

AGE DIFFERENCE IN POLITICAL DECISION MAKING: Strategies for Evaluating Political Candidates

Ellen D. B. Riggle and Mitzi M. S. Johnson

To investigate age-related differences in strategies used to evaluate political candidates, an experimental study employed protocol tracing techniques with a computerized information matrix. Forty younger and forty older adults gathered information about and evaluated candidates in national and local elections. Older adults accessed less information but took longer to examine information and make choices. Differences in strategic processing suggest that young adults were more likely to organize their information searches by issues and to eliminate candidates based on issue stances. In contrast, older adults were more likely to organize their information searches by candidates and to engage in satisficing.

The population of senior citizens is growing, both in absolute terms and in political importance. However, many societal stereotypes present older adults as slow and forgetful. "Younger folks" tend to worry about the reasoning abilities of "older folks" in political as well as other decision domains. Are their memories of Truman, Ike, and Vice-President Nixon accurate and reliable? And are they relevant to today's politics? (In fairness, of course, societal stereotypes present younger adults as alienated and apathetic citizens.) To assess the strategies employed by older adults to evaluate political candidates, we can look at several indicators. One starting point is to look at the decision *process* itself. By ascertaining the process used to arrive at the outcome, we can compare the strategies used by older and younger adults and the possible implications for the "reasoning" used by older citizens in voting decisions.

Prior research in political science has treated older citizens as a cohort or special-interest group. It has been implicitly assumed that the effects of aging derive from self-interest, social location, and life experiences. However, we

Ellen D. B. Riggle, Department of Political Science, University of Kentucky, 1615 Patterson Office Tower, Lexington, KY 40506. Mitzi M. S. Johnson, Department of Behavioral Science, University of Kentucky, College of Medicine Office Building, Lexington, KY 40536.

have discovered little about the processes and strategies used by age cohorts in acquiring and evaluating information in making decisions about politics. These decision-making processes may differ by age group.

Research in cognitive aging (to confirm some of common wisdom) has found that as we get older we lose some of our ability to remember, and we become generally slower at cognitive tasks. These effects may influence the information processing and decision-making strategies of older citizens. The effects of cognitive decrements associated with aging may also combine with the political experience accumulated by older citizens to modify decision-making processes and strategies as compared to younger citizens. These modified strategies may lead older citizens to use different amounts and types of information in their evaluations of politicians and political candidates.

These age differences may be obscured in studies based on aggregated data, but may become visible in experimental studies. To investigate the effects of aging on the process of political decision making, we employed computer-based protocol tracing techniques in candidate evaluation tasks. The protocol tracing program allows for the analysis of the effects of timing, information access, and searches by organizational dimension. The different patterns of information access and sequential searching along candidate and issue dimensions reflect different decision rules and strategies (see Lau and Redlawsk, 1992), as well as differences in cognitive capacities and adaptive processes (see Johnson, 1990).

AGING AND POLITICAL BEHAVIOR

Political scientists have typically treated older citizens as a political cohort or special-interest group. Researchers have focused on how the life experiences, life-cycle, demographic, and self-interest differences between older and younger citizens affect their political behavior (see Jacobs, 1990, for a general review).

Conservatism. Initially, findings of increased conservatism by older voters were attributed to increased concerns about safety, security, and health as part of aging and the life cycle (e.g., Zellman, 1975). Later researchers countered this explanation with compositional and generational arguments. These researchers found greater conservatism among older voters to be related to education, income, and socioeconomic differences between older and younger cohorts of voters (Cutler, 1977; Campbell and Strate, 1981). Conservatism among older voters in the early studies (e.g., Campbell et al., 1960) has now been linked to a period effect—growing up during the Great Depression.

Issue support. Older Americans have often been assumed to give greater support to certain public policies and programs, especially those that disproportionately benefit older age groups. Social Security and Medicare were cre-

ated in large part to benefit older Americans, giving the cohort a common public policy concern and fostering support for these programs, although this support is mediated by economic and partisan differences (Rhodebeck, 1993; Day, 1990).

Participation. Several theories have been proposed to explain the political participation of older Americans. Disengagement, selective withdrawal, and cohort composition have been used to explain different rates and types of political engagement. Circumstances surrounding the aging process, such as difficulty obtaining information, difficulties traveling, and limited income, combine to make participation in politics more costly to older citizens. While passive forms of participation seem to remain steady (i.e., following public affairs), more demanding forms (i.e., attending political meetings) decline in favor of "age-appropriate" activities, such as reading newspapers aimed at senior citizens (Jennings and Markus, 1988).

Overall, studies of voting behavior have noted differences between age groups and have attributed these differences to conservativeness and self-interest. However, it is also possible that there are age-related differences associated with other *effects* of aging. The accumulation of experience and knowledge and the loss of certain mental capacities may lead to the development and use of alternative or modified information processing and decision-making strategies by older citizens.

