupted by the poll, and therefore these subjects made their initial (and only) decision at the end of the campaign. The results of the time required for decision for these groups of subjects are shown in Table 5.5.

Insert Table 5.5 about here

Hypothesis 3 predicts that there will be no difference in time required for on-line processors to make a decision whether the decision is made early or late, while memory processors should take more time the later into the campaign the decision is made. To test this hypothesis, the linearity of each trend was tested, using a one-way analysis of variance. The results show that neither processing condition shows a trend of any type,

with both non-linear and linear trends failing to reach significance. In other words, there is no trend at all in the data. Thus, Hypothesis 3 cannot be supported. While there is a pattern suggestive that subjects placed into the memory-based condition generally took longer to make a decision than those in the on-line condition, the results do not approach statistical significance. The differences are, at least, generally in the right direction. The same cannot be said for the decision time required at the end of the campaign compared to early in the election. While again the results are not statistically significant, there is a clear trend that decision-making at the end of the campaign takes longer than it does early on, whether subjects are in the on-line or memory conditions. In fact, the strongest results show the group of on-line processors who made their choice at the end of the campaign taking nearly 35% *more* time to make a decision when compared to those subjects who were forced to decide on a choice only one-third into the campaign. While it is true that the two groups of memory processors show even more divergence, with those making a later choice more than 60% slower than those making the earlier choice, this difference does not even approach significance as the mean of the late memory based group is inflated due to a few outliers who took much more time than other subjects to make a decision. Removal of these outliers actually shows memory subjects taking slightly less time to make a decision late in the campaign compared to near the beginning. That these differences are not significant is confirmed by carrying out the same tests of linearity after a log transformation of the decision speed variable. The effect of this transformation is to limit the impact of the outliers. When the transformed variable is used, it is quite clear that the trends expected by Hypothesis 3 cannot be confirmed.

These results are puzzling at best. One possibility might be a confound between the decision time and the number of candidates in the decision set. Recall that some of the subjects in each processing condition chose between only two candidates in their party, while others had to distinguish between four candidates. It is possible that the difference in complexity would interfere with processing and decision-making. Table 5.6 reports the time to make a decision segmented by the task demand condition. The two candidate condition still fails to support the hypothesis, which anticipates that there would be little difference in decision-making speed for on-line subjects no matter when the decision was made. Instead, there is an almost significant difference, with on-line subjects choosing between two candidates and who make their choice late taking 50% longer than those who made a decision early in the campaign. At first glance, the memory group appears to perform as expected, with later decision-makers taking longer than earlier ones. But, once again, the caveat must be offered that the later group's results are skewed by outliers. When the outliers are adjusted for by the log transformation of the decision time variable the results show little difference in processing speed between early and late decision-makers in the two candidate memory condition. The four candidate condition fairs little differently. In general, the pattern follows the two candidate condition, though in an attenuated fashion. In neither case can the hypothesis be supported.

Insert Table 5.6 about here

Hypothesis 4: An important implication of the on-line model of evaluation is that voters should be making evaluations as they go along. Rather than make global comparisons across candidates as pieces of information are encountered, a pure on-line processor will use each piece of information to update the OL Tally for the candidate to whom the information pertains. This implies that information encountered early in the campaign will act as an anchor, creating a starting point for the candidate evaluation. Additional information, as it is acquired, will cause adjustments to the OL Tally from the initial anchoring position (Lodge, McGraw, & Stroh, 1989.) Consequently, for on-line processors, early information should have more power to predict the actual choice, when compared to information encountered late in the campaign.

The opposite would be expected for memory processors. Given the limitations of memory processing, especially the short-term memory bottleneck, a memory model must assume that information encountered towards the end of the campaign will have greater impact on the vote decision. If a voter is expected to search the contents of memory for information in order to vote, then those associations with the candidate which are most recent should have a higher likelihood of being retrieved during the search. Thus, the strongest memories are the ones which will most influence the vote.

To test Hypothesis 4, the simulated campaign was divided into three segments: early, middle, and late. The affect generated by the information encountered in each period was calculated, using subjects' own statements of like or dislike as collected during the cued recall debriefing described in Chapter 4. Subjects were asked to indicate whether each piece of information encountered made them feel "better, worse, or the same" about the candidate to which the item referred. Affect scores were created by

simply counting each answer of "better" as a +1, each answer of "worse" as a -1, and each neutral answer as zero. The resulting scores could then be used to predict the vote for each subject if the election were held at the end of the first third, second third, or actual conclusion of the campaign.

Table 5.7 reports the results of a discriminant analysis performed using the actual primary vote as the variable to be predicted and the affect attached to the early or late information encountered by subject as the independent variable. Subjects were stratified by the processing manipulation and the task demand manipulation, and the analyses were performed for each group independently. The results are the exact opposite of what was anticipated by Hypothesis 4. If the expected patterns had held, the larger share of on-line processors would have been correctly predicted using early information while the larger share of memory processing subjects would have been accurately predicted using information learned near the end of the campaign. Instead, in both the easy and more difficult task demand situation, the actual vote for those subjects placed into the on-line condition was more readily predicted by the information they viewed in the last third of the campaign. The vote of memory processing subjects in the four candidate condition were also more accurately predicted by later information than by early information. But for memory processing subjects in the two candidate condition, early information predicted the actual vote slightly better than information encountered near the end of the campaign.

Insert Table 5.7 about here

In general, then, it seems that in this experimental environment, it is not so clear that on-line and memory-based processors are particularly different in which information informs their vote. The more significant difference in ability to predict the vote comes from the task demands faced by subjects. For those in the four candidate condition, the early information is not very good at predicting the vote, while the information encountered during the last third of the campaign does an excellent job for both memory and on-line processors. For these voters, facing a more difficult choice, it appears to take longer to determine what information is needed to make a choice.

One possible reason for the failure of Hypothesis 4 may come from an understanding of the search process used by subjects, especially those in the four candidate condition. Evidence from the cued-recall debriefing scripts shows a tendency by subjects to begin their information acquisition efforts in an almost random fashion, first trying to learn the most basic information about the candidates. Once they have begun to sort out the candidates and have determined who is in which party, subjects can begin to focus on those candidates who look most interesting, on whatever basis. Thus, in the earliest minutes of the simulation, subjects are developing likes and dislikes about the whole range of candidates. As the campaign progresses, however, they may begin to limit their information search to fewer candidates. And, by the latter part of the campaign, subjects often indicate in the debriefing that they ignored candidates they found less appealing and focused on learning more about their favorites. In this case, the affect

associated with the information examined in the early part of the campaign will be spread among multiple candidates, with each perhaps having some good and bad points. This would make prediction from early information difficult, whether subjects are processing on-line or via memory. However, the same process would tend to create strong affect towards more favored candidates in the latter part of the campaign, as subjects stopped looking at less preferred alternatives. Thus, this process may be acting to confound the analysis of whether on-line processors differ significantly from memory processors in forming evaluations.⁵⁵

Of course, these results may simply reflect the time required by subjects to familiarize themselves with the election campaign. Recall that all of the candidates are invented and that subjects know nothing about them when the campaign begins. As a consequence, for some period of time, subjects must make an effort to simply learn who is who. It could be that such a process early in the election is interfering with the use of information acquired at that early stage. If so, perhaps the expected patterns can be found if information viewed during a slightly later time period is considered. Table 5.8 repeats the analysis of Table 5.7, but uses information viewed by subjects during the middle third of the campaign rather than the earliest information as a baseline. Even so, the results continue to require rejection of the hypothesis. While the middle information certainly predicts the vote better for the four candidate condition, the patterns do not change. In general, information encountered later in the campaign is a better predictor of the vote in three out of four cases. The only exception continues to be subjects in the two candidate

⁵⁵ The data available do not appear to lend themselves to analyzing this hypothesis in as useful a fashion as originally intended. Further analysis in Chapter 6 examines whether the assumption of an

memory processing condition, for whom the earlier information is better. Once again, this is the opposite of what is expected by the on-line model.

Insert Table 5.8 about here

Hypothesis 5: The final hypothesis to be examined in this chapter suggests that on-line information processors should be expected to have an advantage in decision-making over those using a memory-based process under certain conditions. In particular, on-line processing should lead to a better quality vote decision when subjects face a larger number of candidates (*i.e.* 4) compared to the use of memory based processing. Presumably it would be much more difficult to keep the candidates sorted out in the voter's mind when there are a large number of them. While on-line processing merely requires the retrieval of the OL Tally, memory processing suggests that available memories are searched. With a larger number of candidates, these memories may be more confused.

Table 5.9 reports the results of a simple comparison of the decision quality score for on-line processors compared to those in the memory condition across all subjects.⁵⁶ As would be expected, the major difference in decision quality is accounted for by the task demand manipulation; subjects facing only two candidates do much better than those facing four, regardless of processing condition. Within task conditions, however, no clear

anchoring and adjustment process, with the resultant averaging of each evaluation into the OL Tally, correctly describes the process on-line subjects actually appear to have used in this study.

⁵⁶ See Chapter 4 for a complete discussion on the calculation of the decision quality score.

pattern emerges. In the two candidate condition, on-line processors appear to do slightly better than memory processors, but in the four candidate condition, memory processors unexpectedly do better. However, the differences are small and statistically insignificant. Thus, there is no support for the hypothesis that on-line processors would do better in the more difficult condition.

Insert Table 5.9 about here

While it is not clear whether on-line processing provides an advantage in decision quality under the conditions of this experiment, additional results presented in Tables 5.10 and 5.11 lend support to the hypothesis that, under certain conditions, on-line processing can detract from decision quality. Hypothesis 5_a theorized that when candidates hold non-stereotypical positions, or voters are ideologically unconstrained, on-line processing could cause decision quality to decline. On-line processors, according to Lodge (1995,) do not make comparisons across candidates. Instead they evaluate each candidate independently of all the others. Thus, judgments relying on comparisons between candidates should be less used by on-line processors. When either the candidates hold unexpected positions, or voters themselves are ideologically unconstrained, failure to compare candidates might lead to making inferences about candidate positions which are inaccurate. Inferences work best when the political environment "hangs together" in a predictable fashion. But when a candidate does not hold predictable views, for example, a Democrat opposed to abortion rights, making an inference about the candidate's position can lead a voter astray. Thus, a voter who learns the position of one candidate but merely

infers the position of another may not be correctly assessing both candidates. Likewise, a voter who holds positions not normally associated with each other will have to learn more specifics about candidates in order to determine which best meets her requirements.

To test whether this does occur in this study, one-way analysis of variance was used, contrasting the cell for on-line processors and non-stereotypic candidates (Table 5.10) or unconstrained subject ideology (Table 5.11) with the remaining three cells. The results in these two tables support the hypothesis. In Table 5.10, subjects who voted for one of the two non-stereotypic candidates in the experiment are contrasted with those who voted for any of the six ideologically consistent candidates.⁵⁷ Accuracy was no different between memory and on-line processors for subjects who voted for one of the ideologically consistent candidates. But for those subjects who chose one of the inconsistent candidates, on-line processors performed far worse than memory-based processors. Table 5.11 reinforces this finding. In the four candidate condition, subjects whose own ideology is less constrained again performed worse in the on-line condition. But this difference does not persist in the two candidate condition. In that condition unconstrained on-line subjects actually appear to do slightly better at making a decision than other subjects. This contrast, however, must be subjected to a two-tailed test, since the result is not in the hypothesized direction, and under such a test the difference is not statistically significant.

Insert Tables 5.10 and 5.11 about here

⁵⁷ This analysis must be limited to the four candidate task demand condition. In the two candidate conditions, subjects faced the extreme and moderate candidates from the party. An inconsistent candidate was available only in the four candidate condition.

Conclusion

The hypothesis testing results are mixed at best. Several expected relationships were not found, while a few surprises turned up. Yet, on balance, several things are clear. First, subjects were probably placed into two different processing conditions, based on the instructions given at the beginning of the experiment. Enough variation is found between the conditions to suggest that these two groups of subjects did some things differently. In particular, the finding that subject in the on-line condition had an easier time making a decision than did those in the memory-based condition is clear evidence that the manipulation had the effect of creating two groups of subjects. However, given the limitations of really following mental activity, it is necessary to rely on theory to assert that the two groups were memory-based and on-line. Certainly a great deal of evidence from previous studies exists that person evaluation proceeds on-line, in the absence of any countervailing instruction. Thus, the on-line group in this study are presumed to have been in that condition chiefly because they knew that they would be evaluating people (candidates) and no instructions were given to motivate a different type of processing. The memory-based subjects did receive special instructions, telling them they would be given a memory test and that they would have to justify their decision. Subjects in this condition were expected to access less information as they studied the information more carefully in order to remember it. The evidence is that this did happen. Memory-based subjects were also expected to show a stronger relationship between the content of their memories and the vote choice, which they did not. Finally, there is some evidence that those in the memory condition performed as expected when faced with

non-stereotypic candidates, or when the subjects themselves held unconstrained ideologies. Thus, while the effects of the memory manipulation are not very strong, and in some cases the results are counter to expectations, there were some clear differences in theoretically consistent directions between the two processing conditions. Evidence reported in the next chapter will also substantiate the claim that there were two different processes at work.

Yet the very mixed results make clear that something unexpected occurred in this experiment. Two major possibilities exist. First, perhaps the intervention did something other than generate memory processing, so that the fact that some hypotheses were not supported derives from failure to truly compare on-line and memory-based processing. If this were the case, it would limit severely the conclusions that could be drawn from any approach that contrasts the two processing groups. But it would not be fatal to the underlying analysis that will be explored in the next chapter, which examines the effects of memory on voter decision-making. This examination does not depend on whether any subjects were successfully placed in a memory condition.

That memory might matter even for on-line processors is the second possibility for the mixed results of this chapter. In short, the results could be due not to any failure to place subjects in two distinct processing conditions, but because memory plays a much greater role in voter decision-making for the subjects in the on-line condition than would be expected from the Stony Brook model. In fact, it may be that the on-line model is severely limited in actual practice. The Stony Brook model insists that memory for information encountered during the political campaign plays no direct role in voter decision-making. But, as argued in Chapter 2, the Stony Brook model was formulated

under conditions which failed to mimic the ongoing play of candidates, information, and time, that are an important part of any real political campaign. Thus, even though the results of numerous tests of the model consistently downplay the role of memory, these findings remain suspect until verified or challenged by a methodology which provides a better portrayal of the flow of a presidential campaign.

As argued earlier in Chapter 4, the methodology used in this study clearly moves further towards modeling the "real world" of election campaigns than any of the reported Stony Brook studies. It uses multiple candidates and an information flow mimicking the dynamic nature of a political campaign in a unique approach to examining the question of how campaign information is processed. That the results developed in this chapter are at significant variance with the on-line claims of the Stony Brook model leaves the appropriateness of that model as a description of how voters facing multi-candidate elections process campaign information quite suspect. Whether or not this experiment successfully manipulated subjects so that there were two distinct groups of information processors is certainly open to question. But if it failed to do so, then the Stony Brook model argues that all subjects should have been on-line processors. Therefore, the results of the analyses in this chapter should have been consistent with that model, no matter which processing group subjects were purportedly assigned to. But that is not the case. Subjects who were not given the intervention instructions and who therefore should have been processing on-line did not perform in a manner completely consistent with the on-line model, for the most part. Whether the other subjects performed consistently with memory assumptions is less important here. What is most important is that many basic

assumptions of the on-line model do not seem supportable in an environment which better mimics a real election campaign.

