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Choosing Executives

A Research Report on the Peak Selection Simulation

CENTER FOR CREATIVE LEADERSHIP

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Center for Creative Leadership
Greensboro, North Carolina

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Preface

As researchers at CCL working with issues around executive selection, we have always been interested in the stories of problem CEO and top-management successions that abound in the press, the literature, and in the hallway chat of many organizations. The fact that people know that senior-management succession failure rates are high and don't know why motivated us to find out more about what makes for effective selections.

The Peak Selection Simulation, a part of the Leadership at the Peak program held at CCL's Colorado Springs campus, was an ideal way to gather data around this topic. This simulation replicates the decision-making styles of those who make choices about executive selections in the organization. So, we enlisted 621 executives who attended the program from 1995 to 1997 as research subjects and developed a research study that asked specific questions on how selection data are used. This report documents that study.

The blend of talent required to develop the Peak Selection Simulation is unique to the Center's experience. Some three dozen professionals were involved. In addition to research-and-training method, this network brought interactive multimedia technology, the crafts of fiction and the dramatic arts into unified and compelling discourse. The authors are proud to cite the contributions of: Raoul Buron, Senior Program Associate/Chief Assessor; Bruce Byington, Manager of Administration, Colorado Springs; Bernie Ghiselin, Greensboro adjunct staff member, who wrote the candidate vitae as well as the background on Looking Glass, Inc.; Richard Guzzo, Professor of Psychology and Management, University of Maryland, College Park; George Hollenbeck of Livingston, Texas, a management psychologist and former human resources executive who is an adjunct trainer for CCL; Susan Hyne, Training Resources Designer/Project Coordinator, Colorado Springs; Mary Leight, Atlanta, who consulted on training design and developing executive profiles; Erin Pottratz and Interactive Papyrus, Colorado Springs, who guided the design and development of the multimedia presentation; Garold Stasser, Professor of Psychology, Miami University of Ohio; Mario Trujillo, Manager, Computer Services, Colorado Springs; the program trainers: David Campbell, Robert Ginnett, Charles Hinkle, Peter Neary, DeDe Osborn, Garry Powell, and Randy White; Carey Edwards, Pam Kanuch, and Lisa Szumigala, administrative coordinators for Leadership at the Peak; the feedback staff including David Burger, Carl Davison, Berten Dragten, Doug Frost, Michael Galvin, John Hartung, Harvey Hodge, Chuck Lobitz, George Nicholos, Susan Powell, Lynn Rhodes, Paul Seymour, Pam Shipp, Bob Tinker, Cherre Torrok,

Maria Valdez, Lorri White, and Karen Wilson-Starks; the Executive Selection Research Advisory Group (ESRAG); and, for keeping it all together, Jennifer Beck, Dawn Cecil, and Laurie Merritt.

We would like to thank Wynne Whyman and others for their day-to-day help with general information as well as the gathering and organizing of data. We are also grateful to Joanne Ferguson, Marcia Horowitz, and Martin Wilcox, the editorial staff at CCL; and to the reviewers of this report—Susan Jackson, Professor of Psychology and Management at Rutgers University; Garold Stasser, Professor of Psychology, Miami University of Ohio; and, from CCL, Bart Craig, Jim Francek, Gina Hernez-Broome, Jean Leslie, Marian Ruderman, Ellen Van Velsor, and Wynne Whyman.

Finally, this report is dedicated to Richard Campbell, who was the leader of the executive selection research team. It represents his invaluable contribution to the formation of the CCL program of research on executive selection and to the presentation of it captured here. Unfortunately, Richard died in 1997 before he could see the outcomes of the work he inspired. Richard, we love you and we miss you.

Executive Summary

In 1995 the Peak Selection Simulation (PSS) began to be used in the Center for Creative Leadership's Leadership at the Peak training program held in Colorado Springs. PSS, which uses a multimedia presentation that allows access to interview material, human resources information, and search firm information, provides a mechanism to capture and learn about the decision-making processes of those who make choices about selecting executives.