THE EFFECTS OF AGING ON DECISION-MAKING PERFORMANCE

Aging effects are variable due to the plethora of factors that can affect the aging process (e.g., biological or environmental). Previous research in cognitive aging has found evidence of age-related declines in memory and problem-solving abilities. Data specific to decision-making performances reveal two consistent findings: (1) older people take more time to search information and make decisions (Johnson, 1990; 1993); and (2) older people search less of the available information (Johnson, 1990; 1993; Streufert et al., 1990; Hershey et al., 1990). Various studies have also found older adults to be more systematic or strategic in their searches, using "top-down" processing with less total information searched, although this finding is not consistent across domains (Johnson, 1990; 1993; Sinnott, 1984).

Knowledge, motivation, and technology can help to offset the effects of the decline in cognitive mechanics (Baltes and Baltes, 1992). Knowledge base can help to lessen the amount of information an older person needs in order to form an impression or make a decision. Motivation to activate cognitive reserves via learning, exercise, or training can increase the decision-making capacity and performance of older adults. Technological support can also aid

older adults in information processing and decision tasks, including compensation for physical limitations in movement and increased access to information.

Older adults may adapt to the decline in their cognitive mechanics (processing or abilities) by changing their decision-making strategies. Selective optimization is a general adaptation process that implies the use of a combination of strategies in order to maximize the quality of the decision while minimizing the cognitive effort or demands. Selective optimization initially restricts the number of options to those of the presumed highest quality. These restricted options may then be evaluated in subsequent strategic searches (c.f. Payne, Bettman, and Johnson, 1993).

PROCESS TRACING POLITICAL DECISIONS BY OLDER AND YOUNGER CITIZENS

Political scientists are interested not only in decision outcomes, such as the vote, but also in the processes by which citizens arrive at these outcomes. How citizens acquire information, or what they choose to pay attention to, is central to the discovery and understanding of the decision rules or strategies to combine and use the available information. Much attention has been given to the types of information that influence decisions, such as political and social demographics and issue attitudes (e.g., Berelson, Lazarsfield, and McPhee, 1954; Campbell et al., 1960; Nie, Verba, and Petrocik, 1976; Fiorina, 1981). Less attention has been paid to how these "types" of information are processed (for notable recent exceptions, see Lodge, McGraw, and Stroh, 1989; Ferejohn and Kuklinski, 1990; Lau and Redlawsk, 1992).

Process Tracing

Process tracing techniques were developed by cognitive researchers for the study of the dynamic process of individuals' gathering and evaluating information (Payne, Bettman, and Johnson, 1993; see also Einhorn and Hogarth, 1981; Abelson and Levi, 1985, for reviews). Process tracing records the sequence of access of pieces of information. The protocol from this record can be used to determine the primary information search pattern by the examination of the alternative and attribute of the n th + 1 piece of information as a function of the alternative and attribute of the n th piece of information accessed (Johnson, 1990). This method makes two assumptions of importance here: (1) that looking at a piece of information means that piece will be cognitively processed; and (2) that the selection of pieces of information is governed by a predetermined rule or strategy for information gathering and decision making (Johnson, 1990; Svenson, 1979).

Herstein (1981) first used a process tracing technique to examine political

behavior using an "information board," with information about the policy stands, backgrounds, and personalities (attributes) of different candidates (alternatives), in order to assess the validity of voting behavior models. Herstein found little support for the cognitive processes proposed (implicit or explicit) by early models of voting behavior. More recently, Lau and Redlawsk (1992) have used computerized information boards in order to make assessments of the use of compensatory and noncompensatory decision-making strategies during political campaigns. They found, using convenience samples and a "hyper" computerized information matrix, that "most vote decisions were based on within-candidate search processes and non-compensatory decision strategies."

Inferring the use of strategies is theoretically based on two types of decision-making rules. Noncompensatory rules employ heuristics that intentionally limit or reduce information searches, such as elimination by aspect or satisficing. Noncompensatory refers to the inability of unaccessed positive information to "compensate" for or counterbalance earlier accessed negative information. For instance, in elimination by aspect (or more specifically, "issue elimination"), individuals would access information about all the alternatives (candidates) along a single aspect (issue). Candidates who did not agree with the voter's stand on this initial issue would be eliminated from further consideration. Candidates who did agree with the voter's stand would be compared on additional issues. Individuals using a "satisficing" strategy, on the other hand, would search information about a single candidate until either (a) the information revealed an issue stand the voter did not agree with, causing them to start searching information about another candidate, or (b) sufficient information had been accessed to make the candidate acceptable. Thus, not all information about a single candidate would necessarily be searched, nor would information about every candidate be accessed.

In contrast, compensatory rules lead to a search of all available information, additively weighing the positive and negative values of each piece of information for each alternative. Compensatory refers to information counterbalancing positively and negatively, regardless of order of access. Spatial models of voting are an example of compensatory voting strategies (Enelow and Hinich, 1984). These models assume that voters access and calculate the distance of their stand from each candidate's position, weighing the importance of each. The weighted distances are summed for each candidate across all issues and the candidate closest to the citizen receives the vote.

Predictions

Given the presumed diminished cognitive capacities of older citizens, they are likely to engage in different information gathering and evaluation strategies in decision-making tasks than younger citizens. These strategies will pro-

duce systematic differences between the two groups that appear when looking at the processes (not necessarily the outcomes) by which they search for information about political candidates.