Figure 5.1
Amount of Information Examined

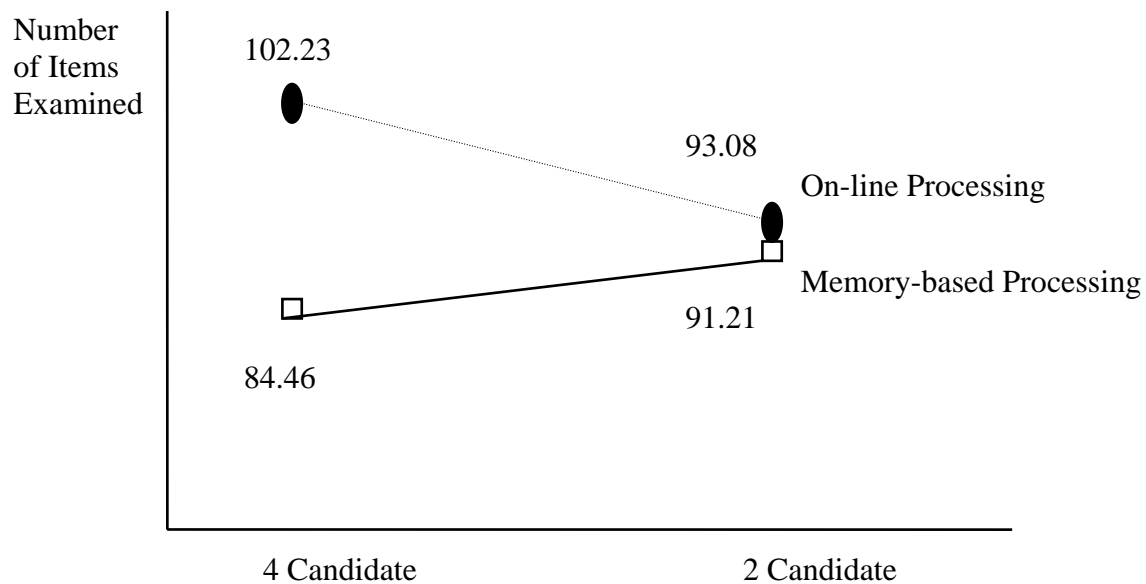


Table 5.1
Analysis of Variance
Amount of Information Examined by Processing and Task Difficulty

	SS	df	MS	F	Prob.
Information Processing (I)	2438.01	1	2438.01	2.498	< .10 (one-tailed)
Task Difficulty (D)	44.92	1	44.92	.046	n.s.
I x D	1546.01	1	1546.01	1.584	n.s.
Residual	91742.37	94	975.98		

Figure 5.2
Proportion of Vote Accurately Predicted by Memory Affect
by Information Processing

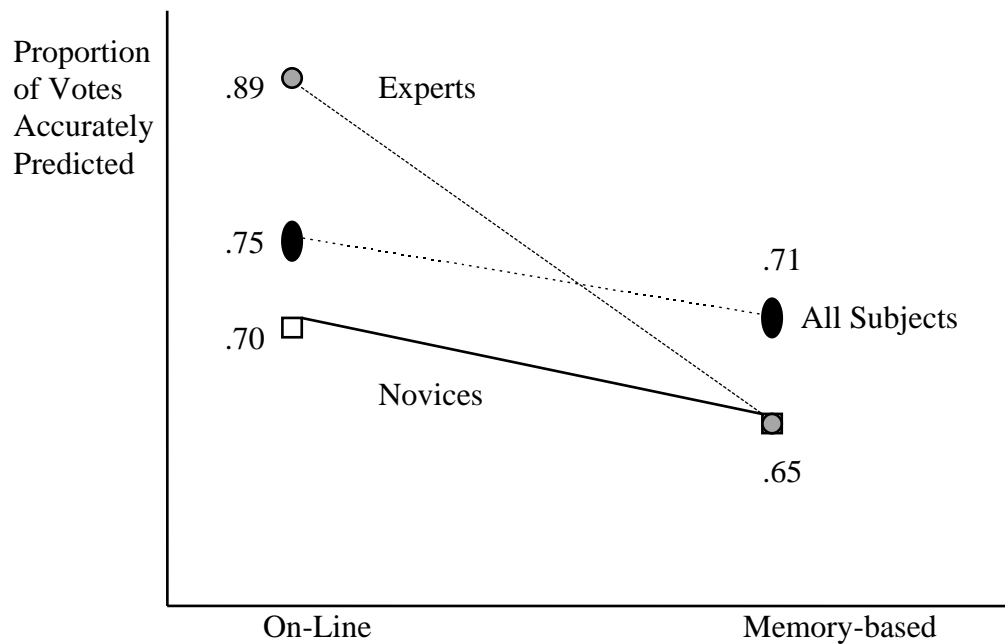


Table 5.2
Proportion of the Vote Accurately Predicted

Information Processing	-.2412	(.6694)
Expertise	.9806	(.7811)
Info Processing by Expertise	-.8135	(1.0313)
Constant	.6931	(.4629)

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

Table entries are logistic regression weights. Standard errors in parenthesis.

Figure 5.3
Proportion of Vote Accurately Predicted by Memory Affect
by Task Demands

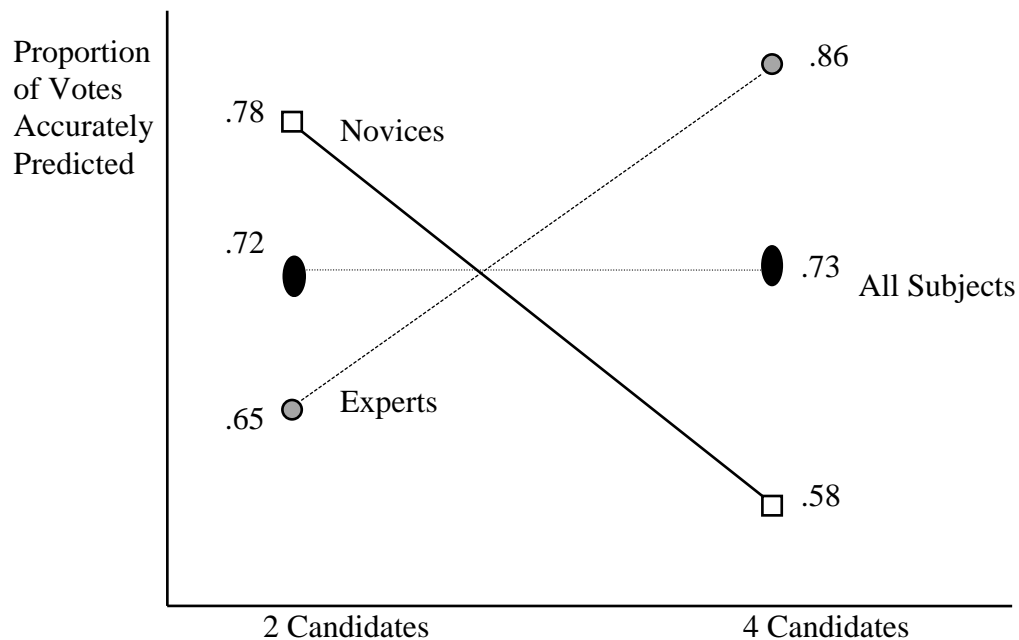


Table 5.3
Proportion of Vote Accurately Predicted

Task Demands	-.8289	(.6881)
Expertise	-.4235	(.7273)
Demands by Expertise	1.7268*	(1.0181)
Constant	1.0296**	(.5210)

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

Table entries are logistic regression weights. Standard errors in parenthesis.

Table 5.4
Difficulty of Decision by Processing Mode

Reported Difficulty of Primary Choice (1=not difficult, 5=very difficult)

On-line	3.280	(1.179)
Memory-based	3.633	(1.270)
t < .10 (one-tailed)		

Confident of Correct Choice (1=extremely confident, 5=not at all confident)

On-line	3.234	(1.371)
Memory-based	3.522	(1.260)
n.s.		

Time Required to Make Decision (in seconds)

On-line	10.645	(7.531)
Memory-based	16.657	(26.237)
t < .10 (one-tailed)		

Overall Index of Difficulty (higher values indicate more difficult)

On-line	.1018	(.644)
Memory-based	.4015	(.943)
t < .05 (one-tailed)		

Table entries are means, standard deviation in parentheses.

Table 5.5
Speed of Decision by Processing Mode

	<i>Actual Time Required for Decision (seconds)</i>		
	Early	Middle	Late
On-line Processors	9.945 (7.166) n=17	15.41 (14.183) n=17	13.003 (6.820) n=16
Memory Processors	12.533 (10.472) n=16	12.76 (8.999) n=16	20.755 (38.910) n=17

<u>Tests of Linearity</u>					
	SS	df	MS	F	Prob.
<u>On-line Processors</u>					
Between Groups					
Linearity	81.28	1	81.28	.8063	n.s.
Dev. from Linearity	173.59	1	173.59	1.7220	n.s.
Within Groups	4737.98	47	100.81		
<u>Memory Processors</u>					
Between Groups					
Linearity	567.84	1	567.84	.9644	n.s.
Dev. from Linearity	162.83	1	162.83	.2766	n.s.
Within Groups	27083.64	46	588.77		

Table 5.6
Speed of Decision by Processing Mode
Two Candidate v. Four Candidate Primary

Two Candidates in Party Primary

	<i>Actual Time Required for Decision (seconds)</i>		
	Early	Middle	Late
On-line Processors	8.513 (3.645) n=8	10.683 (9.549) n=8	12.035 (5.740) n=8
Memory Processors	14.720 (14.256) n=8	13.319 (11.078) n=8	28.464 (57.380) n=8

Tests of Linearity

	SS	df	MS	F	Prob.
<u>On-line Processors</u>					
Between Groups					
Linearity	49.61	1	49.61	1.0832	n.s.
Dev. from Linearity	.89	1	.89	.0195	n.s.
Within Groups	961.84	21	45.80		
<u>Memory Processors</u>					
Between Groups					
Linearity	755.67	1	755.67	.6265	n.s.
Dev. from Linearity	365.03	1	365.03	.3026	n.s.
Within Groups	25329.18	21	1206.15		

Table 5.6 Continued
Speed of Decision by Processing Mode
Two Candidate v. Four Candidate Primary

Four Candidates in Party Primary

On-line Processors	11.217 (9.339) n=9	19.608 (16.744) n=9	13.972 (8.037) n=8
Memory Processors	10.346 (4.563) n=8	12.193 (7.076) n=8	13.902 (5.899) n=9

Tests of Linearity

	SS	df	MS	F	Prob.
<u>On-line Processors</u>					
Between Groups					
Linearity	39.21	1	39.21	.2658	n.s.
Dev. from Linearity	289.13	1	289.13	1.9600	n.s.
Within Groups	3392.83	23	147.51		
<u>Memory Processors</u>					
Between Groups					
Linearity	53.52	1	53.52	1.5201	n.s.
Dev. from Linearity	0.03	1	0.03	.0007	n.s.
Within Groups	774.68	22	35.21		

Table 5.7
Percentage Vote Correctly Predicted from Information Examined
by Task Demands and Processing Mode

	<i>Predicted Vote Based on:</i>	
	Early Information	Late Information
2 Candidates in Party Primary		
On-line Processing (n=20)	75.00%	85.00%
Memory Processing (n=22)	72.73%	68.18%
4 Candidates in Party Primary		
On-line Processing (n=26)	46.15%	80.77%
Memory Processing (n=23)	30.43%	73.91%

Table entries are percentage of cases correctly predicted using discriminant analysis.

Table 5.8
Percentage Vote Correctly Predicted from Information Examined
by Task Demands and Processing Mode

	<i>Predicted Vote Based on:</i>	
	Middle Information	Late Information
2 Candidates in Party Primary		
On-line Processing (n=20)	70.00%	85.00%
Memory Processing (n=22)	81.82%	68.18%
4 Candidates in Party Primary		
On-line Processing (n=26)	69.23%	80.77%
Memory Processing (n=23)	69.57%	73.91%

Table entries are percentage of cases correctly predicted using discriminant analysis.

Table 5.9
Voter Decision Quality

	<i>Task Difficulty Manipulation</i>				
	2 Candidates	4 Candidates			
<i>Processing Manipulation</i>					
On-Line Processing	.75 (n=24)	.43 (n=26)			
Memory Processing	.70 (n=23)	.49 (n=22)			
ANOVA Results					
	<u>SS</u>	<u>df</u>	<u>MS</u>	<u>F</u>	<u>Prob.</u>
Task Difficulty (D)	1.671	1	1.668	9.088	<.01
Information Processing (I)	.000	1	.000	.001	n.s.
I x D	.075	1	.075	.411	n.s.
Residual	16.703	91	.184		

Table 5.10
Decision Quality and Non-Stereotypic Candidates

Four Candidate Primary Election*

Preferred Candidate is:

	Stereotypic	Non-Stereotypic			
<i>Processing Manipulation</i>					
On-Line Processing	.50 (n=18)	.27 (n=8)			
Memory Processing	.50 (n=16)	.46 (n=6)			
One-way Analysis of Variance					
Source	D.F.	SS	MS	F	Prob.
Between Groups	3	.3337	.1112	<1.0	n.s.
Within Groups	44	7.0404	.1600		
Contrast	Value	SE	T	DF	Prob.
On-line/Non-stereo	-.6437	.4749	-1.355	44.0	<.10 (one-tailed)

* In the two candidate primary, neither candidate was non-stereotypic. Thus, this analysis cannot be carried out for subjects in the two candidate condition.

Table 5.11
Decision Quality and Subject Ideological Constraint

	<i>Subject's Ideology is:</i>	
	Constrained	Unconstrained

Two Candidate Primary Election

Processing Manipulation

On-Line Processing	.67 (n=9)	.80 (n=15)
Memory Processing	.73 (n=11)	.67 (n=12)

One-way Analysis of Variance

Source	D.F.	SS	MS	F	Prob.
Between Groups	3	.1558	.0519	<1.0	n.s.
Within Groups	44	9.2485	.2151		

Contrast	Value	SE	T	DF	Prob.
On-line/Unconstrained	.3394	.4364	.778	43.0	n.s. (two-tailed)

Four Candidate Primary Election

Processing Manipulation

On-Line Processing	.55 (n=13)	.30 (n=13)
Memory Processing	.44 (n=4)	.50 (n=18)

One-way Analysis of Variance

Source	D.F.	SS	MS	F	Prob.
Between Groups	3	.4679	.1560	<1.0	n.s.
Within Groups	44	6.9063	.1570		

Contrast	Value	SE	T	DF	Prob.
On-line/Unconstrained	-.5904	.4107	-1.438	44.0	<.10 (one-tailed)

Chapter 6 Memory and Voting

The on-line model of candidate evaluation did not perform nearly as well as expected in the previous chapter. Subjects who should have been processing on-line, if that truly is the default mode of processing campaign information, did not live up to the expectations of the model, in many ways. They did not report fewer memories, and they did not make a vote choice faster than other subjects supposedly placed in the memory processing condition. Further, and quite importantly, the information which appeared to best predict their vote decision was viewed late in the campaign, rather than earlier, in direct opposition to the on-line model's assumptions about how evaluations proceed.

But there is a far more interesting question that needs to be explored than simply a comparison of the two models as made in Chapter 5. Despite the effectiveness with which Lodge has argued in favor of on-line processing and the support found in several Stony Brook studies, the approach used by Lodge and his colleagues has a serious design flaw that may have led to their results seriously understating the role of memory in a real-world election campaign. Taken to its logical conclusion, the Stony Brook model suggests that memory should play no significant role in the decision-making process given the existence of an on-line tally. Throughout the studies there is a clear assertion that memory for candidate positions and attributes is not involved in the evaluation process. Yet, such a bold statement seems to defy logic; a voter certainly must remember some things about the election environment; including candidate names, the voter's own preferences on issues of importance, and the like. In addition, as noted in earlier chapters, some campaign information that is encountered does filter through working memory and

establish itself in long-term memory, connected to the candidate memory structure. Thus, there is some role for memory after all. The question is, to what degree do the contents of a voter's memory matter?