The study described here includes data gathered in conjunction with the use of PSS between November 1995 and December 1997. The purpose of the research was to identify (1) how executives search through information about job candidates, (2) how executives' information search affects their job candidate preference, (3) how executives' personalities and individual differences affect how they search through information, and (4) how executives' personalities and individual differences affect their preference of job candidate.

Methodology

There were 621 executives from the top three levels in their home companies who participated in this study. Prior to their arrival at the training program, biographical and personality data were collected from each. As these executives looked at the information in PSS, data were gathered about how they searched through the information on the computer. These data included how much time they spent on each screen they entered, in what order they entered the screen, and which of the candidates they preferred.

Findings

There were four primary conclusions. First, people are more likely to look through all of one candidate's information before going on to the next candidate when presented with a complex selection task. Second, people spend more time on candidates that they like than on candidates they don't like. Third, people are more drawn to interview information than to standard résumé information. Fourth, women and people with an interpersonal orientation bring a useful perspective to the selection process, which often shows up in better decision-making and selection outcomes.

Introduction

Selecting executives for high-level positions has been an area of concern for many years (DeVries, 1993). But as organizational environments continue to change at a rapid pace, performance demands at the executive level are making effective executive selection even more critical today than it was in the past.

Despite the obvious need for more information about how to successfully select executives, there is a paucity of established knowledge about how this very important process takes place in organizations. The purpose of this report is to add to the knowledge base about how those responsible for selecting executives in organizations make these decisions.

We present a picture of how selection is done in many organizations by describing a portion of an ongoing research study at CCL. This study looks at how executives use the information they encounter in CCL's Peak Selection Simulation. The simulation, a part of CCL's Leadership at the Peak (LAP) program held in Colorado Springs, allows us to study the decision-making processes of those who select executives in their organizations.

Description of the Peak Selection Simulation (PSS)

PSS is an executive selection simulation in which those who make decisions about selection can see the various elements that go into their decision-making. (See Appendix A for further detail on the PSS.) Participants are provided with information about a company, a position, and four candidates on paper at least a week before the simulation is to occur. Using an interactive multimedia presentation, participants in LAP are asked to evaluate the four candidates (A, B, C, and D) for a high-level executive job within the management team and to rank each candidate's acceptability for the position of president of the Advanced Products Division of Looking Glass, Inc., a glass and glass technologies manufacturer. There are three different options for Candidate A: white male, white female, and black male; Candidate B is a white male Ph.D.; Candidate C is a white male originally from Poland and more recently from London; and Candidate D is a white male.

Information about the candidates and their attributes is provided in written, audio, and video forms on the computer within the categories of Candidate Interview, Others' Opinions, HR Information, Résumé, and Search Firm Report. A design solution was built into the simulation with Candidate A ranking first, Candidate B ranking second, Candidate C ranking third, and Candidate D ranking fourth.

Research Questions

The study was carried out with 621 executives who participated in the PSS from November 1995 to December 1997 and was guided by these four sets of questions: *(1) Search Strategy:* How do executives search through information about job candidates? Are there differences in search as a function of demographic characteristics or personality? *(2) Attention to Candidates:* How did executives distribute their time among candidates? Did this time distribution differ by demographic characteristics or personality type? *(3) Attention to Categories of Information:* How did executives distribute their time among the different types of information? Did executives' time distribution differ by individual differences or personality type? *(4) Effects on Candidate Ranking:* Were the types of transitions performed related to how likely executives were to reach the design solution? Was the time distribution among the candidates related to how likely executives were to reach the design solution? Was time distribution among types of information related to how likely executives were to reach the design solution? Were individual differences or personality type related to how likely executives were to reach the design solution?

Overview and Audience

The next section of this report, Methods, outlines the demographics of the participants, describes procedure, explains development of the measures, and offers an analysis. Following that, the Results section first lays out the descriptive statistics; second, the search strategy; third, candidate data; fourth, categories of information; and fifth, effects on candidate ranking. Last, the Discussion section answers the original research questions stated above. This section also includes our proposal for one answer to the question about what affects candidate rankings and discusses future directions.