First, we would predict, like previous research in different domains, that older adults will spend more time searching the information matrix and will take longer looking at each piece of information accessed than younger adults. Second, also similar to research in different domains, older adults will access less of the available information (a form of selective optimization). Third, the strategies used by older adults for organizing their searches should differ from the strategies used by younger adults. The strategies used by older adults should involve more selective optimization and noncompensatory searches of information.

METHOD

Overview and Design

Older (ranging in age from 50 to 85, $n = 40$) and younger (ranging from 18 to 35, $n = 40$) subjects were recruited to participate in a study of decision making about political candidates. Decision tasks included gathering information in order to vote in a special U.S. Senate election and a local city council race. Subjects completed various measures related to the information matrices, their political knowledge and attitudes, and their health status (for additional assessment of the older subjects). A 2 (age group) by 2 (election level) mixed factorial experimental design yielded data from a multichoice, multiattribute decision-making task.

Sample

Young adults were recruited from undergraduate political science courses. Older adults were recruited from the Sanders-Brown Center on Aging volunteer subject pool. All subjects were paid \$10 for their participation in the study. Young and older adults were randomly assigned so that there were 20 young and 20 older adults in each task presentation order group. One subject, a non-English-speaking younger adult, was dropped from analyses.

Obviously neither sample is random nor particularly representative of their age group. However, these "convenience" samples are members of the subset of their age groups who are most likely to engage in political participation, including voting. College students are more likely to vote than nonstudents of the same age. Likewise, noninstitutionalized older citizens are also more likely to participate in politics and vote. (In addition, the Sanders-Brown subject pool was created using surveys sent to a list of registered voters.)

The mean age of the young adults was 24.0 years (± 4.61) and for older adults was 72.2 years (± 7.42). Most of the young adults were male (66.7%) in contrast to the older adults (55.0% female). Many of the older adults were married (65.0%) as opposed to a majority of the young adults who were single (84.6%). As might be expected, many of the older adults were retired (67.5%) and all of the young adults were students. The mean education level was 14.3 years for older adults and 15.2 years for younger adults. About a quarter of each sample considered themselves to be employed full- or part-time.

Procedure

After obtaining informed consent from all subjects, a research assistant outlined the program. Subjects participated individually at a time and place convenient to them. A self-instruction program written and installed on a laptop computer presented the experimental task and administered individual difference tests and questionnaires, although a research assistant was present to demonstrate the task and answer all questions.

In a demonstration of the experimental task, the research assistant showed subjects how to go about requesting information in order to make a decision about which of two stereo systems one would choose to buy. Subjects received an oral overview and demonstration of the task instructing them in the use of color-coded keys on the computer to request information. After any questions had been addressed, subjects proceeded to the experimental task and were asked to refrain from asking questions during the task.

The experimental task involved collecting information in order to select a candidate for whom subjects could vote in each of two races: a special U.S. Senate election with six candidates, and a local city council election with eight candidates. Information was organized in a matrix with candidate names labeling the columns (national: Myers, West, Green, Henry, Petty, and Hurst; city: Beck, Robek, Orr, Smith, Wrenn, Adams, Gates, and Crane) and issues labeling the rows (national: energy tax, health care, budget amendment, foreign aid, abortion, gun control, defense spending, social security; city: cable TV, landscaping, homeless shelter, pooper scooper laws, enhanced 911, and child care zoning; information about the party affiliation and experience of each candidate was made available to half of each age group). All of the candidates were fictional, but the matrices were designed to simulate matrices that appear in many newspapers right before an election. (See Figures 1 and 2, ignoring the numbers in the cells for now.)

To select a piece of information subjects pressed the cursor keys to highlight a cell of the matrix and pressed the "enter" key. When they were finished reading the display (two or three lines containing up to 66 characters), subjects pressed the "backspace" key. After a piece of information was

	Myers	West	Green	Henry	Petty	Hurst
Energy Tax	41	40	1	16	17	32
Health Care	42	39	2	15	18	31
Budget Amend- ment	43	33	3	14	19	30
Foreign Aid	44	34	4	13	20	29
Abor- tion	45	35	5	12	21	28
Gun Control	46	36	8	9	22	27
Defense Spend- ing	47	37	7	10	23	26
Social Secur- ity	48	38	6	11	24	25

Candidate-only search

FIG. 1. Special senatorial election.

viewed, the cell was marked with an asterisk. Subjects could use as much or as little information as they wished, could repeat previous requests to review information, and could take as much time on each task as they wished. At any time during the task, subjects could choose an OPTION by pressing the "esc" (escape) key. Options included a horizontal list of the candidates from which to choose in DECISION, the introductory description of the task and instructions regarding how to use the computer in an OVERVIEW, and an external memory aid in a REVIEW. The REVIEW option took the form of 5 character words or abbreviations designed to capture the essence of information contained in each cell of the matrix. Only cells that had been previously accessed revealed cued information for review. To make their decision, subjects highlighted the word DECISION and were presented a list of choices. After entering their choice they were finished with the task.