While the Stony Brook model would suggest that the answer to the question is “not at all,” in previous studies Lau and I have completed using our dynamic process tracing design, we have found that memory does count under certain conditions (Lau & Redlawsk, forthcoming.) Importantly, memory appears to us to be a critical variable in whether a voter manages to pick the "correct" candidate to support.⁵⁸ Voters in our previous studies who show a more effective use of memory also show a greater likelihood of casting an accurate vote even as much of the evaluation process appears to occur on-line. Memory appears to play an important role when information comes at the voter in a chaotic, unorganized fashion, which is, of course, the essence of a political campaign. However, the Stony Brook model as currently formulated has developed primarily from experimental research involving single political figures, even though Lodge (1995) suggests the process that would be used in an election would parallel that used in the single candidate studies. Voters are believed to maintain distinct tallies for each candidate which are manifested as affective tags connected to the long term memory knowledge structure of that candidate. Upon being called to make a choice (which does not have to be in the voting booth) the voter retrieves each OL Tally and makes a comparison between them, choosing the candidate with the highest value. Direct comparisons on specific attributes are not otherwise made between candidates. Instead,

⁵⁸ By “correct” I mean the candidate who is closest to the voter on issues, ideology, and group affiliations. See Lau & Redlawsk (forthcoming) for a detailed description of how vote accuracy was

voters compare each piece of information to their personal preference position for each particular item and increment or decrement the tally for the candidate without regard to positions taken by any other candidates. Indeed, in this respect Lodge's approach is similar to Kelley and Mirer (1974) who argue that voters simply sum up likes and dislikes about each candidate and choose the one with the best score. Though the similarity is striking, Kelley and Mirer see the "summing up" as a process that takes place from information in memory when the choice is to be made. Lodge also differs from Kelley and Mirer in arguing that the OL Tally does not represent an additive total of each piece of information. Instead, it represents an averaging process, where each new piece of information is averaged with existing information, rather than simply added to it. Lodge takes this to mean that early information carries more weight than later information, making the order in which information becomes available during the campaign an important factor in vote choice.⁵⁹

A primary reason why Lodge's studies have consistently shown memory to be unimportant may be that until recently, all of his reported studies used only one political figure. Subjects were not asked to choose, as they do in an election, but simply to evaluate one politician. Under such circumstances people could be expected to use an OL Tally and there can be little doubt that an on-line process pertains to evaluations of single political figures outside of the election environment.⁶⁰ But to use a single candidate to

determined. While similar to the calculation used in this project (See Chapter 4) there are some important differences between the studies.

⁵⁹ This represents a primacy effect, where information that is learned first is more important than that which is learned later. Lodge reports that their laboratory studies have shown that the importance of new information and its ability to adjust the OL Tally decreases in a curvilinear fashion (Lodge, Steenberger, and Brau, 1995.)

⁶⁰ In fact, Lodge, McGraw, and Stroh (1989,) following Hastie and Park (1986,) note that subjects can be expected to default to on-line processing when the task is defined as an evaluation task.

make statements about elections is to mispecify the research design. It is less than clear whether the Stony Brook findings hold in an election contest. Elections entail two or more candidates who may be compared to each other as well as to the voter's own ideal point. This may generate a different process altogether.

With some recognition of this fact, Lodge recently extended his basic experimental paradigm into a two candidate environment (Lodge, Steenbergen, and Brau, 1995.) Even so, the analysis of this latest study continues to show no role for memory to play in the Stony Brook model. This result should not be surprising, but it can not be taken as conclusive evidence that voter memory is unimportant in a campaign. The Stony Brook research does not attempt to mimic the dynamic flow of a campaign in the experiments. Instead, even in the two candidate design information was presented to subjects in an easy to read and compare form -- with one candidate next to the other, much like the static information board approach. Thus, subjects could easily make comparisons between the candidates, greatly facilitating their decision task and eliminating the need to remember specifics. This flaw would be of no consequence if information during a real-world political campaign were organized in such a fashion, so that whenever one candidate's position on an issue was presented, the other candidate's position would be listed as well, in easily comparable form. But, in the real world, this rarely happens. Instead, voters may receive candidate A's position on welfare today, and candidate B's next week. If a voter is interested in making direct comparisons on attributes of importance, it may be necessary to remember candidate A's position when encountering candidate B's stand. Thus, the voter who thinks in terms of making direct

comparisons between candidates is required to find some way to maintain information beyond what is allowed for in the Stony Brook on-line model.

Processing Patterns and Memory

Of course, this begs the question of whether voters do make such direct comparisons. Where models such as Kelley and Mirer (1974) are predicated on comparison, the on-line model assumes that all evaluation occurs within candidates, rather than within attributes. Fortunately, this question can be addressed empirically -- the process-tracing methodology used in this study provides the ability to examine the type of transitions that subjects use in moving from one item to another. Processing within-candidates; that is, in a manner where subjects focus on one candidate for several attributes and then switch to another and examine several pieces of information about that candidate, will be evidenced by higher use of *intra-candidate transitions*, while those who examine information by first looking at one candidate on an issue and then searching for another candidate on the same issue will show *intra-attribute transitions*. The strict on-line model would predict that for on-line evaluations, few intra-attribute transitions would occur, while a large number of intra-candidate transitions could be expected. While the model makes no predictions for memory-processors, candidate-based search might be expected here as well, since a strategy of connecting specific memories to a candidate node in long-term memory might be the most effective for memory recall.⁶¹

Table 6.1 presents the mean proportion of all available intra-candidate and intra-attribute

by attempting to short-circuit the evaluation process.

⁶¹ The zero-order correlation between the use of intra-candidate transitions and the total number of memories reported for all subjects is .1750, $p < .1$; while the correlation between intra-attribute search

transitions that were actually made during the experiment.⁶² As can be seen readily, subjects made approximately three times as many intra-candidate transitions as they did intra-attribute (.40 vs. .13.) There was a significant preference for moving within candidates; examining first one item from a candidate and then another from the same candidate, before switching to another candidate. This processing difference was consistent for both on-line and memory-based subjects.

Insert Table 6.1 about here

While this evidence would appear to strongly support the contention of the on-line model that comparisons are not made between candidates, it is important to note that even though more candidate transitions are made, the proportion of available intra-attribute transitions actually made is not insignificant.⁶³ The design of the system tended to make intra-candidate transitions easier, in that the likelihood of having an item available on the screen for the candidate who was just examined was greater than the likelihood of finding the same attribute for another candidate immediately available. A subject who wished to

and the number of memories is $-.0473$, *ns*, providing some evidence that within-candidate search is related to improved memories of the information encountered.

⁶² Given the nature of the dynamic information board, there are times during the experiment when it is not possible to make either an intra-candidate or an intra-attribute transition, given the contents of the six items shown on the screen at any one time. The measures of these transitions used throughout the analysis are adjusted by only considering the proportion of transitions that were actually available at any given time.

⁶³ Processing completely randomly, approximately 16% of all transitions would have been intra-candidate, while just over 1% would have been intra-attribute. Given six candidates, a subject could pick any one of the six immediately following an item for candidate A, in only one case would the subject make an intra-candidate transition -- if candidate A is picked again. Given 66 separate pieces of information on each of the candidates -- issue, party, endorsements, polls, and candidate information -- any one transition would have to be from Attribute A for Candidate A to Attribute A for any of the other five candidate to be an intra-attribute transition. Thus, in random processing, theoretically only one in 79 transitions would be intra-attribute.

make an intra-attribute transition might have to be more patient to await the availability of a suitable item than would one using intra-candidate search. Further, the making of a direct intra-attribute transition only indicates that the subject immediately searched for the same information for a different candidate. It does not provide any indication that a subject might make comparisons across candidates on a delayed basis, as information became available. Combined with the evidence of direct intra-attribute transitions the measure of the depth of search -- that is, the degree to which subjects examined the same information for multiple candidates -- gives an additional comparison across candidates. This measure, presented in the second half of Table 6.1, shows that for nearly half of the items subjects looked at, they examined them for two or more candidates within their party. Further, those subjects who had four candidates in their primary election compared three or more candidates on just over one-third of all attributes examined. There are no differences here between processing modes, indicating again that all subjects make an effort to learn about the candidates in a way which implies that comparisons are occurring between those candidates.

Thus, even if voters are often concentrating within a single candidate as they make their evaluations, there is evidence that from time to time they do wish to compare candidates across attributes. This comparison process is not accounted for by the current on-line model. However, just the act of moving from one candidate to another within the same issue does not itself prove that voters are comparing candidates to each other. It could simply represent a random move through the information available to the subject. Or, if the choice is made with the intent of examining how the second candidate stands on an issue just examined for the first candidate, voters could still be simply updating

individual tallies for each candidate, without making a direct comparison between them. On the other hand, if direct comparisons are being made, then there is a process involved in evaluations not described by the Stony Brook model. Evidence that this latter is the case will be presented later in this chapter. For now, the important point is that some number of intra-attribute transitions do take place during campaign information search and that a significant amount of search which would facilitate direct comparisons does happen.

In addition to the possibility that voters use memory in order to make direct comparisons between candidates on information which is not necessarily available at the same time for every candidate, memory may also be important in the evaluation of single candidates. During an election campaign voters may encounter the same information multiple times. The Stony Brook on-line model argues that each time a piece of information is encountered it is evaluated and the OL Tally updated accordingly. This is true whether or not the same piece of information has been encountered previously. Thus, repeated exposures to the same information will affect the OL Tally *each time there is an exposure*. The implications of this are quite significant, suggesting that a campaign need only determine the issues most likely to influence voters toward its candidate and away from any others and then repeat those issues time and again during the campaign. On the other hand, voters might use memory in order to discount repeated effects of the same information. That is, if a voter remembers previously encountering a particular piece of information it is possible that the OL Tally will not be updated upon repeated exposures, since the voter could well recognize that the information has already been evaluated.

Thus, another role for memory during a campaign might be to limit the effects of repeated exposures to already processed information.

The On-line Tally and Memory

The question of whether the OL Tally is itself informed by memory and whether it is best represented by an averaging process can be addressed by calculating measures of the OL Tally using a 2 x 2 matrix of assumptions. There are two possibilities for the use of memory -- either memory is used or it is not. Likewise, there are two approaches to calculating the Tally -- averaging or additive (as noted in Chapter 4.) It is important to note that any measure of the Tally must be uncontaminated by the ultimate evaluation made once the election is complete. Thus, it is impossible to calculate an OL Tally by reviewing items with subjects and asking how they felt after they have already voted. Fortunately, the nature of process tracing eliminates this problem. As subjects examined information about the candidates during the election simulation, the computer recorded which items were examined. This information, combined with the preferences on issues, parties, and groups provided by subjects in the initial opinion survey allows the creation of measures approximating the OL Tally.

The OL Tally calculations used here are generated independently of the vote. Four possible measures were examined. The first approach used the basic Stony Brook model, with the Tally calculated as an averaging process assuming no memory for previously examined items. Thus, every time some information about a candidate is encountered, the evaluation of that information is averaged with all prior information learned about that candidate regardless of whether the information had been previously encountered and processed. The second approach again assumed an averaging process,

but hypothesized that memory for previously encountered items would prevent any updating of the Tally when an item was *re*-examined. Next the Tally was calculated assuming an additive approach, much like the Kelly and Mirer calculation for likes and dislikes. The additive calculation was applied first to the no memory effects assumption and then allowing for memory effects.⁶⁴

Table 6.2 reports the correlations between these four conceptions of the OL Tally and the feeling thermometer evaluation for the candidate for whom subjects voted. While little difference can be accounted for by the assumption of memory processes during updating, the difference between an averaging and an additive integration process are very clear. In this experiment, the use of an averaging process results in almost no correlation between the Tally and the evaluation of the candidate. On the other hand, assuming an additive Tally results in a significant positive correlation between the two. On the basis of this evidence, then, it is hard to support Lodge's averaging process. The Tally works best when it is assumed that each new piece of information is simply added to the sum of all previous information that has been examined. Turning to the question of memory and the Tally, however, the results are not as clear. The data do not allow rejection of the Stony Brook assertion that memory does not play a role in updating the Tally. However, it cannot be argued that memory is unimportant, either. Further analysis in this chapter will include both the memory and no-memory assumption for the OL Tally, in order to compare the results.

Whether memory matters or not in an election environment can only be studied by extending the on-line model beyond the single political figures of most Stony Brook

⁶⁴ Refer to Chapter 4 for more complete details on the OL Tally calculation.

experiments to the two (or more) candidate election. If the model holds only for evaluation of single political figures, then it does not move us very far to understanding voting, which is inherently a contest between multiple candidates. On the other hand, Lodge gives us every reason to think that the basic model will hold for elections, which are inherently more complicated than the evaluation of a single candidate. After all, one of the values of the on-line model is that it accounts for the limited information processing capacity of humans. If this simplifying process is used in the relatively simple case of forming impressions of a single individual, then it would be all the more likely to be used in the more complicated case. But this must be tested. Further, conditions under which on-line processing is likely to appertain during an election must be established. Do all voters approach election campaigns in this manner? Or are some voters motivated by various factors to attempt to maintain greater memory stores which they actually do consult in order to make a decision? Perhaps there is a difference in a relatively simple election campaign -- two candidates of significant ideological distinction compared to a multi-candidate election in which ideology is blurred. It may also be that the information flow during the course of an election campaign has an impact on the use of memory. Perhaps some voters actually are interested in making direct comparisons about candidates. If so, information flows during campaigns are rarely accommodating. Instead, information may appear about one candidate at one point, and the same information may appear about another candidate at another point in time. This would then require the voter interested in making these comparisons to store the first candidate's information in memory, in order to use it later to make the comparison. Thus, there may be a set of voters for whom memory is a more important factor than the on-line

model currently specifies. This project is designed to investigate the conditions under which memory plays a role in voter decision-making. To examine memory and its impact on information processing during an election campaign, several questions are explored in this chapter.

Question 1: What types of memories are reported and who reports them?

Given the wide array of information to which voters can be exposed during a presidential election campaign, are there any particular types of memories more likely to stick in voters' minds? Voters may differ, of course. Some may tend to remember information about candidate traits. Others might be motivated to try to remember issue positions. Still others might find that group related information is most readily stored in long term memory. Before examining if memory has any affect on the quality of the decision made, there must be an effort to establish if there are any patterns in the types of memories voters report.

Question 2: How does memory compare to the information actually viewed by voters during the election campaign?

Is memory a veridical representation of the information encountered, or are some types of information more likely to be remembered? If voters simply store information about the campaign as they receive it, then reports of memories should closely align with the particular information learned about each candidate. The Kelley and Mirer (1974) model presumes this to be the case -- that memories represent at least an accurate and unbiased subset of the campaign to which the voter was exposed. Lodge, et al. (1989) find that the contents of memory of their subjects are highly biased and do not represent the information to which subjects were exposed during the experiment. But, given the limitations of the Stony Brook experiments and their failure to accurately model the dynamics of a presidential campaign, this question must be explored.

Question 3: Are the memories reported by voters accurate? Whether or not voter memories after the election fully represent the information that was part of the campaign, are those memories at least accurate in their content?

Question 4: Does memory matter? Can memory be used to improve predictions of the vote choice? Are subjects with more accurate memories more likely to make a better quality decision? How might memory affect the OL Tally itself? As noted above, some evidence has been found by Richard Lau and I (forthcoming; see also Redlawsk, 1995) to suggest that no matter what processing method voters are using, accurate memories are an important factor in determining whether voters can select the candidate who best represents their stated interests. Lodge might suggest that these findings are an artifact of an experimental design in

which voters were provided an incentive to be accurate.⁶⁵ Thus this question needs further examination. If memory is important, it casts some doubt on the validity of the on-line model as a complete explanation of how voters use campaign information.

The answers to these questions are the focus of the remainder of this chapter.

What types of Memories are Reported?

Turning to the memories reported by subjects, we find, as we might expect, far fewer memories reported than number of items actually examined. Table 6.3 lists the number of memories reported by subjects, along with a breakdown by type of memory. Overall, subjects reported a mean of 11.20 memories across all six candidates.⁶⁶ Memories were much more likely to be positive than negative (5.76 positive memories compared to 2.86 negative memories per subject). In general, issues led the way, with subjects reporting more memories that related to issue positions by the candidates than any other.⁶⁷ Person memories were next, followed by party memories.⁶⁸ Reports of

⁶⁵ In the study reported in Lau and Redlawsk (forthcoming) subjects were informed before the campaign began that the experimenters would evaluate their decision accuracy and place those who were accurate into a lottery to receive a \$25 prize. The purpose of this instruction was to create an incentive to take the experiment seriously. It was found that subjects were quite engaged by the experiment and in later experiments the incentive was eliminated. I (Redlawsk, 1995) report results that make up a part of the current project in which memory effects found by Lau and I in previous experiments (forthcoming) are not as strong with the incentive removed.