Appendix A contains a detailed description of the creation and use of the PSS. Appendix B contains additional results and information, which are useful and informative but not critical to the reader for immediate understanding of the presented results. Appendix C contains a literature review and discussion of executive selection as a decision-making task. This is helpful in understanding the context around selection.

This report is written primarily for an academic and research audience. However, statistically sophisticated practitioners and anyone who questions how candidate data are used by decision-makers may also find the results useful.

Methods

Participants

The 621 participants were attendees at the Leadership at the Peak training program conducted at CCL's Colorado Springs campus. LAP is a five-day executive development program for CEOs and two levels down.

The group included 167 CEOs (31%), 338 high-level executives (one level down, 63%), and 32 upper-middle managers (two levels down, 6%) from companies around the world. They were an average age of 46 years, ranging from 29 to 67. There were 540 (87%) men and 81 (13%) women, and 424 (78%) of the participants identified the United States as their country of origin, while 121 (22%) identified another country as their country of origin. Eighty-seven (16%) participants had Ph.D.s, 237 (44%) had MAs or MSs, 193 (36%) had BAs or BSs, and 23 (4%) had received a high school education or less. Four hundred ninety-five (93%) participants identified themselves as white, 8 (1.5%) as Hispanic, 1 as Indian (.1%), 10 (1.8%) as Asian, 10 (1.8%) as black, and 8 (1.5%) as other. Because of the small numbers of participants in each racial category other than white, it was decided that for analyses the races would be grouped into white (with 495 participants or 93%) and non-white (with 37 participants or 7%).

Procedure

Materials. The materials used in this study included a number of paper-and-pencil personality tests and demographic questions and a computer program for the information search and candidate evaluation.

Personality Tests. These included the Kirton Adaption Innovation Inventory (KAI), the Fundamental Interpersonal Relations Orientation-Behavior (FIRO-B), and the Myers-Briggs Type Inventory (MBTI). [The MBTI yields sixteen types, and has four scales that have continuous scores along scales that run from introvert to extrovert, sensing to intuitive, thinking to feeling, and perceiving to judging. The relationship between personality type as described by the MBTI and search (strategy, candidate, and category) and between MBTI type and final individual ranking will be examined here.] Only the MBTI results will be reported in this study because the other results were neither meaningful nor consistent.

Demographic Questionnaire. One page asked a series of questions about the participants including age, sex, country of origin, native language, current country of residence, highest degree earned, years of education, and race.

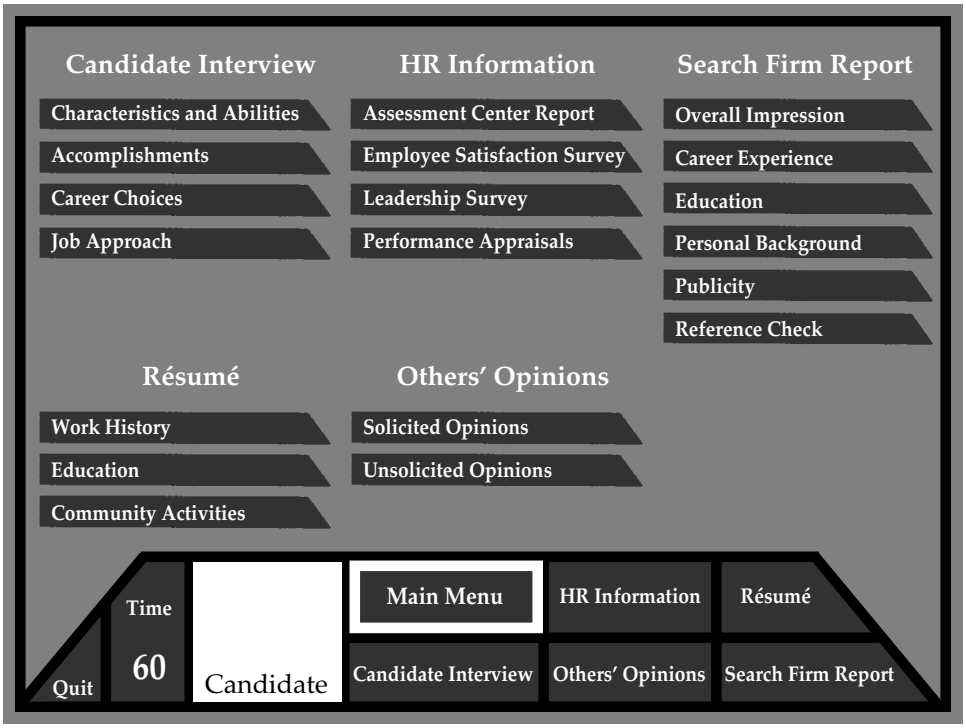
The Peak Selection Simulation. The computer program called the Peak Selection Simulation was developed in 1993 by Richard Campbell, Valerie Sessa, and Jodi Taylor, with the help of many others.