After subjects completed the experimental task they answered demographic questions regarding their age, marital status, educational attainment, occupation, income, health, hearing, and vision. In the last component of the

	Beck	Robek	Orr	Smith	Wrenn	Adams	Gates	Crane
Cable TV				24		23		
Land-scape	4	5	6	7	8	3	2	1
Home-less				21		22		
Pooper Scooper	9	10	11	12	13	14	15	16
Enhanced 911				20		19		
Child Care				17		18		

Issue elimination

FIG. 2. City council election.

session, subjects completed measures of political “demographics.” Subjects identified themselves along a 7-point continuum of strongly liberal to strongly conservative, with a midpoint labeled “moderate.” Similarly, subjects classified themselves using a 7-point continuum from strongly Republican to strongly Democratic, with a midpoint labeled “Independent.”

The computer recorded the explicit information search protocol of each subject. These records contained the sequence of requests for information and options as well as the time spent in each activity. The organization and sequence of subjects’ search patterns indicate use of strategies (see also Johnson, 1993).

RESULTS

Information about some of the issues was accessed more often than information about other issues. For example, information cells about health care and abortion were accessed more often than information cells about the budget amendment or foreign aid. However, there were no significant age differences in which types of information were accessed. Likewise, although there were some candidates who received more votes than others, there were no significant age differences in voting.

Similar to the results of some previous research, older subjects were more

likely to self-identify as conservative than younger subjects ($n = 78$, $df = 6$, $\chi^2 = 13.7$, $p < 0.04$). There were, however, no significant differences between the two age groups in party identification.

A principal components analysis confirmed three separate dimensions of quantitative dependent measures. Consistent with prior research, the dependent measures, individually described below, load on factors of time, information access, and search organization (see Table 1). Further, time and information access measures are significantly correlated (negatively, reflecting age differences as will be seen below), but neither is significantly correlated with search organization measures.

Time

The primary purpose of the study was to examine the decision-making process. Table 2 contains the mean total time per decision (measured from the first appearance of the matrix to the time that subjects cast their vote) and mean time per cell access (measured as the mean number of seconds spent viewing the cells accessed). An analysis of variance of the age groups finds, as expected, that older subjects did take significantly longer than younger subjects to complete their information search and vote decision [$F(1,75) = 20.53$, $p < 0.0001$]. Likewise, older subjects spent longer examining each piece of information accessed in any given cell [$F(1,75) = 34.09$, $p < 0.0001$].

TABLE 1. Factor Analysis of Dependent Measures

Variable	Factor 1 Access	Factor 2 Organization	Factor 3 Time
NDTIME	.49	.23	.65
CDTIME	.38	.32	.63
NCELLM	-.47	.36	.72
CCELLM	-.47	.41	.64
NTINFO	.84	.01	-.09
CTINFO	.89	-.03	-.04
NPINFO	.89	.01	-.09
CPINFO	.91	.05	-.08
NIRR	.17	-.83	.16
CIRR	-.07	-.83	.25
NCRR	-.11	.76	-.17
CCRR	.18	.81	-.20
Eigenvalue	5.3	3.8	2.2
Difference	1.5	1.5	1.1
Proportion	.33	.24	.14

TABLE 2. Mean Decision Times and Access Time per Cell in Seconds

Age Group	Mean Total Decision Time	
	National (NDTIME) Mean (st. dev.)	City (CDTIME) Mean (st. dev.)
Older (<i>n</i> = 40)	668 (322)	581 (327)
Younger (<i>n</i> = 39)	421 (184)	366 (156)

Age Group	Mean Time per Cell Access	
	National (NCELLM) Mean (st. dev.)	City (CCELLM) Mean (st. dev.)
Older (<i>n</i> = 40)	9.9 (4.8)	9.8 (6.6)
Younger (<i>n</i> = 39)	4.7 (2.4)	4.4 (1.6)

Information Access

It was also expected that although older subjects would spend more total time searching information, they would spend more time on each piece of information and search less of the total available information. Analysis of the total amount of information accessed (the total number of requests including repeated access of the same cell) and the proportion of information accessed (the number of cells accessed divided by the total amount available (48), excluding repeated access of the same cell) confirms an age difference. The means are reported in Table 3. The ANOVA results reveal a significant differ-

TABLE 3. Cell Information Access

Age Group	Total Number of Information Cells Accessed	
	National (NTINFO)	City (CTINFO)
Older (<i>n</i> = 40)	32.3 (21.8)	30.1 (21.1)
Younger (<i>n</i> = 39)	45.0 (21.8)	42.2 (20.0)

Age Group	Proportion of Information Cells Accessed (%)	
	National (NPINFO)	City (CPINFO)
Older (<i>n</i> = 40)	54% (.30)	52% (.34)
Younger (<i>n</i> = 39)	70% (.26)	70% (.28)

Note: Standard deviations in parentheses.

ence between the total number of cells of information accessed, with older subjects accessing fewer cells than younger subjects [$F(1,75) = 8.71, p < 0.01$]. Likewise, the proportion of information accessed by older subjects is significantly less than the proportion accessed by younger subjects [$F(1,75) = 7.28, p < 0.01$].