⁶⁶ While much of the analysis in this Chapter focuses on memories for candidates within the subject's chosen political party, the memory test itself simply provided the last names of each candidate on a blank sheet of paper leaving it up to the subject to remember which candidate was in which party. Thus, initially the results of the memory testing for all candidates will be presented. However, as subjects were limited to choosing only from those candidates actually in their party, analysis of the effects of memory on the vote will be limited to memories for subject party candidates only.

⁶⁷ All of the campaign information presented during the election can be categorized into five groups. Issue information consists of items which present candidate stands on a wide array of campaign issues. Person items are information about the candidates, including background characteristics, personality, prior experience, and the like. Party information simply provided the name of each candidate's political party. Group information consisted of endorsements of candidates by various interest groups. Hoopla based information included polls, campaign slogans, and information designed to focus on the horserace aspect of the campaign.

endorsements (group memories) and campaign hoopla (polls, slogans, etc.) trailed behind. Anova modeling shows that these summary measures mask some significant differences in memory recall across experimental conditions, particularly differences between those subjects facing a relatively easier campaign (only two candidates from which to choose) and those facing a more difficult choice (the four candidate primary election). However, no interactions between the processing and task difficulty conditions are found for any memories, nor are there any significant effects for the processing manipulation. But, as shown in Table 6.4, there is a significant difference in the *total* number of memories reported by those in the two candidate condition and those in the four candidate condition, with subjects in the less demanding situation reporting more memories ($F=5.375; p<.05$). Subjects who had a more difficult task -- facing four candidates within their own party -- appeared to have been unable to retain nearly as much information in memory across all six candidates.⁶⁹ In particular they reported fewer issue and group based memories. In addition, they were less likely to note the party of the candidates on the memory form. Interestingly, however, nearly all of the

⁶⁸ Note that the upper limit on the number of party related memories is six, since this is simply a count of whether or not the subject noted the party of each candidate on the memory form. The fact that party is third in the number of memories is not to say that party is not important to subjects. Overall, 73% of the memories reported were listed for candidates from within subjects' political party. Only 27% were listed for the candidates outside of the party. For those subjects with only two candidates in their party, nearly 63% of memories were for those two candidates, compared with an expected 33% if party did not matter at all. For those in the four candidate condition, 82% of memories were attached to those four candidates. Of course, since this was a primary election, one could argue that subjects should not have looked at all at the other party, focusing only on their own. As it turns out, while subjects recognized they could not vote for candidates from the other party, many noted in debriefing that they were interested in who the other party might be supporting in the general election, and therefore spent some time looking at candidates outside of their own party.

⁶⁹ Not shown is the fact that much of the difference in total memories reported occurs because subjects in the two candidate condition report more memories for the out-party candidates. Considering only the in-party candidates, subjects in the two candidate condition reported a mean of 8.29 memories for these candidates, or more than 4 memories per candidate within their party.

difference between the two groups can be accounted for by the difference in negative memories. That is, those in the four candidate condition reported significantly fewer negative memories than those in the easier condition ($F=14.705, p < .001$.) It appears that unfavorable feelings about the candidates are more quickly forgotten when task demands become greater.

On the other hand, there appears to be no difference in the types or amounts of memories reported based on mode of processing. Whether subjects were in the on-line processing condition (presumed to be the default condition) where the main goal was evaluation and choice, or in the memory-based condition where subjects knew they would have to list what they remembered about the candidates, roughly the same number of memories were reported (Table 6.5). In fact, if anything, those in the on-line condition reported slightly more memories than those in the memory condition! On-line subjects reported slightly more hoopla memories and person memories, while memory processors reported slightly more issue, party, and group memories; however, none of these differences reached significance. This result, however, cannot be interpreted as a failure of the processing manipulation, as there is no reason to expect differences in the raw numbers of memories reported. Since working memory is severely limited (Miller, 1956) and subjects had available extremely large amounts of information compared to memory capabilities, it is likely that many pieces of information made it into memory in either condition. When called upon to report memories after the campaign was completed, both

Subjects in the four candidate condition reported only 7.71 memories, or fewer than two memories per candidate within their party.

groups of subjects may have been limited in their ability to report large numbers of memories due to the limitations of memory retrieval and working memory.⁷⁰

Insert Tables 6.3, 6.4 and 6.5 about here

Memory as a veridical representation of information encountered

In their analysis of memory in an on-line evaluation process, Lodge, McGraw, and Stroh (1989) argue that the contents of memory for their subjects are not a good representation of the information that was actually viewed by the subjects. Using both recognition and recall memory, they show that subjects have a significant amount of inaccuracy in their memories. There are two parts to this inaccuracy. First, people may not retain in memory a veridical representation of that which they encountered. That is, the memories that are reported may not correlate with that which was viewed in the first place. And second, the information they do actually manage to retrieve from memory may be inaccurate. Table 6.6 explores the first of these points; the degree to which the memories reported by subjects in the election simulation relate to the items actually viewed during the campaign. The first column displays the relative proportion of each of

⁷⁰ The associative memory model (Anderson, 1983) calls for the creation of a person memory node upon first encounter with information about a new person, if the goal of the encounter is to make an evaluation. Subsequent information that makes it into memory will be organized via the person node, making retrieval of the information relatively simple upon activation of the person node by some prompt -- for example, a memory test prompted by the person's name. On the other hand, a pure memory processor not expecting to make an evaluation will not necessarily generate such a person node, and memories that are created will not be as well organized or as easy to retrieve. While this could also account for the fact that on-line processors in this experiment recall slightly more memories, the fact is that memory processors in this election environment were undoubtedly processing in a hybrid mode, simply because of the election environment, where all subjects knew they would be voting in the end, and therefore forming an evaluation.

the types of information that were available to subjects during the election campaign. The second column represents the share of each type of information that was actually viewed during the campaign.⁷¹ On average, issue and person information were most often examined, with person information comprising 44% of all information that was viewed and issues comprising 32%. Hoopla and group information follow. The third column of Table 6.6 shows the average share of each type of memory reported. It is immediately clear that the items reported from memory across all subjects are not very representative of the items actually viewed. Instead, issue information is greatly over-represented in the memories listed, while all other types of information are under-represented. This pattern holds whether subjects were in the two or four candidate primary. It also holds for the processing type manipulation -- in all cases subjects over-report issues and under-report most of the other types of items.⁷² During this mock election campaign voters actually viewed candidate centered information to a greater degree than issue information, but across manipulations voters uniformly recalled significantly more issue information as a share of all memories reported. There is a clear bias in the memories reported when compared to the information actually viewed.

Patterns of reported memories do not appear to differ very much either across or within the task demands and processing manipulations with one exception. In the processing manipulation, there is a significant difference between subjects who were in

⁷¹ Because of the unique nature of party information, it is not included here. Due to the design of the experiment, once a subject knew the party for one candidate, she automatically knew it for all of the candidates, based on a color coding scheme. Thus, theoretically, a subject needed to access party identification only once, and in doing so would gain six bits of information. This means that party memories are not directly comparable to party information accesses, and therefore are dropped from this analysis.

⁷² Because the pattern is consistent across manipulations, Table 6.5 omits the analysis between conditions.

the on-line condition and those in the memory condition in the share of issue-based, and to a lesser extent, person-based information they remembered, as shown in the bottom half of Table 6.6. Those in the on-line condition reported a significantly smaller share of issue-based memories than those in the memory condition ($t=1.67$; $p<.10$) while reporting a larger share of person-based memories ($t=1.55$, $p<.15$).⁷³ There seems to be a bias towards reporting issue memories among those who were told they would have to report their memories after the simulation. This bias cannot be accounted for by any difference in the types of information viewed by subjects, as there is no difference in the amount of issue-based or person-based information these two groups examined. Thus on-line processors viewed the same types of information as memory processors, and recalled about the same number of memories, but their memories are skewed away from the issues and more towards the candidate. In either case, however, reported memories do not match closely the items actually viewed during the campaign, providing additional clear support to previous findings that memory contains neither an exact replica of the information that was encountered, nor even a representative sample of that which was processed.

Insert Table 6.6 about here

Memory Accuracy

⁷³ It should be noted here that these differences also provide additional support for the assertion that the manipulation of subjects into “on-line” and “memory-based” groups appears to have had an effect.

In addition to the question of whether memories truly represent what was originally encountered there is the question of whether the memories that are reported are accurate ones. Table 6.7 examines the overall accuracy of memories reported for all candidates, for candidates only from within the primary party, and for the candidate ultimately selected by the voter. Not every memory listed by subjects could be scored for accuracy. Memories that did not include enough detail about a position or trait (for example, a subject might simply list “his foreign policy” as a memory) generally could not be scored. However, across all subjects an average of more than 85% of memories could be scored for accuracy.⁷⁴ This did not vary much across all memories, party-only memories, and memories for the voter’s choice. Overall, an average of nearly 10 memories per subject could be scored for accuracy. In general, these memories were highly accurate, with about 4 in 5 statements correctly remembered. This, too, did not vary whether the memories were global or focused on party or candidate. Whatever perceptual screening is operative when viewing candidates and recalling information, it appears not to have affected the accuracy of the memories recalled.

However, some type of screening did affect the likelihood of reporting memories at each level. Table 6.8 shows the proportion of all memories and of accurate memories compared to the number of items viewed for all candidates, candidates only from the subject’s party, and the chosen candidate. The first part of Table 6.8 shows that information search was directed; random search would have resulted in an equal share of

⁷⁴ For those memories which could be scored for accuracy, the process was fairly simple. Memories listed by the subjects were compared to written copies of all information presented during the campaign. If the gist of a memory for a candidate matched an item of information that had been available for that candidate and the memory was correct it was scored as accurate, otherwise it was considered inaccurate.

16.67% of items viewed for each of the six candidates. However, subjects concentrated search on their party, with in-party candidates each receiving an average of 21.6% of all unique items viewed. As subjects found a candidate they liked, they became more focused, so that the candidate subjects voted for received nearly one-quarter of all accesses of information.

Turning to reported memories in the middle section of Table 6.8, subjects had, on average, memories representing about 12% of the pieces of information they viewed for all candidates. For the information viewed within the subjects' party, this climbs to about 14%, while for the candidate they ultimately chose, subjects remembered about 19% of the information they viewed. Subjects clearly remembered more relative to what they viewed for the candidate they voted for, compared to all candidates ($t=7.60$; $p<.001$.) In fact all combinations of differences between the three levels of memory are significant. The same pattern holds true for accurate memories, shown in the bottom third of Table 6.8. Subjects not only remembered more about the candidate they chose, relative to the number of items viewed for that candidate, but they also had more accurate memories as a proportion of items viewed for that candidate. The process of making a choice appears to have made it easier for subjects to recall information about their chosen candidate when compared to others. Not only did voters access more information about their preferred candidate, but they remembered a greater percentage of that which they viewed, and they remembered it fairly accurately.⁷⁵

⁷⁵ No significant differences were found in any of the measures of accuracy for on-line versus memory-based processors. For the task demand manipulation, some differences appear between the two and four candidate conditions, but they are completely due to the difference in the number of candidates in the party primary, as would be expected, and are not reported here.

Insert Tables 6.7 & 6.8 about here

Memories clearly are not a veridical representation of the information that went into creating them. Voters showed a significant difference between the types of information they accessed during the campaign and the information that they reported as memories. However, what they did remember, they remembered with fairly good accuracy. Subjects were particularly good at reporting memories for their own party and for the candidate they ultimately selected.

Does Memory Affect the Vote?

Traditional voting models have typically focused on predicting the direction of the vote, using various personal characteristics of the voter along with candidate information such as issue positions to predict which candidate had been chosen by the voter in the election. The following analysis uses a similar approach in order to assess the effects of memory on the direction of the vote. Two sets of analyses were conducted. In the first, the multiple regression was used to estimate the relationship between the OL Tally, Memory, and the feeling thermometer evaluation of the candidates. In the second, logistic regression was used to predict the direction of the actual vote using the same independent variables. In both analyses, the first step was to compute the dependent variable. Because of the task difficulty manipulation some subjects faced a choice between two candidates, while others had to choose among four. In order to account for this problem, the vote choice was operationalized as a dichotomous variable with a vote

for a moderate candidate coded high and a more extreme vote coded low.⁷⁶ For the feeling thermometer analysis, the rating for the more extreme candidate(s) was subtracted from that of the more moderate candidate(s) resulting in a continuous dependent variable representing the net evaluation of the moderate candidate. For the vote analysis, the dichotomous vote variable was used directly. Logistic regression predicts the probability of an event occurring or not occurring, which is appropriate for determining whether or not a subject voted for the moderate candidate, compared to the more extreme option (Norusis, 1994.) Predictor variables for both approaches included the experimental manipulations⁷⁷ along with measures for the on-line tally and memories. The OL Tally measure was computed twice for each analysis, using the additive integration process described above, testing both the memory and the no memory assumptions. These summary OL Tally evaluations for the candidates were then combined into a single measure of a net on-line tally.⁷⁸ For each memory reported by subjects, an affective value was also provided by the subject, so that each memory could be scored for “like,” “dislike,” or no feeling (Kelley & Mirer, 1974.) A net affective memory score was then calculated for each candidate and then combined into a single comparative measure of

⁷⁶ In the two candidate condition, this coding represents the actual choice faced by subjects. In the four candidate condition, a vote for either of the two moderates was coded “1” and a vote for either of the two more extreme candidates a “0”.

⁷⁷ The poll interruption manipulation was coded as two dummy variables to represent the contrast between those interrupted by the poll one-third of the way through the experiment and those interrupted two-thirds of the way through with those subjects who were not interrupted by the poll.

⁷⁸ The relative on-line tally measure was created by first calculating the on-line tally for each available candidate. Then, if the subject voted for one of the two extreme candidates, the tally for that candidate was assigned as the “extreme candidate tally.” Likewise, if the vote was for a moderate candidate, the tally for the candidate selected was assigned to the “moderate candidate tally”. In the two candidate condition, the tally for the candidate not chosen was assigned to the opposite category (extreme or moderate) from the vote choice. In the four candidate condition, the mean of the tallies of the two candidates in the opposite group was used. In both cases, the resulting “extreme candidate tally” was subtracted from the “moderate candidate tally” to create the comparative on-line tally measure.

affect associated with memories in the same fashion as the on-line tally measure.

Interaction terms between the processing mode and task demand manipulations and each of the on-line tally and the recall memory affect measures were also calculated. This was done to account for the expected differences in the effects of memory for on-line processors compared with memory based subjects, as well as test for effects from easier (2 candidate) or harder (4 candidate) choices.⁷⁹ If the memory manipulation successfully interrupted the default on-line evaluation process, then memory based subjects should show little effect of the on-line tally, while continuing to show effects for the memory affect they report.

The inclusion of the main effects of the experimental manipulations as predictor variables should not be interpreted as having been done with expectations that they would affect the vote choice or candidate evaluations. There is no theoretical or practical reason why they should do so. On the other hand, in order to control for any unexpected effects of the experimental manipulations, the main effects of the manipulations are included, along with an interaction term between the processing and task difficulty conditions.