The purpose of the simulation was to give high-level executives a realistic experience in executive selection, to provide data for research on selection decision-making by executives and executive groups, and to provide a venue for group decision-making on executive selection. This program was developed to simulate the information that would be received when hiring for a high-level position in a company. There was a design solution embedded in the information provided to the participants in the computer program (see the description of PSS in Appendix A for a complete explanation of the design solution).

The four candidates were candidates A, B, C, and D. The attributes of the candidate who would be the best alternative were derived from an organizational assessment and a job analysis. Once the attributes were identified, the candidate profiles were constructed such that one of the candidates was best qualified to fill the position based on the organizational assessment, the job analysis, and the opinions of three subject matter experts. The design solution for ranking the candidates in order (from most appropriate candidate to least appropriate candidate) was Candidate A, Candidate B, Candidate C, Candidate D. All participants were presented with all candidates, and the design solution stayed constant. However, the face and voice of the candidate was changed for Candidate A so participants saw and heard either a white male version of Candidate A, a white female version of Candidate A, or a black male version of Candidate A.

Information about the four candidates was presented in the following categories: Candidate Interview, Résumé, HR Information, Others' Opinions, Search Firm Report, and Memory Boxes. The Memory Boxes were embedded in the other five techniques, and consisted of personal memories that the decision-maker could access about each candidate. The computer program included videotaped, audiotaped, and written material presented during the course of the information search on the candidates by the participants. When participants looked at the base screen in the program, they saw a list of the four candidates with their pictures attached, as well as a list of the categories of information (see Figure 1). Using the mouse, the user could point to a candidate and look at any of the categories of information regarding that candidate.

Figure 1
Peak Selection Simulation base screen



Note: This base screen is shown for all candidates.

Data Collection. Data were collected in two parts.

Part 1. Packets were sent out to all participants several weeks before their program commenced that included personality and demographic information questionnaires. Participants filled out these questionnaires on themselves and returned them to CCL's testing facility. Also included in this packet was some basic information about the simulation including information about the company and position being selected for in the PSS, as well as some minimal information about the candidates.

Part 2. Participants arrived for their Leadership at the Peak training week. Once they arrived they were reminded that they had received information regarding the PSS, and that they should review the information before

going into training the next day. On the first day of training, participants were divided into groups. While one group was involved in another training exercise, the other group was going through the PSS on their individual computers. Participants were identified by a form (on the computer), which was filled out by trainers and identified the participants uniquely. The participants were given sixty minutes to complete their information search in the computer program. At the end of the sixty minutes the program stopped, and they were asked to rank the four candidates. The groups then switched places.

Development of Measures

Two types of measures were developed in the course of this study: individual differences measures and dependent variable measures.

Individual Differences Measures. Individual differences measures defined categorical differences between different groups in the sample. Level in home company organization was divided into three groups: CEOs, high-level executives (one level down), and upper-middle managers (two levels down). Age was also divided into three categories based on natural divisions in the data. The three age groups were under 43, 43 to 49, and over 49. Participants were also placed in categories based on their country of origin. Four hundred twenty-four (78%) of the participants identified the United States as their country of origin, while 121 (22%) identified another country as their country of origin. As no single country other than the U.S. was represented by enough subjects to run analyses by a country other than the U.S., subjects were grouped as either U.S. or non-U.S. in origin.