Strategic Organization

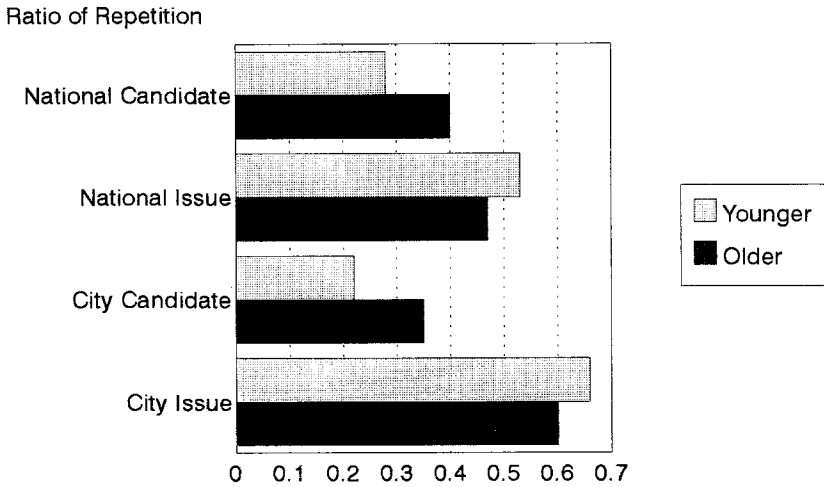
The information search protocols were analyzed quantitatively and qualitatively. Computerized information search protocols allow for quantifiable measures of the proportion of subjects' searches organized by candidate and by issue. These organizational search measures are calculated as the ratio of the cells accessed that were dimensionally sequential, either vertically (down a single candidate) or horizontally (across a single issue). The search ratio for issues is computed as: Issue Repetition Ratio (IRR) = [(issue repetitions - 1) - (number of dimensions - 1)] / [(total number of cells accessed - 1) - (number of dimensions - 1)]. The Candidate Repetition Ratio (CRR) simply substitutes candidate repetitions for issue repetitions (for a discussion of subjective organization measures, including ARC, see Murphy and Puff, 1982).

Figure 3 graphs the mean comparisons for the organizational search measures. The ANOVA reveals a significant interaction between organizational measures and age group [$F(1,75) = 6.02, p < 0.02$]. Younger subjects had higher ratios of issue repetitions than candidate repetitions and had higher ratios of issue repetitions than older subjects. Older subjects also had higher ratios of issue than candidate repetitions, but their candidate repetition ratios were higher than those for younger subjects.

Strategic Processing

Individual subject protocols were "mapped" onto blank matrix sheets identical to the dimensions of the computerized information matrix. A number representing the sequential order of access was placed in each cell. Two research assistants sorted the "maps" into similar strategy categories by the direction and consistency of the sequential search patterns. (See Figures 1 and 2 for sample protocol maps.) Intercoder agreement was 90 percent and differences in categorization were reconciled by simultaneous examination of the maps in question.

Seven "prototypical" search patterns were identified: (1) "Candidate only" searches, in which subjects searched the matrix vertically, accessing all or part of the information about each candidate separately, presumably forming impressions of each (see Figure 1 for an example of candidate only searching); (2) "Issue only" searches, in which subjects searched the matrix horizontally,



National Candidate $F=4.08$; National Issue $F=4.29$; City Candidate $F=5.46$; City Issue $F=4.19$. All $df=1,75$; all $p's < 0.05$.

FIG. 3. Proportion of candidate- and issue-centered searches.

scanning each candidate's stances on a particular issue before going on to a different issue; (3) "Issue elimination" or elimination by aspect, with subjects using candidate stances on one or two issues to narrow their search to a comparison of two or three candidates along additional issues (see Figure 2 for an example of issue elimination searching); (4) "Satisficing," in which subjects search information by candidate until identifying the first acceptable candidate who met minimal standards, characterized by an incomplete search of either rows (issues) or columns (candidates); (5) "Issue with some candidate searching," in which the predominant pattern was one of issue searching, but there were also at least one or two candidate searches—a typical sequence included a horizontal issue search and ended with a vertical search of the candidate selected; (6) "Candidate with some issue searching," where the predominant pattern was one of searching by candidate, but also included one or two comparisons of issue stands across candidates—such as a candidate search that ended with a final comparison of all the candidates along a single (presumably most important or diagnostic) issue; and (7) "Mix" of issue and candidate searches, which included complete searches vertically and horizontally (accessing each piece of information twice) as well as searching short sequences of information vertically and horizontally.

Table 4 reports the results of analysis of the search pattern categorizations. Strategies were pooled over election type to allow greater confidence in the

TABLE 4. Predominant Search Pattern Strategies

Strategy	Older Subjects <i>N</i> (%)	Younger Subjects <i>N</i> (%)
Candidate only	11 (14%)	5 (7%)
Issue only	24 (30%)	19 (26%)
Issue elimination	4 (5%)	16 (22%)
Satisficing	19 (24%)	3 (4%)
Issue w/some candidate	7 (9%)	12 (16%)
Candidate w/some issue	4 (5%)	0 (0%)
Mix	11 (14%)	19 (26%)
	<i>N</i> = 80 (100%)	<i>N</i> = 74 (100%)

analysis; however, analyses of each election type separately yield similar results. The overall pattern shows significant differences in the choice of search strategies (chi sq. = 28.927, *df* = 6, *n* = 154, *p* < 0.001). Older subjects were significantly more likely to engage in "Candidate only" and "Satisficing" searches than younger subjects. Younger subjects were significantly more likely to engage in "Issue elimination" searches and to use a "Mix" of issue and candidate searching.