In these analyses the important predictors are the on-line tally and the memory affect. The Stony Brook experiments have consistently shown that in the presence of the OL Tally, memory has no independent effect on the direction of the vote. In the present analysis the on-line tally variable and the memory affect variable are both to be used to

⁷⁹ The processing manipulation is coded so that on-line processing is “0” and memory processing subjects receive a value of “1”. Thus, the interaction terms between processing mode and the on-line tally, and processing mode and memory affect indicate the degree to which memory processors differ from on-line processors. Likewise, the task demand manipulation is also coded 0/1, with 1 representing the 4 candidate condition.

predict the vote direction. If the net affect of the candidate memories in this experiment has no significant effect, the Stony Brook findings are replicated in a very different environment from the original experiments. However, if memory is shown to have an independent effect, then evidence is provided that once subjects face a more reasonable approximation of an election environment, rather than a simple list of positions and characteristics for a single candidate, memory is playing some sort of role.

Turning first to the feeling thermometer analysis in Table 6.9, the results seem quite clear, with little difference whether the OL Tally is computed assuming a memory process or not. In the initial model, the OL Tally is a significant predictor of net candidate evaluation, although the resulting R^2 is very weak. The higher the net OL Tally score in favor of the moderate candidate, the greater is the net evaluation of the moderate, which is what was expected. Examining the interaction terms, we find that while the OL Tally is a strong predictor for subjects in the online condition, for those in the memory condition, the OL Tally is much weaker, indicating both that the manipulation was successful and that subjects primed to use memory show less reliance on the on-line evaluation process. While both interaction terms associated with the OL Tally are negative, implying that memory processors and those facing more candidates are less likely to find the Tally useful, these conclusions are suggestive at best since neither result is statistically significant. Clearly, *when memory is not included in the model*, the OL Tally does appear to be useful in predicting evaluations.

The results of the initial model, while not strong, are in the direction predicted by the Stony Brook model of on-line evaluation. But, this initial model is misspecified. Once memory is introduced as a predictor variable, the results change quite a bit, as displayed

in the bottom half of Table 6.9. The associated R^2 indicators climb to nearly .40, a very respectable result. Main effects for the OL Tally are eliminated; the only effects are a significant interaction between the Tally and task demands. Subjects facing four candidates show strong evidence that the OL Tally does not work for them. More interestingly, the main effects of memory are very strong: the more the net affect associated with uncued recall memories favors the moderate candidate, the higher the feeling thermometer evaluation of that candidate. And while these main effects are not modified by the processing condition, they are strongly effected by the presence of four candidates rather than two. Taken together with the interaction term for the OL Tally, the interaction between the number of candidates and the relative effects of the Tally *versus* memory seem striking. Simply put, subjects facing the more difficult task of keeping track of four candidates in a primary election show strong positive effects for memory and, if anything, negative effects for the OL Tally. But even for those subjects in the two candidate condition memory overwhelms any effects of the OL Tally.

Showing evidence of memory in the evaluation of candidates is important, but the more direct approach is to show that the actual vote choice is influenced by memory. Table 6.10 presents this analysis. As with candidate evaluation, the results of looking directly at the vote choice confirm that memory is important.⁸⁰ The initial models, containing the OL Tally but no memory effects, are very weak and provide no new insight. Accordingly, they are omitted from the Table. Overall, at best 63% of the

⁸⁰ Interpretation of the coefficients from a logistic regression is not as simple as in linear regression. The model being tested is the probability of a correct vote, which is calculated as:

$$\text{Prob}(\text{Vote for Moderate Candidate}) = 1 / (1 + e^{-Z}) \text{ where } Z = B_0 + B_1 X_1 + \dots + B_p X_p.$$

subjects can be accurately classified by these initial models, if we assume that the OL Tally is itself informed by memory, while the model built on the no-memory OL Tally is even weaker. In both cases none of the individual variables are statistically significant. Once again, however, the addition of memory affect has a substantial effect on the models. The revised models predict voting direction with a high degree of accuracy: approximately 90% of subjects are correctly classified. Despite the insistence of advocates of the Stony Brook model, there seems to be a role for memory to play in the vote choice itself -- those memories that subjects like or dislike about the candidates are predictors of the vote choice, even in the face of the on-line tally. The interaction terms make the nature of the role of memory and the on-line tally fairly clear. The Tally is overwhelmed by memory effects. The memory effects themselves are strongest for subjects facing a complicated choice, when compared to those subjects facing a simpler decision between two candidates.

These findings cannot be easily reconciled with the model of the OL Tally developed by the Stony Brook experiments. Lodge and his colleagues have argued that the OL Tally is not informed by memory, and that when both the Tally and contents of memory are tested for their effects on candidate evaluation, it is the Tally which explains the evaluation, not memory. Yet the findings reported above clearly indicate that the contents of memory affect both candidate evaluation as measured by feeling thermometers *and* the direction of the vote itself. These results could not be more divergent from the Stony Brook model. The key may lie in the more realistic campaign environment in which subjects in the current experiment participated. The Stony Brook model was developed in a series of experiments using only a single political figure with

subjects receiving information in a static, easy to assimilate format. No comparisons between candidates were necessary and subjects did not expect to have to make a choice at the end of a political campaign. In such an artificial environment, the use of a simple on-line evaluation process is clearly highly efficient and allows the evaluator to use information quickly and easily. Political campaigns, however, are not so tidy that voters can easily acquire information and use it to make evaluations. Thus, the current experiment, which models the dynamic nature of a multi-candidate political campaign, appears to be stimulating different processes in subjects who know they must not only evaluate, but actually choose between candidates. In so doing, these voters may use a kind of OL Tally in order to simplify certain parts of the evaluation process, but if they do, the Tally is less important in the end than the memories subjects report about the campaign.

A second reason for the divergence in findings may be attributable to different operationalizations of the OL Tally itself. In the Stony Brook studies, the Tally is typically computed based on the likes and dislikes of each campaign statement as expressed by the subject during the course of the experiment. This resulting measure is then taken to approximate the overall on-line evaluation. (Lodge, McGraw, and Stroh, 1989.) In the current experiment, the OL Tally is calculated using far more information, including not only issues, but also group endorsements, candidate personality, and party affiliation. The evaluations of the candidate positions are generated using externally developed criteria. Subjects record their general political preferences in a pre-election questionnaire that does not include any of the actual detailed issue positions used in the experiment. The candidate positions on the issues are compared to subject positions on

the same general issues, and the result combined into the Tally. This difference means that the OL Tally used in this experiment is more comprehensive than that used in prior studies. Thus, the findings that the Tally is not as important as memory becomes all the stronger.

Insert Tables 6.9 and 6.10 about here

I turn now to the question of whether memory affects the quality of the vote decision. That is, are subjects who are able to remember more -- whether using on-line or memory processing -- better able to choose the candidate closest to their own positions? Using the quality measures described in detail in Chapter 4, we can first examine whether voters are at all accurate in their decision-making. Table 6.11 lists some descriptive statistics that are quite telling. On a quality scale that can range from 0 to 1, the overall score was a respectable .59 for both the revealed preference and full information measure.⁸¹ But this result masks significant differences created by the experimental manipulations. In particular, subjects who faced only two candidates from whom to choose in their party's primary (along with four candidates from the other party) were readily able to distinguish between them, with a decision quality score of .72. On the other hand, in the more difficult case of four candidates, subjects did less well with the

⁸¹ As described in detail in Chapter 4, two measures of the correctness of the vote are being used in this study. Both are based on a quality assessment developed by Riggle and Johnson (1996) from Payne's (1993) decision outcome index. The "revealed preferences" measure indicates decision quality from the perspective of the voter herself by including in its calculation only that which was actually examined by the subject. The "full information" measure assumes that subjects should have looked at

scores dropping to below .50. This result is not unexpected -- the four candidate condition included candidates who were quite close to each other in their issue positions and therefore hard to keep straight in the minds of subjects. At the same time, the mode of processing appeared to have little effect on decision quality. Anova analysis confirms that the only significant effects of the experimental manipulations were for the task demand (number of candidates) manipulation. No interaction effects were observed between the task demands and the mode of processing.

Insert Table 6.11 about here

To examine the impact of memory on the ability of subjects to choose the correct candidate multiple measures of quality were developed and tested as fully described in Chapter 4. I began by analyzing decision quality using first the normative measure (full-information) and then the more realistic revealed preferences measure. OLS regression was chosen to test the models. Two sets of models were specified: initial models which excluded memory affects, and revised models which fully incorporated the memory variables. In both sets of models the independent variables included the experimental manipulations, measures of the difficulty subjects had using the computer, measures of the type of information search employed during the campaign, along with some basic subject background variables.⁸² In the revised models, counts of the number of accurate

everything (even though this was actually impossible) in a normative view that suggests voters should be fully informed.

⁸² The manipulations were all coded as dichotomous variables, with 0 indicating the low task demand condition, the on-line process condition, and the absence of interruptions for a poll. The value 1 was assigned to the four candidate task demand, the memory processing manipulation, and the presence of either an early or late interruption for a poll. Preliminary analysis showed that including interaction

memories for the candidate that should have been chosen and the number of accurate memories for the remaining candidates in the subject's political party were added, along with interaction terms between the numbers of accurate memories and the task demand and processing manipulations. Unlike the analysis of vote direction reported in Table 6.10, the manipulations and interaction terms were included here with the expectation that effects might be found. Given that the four candidate condition should have presented subjects with a more difficult choice than the two candidate condition, decision quality should be expected to suffer in the four candidate condition. And while initial Anova analysis showed no differences in quality attributable to the processing condition, it is possible that within a multivariate analysis we might find differences in quality attributable to differences in accurate memories that might occur between processing conditions. Once memory was added the difference between the models assessed.

It should be pointed out that the OL Tally measure is not included in this analysis. The OL Tally is a measure of support for candidates based on evaluations of information accessed by subjects about the candidates. As such, it can be expected to correlate with the direction of candidate evaluation and the vote, but it does not necessarily have anything to do with the quality of the decision. While memory *is* included in the decision quality analysis, the memory variable included here reports the *accuracy* of memories,

terms between the various experimental manipulations added nothing to the analysis; such interaction terms were not included in further analyses. Information search was measured as the proportion of transitions from one piece of information to another which were within candidate (intra-candidate search) or within information types (intra-attribute search; see Lau, 1995, for a detailed discussion on these measures.) The share of items on the computer chosen by mistake as reported by subjects was used as a measure of the difficulty of using the computer. Subject expertise was assessed from response to factual questions on the initial questionnaire, combined with measure of political involvement and media use. Finally a measure of the degree to which subjects' issue positions were constrained on a liberal-conservative spectrum were included (Barton & Parsons, 1977.) Data for this measure were gathered during the on-line attitudes questionnaire preceding the experiment.

not the affect associated with them, as was used in the evaluation analysis. There is no analogous approach to the Tally -- to talk of its accuracy is not appropriate, and thus it is not included in the following analysis.

Table 6.12 reports the results of these regressions. In the first part of the Table, the results of the regression without memory are shown. As expected, it is clear that an accurate vote is affected by task demands; however, there were no main effects on quality from the processing manipulation. Those subjects facing four candidates are less likely to vote accurately than those facing two candidates. Somewhat unexpectedly, the poll interruption manipulation degraded decision quality, but only for those subjects who were interrupted two-thirds of the way into the campaign.⁸³ All three individual difference measures -- issue constraint, errors in using the computer, and political expertise -- were significant in the initial revealed preference model in ways that were fully expected. Those subjects reporting more errors in using the computer have their decision quality adversely affected. Likewise, those whose ideology was less constrained on issues were less likely to make the optimal decision. Finally, political expertise increased the quality of the vote decision.

Of particular interest in the initial models are the effects of the information processing variables. The manner in which voters move between pieces of information seems to matter, especially in the full information model. When subjects choose to search for the same piece of information across multiple candidates -- intra-attribute search --

⁸³ Although in hindsight, it seems reasonable to suppose the interfering with the process of examining campaign information to ask a poll would interrupt information processing. The interruption took the form of a screen which appeared stating that a Gallup Poll taker was calling and asking for an opinion of the form: "If the election were held today, which candidate would you choose" with the available candidates listed on the screen. The subject simply clicked on her preferred choice (one could not refuse to take the poll) and was returned to the campaign headline screen.

quality is improved significantly. On the other hand, when subjects search within candidates -- examining a single candidate on several dimensions in a row -- quality is not improved. It appears that engaging in the kind of search which tends to indicate comparison across candidates improves the quality of the decision.⁸⁴ This is so even though in this experiment intra-attribute searches might require a subject to have some patience since information common to multiple candidates was not always available at the same time. Subjects who waited to make sure they could access the same information for multiple candidates were rewarded by making a more accurate vote choice. This finding provides an initial suggestion that memory might matter in decision quality. If subjects are using search strategies that suggest the need to use memory in order to make comparisons, and if such strategies appear to improve decision quality, then an indirect role for memory has been established. To be sure, the type of memory that may be used in this case is short-term memory (STM), given that the first candidate's position is likely to still be in STM when the position of the second candidate is accessed. Even so, the use of any memory process is not predicted by the on-line model, nor is any use of intra-attribute search. Further, there are times when in order to make a direct comparison, subjects must at least process the headings for many items before finding the one they want. In this case, they may need to make a special effort to remember the first candidate by the time they find the second.

⁸⁴ Lodge (1995) argues that processing campaign information on-line, voters do not make direct comparisons, and do not need to engage in intra-attribute search. However no evidence was found in this experiment to support Lodge's position -- there were no differences between on-line and memory-based processors in the types of information search they use. While more intra-candidate search was exhibited than intra-attribute, processing mode had no effect. Both types of processors were just as likely to search within attributes and across candidates, as if making direct comparisons.

The second part of Table 6.12 shows the changes in the models when accurate memories reported by subjects are added as independent variables, and allows us to examine the direct role of memory in decision quality. While the models are similar, assessment of quality using the revealed preference measure provides a stronger test. With the revealed preferences approach, quality is assessed based on the information subjects showed to be important to them, thus including in the dependent variable a type of weighting to allow for differential interest in types of campaign information by subjects. Adding the memory variables to this model makes a large difference in the explained variance, from .2611 without the memory variables to an adjusted R^2 of .3366 with memory included. None of the previously significant predictors are rendered insignificant. No main effects for memory itself are found, however, whether the memories are for the best candidate or for the rest of the candidates in the subject's party. This can be interpreted to indicate that for subjects in the two candidate, on-line experimental condition, memory does not improve quality. Thus, for those subjects facing a relatively easy choice -- only 2 candidates -- maintaining accurate memories is less important. On the other hand, the interaction term between accurate memories for the best candidate and task demand is significant and positive. This indicates that for subjects in the four candidate condition, maintaining accurate memories for the candidate who best fits their interests is important to voting accurately. The fact that the interaction term between such memories and the processing mode is not significant and is very small, indicates that whether subjects are processing on-line or in the memory-based condition, quality in memories for the best candidate is important when facing a difficult choice. An interesting result occurs when considering memories for the candidate(s) who are not the

best choice for the subject. Maintaining accurate memories for those candidates degrades decision quality in the high task demand situation. It appears that when faced with a difficult choice, the more accurate subjects are about the best candidate the more likely they are to vote for that candidate. But, conversely, the more they maintain accurate memories for the less optimal candidates, the worse the decision. However, this is mitigated for subjects in the memory condition, for whom maintaining memories for the non-optimal candidates appears to have little effect.⁸⁵ But for subjects in the four candidate task condition, who were on-line processors, maintaining additional memories for candidates other than the optimal choice, appears to negatively affect decision quality. Given limited information processing capacity and the working memory bottleneck, it would appear that memory accuracy has both a benefit and a price in terms of the quality of the decision.⁸⁶

Insert Table 6.12 about here

Discussion

What can now be said about the role of memory in political information processing? Do the memory based models which have predominated our thinking about

⁸⁵ This can be established by noting that while the coefficient for accurate memories for the non-optimal candidates for subject in the four candidate condition is $-.0699$, the coefficient for the same memories for subjects in the memory processing condition was $+.0536$. Combining the two conditions, that is, subjects in the four candidate, memory based condition, gives a coefficient of $-.0163$, a very slight degradation of decision accuracy.