Participants were also grouped by level of education. The level of education groupings are Ph.D., MA/MS/MBA, and BA and below. With regard to race, 495 (93%) participants identified themselves as white, 8 (1.5%) as Hispanic, 1 as Indian (.1%), 10 (1.8%) as Asian, 10 (1.8%) as black, and 8 (1.5%) as other. Because of the small numbers of participants in each racial category other than white, it was decided that for analyses the races would be grouped into white (with 495 participants or 93%) and non-white (with 37 participants or 7%).

Dependent Variable Measures. Different manipulations were performed on the raw data to make it accessible for analysis. The search pattern of each individual was organized such that each participant's time on each candidate, time on each category of information, transitions from one screen to another, and final candidate ranking was accessible in one database for analysis.

Measures of time on each candidate were constructed by adding together the time spent on each screen relevant to each candidate. Similarly, measures of time on each category of information were constructed by adding together the time spent on each screen relevant to each category of information. Transitions from one screen to another were a bit more complicated to compute.

Payne's (1976) analysis was chosen for computing the transition patterns. These transitions were computed by identifying the candidate and category for the *nth* piece of information, and the candidate and category for the *nth + 1* piece of information. If the candidate and the category are the same, the transition is computed as within candidate/within category (serial). If only the candidate is the same, the transition is computed as within candidate/between category (also serial). If the category is the same, the transition is computed as parallel. A description of the use of serial and parallel transitions was obtained using these series of computations describing the transitions from one screen to another.

Analyses

A variety of analyses were required for this report because of the different types of data. Many of the demographic measures (sex, race, level in home company, age, country of origin) were nominal (categorical) in nature. Three of the dependent variables (time on candidate, time on category, and search strategy) were interval (equal distances between points on a scale) data. The fourth dependent variable (candidate ranking) was an ordinal (i.e., good, better, best) variable. Because of this diversity of types of data, there were many different analyses performed. Analyses for descriptive statistics included both standard parametric statistics (e.g., means and standard deviations) as well as non-parametric statistical techniques (e.g., chi-square). Analyses performed to answer the primary questions of interest included Analysis of Variance (ANOVA), Tukey's Honestly Significant Differences Test, Regression, chi-square, Kruskal-Wallis, and Cramér's *V*. The specific analysis employed to look at particular data will be described at appropriate places throughout the Results sections.

Results

Results is divided into five sections. Section 1, Descriptive Statistics, describes the sample and the dependent variables, including relationships among the individual differences variables and relationships among the dependent variables. This will help the reader understand what the sample is like and how individual differences within the sample interrelate. Beginning with Section 2, the four research questions are addressed. Section 2 itself looks at search patterns in the form of different types of transitions. Section 3 looks at candidate search by individual differences. Section 4 looks at category search by individual differences. Section 5 looks at effects of search and individual differences on candidate rankings. An in-depth description of the sample and relationships between the different demographic categories in the sample can be found in Appendix B.

Section 1: Descriptive Statistics

Individual Differences

Among the patterns of relationships among the individual differences variables, two relationships are particularly important. First, the women in this sample are both younger and at a lower level in their home companies than are the men in this sample. When age is controlled for, a higher percentage of women report that they are in the lower levels of management in their company than do men. Second, two-thirds (67.5%) of the non-white participants included in this study do not identify the U.S. as their country of origin. In other words, 21% of non-U.S. participants identified themselves as non-white.

Dependent Variables

An analysis of the relationships among the dependent variables suggests primarily that all types of information were not equally interesting to participants for all candidates. There was little variability in focus on some types of information. For example, the focus on the Interview and the Résumé information was equal for all candidates. In fact, a lot of time was spent on the Interview for all candidates, while little time was spent on the Résumé for all candidates. On the other hand, there was a great deal of variability in focus on HR Information, Others' Opinions, and Search Firm Report for the different candidates. For example, the Search Firm Report was focused on more for

Candidates A and C, and less for Candidates D and B. Also, Others' Opinions was focused on less for Candidate A, while it was focused on more for Candidate D.