The proportions of older and younger subjects who used Issue Elimination and Satisficing strategies appear to suggest that the age groups were equally likely to use noncompensatory strategies (see above discussion), albeit different ones (chi sq. = 17.74, *df* = 1, *n* = 42, *p* < 0.0001). The coding of the other patterns was not based on compensatory versus noncompensatory criteria. However, the quantitative data reported in Table 3 suggest support for the hypothesis that older subjects used more noncompensatory strategies. Older subjects used less information, thus making less complete searches.

DISCUSSION

Although there were no significant differences in voting patterns (decision outcomes), there are important differences in the decision-making processes. The decision paradigm itself, with no "right" or "wrong" answer, and this design using candidates who were ideologically equivalent (no extreme candidates on either side of the spectrum), lends itself to similar patterns of decision outcomes regardless of the information search strategy used. Different task paradigms may lead to different outcome patterns as a reflection of the differences in evaluation strategies. The differences in processing strategies themselves imply different entry points for influencing outcomes, i.e., different types of persuasion that may be used to win votes.

Time

The finding that older subjects take more time to complete the task and to examine each piece of information is consistent with the findings of past studies in different domains (Johnson, 1990, 1993). Taking more time to complete the task may be a function of the decline in physical (biological) adeptness due to aging, or a decline in mental (cognitive) adeptness, or a combination of both. It may also be the case that either their decision-making strategy requires increased processing, or it takes longer to process each piece given past experience with or knowledge about politics.

It is reasonable to think that differences in processing time may be related to the use of computers in the task. Three considerations suggest that this difference is more than an artifact. First, all subjects were given a demonstration task to acquaint them with the keystrokes (which were color coded and required no typing skills). Second, while a question checking the difficulty the subject had in using the computer revealed a marginally significant age difference, a majority of all subjects rated the task as "fairly easy" or "very easy." And third, these findings are consistent with findings in other domains that have not relied on computerized tasks. Beyond these considerations, however, time is most important in relation to the organizational measures and processing strategies used. If the time differences affect these measures differentially for older and younger subjects, it is further evidence that older citizens are changing their processing strategies to accommodate their capacity and capability limitations.

Future studies of voting behavior may find that older voters' knowledge and reactions to candidates are a function of the pace of the information they receive. For instance, older voters may be less able to process fully the montages of information often presented in commercial formats and may be better served by media techniques that allow for greater processing time (e.g., newspaper stories). This may also lead to a greater reliance on heuristics for processing among older adults.

Information Access

Older subjects accessed less information from the matrix than younger subjects, both in absolute access and as a proportion of the amount available. This is also consistent with findings from research in other domains (Johnson, 1990, 1993; Streufert et al., 1990; Hershey et al., 1990). Because older subjects spend more time on the task and more time with each piece of information, it is possible that older subjects just "get tired" of looking and stop, leaving much information unaccessed. However, further quantitative and

qualitative analyses do not support this explanation. Decision-making strategies are clearly evident in the protocols of older subjects.

It is more likely that the decision-making strategies used by older subjects require less information. This dramatic decrease in the amount of information processed by older individuals indicates that political candidates and strategists should carefully choose the most important information to make salient to older voters, thus tailoring their message and its form to the audience. It is also possible that, if older adults use less information and engage in satisficing, they may make decisions earlier in a campaign. Thus, information presented earlier in an election may have a greater impact on older citizens than later information.

Organization and Strategic Processing

The decision-making strategies used by older subjects did differ from those used by younger subjects. Although previous research in different domains has found differences in processing time and information access, few differences in processing strategy have been found (see Johnson, 1993, for a review). Differences in the present study may be related to the nature of the evaluations. The task herein involved evaluating people (in the form of political candidates) in contrast to previous research that has centered on the evaluation of objects (such as apartments or cars).

In the present study, older subjects relied more on candidate-centered strategies and engaged in "satisficing," searching for the first candidate to meet some minimal set of requirements. Older subjects also engaged in candidate-centered searches with some issue checking and mixtures of issue- and candidate-centered sequences in searching. These strategies could also be characterized as predominantly partial, noncompensatory searches.

Younger subjects relied more on issue-centered search strategies. Although they were equally as likely as older subjects to use issue-only strategies (a complete, compensatory search), they were significantly more likely to use issue elimination (elimination by aspect) as a strategy. They were also more likely to use an issue-centered search with a final search of the candidate for whom they intended to vote. The organizational measures also showed that their mixed issue and candidate sequence searches were more issue centered.