⁸⁶ Three way interactions between the processing mode, task demands, and accurate memories were included in an initial model specification. These interactions were non-significant and the coefficients trivial. Thus they are not included in the models described in Table 6.12.

how voters make decisions accurately describe the process? Or are Lodge and the other Stony Brook researchers correct in their assessment that we should expect no real connection between the contents of memory and the vote decision? The issue is not simply one of academic interest. If voters routinely process campaign information in the on-line mode, then prior research may have systematically underestimated the factors that actually go into the vote decision, by focusing on what voters could remember after the election. This, in turn, may have led to a view of voters as uninformed and less able to fully participate in the election process. In an attempt to contrast the two models, this project was designed to place some voters into a memory processing mode, while allowing others to process in their usual, presumably on-line, mode. The resulting similarities and differences between the two groups are instructive.

On-line processors appear to be slightly more efficient, examining somewhat more pieces of information than did those in the memory mode, especially when the campaign is complicated by a large number of candidates. Subjects who did not expect to have to recall what they saw examined about 18% more information in the four candidate primary, obviously spending less time on each item they viewed. On the other hand, there were no differences in the number of memories reported by the on-line processors compared to the memory subjects. This finding is somewhat unexpected, as Lodge argues that there is no reason to keep information in memory, and therefore, one would presume, less information available for recall when the unexpected memory test is given. In fact, since the memory processors, by definition, expected to have to recall information, it seems especially interesting that they could not recall any more details than those in the on-line condition. Further, those in the on-line condition were no less

accurate in their recall than those in the memory condition. It seems that more campaign information actually is retained and organized in memory than would be expected based on the standard on-line model. This does not mean that Lodge is wrong and that voters make their decisions in a memory-based process. The nature of the memories reported tends to be quite general, in keeping with Gant and Davis (1984), rather than showing much detail. In effect people report summaries of what they viewed, and seem to be able to report these summaries whether or not they process the information on-line.

This study does confirm the long-standing recognition that the contents of memory do not necessarily reflect accurately the information that went into their development. Subjects in this study routinely over-reported memories for issue positions, compared to the amount of issue information that they viewed. This finding is consistent across both the task demands manipulation and the processing mode manipulation. Issue information was generally well behind candidate based factors as the information viewed most by subjects. Yet, in nearly every case, more issue memories were reported, while memories for other information, person, group, and hoopla, were less prevalent than the information examined. Memory based processors had the largest difference, reporting a much greater share of issue memories at the expense of all others. On the other hand, on-line processors were more evenhanded, reporting the same share of issue and person based memories, although they examined significantly more person items. An interesting implication of this finding is that more issue information may inform the vote decision than credit has been given for in the past. It may be true that issue information is less prevalent in the political environment (this was certainly true in this experiment). Yet, even so, voters cut through much of the noise and focused quite consistently on the issues

as the memories that they reported. Even if the on-line model is correct, and memories are not closely linked to the decision choice, the fact that memory processors (where the decision and memories are linked) and on-line processors show the same pattern suggests that issues may have more power in the decision than might otherwise be expected. Of course, alternatively, this finding could be an experimental artifact. Subjects may simply desire to appear more “rational” to the experimenter, particularly in the memory-based condition, where they expected to be tested.

Memories do appear to be focused much more on the candidate that is ultimately chosen than on the remaining candidates. This, of course, makes sense, since the voter has also generally spent more time examining information for the candidate ultimately selected. Across all manipulations, subjects consistently viewed more information for candidates within their party than those from the other party (which is completely expected for a primary election). Further they gave a significantly greater share of their attention to the candidate they ultimately chose, even compared to other candidates within the party.⁸⁷ Total memories and accurate memories, as a share of information viewed, show the same pattern. What is striking is that the increase in memories for the selected candidate is quite strong; it is an increasing percentage of an increasing number of items viewed. Not only are more items examined for the candidate selected, but a larger percentage of those items result in recalled memories. Once again, this pattern holds true for on-line as well as memory processors. Both groups of subjects apparently

⁸⁷ The debriefing held following the experiment, during which subjects were walked through every item they examined, confirms this process. Voters started out somewhat randomly, since they knew nothing about the candidates at the beginning. Once determining party, they generally began to focus more on the candidates of their own party. Finally, as a candidate appeared who was more attractive, subjects show a tendency to focus more on that candidate, to confirm or deny, their initial beliefs.

organized memory in such a fashion that those memories representing their party and their final choice were easier to recall than memories for other candidates. But, interestingly, subjects were no more accurate in their recall of memories for their preferred candidate compared to any other candidate. Once again, there is some evidence for a memory process occurring, even in the on-line processing condition.

The Stony Brook on-line model has no place in it for memory. On-line processors, it is argued, do not need memory in order to make their evaluations. However, the model is predicated on the results of experiments which have mostly consisted of the evaluation of a single political figure using information in an easy to access, easy to study format. In the one two-candidate experiment that has been reported (Lodge, Steenbergen, & Brau, 1995) subjects were handed an information sheet which listed the candidate positions side by side, much like a traditional information board. However, unlike an information board, the experimenters could not track the order in which subjects viewed the information, because all information was always in view on the page. More importantly, most, if not all of the information presented could be readily processed in short-term or "active" memory, limiting the need for permanent storage and retrieval of campaign positions. Thus, strong statements that voters do not make comparisons across candidates when processing information on-line are generated not from empirical evidence, but from assumptions about how on-line processing proceeds. The evidence of the some positive effects from intra-attribute transitions and the generally negative effects from intra-candidate search on the quality of the decision is an important clue. More intra-attribute search -- the kind of search which facilitates comparisons across candidates on a few issues -- appears to be better. Does intra-attribute

search require memory to be used? The answer must be a clear yes, if the goal of such search is to compare candidates on issues. Subjects in this project had to be patient to conduct such searches; like the real world, information was not always readily available to make comparisons. But for those who were patient, the evidence is that such searches and the memory process that can be inferred from such a search, can be beneficial.

The empirical evidence presented in this chapter -- from an experiment which more realistically presents campaign information -- argues strongly for a rethinking of the role of memory in political information processing. This is not to say, however, that voters do not process on-line. In fact, they may process the vast majority of information they encounter in just such a fashion, evaluating it as they encounter it, updating a tally, and discarding the information. But, for some campaign information voters want to be able to make comparisons. To do so, they either have to have the information for each candidate and position they want to compare readily at hand (as in the Stony Brook experiments and some newspapers on occasion, but not much of the rest of the real campaign world) or they must rely on memories for candidate positions in order to make the comparisons. The evidence from the current experiment, along with that reported previously (Lau & Redlawsk, forthcoming) shows that memory does matter in two ways. As a factor in the vote choice, the affect attached to memories remains a strong predictor of the choice even after accounting for the on-line tally's effects on choice. While this does not prove with any certainty that these memories are not simply rationalizations (see Rahn, et al., 1992) the ability of accurate memories to predict decision quality cannot be so easily countered. Clear evidence exists that the accuracy of voters' memories matter in the voters' ability to select their preferred candidate from among several choices. While

the effects of memory accuracy are not straightforward, with some types of memories improving decision quality while others degrade it, memory clearly plays a role. In particular, it plays a strong role for those voters facing a complicated decision environment, modeled in this experiment by four candidates within the subject's own party. In such an event, reliance on accurate memories for the candidates -- especially for the candidate who is the optimal choice -- clearly improve decision quality, whether or not on-line processing is occurring. The only conclusion that can be drawn is that memory must play a role in voter decision-making, the Stony Brook model notwithstanding.

Table 6.1
Measures of Intra-Attribute Comparisons

<u>Transitions</u>	<i>Proportion of available transitions made:</i>	
	<i>Intra-Candidate</i>	<i>Intra-Attribute</i>
All Subjects (n=98)	.40 (.11)	.13 (.06)
Processing Manipulation		
<i>On-line Processing</i> (n=50)	.40 (.13)	.13 (.07)
<i>Memory-based Processing</i> (n=48)	.40 (.10)	.12 (.06)
<i>Difference (t-test):</i>	n.s.	n.s.
Task Difficulty Manipulation		
<i>2 Candidates</i> (n=48)	.42 (.11)	.12 (.06)
<i>4 Candidates</i> (n=50)	.38 (.11)	.13 (.06)
<i>Difference (t-test):</i>	<i>p</i> <.1	n.s.
<hr/>		
<u>Depth of Search</u>	<i>Proportion of same information examined for:</i>	
	<i>2 Candidates</i>	<i>3 or more Candidates</i>
All Subjects	.50 (.19) <i>n</i> =98	.35 (.15) <i>n</i> =50
Processing Manipulation		
<i>On-line Processing</i> <i>n</i> =50	.49 (.21) <i>n</i> =50	.37 (.17) <i>n</i> =26
<i>Memory-based Processing</i> <i>n</i> =48	.50 (.17) <i>n</i> =48	.33 (.13) <i>n</i> =24
<i>Difference (t-test):</i>	n.s.	n.s.
Task Difficulty Manipulation		
<i>2 Candidates</i> (n=48)	.43 (.19) (n=48)	---
<i>4 Candidates</i> (n=50)	.56 (.16) (n=50)	.33 (.13) <i>n</i> =50
<i>Difference (t-test):</i>	<i>p</i> <.001	---

Note: Entries are means; standard deviations in parentheses. ANOVA modeling showed no interaction effects for the task difficulty and processing manipulations.

Table 6.2
Assessment of On-line Tally Measures

All Subjects		Memory Assumption	
		Memory	No Memory
Integration Rule	Averaging	.0784	.0711
	Additive	.2486**	.2457**

Table entries are zero-order correlations between measures of the OL Tally and the feeling thermometer evaluation of the preferred candidate.

* $p < .1$ ** $p < .05$ *** $p < .01$

Table 6.3
Mean Number of Memories Reported
(n=99)

<i>Memory Category</i>	<i>Mean #</i>	<i>Std Dev.</i>
Issue based memories	4.64	(3.93)
Person based memories	3.51	(3.32)
Party based memories	1.84	(2.19)
Group based memories	0.71	(1.18)
Hoopla (Polls, slogans, etc.)	0.38	(0.89)
TOTAL MEMORIES	11.20	(7.32)
Minimum # Memories = 0		
Maximum # Memories = 31		
 <i>Memory Valence</i>		
Positive Memories -- pro candidate	5.76	(3.77)
Negative Memories -- anti candidate	2.86	(2.82)
Neutral Memories -- neither pro nor anti	2.59	(2.71)

Table 6.4
Memories by Task Difficulty
(n=99)

<i>Memory Category</i>	<i>Low Difficulty</i> <i>2 Candidates</i> (n=48)	<i>High Difficulty</i> <i>4 Candidates</i> (n=51)	<i>Diff. Sig.</i> <i>t-test</i>
Issue	5.48 (4.28)	3.84 (3.41)	< .05
Person	3.67 (3.51)	3.35 (3.16)	n.s.
Party	2.31 (2.36)	1.39 (1.94)	< .05
Group	0.94 (1.47)	0.49 (0.78)	< .10
Hoopla	0.44 (1.09)	0.33 (0.65)	n.s.
TOTAL MEMORIES	12.94 (7.12)	9.57 (7.20)	< .05
Positive Memories	6.25 (3.84)	5.29 (3.67)	n.s.
Negative Memories	3.92 (3.25)	1.86 (1.89)	< .001
Neutral Memories	2.77 (2.64)	2.41 (2.79)	n.s.

n.s. = Difference is not significant; Standard deviations in parentheses.

Table 6.5
Memories by Processing Mode
(n=99)

<i>Memory Category</i>	<i>On-line Processing</i> (n=50)	<i>Memory-based Processing</i> (n=49)
Issue	4.44 (4.14)	4.83 (3.73)
Person	3.98 (3.58)	3.02 (3.00)
Party	1.76 (2.08)	1.92 (2.33)
Group	.64 (0.83)	.77 (1.46)
Hoopla	.50 (1.05)	.27 (0.67)
TOTAL MEMORIES	11.48 (7.48)	10.92 (7.23)
Positive Memories	5.92 (3.10)	5.59 (3.87)
Negative Memories	2.78 (2.77)	2.94 (2.90)
Neutral Memories	2.78 (2.94)	2.39 (2.47)

There are no significant differences in any measure between on-line and memory-based processors; Standard deviations in parentheses.

Table 6.6
Information Remembered vs. Information Viewed

<u>All Subjects (n=94)</u>				
<i>Memory Type</i>	<i>Proportion of Available Items</i> ⁸⁸	<i>Proportion of Items Viewed</i>	<i>Proportion of Memories</i>	<i>Diff. Sig. (t-test)</i>
Issue	.36	.32 (.08)	.49 (.29)	< .001
Person	.29	.44 (.07)	.40 (.29)	n.s.
Group	.08	.11 (.05)	.08 (.12)	< .01
Hoopla	.27	.13 (.08)	.04 (.09)	< .001
<u>Between Processing Conditions</u>				
	<i>On-line (n=46)</i>	<i>Memory Based (n=48)</i>	<i>Diff Sig.</i>	
<i>Mean Share of Items Viewed</i>				
Issue	.31 (.07)	.33 (.08)	n.s.	
Person	.44 (.08)	.44 (.08)	n.s.	
Group	.11 (.06)	.11 (.06)	n.s.	
Hoopla	.14 (.07)	.12 (.06)	n.s.	
<i>Mean Share of Memories</i>				
Issue	.44 (.26)	.54 (.31)	< .10	
Person	.44 (.29)	.35 (.29)	< .15	
Group	.07 (.11)	.08 (.13)	n.s.	
Hoopla	.05 (.08)	.03 (.09)	n.s.	

n.s. = not significant; Standard deviations in parentheses. Subjects with no memories excluded from analysis.

⁸⁸ Party information was also available during the campaign. A total of six party items were included, one for each candidate listing that candidate's party affiliation. The proportion of available items reported in this table is adjusted for the removal of party information, since it is not included in any of the analysis for the primary election. The remaining items total 100%.

Table 6.7
Accurate Memories
 n=99

<i>Mean # of Memories</i>	<i>Mean Number Reported</i>	<i>Mean # Scored</i>	<i>% Scored for Accuracy</i>
Memories for all Candidates	11.20 (7.32)	9.60 (7.10)	85.7%
Memories within Subject Party	7.99 (5.75)	6.95 (5.63)	86.9%
Memories for Vote Choice	4.36 (3.04)	3.86 (3.02)	88.5%

<i>Memory Accuracy</i>	<i>Mean # of Scored Memories</i>	<i>Mean Proportion</i>
Accurate Memories, All Candidates	8.06 (6.64)	.80 (.22)
Accurate Memories within Party	5.72 (5.30)	.78 (.26)
Accurate Memories, Vote Choice	3.22 (2.97)	.78 (.30)

Standard deviations in parentheses.

Table 6.8
Memory Accuracy in Proportion to Number of Items Viewed
 n=99

	<i>Proportions</i>		
	<i>All Candidates</i>	<i>Within Party</i>	<i>Vote Choice</i>
Share of Items Viewed per candidate	.1667 ⁸⁹	.2162 (.071)	.2456 (.075)
All Candidates & Within Party	t=6.90	p<.001	
All Candidates & Vote Choice	t=10.36	p<.001	
Within Party & Vote Choice	t=7.57	p<.001	
All Memories as share of items viewed	.1221 (.075)	.1429 (.089)	.1905 (.118)
All Candidates & Within Party	t=4.39	p<.001	
All Candidates & Vote Choice	t=7.60	p<.001	
Within Party & Vote Choice	t=6.70	p<.001	
Accurate Memories as share of items viewed	.0861 (.066)	.0989 (.080)	.1350 (.111)
All Candidates & Within Party	t=3.64	p<.001	
All Candidates & Vote Choice	t=5.94	p<.001	
Within Party & Vote Choice	t=5.19	p<.001	

n.s. = not significant; Standard deviations in parentheses.

⁸⁹ If information search proceeded completely randomly, it would be expected that each candidate would get about 1/6 of the accesses for information.