Section 2: Search Strategy

Research Questions: *How do executives search through information about job candidates? Are there differences in search as a function of demographic characteristics or personality?*

The results in this section will be presented in the following order: description of search data, description of search strategy, effects of demographics on search, and a summary that relates the results.

The Search Data

The data were evaluated in terms of serial and parallel search. To do this, each participant's search was coded by transition. This means that every move a participant made from one screen to another, searching for information, was coded as to whether that change was serial (within candidate/within category or within candidate/between categories), parallel (between candidates/within category), other (not within either category or candidate), between base screen (each candidate screen, which has the candidate's picture and all information categories listed) and another candidate screen, or between base screens. In this way a pattern of search is described for each participant.

The Search Strategy

The searches were primarily serial. Seventy-seven percent of the transitions were serial (within candidate/within category or within candidate/between categories), 3% were parallel (between candidates/within category), 11% were other, and 15% involved a candidate base screen. Generally participants searched through one candidate almost completely before moving on to another candidate. These serial searches were primarily within candidate/within category (62% out of 77%). Within candidate/between categories searches made up the remaining 15% out of 77%. This demonstrates that the participants used serial search techniques most of the time. Whether this pattern is a result of conscious choice on the part of the participants or a result of the set-up of PSS is difficult to determine.

Effects of Demographics on Search

There were some minor differences by demographic categories and personality (listed in Appendix B). However, it is accurate to characterize the searches performed by *all* participants, regardless of demographics, as predominantly serial searches.

Summary

Search strategy did not differ much by candidate, category, or condition. Overall, the picture of how these participants looked through the information is clear: They generally went from one screen to the next within a candidate, beginning in the category they found most interesting. In most cases, participants began with Interview material, then went to Others' Opinions or the Search Firm Report. They generally stayed within a candidate until they felt they had enough information (or had spent enough time) and then they went on to the next candidate. Participants usually began with the candidate either at the top or at the bottom of the list (Candidate A or Candidate D).

From these results we can conclude that in this simulation people primarily search in a serial manner. There are two possible explanations for the extreme consistency of this behavior in this case. First is that the sheer complexity of this task (and of most executive selection tasks) results in people feeling more comfortable evaluating the options one at a time (serial search) rather than comparing them on each attribute (parallel search). Anecdotal evidence suggests that when an executive selection is being done, the executives involved are likely to want to get a "holistic" view of each candidate rather than comparing each candidate on each attribute individually. Another is that the simulation is set up in a way that encourages a serial rather than a parallel search. When looking at the base screen for a candidate, it is much easier to go into another screen for that candidate than it is to go into the same topic area for another candidate.

Though it is not completely clear whether the subjects were using a compensatory or a noncompensatory strategy, it is most likely that they were using a compensatory strategy. This conclusion is based both on the search strategy (serial rather than parallel) and on comments made by participants. Some of the group discussion tapes and conversations with participants strongly suggested that participants were trying to get a holistic view of the candidates, and were making their decisions based on these views rather than on a strict comparison of the specific attributes held by each of the candidates. Therefore, though the set-up of the simulation may have contributed to

the extreme consistency of search pattern, we believe that a serial strategy is probably common among executives involved in an executive selection.

Section 3: Attention to Candidates

Research Questions: *How did executives distribute their time among candidates? Did this time distribution differ by demographic characteristics or personality type?*

In addition to looking at whether searches are serial or parallel, these searches can be described in terms of time spent on the candidates. The purpose of this analysis is to see whether there are patterns in attention to candidates or categories of information, and whether or not these patterns are related to the participants' final rankings of the candidates.

This section will first describe the data; then it will look at the effects of each demographic variable and MBTI type on the four time search variables related to the candidates: time on Candidate A, time on Candidate B, time on Candidate C, and time on Candidate D. Finally, overall conclusions will be included in a summary.