This clear distinction in information search patterns has implications for analysis of voter evaluations. It suggests that older adults may be more likely to be persuaded by "personal" characterizations of candidates, and less influenced by candidates' stances on single issues, whereas young adults are more likely to be influenced by issues—either single or a small number of issues. This is in contrast to suggestions that older voters give greater support to candidates based on public policies and programs linked to their age status. It

may also indicate that the MTV "town meetings" to discuss issues with "Generation X" voters (employed by presidential candidate Bill Clinton in 1992) is an effective strategy for influencing younger citizens, while face-to-face handshaking and sharing a meal in a senior citizen center to convey personal interest are more effective for courting older voters.

These different strategies may also imply or be associated with (either intentionally or unintentionally) different types of democratic representation. Voting on the basis of candidate-centered searches, or "impressions" of candidates, corresponds to a form of trustee representation, where representatives with appropriate "homestyles" make judgments in the best interests of their constituents. Issue-centered, compensatory searches, on the other hand, seem more congruent with delegate representation, where representatives are expected to mirror closely the policy views of their constituents. Whether there is a generational difference in voter preferences with respect to different models of democratic representation is an important question that must be left to future research.

Aging and Experience

Further discussion of results revolves around two basic issues that are not easily distinguished. The increased experience afforded by age can give older people greater knowledge and context with which to understand politics and evaluate politicians. This may make it easier for older citizens to understand and use information (cf. the literature on experts and novices, e.g., Charness, 1989; Fiske, Kinder, and Larter, 1983). It may also allow them to use more efficient information processing strategies, such as satisficing.

Aging is also associated with biological decrements that may lead to deficits in cognitive processing. This may offset the advantages or lessons of experience. Such decrements may cause older people to access less information or choose less compensatory strategies, such as satisficing. This potentially affects the optimality of older adults' decisions by effectively eliminating information from their searches. Decrement may also prevent older people from making connections between information received and previous experience. Although more knowledge has been acquired, its access may be more difficult. The amount of time necessary for processing new information may substantially increase. In the absence of the necessary time, processing connections to previous experience may be incomplete (cf. Lau and Redlawsk, 1992).

Age-related decrements may cause temporary or chronic changes in decision-making strategies. Eliminating choices from consideration, setting minimum instead of optimum standards, or relying on easily collected information and commonly used strategies can simplify the task and help individuals to

adapt to the effects of age. For example, satisficing effectively eliminates choices from consideration on the basis of order of access. If a candidate meets some minimal standards, then other candidates, especially those who appear later in the race, are automatically left unconsidered.

Forming impressions of candidates and comparing overall evaluations may utilize and apply everyday person impression techniques and strategies. In elections, information about candidates may be primarily personal in nature or come in candidate profiles, causing older people with experience in evaluating candidates to automatically form personal impressions. Additionally, experience with evaluating politicians may cause older people to trust their impressions more than the candidate's actual statements of specific issue stances (cf. the literature on schematic processing of candidates: Lau and Sears, 1986).

While past research has discovered some aggregate differences between older and younger voters, it has possibly overlooked some fundamental processing differences. Future research may focus on several possible age-related differences, including: (1) the effects of experience versus the decrements of age; and (2) the reasons why older subjects are seemingly more likely to use candidate-centered searches while younger subjects conduct more issue-centered searches. Finally, we may also want to consider different models that assess the quality of decision outcomes made by older and younger citizens given differences and similarities in their decision calculi.

Acknowledgments. This research was supported by grant AG09976 from the National Institute on Aging (M. Johnson, PI). The authors would like to thank Barry Tadlock and Dr. David Wekstein (of the Sanders-Brown Center on Aging) for their assistance. We would also like to thank Mark Peffley, Neil Charness, and Robert S. Wyer, Jr., for their insightful comments. Correspondence should be sent to Ellen Riggle, Department of Political Science, University of Kentucky, Lexington, KY 40506-0027.

NOTES

1. Lau and Redlawsk used a computerized matrix similar to the one used herein. They chose to simulate a presidential election and to mimic the "pace" of such an election with a scrolling screen of information. We make different choices both in terms of the level of elections and the specifications for our information display and access, which are explained below.
2. The design was also counterbalanced for order of presentation and some significant order effects were found. However, these did not affect the significance of the reported analyses and represent learning effects given the two decision tasks. Therefore, we delete these from the analysis presented.
3. The older adults are all classified as "highly functional" in terms of their eyesight, hearing, and other health-related measures.
4. These issues, especially the local issues, were chosen by scanning the local newspapers for

topics of current debate. Also, we recognize that information for some races (a Senate race, for example) is available over the course of many months, and for others (a local council race) little information is available until right before the election.

5. Information concerning political sophistication, interest, and knowledge, as well as measures of abstract reasoning, intelligence, and vocabulary skills, was also collected. The analyses of these individual difference measures are reported in Johnson and Riggle, 1994. Analyses do not find domain-specific political measures to have a significant impact on the reported measures and therefore the results are not included herein.
6. For example, Hartley, 1990, who used a pencil and paper alternative and attribute matrix to describe insurance plans and follow information consideration patterns.