Table 6.9
Effects of Memory and the OL Tally on Candidate Evaluation

All subjects (n=84)

Initial Stony Brook Model	<i>OL Tally without Memory</i>		<i>OL Tally with Memory</i>	
Processing Manipulation	-2.0617	(9.3282)	-1.9010	(9.3686)
Task Demand Manipulation	-.7092	(9.4722)	-.2006	(9.5564)
Poll Interrupt -- one-third	13.1668	(8.0692)	12.4824	(8.1383)
Poll Interrupt -- two-thirds	11.0904	(8.1403)	9.7469	(8.2416)
Processing x Task Demands	3.4107	(13.3393)	3.5202	(13.4987)
Net On-line Tally	1.3509**	(.5975)	1.5628**	(.7030)
Tally x Memory Processing Manip.	-.5715	(.7420)	-.5246	(.9061)
Tally x Task Demand Manip.	-.1233	(.7677)	-.4142	(.9263)
Constant	-6.8908	(7.9470)	-7.0049	(8.0088)
Adjusted R ²	.0428		.0259	

Revised Model with Memory Affect

Processing Manipulation	-4.1329	(7.5574)	-4.1794	(7.5472)
Task Demand Manipulation	-1.1509	(7.6585)	-.3202	(7.6734)
Poll Interrupt -- one-third	7.5676	(6.5440)	7.6211	(6.5195)
Poll Interrupt -- two-thirds	4.2663	(6.8589)	5.2508	(6.7799)
Processing x Task Demands	3.3849	(10.7564)	2.5073	(10.8013)
Net On-line Tally	.1378	(.6295)	.1811	(.7173)
Tally x Memory Processing Manip.	.2807	(.7288)	.3287	(.8523)
Tally x Task Demand Manip.	-1.3481*	(.7463)	-1.6191*	(.8630)
Net Memory Affect for Candidates	3.8205***	(1.2502)	3.6918***	(1.2177)
Memory Affect x Memory Processing	-.8839	(1.6305)	-.6517	(1.5840)
Memory Affect x Task Demand	5.4402***	(1.7612)	5.2513***	(1.6950)
Constant	-.0128	(6.6014)	-.5911	(6.6055)
Adjusted R ²	.3826		.3841	

* $p < .1$ ** $p < .05$ *** $p < .01$

Table entries are unstandardized regression weights; standard errors in parenthesis.

Table 6.10
Effects of Memory and the OL Tally on the Vote Choice

All Subjects (n=95)
Logistic Regression

Revised Model with Memory Affect	<i>OL Tally without Memory</i>		<i>OL Tally with Memory</i>	
Processing Manipulation	-.0591	(1.0359)	.7743	(1.0189)
Task Demand Manipulation	1.0041	(1.3112)	-.1585	(1.2569)
Poll Interrupt -- one-third	-1.0372	(.9303)	-.9959	(.9165)
Poll Interrupt -- two-thirds	.1025	(.9101)	.3120	(.9022)
Processing x Task Demands	-.8843	(1.6300)	-.7217	(1.5941)
Net On-line Tally	-.2196	(.1916)	-.2211	(.2187)
Tally x Memory Processing Manip.	.2601	(.1962)	.2665	(.2225)
Tally x Task Demand Manip.	-.1220	(.1557)	-.1627	(.1842)
Net Memory Affect for Candidates	1.5383**	(.7923)	1.2891**	(.6401)
Memory Affect x Memory Processing	-1.0882	(.8074)	-.8371	(.6631)
Memory Affect x Task Demand	1.3273*	(.7962)	1.4772*	(.8682)
Constant	.2214	(.9896)	.2310	(.9811)
	-2 Log Likelihood	50.842	50.952	
	Model Chi-square	62.934 11df $p=.0000$	65.858 11df $p=.0000$	
	Correctly Classified	89.47%	90.53%	

* $p < .1$ ** $p < .05$ *** $p < .01$

Table entries are logistic regression weights; standard errors in parenthesis.

Table 6.11
Decision Quality Measures

	Normative Full Information	Revealed Preferences
All Subjects	.59	.59
Task Difficulty		
Low -- 2 Candidates	.72	.72
High -- 4 Candidates	.47	.46
Processing Mode		
On-line Processing	.59	.58
Memory Processing	.60	.59
Task Demands x Processing Mode		
<i>Low Demands</i>		
On-line Processing	.71	.75
Memory Processing	.74	.70
<i>High Demands</i>		
On-line Processing	.48	.43
Memory Processing	.46	.50

Table 6.12
Effects of Memory on Decision Quality

<i>ALL SUBJECTS (n=92)</i>		<i>Measures of Voting Accuracy.....</i>	
<i>Initial Model without Memory</i>		<i>Full Information</i>	
<i>OLS Regression</i>		<i>Revealed Preferences</i>	
Task Demand Manipulation	-.2178** (.0911)	-.2373*** (.0836)	
Processing Mode Manipulation	.0325 (.0891)	-.0072 (.0817)	
Poll Interrupt -- one-third	-.0946 (.1089)	-.0228 (.0999)	
Poll Interrupt -- two-thirds	-.2148** (.1080)	-.2135** (.0991)	
Subject Difficulty with Program	-.7922 (.6114)	-1.3124** (.5607)	
Subject Ideology Unconstrained	-.0501** (.0208)	-.0552*** (.0190)	
Subject Political Expertise	.0586 (.0490)	.1576**** (.0450)	
Intra Candidate Transitions	.1814 (.4066)	-.0766 (.3729)	
Intra Attribute Transitions	1.2283* (.7279)	.8368 (.6675)	
Constant	.7282**** (.2313)	.9233**** (.2122)	
	Adj. R ² =.1350	Adj. R ² =.2611	
<hr/>			
<i>ALL SUBJECTS</i>			
<i>Revised Model with Memory</i>			
Task Demand Manipulation	-.2968** (.1331)	-.2646** (.1198)	
Processing Mode Manipulation	-.0320 (.1397)	-.1405 (.1257)	
Poll Interrupt -- one-third	-.0841 (.1081)	-.0260 (.0972)	
Poll Interrupt -- two-thirds	-.1874* (.1127)	-.1860* (.1014)	
Subject Difficulty with Program	-.4597 (.6226)	-1.2694** (.5601)	
Subject Ideology Unconstrained	-.0467** (.0204)	-.0583*** (.0183)	
Subject Political Expertise	.0686 (.0502)	.1765**** (.0451)	
Intra Candidate Transitions	.0787 (.4268)	-.1798 (.3840)	
Intra Attribute Transitions	1.3071* (.7132)	.7258 (.6417)	
Accurate Memories/Best Candidate	-.0197 (.0352)	-.0239 (.0316)	
Acc. Mem/Best Cand. by Task Demand	.1068** (.0424)	.1085*** (.0382)	
Acc. Mem/Best Cand. by Processing	.0238 (.0399)	-.0035 (.0359)	
Accurate Memories/Other Candidates	.0008 (.0411)	-.0082 (.0369)	
Acc. Mem/Other Cand. by Task Demand	-.0394 (.0415)	-.0699* (.0374)	
Acc. Mem/Other Cand. by Processing	.0077 (.0346)	.0536* (.0311)	
Constant	.7763**** (.2400)	1.0934**** (.2159)	
	Adj. R ² =.1932	Adj. R ² =.3366	

* $p < .1$ ** $p < .05$ *** $p < .01$ **** $p < .001$

Table entries are unstandardized OLS regression weights; standard errors in parenthesis. Subjects reporting no memories are excluded.

Chapter 7

On-line Processing Revisited

The Stony Brook on-line model of voting has tremendous appeal as a psychologically realistic view of how voters might process campaign information, integrate it into existing affect towards the candidates, and then make a decision when election day comes around. The idea that voters need only maintain an OL Tally for each candidate, rather than searching the contents of memory in order to make an evaluation, fits far better with what is understood about the ways in which people simplify difficult cognitive tasks, compared to traditional voting models which presume memory-based processes. Given a complicated decision environment, it is cognitively simpler to maintain one major piece of information about candidates -- how the voter feels about each one overall -- than to try to juggle detailed information about each candidate's position on the issues, personal characteristics, and the like. Cognitively speaking, simpler is certainly better.

The on-line model has a further appeal to those political scientists who see voters as perhaps not as ill-informed as many would believe. If the on-line model is accurate, then far more information could be contained in the OL Tally than could ever be expressed by a voter when asked to explain reasons for the vote. The on-line model suggests that the OL Tally is a summary for a potentially large amount of information encountered throughout the campaign season, and which, once it is evaluated and incorporated into the tally, is safely discarded and cannot be recalled. Thus, voters processing in an on-line fashion cannot be faulted for being unable to recall the details

about each candidate, and political scientists must find other ways of establishing to what degree voters pay attention to and incorporate information into their vote decision.

Yet, despite its appeal, and the significant array of studies which appear to support the on-line model, the findings of the present study diverge significantly from those of the Stony Brook experiments, and even from the long line of psychology experiments which show that person-perception tasks generally proceed on-line. Subjects in this mock presidential election do not proceed as would be predicted by the on-line model. On-line processors were predicted to be at an advantage in many ways. It was hypothesized that they would be able to make decisions more quickly, and that the time to make a decision would not vary based on the point in the campaign at which the decision was made. Memory processors, on the other hand, should take longer to search for memories of the candidates. This search presumably would take the longest towards the end of the campaign when larger amounts of information might be in memory, compared with early in the campaign. None of these predictions were supported in this experiment. On-line processors were slightly faster overall in decision-making, but they did not show the trends expected. Further, in general, on-line processors did not seem to be able to integrate information and make better decisions when faced with a larger number of candidates, as might be expected of a process cognitively easy to use. On the other hand, as predicted, on-line processors fared worse when faced with candidates who were non-stereotypic or when the voters themselves held unconstrained ideological positions. This was as expected, since on-line processors, if they fail to make comparisons between candidates, might incorrectly infer some candidates positions.

Most importantly, the evidence discussed in Chapter 6 shows that something more than a strict on-line evaluation process must have been in use across all subjects, regardless of processing condition. All subjects show evidence of search processes from which we can infer that comparisons were made among candidates. Whether in the on-line processing condition, or the memory processing condition, subjects made intra-attribute transitions and examined many of the same pieces of information across multiple candidates. The OL Tally measure itself did not perform as would be expected by a strict on-line process. The strongest measure of the tally came in using an additive integration rule, not the averaging rule normally assumed to be the case. Subjects expressed roughly the same number of memories, regardless of processing condition, and in both conditions the memories were highly accurate.

In accordance with previous research, the contents of memory were found to be at variance with the information that was actually encountered, with more issue memories reported as a proportion of issues actually examined, and generally less group and hoopla information reported from memory. Further, a greater proportion of memories were reported for the candidate a voter ultimately chose, compared with the amount of information actually viewed for that candidate. While subjects in the two processing conditions viewed essentially the same proportion of information types, those in the memory-based condition were more likely to report issue-based memories and less likely to report person-based memories, compared with what they had actually viewed during the campaign. On-line processors, on the other hand, while also reporting more issue memories as a proportion of what they viewed, reported far fewer than did memory-processors, while reporting a greater share of person memories. Even with these

differences, however, on-line processors appeared to rely on memory to a much greater degree than the on-line model would allow.

Finally, this study differs from previous work in finding that, in the presence of the OL Tally measure, memory affect was a more important predictor of the direction of the vote, and the evaluation of the candidates, than was the OL Tally. This was true whether subjects were in the on-line condition or the memory-based condition. Memory effects were strongest for those facing the more complicated four candidate condition. In all cases, the OL Tally was simply overwhelmed in the multivariate analysis. Memory also appears to play a role in the quality of the vote decision. In the simplest case, a primary with only two candidates, maintaining accurate memories of the candidates appears to do little to improve decision quality. In the more difficult condition of four primary candidates, however, maintaining accurate memories appears to significantly increase the chances that a voter will choose the correct candidate. This appears to hold for all subjects, whether in the on-line or memory-based condition.

These findings do not fit well with the weight of the earlier evidence which seems quite strong and consistent. What is it about this study that resulted in a failure to support the previous research? Perhaps the most likely reason that the results of this study diverge from those of the Stony Brook studies is simply that in all but one of the latter, subjects were never asked to choose from among multiple political candidates. Indeed, the task that was established in those studies was not a choice task at all. Rather, it was a pure judgement task, where subjects were simply asked to make an evaluation of a single political figure. While one can certainly make the case that evaluation is a necessary part of making a choice, the fact that the Stony Brook studies did not require a choice

between candidates limits greatly the extent to which the model derived from those studies can be considered applicable to a political campaign. The distinction between judgment and choice is an important one which often goes unacknowledged. To make a choice means to “choos[e] among a discrete set of mutually exclusive and exhaustive courses of action” (Fischer & Johnson, 1986, p. 59.) Einhorn and Hogarth (1981) note that different cognitive processors are likely to be engaged in the different tasks of choice and evaluation. Elections clearly require a choice; the Stony Brook experiments required simply evaluation.

Likewise, the psychological theory on which the Stony Brook model is based was established and supported through studies which themselves did not entail choices from among multiple alternatives. The groundbreaking work by Hastie and Park (1986) in which they established that most judgments of people proceed on-line, had subjects evaluate a single individual as a potential candidate for a computer programmer position by listening to a conversation between the candidate and another person for five minutes. This is quite similar to the standard Stony Brook approach of evaluating a single political figure based on written information about the figure. Other studies, such as Anderson and Hubert (1963) used lists of words with which subjects were instructed to form an impression of the person described by the lists.

Thus, the on-line model, which without a doubt does apply to a wide range of person-perception tasks, was simply assumed to also apply to a political campaign. After all, it does make sense to consider a campaign a person-perception task, since the voter’s goal during a campaign is to determine which candidate to support. Thus, the voter must evaluate the candidates and in some fashion determine which one rates more highly on

the voter's own personal scale. It is not unreasonable to suggest that this might be done in the same way as other person evaluations, with voters proceeding to independently assess each candidate, not making comparisons across candidates until the time comes to vote. At that point, voters could simply recall each tally and compare. Suggesting such a model based on the Stony Brook and other studies may not be unreasonable, but it appears to be wrong. Something about having more than one person to evaluate simultaneously appears to have changed the way in which the evaluation proceeded. The suggestion made in Chapter 6 is that this something is the perceived need for many voters to make direct comparisons between candidates on salient issues. Lodge (1995) explicitly rejects the idea that voters make such comparisons, but the evidence in this study is that voters proceed to search for information *as if they were* making direct comparisons. While this is not conclusive proof that the comparisons are made, it is strongly suggestive. It seems highly unlikely, given the random nature of the information presentation in the dynamic information board and the effort required to make intra-attribute transitions, that subjects would move from candidate A's position on issue 1 to candidate B's position on the same issue and fail to make direct comparisons. More importantly, evidence from this study shows that those voters who show the greatest use of search patterns suggesting comparisons also do the best job of choosing the correct candidate from among their party's choices. If voters are making such direct comparisons, the consistent links between memory and choice found in the political science literature, and rejected by Rahn, *et al.* (1994) and the Stony Brook researchers as after-the-fact rationalizations, may be the traces remaining from those comparisons. If so, why are the memories so weak? Lodge himself has an answer, when he notes that detailed issue oriented

information doesn't appear very often during the campaign, and is overwhelmed by person information, party labels, and major themes, which are repeated over and over during the campaign (1995.) Further, consider that if the use of memory during the campaign is primarily to make comparisons across candidates, than once a comparison is made and the positions of each candidate evaluated, it may no longer be necessary to continue to refresh the memories involved in that comparison. In a sense, voters may use memory for specific purposes, and use on-line processing otherwise.

A second reason for the divergence of the findings of this study is that the methodology used in this study was dramatically different from that used in any of the previous Stony Brook studies. The dynamic information board approach provided the ability to mimic the flow of information throughout a political campaign, with the resulting confusion the real world campaigns certainly entail. Anyone purporting to study a political campaign must come to grips with the fact that such campaigns proceed over time. They are not static events, and the decision-making processes that voters find themselves involved in must vary as the campaign proceeds. Early on, for example, voters are simply learning the basics about the candidates, many of whom are unfamiliar faces. The initial decision for many voters, especially in a primary election, is probably simply how to find one or two candidates who look reasonable in a host of suits who all look and often sound the same. Once focused, voters have a different task at hand -- to learn what they can to either reinforce their initial feelings about a candidate or to learn enough to reject and start looking through the remainder again. At this point, voters may be making the kinds of direct comparisons on salient issues that the on-line model rejects.