Time Spent on Candidates

Overall, equal time was spent on all candidates. Candidate D was most frequently accessed first (62% of the time), Candidate A was next (24% of the time), with Candidate C (9%) and Candidate B (4%) much less frequently accessed first. In general, 26% of time was spent on Candidate A, 25% on Candidate B, 25% on Candidate C, and 24% on Candidate D.

Effects of Demographics on Candidate Search

Age, level in home company, level of education, and sex of participant did not appear to affect time spent on the different candidates. Race was a primary factor and affected time spent on three of the four candidates, but most of these effects are seen through interactions with other variables. Remember, there appears to be a strong relationship between race and country of origin, because 67% of the non-white participants also identify themselves as being from outside the U.S.

Race. Though we collected data on the specific races of the participants (Hispanic, black, Asian, Indian, white, and other), there were too few in each category other than white to run analyses separately for each, so all categories

other than white were combined into a category that has been labeled non-white.

There were two main effects detected using Tukey's Honestly Significant Differences Test. The first is that non-white participants spent more time on Candidate B than did white participants (F=8.160, p<.004) and more time on Candidate C (the non-U.S. candidate) than did white participants (F=5.002, p<.026). There was no main effect of race on time on Candidate A (the candidate who could be black). (See Table 1.)

Table 1
Percent of time spent on each candidate: By race

	White	Non-white
Candidate A	26.7%	26.5%
Candidate B	24.5%*	25.1%*
Candidate C	25.3%*	26.6%*
Candidate D	23.5%	21.8%

* p<.05

In addition to these main effects, there were a series of interactions which are of interest. There was an interaction of race and country of origin such that non-whites from outside the U.S. spent more time on Candidate A than did whites either from the U.S. or from outside the U.S., and than did non-whites from the U.S. (F=3.74, p<.054). Though this result is not significant at the 95% confidence level, it demonstrates a trend which should be understood in light of potential implications for how demographics may have affected how other candidates were treated.

There was also an interaction of race and country of origin such that non-whites from the U.S. spent the most time on Candidate C (the candidate who was from outside the U.S.), while non-white candidates from outside the U.S. spent the least amount of time on him (F=3.88, p<.049). As Candidate C is the non-U.S. candidate, it is interesting to note that non-U.S. participants overall did not spend more time on this candidate than did U.S. participants overall. It is also interesting to note that U.S. participants who were non-white did spend significantly more time on him than did either non-whites from other countries or whites either from the U.S. or not from the U.S. (See Table 2.)

Table 2
Percent of time spent on each candidate: Race by country of origin

	White/ U.S.	White/ Non-U.S.	Non-white/ U.S.	Non-white/ Non-U.S.
Candidate A	26.6%	27.1%	22.6%	28.3%
Candidate B	24.5%	24.2%	23.7%	25.8%
Candidate C	25.3%	25.6%	29.7%*	25.0%*
Candidate D	23.6%	23.0%	24.0%	20.8%

* $p<.05$

Condition. There were no effects of condition on how much time was spent on any of the candidates. Whether the participants received the white male, the white female, or the black male version of Candidate A did not affect the time spent on any of the candidates. This also means that there were no differences in the amount of time spent on the white male, white female, or black male versions of Candidate A. (See Table 3.)

Table 3
Percent of time spent on each candidate: By Candidate A condition

	White Male	White Female	Black Male
Candidate A	25.9%	26.6%	26.6%
Candidate B	25.4%	24.3%	24.1%
Candidate C	25.5%	25.4%	25.4%
Candidate D	23.2%	23.7%	23.9%

Myers-Briggs Type Inventory. There were no effects of Extroversion/ Introversion or Thinking/Feeling on time spent on candidates, but scores on the Sensing/Intuitive scale and on the Judging/Perceiving scale were associated with time on candidates. There was also an effect based on MBTI type rather than extremity of preference of whether a person was an NF, NT, SF, or ST.