REFERENCES

- Abelson, Robert P., and Levi, Ariel (1985). Decision making and decision theory. In *Handbook of Social Psychology*, Gardner Lindzey, and Elliot Aronson (eds.). New York: Random House.
- Baltes, Paul B., and Baltes, Margret M. (1992). Psychological perspectives on successful aging: The model of selective optimization with compensation. In *Successful Aging: A Psychological Model*, Paul Baltes, and Margaret Baltes (eds.). Cambridge: Cambridge University.
- Berelson, Bernard, R., Lazarsfeld, Paul F., and McPhee, William N. (1954). *Voting*. Chicago: University of Chicago.
- Campbell, John C., and Strate, John (1981). Are old people conservative? *Gerontologist* 21: 580-591.
- Campbell, Angus, Converse, Philip E., Miller, Warren E., and Stokes, Donald E. (1960). *The American Voter*. Chicago: University of Chicago.
- Charness, Neil (1989). Age and expertise: Responding to Tolland's challenge. In *Everyday Cognition in Adulthood and Late Life*, Leonard Poon, David Rubin, and Barbara Wilson (eds.). Cambridge: Cambridge University.
- Cutler, Neal E. (1977). Demographic, social psychological, and political factors in the politics of aging: A foundation for research in "political gerontology." *American Political Science Review* 71: 1011-1025.
- Day, Christine L. (1990). *What Older Americans Think: Interest Groups and Aging Policy*. Princeton, NJ: Princeton University.
- Einhorn, H. J., and Hogarth, R. M. (1981). Behavioral decision theory: Process of judgment and choice. *Annual Review of Psychology* 32: 53-88.
- Enelow, James M., and Hinich, Melvin J. (1984). *The Spatial Theory of Voting: An Introduction*. Cambridge: Cambridge University.
- Ferejohn, John A., and Kuklinski, James H. (eds.). 1990. *Information and Democratic Processes*. Urbana, IL: University of Illinois.
- Fiorina, Morris P. (1981). *Retrospective Voting in American National Elections*. New Haven, CT: Yale University.
- Fiske, Susan T., Kinder, Donald R., and Larter, W. Michael (1983). The novice and the expert: Knowledge-based strategies in political cognition. *Journal of Experimental Social Psychology* 19: 381-400.
- Hershey, Douglas A., Walsh, David A., Read, Stephen J., and Chulef, Ada S. (1990). The effects of expertise on financial problem solving: Evidence for goal directed problem solving scripts. *Organizational Behavior and Human Decision Processes* 46: 77-101.

- Herstein, John A. (1981). Keeping the voter's limits in mind: A cognitive process analysis of decision making in voting. *Journal of Personality and Social Psychology* 40: 843-861.
- Jacobs, Bruce (1990). Aging and politics. In *Handbook of Aging and the Social Sciences*, 3rd ed.
- Jennings, M. Kent, and Markus, Gregory B. (1988). Political involvement in the later years: A longitudinal study. *American Journal of Political Science* 32: 302-316.
- Johnson, Mitzi M. S. (1990). Age differences in decision making: A process methodology for examining strategic information processing. *Journals of Gerontology: Psychological Sciences* 45: 75-78.
- Johnson, Mitzi M. S. (1993). Thinking about strategies during, before, and after making a decision. *Psychology and Aging* 8: 231-241.
- Johnson, Mitzi M. S., and Riggle, Ellen D. B. (1994). Age-Related Differences in Processing Information for Attitude-Laden Decisions. Paper presented at the Cognitive Aging Conference, Atlanta, Georgia.
- Lau, Richard R., and Redlawsk, David P. (1992). How Voters Decide: A Process Tracing Study of Decision Making During Political Campaigns. Paper presented at the annual meeting of the American Political Science Association, Chicago.
- Lau, Richard R., and Sears, David O. (eds.). 1986. *Political Cognition*. Hillsdale, NJ: Lawrence Erlbaum.
- Lodge, Milton, McGraw, Kathleen M., and Stroh, Patrick (1989). An impression-driven model of candidate evaluation. *American Political Science Review* 83: 399-419.
- Murphy, M. D., and Puff, C. Richard (1982). Free recall: Basic methodology and analysis. In *Handbook of the Psychology of Aging*, C. Richard Puff (ed.). San Diego, CA: Academic Press.
- Nie, Norman H., Verba, Sidney, and Petrocik, John R. (1976). *The Changing American Voter*. Cambridge, MA: Harvard University.
- Payne, John W., Bettman, James R., and Johnson, Eric J. (1993). *The Adaptive Decision Maker*. Cambridge, MA: Cambridge University.
- Rhodebeck, Laurie A. (1993). The politics of greed? Political preferences among the elderly. *Journal of Politics* 55: 342-364.
- Sinnot, Jan D. (1984). A Model for Solution of Ill-structured Problems: Implications for Everyday and Abstract Problem Solving. Paper presented at the annual meeting of the Gerontological Society of America, San Francisco, CA.
- Streufert, Siegfried, Pogash, Rosanne, Piasecki, Mary, and Post, Gerald M. (1990). Age and management team performance. *Psychology and Aging* 5: 551-559.
- Svenson, Olga (1979). Process descriptions of decision making. *Organizational Behavior and Human Performance* 23: 86-112.
- Zellman, Gail L. (1975). Antidemocratic beliefs: A survey and some explanations. *Journal of Social Issues* 31: 31-53.