Finally, towards election day, voters may spend time simply reinforcing their preferences.⁹⁰

Whether voters proceed in exactly this manner, or in some other, it is clear that they proceed through an election campaign over time. However, previous studies have not taken this time consideration into account. Nor have they addressed the essentially chaotic nature of the campaign. Instead, subjects have been given lists of information about political figures in easy to read, easy to compare, and easy to evaluate formats. To generalize to an election campaign from this approach is probably unwarranted. The Stony Brook studies do clearly show that evaluation of single political figures proceeds on-line. The results of those studies are strong enough and consistent enough to accept the on-line model in such an environment. And this type of political environment does exist on a regular basis, outside of elections. Citizens are called upon to evaluate political figures outside of the campaign -- for example, for generally three of his four years in office, a president is not being evaluated within the context of competing with other politicians for the job. Thus, in those years, on-line evaluation may best describe the process by which voters come to an evaluation of the president. But, when the evaluation changes from determining whether Bill Clinton is doing a good job or not, to deciding between Clinton and other candidates, the on-line model appears to be less appropriate.

⁹⁰ This speculation as to process is, at the moment, simply speculation. The scripts generated by the extensive debriefing in this experiment provide some clues to this process, and are the data upon which I am basing these ideas. However, the scripts have not yet been analyzed in any systematic way, so that what I write here is necessarily impressionistic.

External Validity

In any experimental project, some concern has to be expressed for the external validity of the study. Experiments are not, of course, able to fully duplicate the "real world" and this experiment is no different. Presidential primary election campaigns run considerably longer than the 20 minutes provided for subjects here. Rarely do campaigns begin with a slate of candidates completely unknown to the voting public as was the case with this election simulation. And campaign information comes at voters in considerably more formats than the simple campaign videos and the predominantly text-based formats that were used in this study. So it is natural to ask the question to what degree can the results of this study be said to give us insight into the process voters use during a real campaign?

Simply arguing that all experiments suffer from the concern of external validity is not enough. It is true that experiments provide the researcher with a tool that allows total control of the environment, and with random assignment of subjects to manipulation conditions, allows the experimenter to draw strong conclusions about what happens within the experiment based on the conditions. But this comes at the cost of simplifying the real world perhaps even to the extent that whatever findings are produced are applicable only within the laboratory.

While the dynamic information board used in this study certainly does not present a political campaign in exactly the same way real voters perceive a campaign, it does provide a number of features which connect nicely to real-world campaigns. The candidates used were very realistic, taking positions on issues appropriate for their ideological stands. Subjects appeared genuinely interested in the outcome of the

campaign, often asking their experimenter “who won?”⁹¹ Information that is presented is much like information from a real campaign; the candidate positions are based on current events, the campaign videos are created from real-world campaign ads, and the candidates are given realistic political histories. Every effort is made to create an environment in which subjects make a real choice among candidates.

The extent to which this methodology does not accurately reflect a real campaign comes from two major considerations. First, real presidential campaigns do take longer than the 20 minutes provided here. While it would be possible to lengthen the time that the simulation runs considerably; or to perhaps run it during a number of sessions over an extended period of time, such approaches would greatly complicate the analysis for what might be very little gain. While subjects are forced to do their information search and make their choice in a compressed time environment, they must still accomplish the tasks that are necessary in any election -- learn about the candidates, assess each against their own personal preferences, and make a decision.

The second major difference between this simulation and a real campaign is the lack of an overt social aspect to the election. Subjects sit at the computer alone. They do not have any opportunity to discuss the campaign with any other person. In a real campaign, of course, many people discuss their feelings about the candidates with others in their various groups. These discussions can reinforce prevailing opinions, or cause

⁹¹ The simulation ended when a subject voted for their preferred candidate in the primary and then used a felling thermometer to evaluate all of the candidates. No indication was given of which candidate “won” the primary, since such a determination would be both arbitrary and unnecessary to the experiment. In other experiments using this methodology, when a general election is included after the primary, subjects find out which candidates “won” the two party primaries and therefore are the candidates in the general election. Determining the winners in these cases depends on the particular experimental manipulations being used. For example, in one version, the candidate the subject votes

voters to reassess their position. This experiment does have a sort of analog to a social element built in through the use of polls and endorsements. These two pieces of information are explicitly generated from “outside” the campaign, and purport to tell subjects what others are thinking about the candidates. While not a perfect replacement for the natural political dialogue that goes on during a campaign, they do provide some semblance of a social dimension.

On balance, even with its limitations, the dynamic information board experiments are useful for studying the question at hand, as well as a range of other issues.⁹² In particular, this project is about decision-making in a choice environment. Subjects are faced with a task of collecting information, evaluating it, and making a choice. Whether or not the environment successfully mimics a presidential campaign is almost beside the point. It clearly does present subjects with a person-perception task, akin to the tasks presented by the Stony Brook researchers and others examining how people evaluate other people. It does so with the one major difference of adding the choice requirement. Thus subjects are placed in a decision-making environment and the results of the experiments certainly tell us something about what happens in such environments. It is not unreasonable then, to conclude that the results also tell us something about voting, to the extent that it is a decision-making task in an information rich environment.

for in the primary never “wins” and the computer randomly picks another one of the candidates as the winner.

⁹² The dynamic board has been used to study information search and acquisition patterns, the use of heuristics by voters, and differences in voter reactions to candidates based on personality and pictures. Some of these experiments are reported in Lau (1995); Lau & Redlawsk (1992); Lau & Redlawsk (forthcoming); Redlawsk (1995b); Redlawsk (1996); and Redlawsk & Lau (1995.)

Future Directions

The dynamic information board provides a new way of examining events which occur over time, and which do not lend themselves to the simple organization required in the traditional static information board. Even so, it is important to consider again the static approaches used by the Stony Brook researchers in order to understand to what degree the findings of the current study and the Stony Brook studies diverge because of the particular methodologies used, rather than for substantive reasons. While I argue that the dynamic board is a more appropriate mechanism for studying the ebb and flow of a political campaign, using a modification of the Stony Brook static approach in which multiple candidates are presented in a campaign environment would allow us to disentangle some of the remaining questions.

Using a variant of the static information board, the same type of campaign environment could be presented to subjects, with the major difference being the inability to model the variation in information flows over the length of the campaign. On the other hand, the same information, the same number of candidates, and the same timeframes could be used as in the present study. If such a study were carried out, using a static, easy-to-compare-candidates information board, results could be more directly compared to the Stony Brook approaches. Why do this, if I believe the dynamic information board is a more accurate depiction of a campaign? Simply put, if the on-line model is supported in the static information board, even with multiple candidates, then an argument can be made that the use of on-line processing is confirmed when the information environment is easily controlled, even in a choice environment. Certainly, in all of the Stony Brook experiment, the information environment has not approximated a campaign, and has been

rather easily managed by subjects. Support for the Stony Brook model in a multiple candidate static information board would also call into question whether the real reason for the failure of the on-line model in this study has anything to do with the difference between evaluation and choice, as asserted above. If, on the other hand, the on-line model is not supported using a static information board, this would provide additional evidence that the approach used in the Stony Brook studies is simply not applicable to the election environment, with multiple candidates and the requirement of choice.

Additional work also needs to be done to establish just what voters are doing if they are not processing campaign information on-line. A revision of this study is needed to better follow the process subjects are using. The manipulation which interrupts two-thirds of the subjects before the end of the campaign needs to be dropped. In addition, lengthening the time of the campaign might be useful in more easily dividing it into segments that could be independently studied. Work by Payne and colleagues (Payne, 1976; Payne, Bettman, & Johnson, 1993; Payne, Braunstein, & Carroll, 1978) suggests that decision makers use different strategies at different points in the evaluation process (see also Fischer & Johnson, 1986.) The dynamic information board approach can readily establish an environment in which this can be tested. In addition to running the mock campaign as before, the system could be set up to provide a “pre-election” period where subjects would learn about the positions and actions of an “incumbent” president, well before election season. Then, that incumbent could be challenged in a campaign environment. The resulting data, collected both in terms of quantitative measures, such as choices of what to examine, and the amount of time spent on each item, and in qualitative terms by discussing the process subjects use with them, might well point up the

differences between true evaluation tasks, such as have formed the basis of the Stony Brook experiments, and evaluation and choice tasks, such as voters face every four years when electing a president.

This study began with the assumption that the on-line model, so well established in the research on person perception would, in fact, be confirmed in an election environment. Instead, the results of this study have raised more questions than they have answered. The on-line model, at least in its basic form, can not be confirmed when choice is involved. Instead, subjects appear to rely on some mix of on-line evaluations and memory-based judgments. More research will be necessary to disentangle the two, and to determine at what point people move from an on-line evaluation process when examining political figures, to a more complicated mix of approaches that allow them to winnow the field down from many potential presidents to the one they actually select on the first Tuesday after the first Monday in November.

Appendix A

Experimental Instructions and Scenario

Subjects beginning the experiment were provided with a set of instructions and a scenario which they read from the computer screen. The instructions were varied in order to create two processing groups. The on-line processing subjects received no special information in their instructions. The memory-based processing group had a paragraph inserted in their instructions warning them of the impending memory test and justification requirement. Both groups read the same scenario.

Instructions

WELCOME to the BALLOT BOX

Read these instructions carefully!

Your task is to "experience" (in a very short period of time) the 1996 presidential election campaign, with a few changes. We have substituted a new set of candidates for those who are likely to run in 1996. None of these candidates are ones you have heard of before. (You may or may not be upset to learn that Bill Clinton is not running for re-election in our mock campaign.) In fact, the candidates for this election don't actually exist; they have all been "made up" for the purposes of this experiment. However, they have been created to be as realistic as possible -- to be the type of candidates who typically run for president in the United States.

As in the practice session, when the campaign begins a series of descriptive labels will scroll down the middle of the screen. Each will appear in one place for a few seconds and then move down the screen. Each of these labels (like, Joe Politician's Stand on the Economy) is associated with some more elaborate (but hidden) information. To "access" or "learn" the information described by any of the labels, simply use the mouse to move the cursor to the label and click the mouse button. You can then study the information for as long as you like. When you are ready to return to the campaign, simply click on the "Done" button.

As usual, the year begins with the primary season and the selection of each party's flag-bearer. The first primary in 1996 is New Hampshire's, scheduled on February 20th, although the Iowa caucuses are to be held 10 days earlier. "Super Tuesday," when about a quarter of the delegates needed to win the nomination are selected, occurs on March 14th. Many of the states (including New Jersey) are thinking of changing when their state's primary is scheduled in order to have more influence over the outcome of the nomination.

For our mock election, we are going to pretend that California, New Jersey, New York, Ohio, and Texas have all coordinated their primaries to occur on Tuesday, April 24. As these states combined have slightly more delegates than those selected on Super Tuesday, we have coined the term "Super Duper Tuesday" for April 24th. These states hope that the party nominees will not be selected before then (and it is a good bet that they will not, at least in this mock election campaign), so that voters in these states will have a great deal of influence over which candidates get the nominations.

Information about the Democratic candidates will be in one color on the screen and information about the Republicans will be in another, but you will have to find out which party's candidates are in which color. (The color assignment is not necessarily the same as it was for the Bush-Dukakis practice session.)

This year there are six candidates from the two parties running for President. Most of the information will be specific to one of the candidates (like Joe Politician's stand on the Economy), but some of the information will apply to more than one of the candidates (such as, Gallup Poll as the Primaries Heat Up). Information of this latter type will be in the same color that the party it is about appears. For example, the Gallup Poll for the Republicans will be in the same color as the other information for Republicans.

The entire "primary season" will last about 20 minutes. As in any campaign, there will be far more information available than you can possibly comprehend in so short a time, and you will have to be selective in what you pay attention to. Hence the longer you look at any given bit of information, the less time there is remaining to learn anything else.

At the end of the primary you will be asked to vote for one of the candidates in one of the party's primary. You can certainly look at any information about any of the candidates during the campaign, irrespective of party, but you can only vote in one of the primaries. And you will have to choose ahead of time which primary to vote in by "registering" with that party before the primary begins.

*Once the election is over and you have voted for your preferred candidate, you will be asked to justify your choice. That is, your experimenter will ask you to explain why you voted for the candidate you chose. In addition, you will be asked to list everything you can remember about the candidates in the primary election. So, you should do your best to remember everything you can as you look at each piece of information.*⁹³

In general, the same type of information is available about every candidate. However, the candidates can adopt different campaign strategies, which could result in different probabilities of your ever learning certain information about different candidates. Please note that the information associated with any label (e.g., Joe Politician's stand on the Economy) will never change during the course of the campaign. That is, you will probably have more than one opportunity to "access" or learn certain information -- and you should feel free to do so -- but the hidden information associated with a label will always be the same.

For this experiment, we will ask you to imagine that the world in early 1996 is much like the world in 1994 -- and thus the political issues during the 1996 campaign are much the same as they are today. For example, while we all hope the crisis in Haiti is long over before 1996, our candidates, by necessity, will be reacting to the world scene of mid 1994 (of which the situation in Haiti is a part). In any case, it is a good bet that there will be another crisis somewhat like Haiti somewhere else in the world by 1996.

If you have any further questions, please ask your experimenter now.

When you are ready to begin the 1996 election, move the cursor to the "Read Scenario" box and click the mouse.

Scenario

It is early 1996. Somewhat surprisingly, the world is much like it was four years earlier when President Clinton was elected. The economy as a whole has picked up from the recession of the early 1990's, but certain areas of the country are still in the economic doldrums, and no one is claiming that "high times are here again." The Republicans made significant gains in the House and Senate in the 1994 elections, but the Democrats still control both houses of Congress. Congress has not passed any major health care legislation, but health care costs continue to rise and millions of Americans still have no health insurance. Congress is apparently now waiting for the outcome of the 1996 presidential election before acting.

⁹³ This set of instructions in italics represent the manipulation designed to force some subjects into memory-based processing. See Chapter 4 for the details on this manipulation.

On the international scene, Israel and its Arab neighbors continue down the rocky road to peace. No new major disputes have broken out, but all parties involved are still not convinced that peace is the best road to travel. The rapid course of events in Eastern Europe has slowed down as all of the former satellites of the Soviet Union struggle with economic reform. The crisis in the former Yugoslavia between Serbs, Croats, and Bosnians still continues. Russia is no longer the "evil empire," and Boris Yeltsin is still its president, but it too struggles with adopting democratic reforms. The major foreign policy success of the Clinton presidency has been the signing of a nuclear non-proliferation agreement with the former Soviet republics, China, and North Korea.

With the signing of this treaty, and his popularity at a 4-year high, President Clinton stunned the political world by announcing he would not run for re-election. Claiming that he had achieved almost everything he had set out to accomplish except major health care reform, "and that is headed in the right direction," Clinton plans to retire from political life "to do some fishing, to play the saxophone, and to get to know my family again." Not all political observers would agree with Clinton's assessment of his accomplishments, of course, but at least the candidates vying for the party's nomination do not have to "run away from the President" as they did in the 1994 Congressional elections.

President Clinton initially endorsed Vice President Al Gore to be his successor as the party's nominee. However, Gore was tragically crippled when he broke his back trying to dance the bugaloo at a fund-raising affair in a Los Angeles disco, and has had to retire from public life. Clinton has now promised to support whichever candidate wins the party's nomination, but will remain neutral during the primary campaign.

Since there is no incumbent President running, neither party would seem to have a big advantage. Consequently, the election promises to be a close one.

To begin the primary election, move the cursor to the Begin Election box and click the mouse button.

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Occupations

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- 1990-1996 Independent Management Consultant
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