There was a correlation between scores on the Sensing/Intuitive scale and time on Candidate A (the potentially female or non-white candidate) such that participants closer to the Intuitive side of the scale spent significantly more time on Candidate A than did participants at the Sensing side of the scale (r=.111, p=.006). (See Table 4.)

Table 4
Correlation of MBTI type and time spent on candidate

	E/I	S/N	T/F	J/P
Candidate A	.010	.111	.014	.037
	p=.807	p=.006*	p=.731	p=.362
Candidate B	.063	-.050	-.075	-.050
	p=.121	p=.214	p=.063	p=.212
Candidate C	-.039	-.013	.067	.044
	p=.330	p=.751	p=.099	p=.272
Candidate D	-.036	-.045	.002	-.024
	p=.372	p=.268	p=.954	p=.553

N = 615 E/I: Extroversion/Introversion T/F: Thinking/Feeling
* p<.05 S/N: Sensing/Intuitive J/P: Judging/Perceiving

There were two main effects for the J/P types (rather than for the scale score). Judging participants spent significantly more time on Candidate D than did Perceiving participants (F=4.155, p<.042), and Judging participants spent significantly more time on Candidate C than did Perceiving participants (F=4.559, p<.033). However, although the differences in percentages exist, they are so small that their practical impact may be small. (See Table 5.)

There were two main effects of type (NF/NT/SF/ST) on time spent on candidates. NF participants spent significantly less time on Candidate C than did either NT or ST participants (F=3.402, p<.0175), and NT participants spent significantly more time on Candidate A than did ST participants (F=3.3145, p<.0197). Although the differences in percentages exist, they are so small that one could argue that their practical impact would be small. However, the impact of MBTI type on final candidate ranking (see Section 5) suggests that these statistically significant but small differences could in fact be critical practically. (See Table 6.)

Table 5
Percent of time spent on each candidate: By Judging/Perceiving type

	J (*n*=380)	P (*n*=235)
Candidate A	26%	27%
Candidate B	24%	25%
Candidate C	26%	25%
Candidate D	24%	23%

Table 6
Percent of time spent on each candidate: By MBTI type

	SF (*n*=14)	NF (*n*=51)	ST (*n*=234)	NT (*n*=293)
Candidate A	28%	27%	25%	27%
Candidate B	24%	26%	25%	24%
Candidate C	27%	23%	26%	26%
Candidate D	22%	24%	24%	23%

Summary

The overall conclusion from these results is that race interacts with different variables and is related to participants' search of the candidates. These results also suggest that MBTI type, as it represents how people perceive the world, is also a factor in participants' searches of the candidate information. Both of these variables are important in that they represent in some way the different frames with which people come to a decision-making task. Therefore, differences in frames appear to affect how people search through information.

Section 4: Attention to Categories of Information

Research Questions: *How did executives distribute their time among the different types of information? Did executives' time distribution differ by individual differences or personality type?*

Searches can also be described in terms of time spent on the categories of information. The purpose of this section is to look at whether there are patterns in what categories of information the participants attended to, and whether or not this difference in attention was related to the participants' final rankings. This section begins with a description of the data and then looks at the effects of demographic variables on: time on Interviews, time on HR Information, time on Résumés, time on Others' Opinions, and time on Search Firm Reports. The summary relates overall conclusions.

Time Spent on Information

There were major differences in the amount of time spent on different categories of information. On average, 32% of time was spent on Interviews, 17% on HR Information, 3% on Résumés, 26% on Search Firm Reports, and 21% on Others' Opinions.

Effects of Demographics on Category of Information Search

There were no effects of level in home company on time spent searching through different categories of information. There were, however, a series of effects of the other variables on each of the categories of information. Time on Interviews and time on Search Firm Reports were most affected by demographics.

Age. Age affected time on Interviews and time on the Search Firm Reports. Participants younger than 43 spent significantly more time on Interviews overall than did participants over 49 (F=5.607, p<.004). Participants younger than 43 spent significantly less time on Search Firm Reports overall than did participants over 49 (F=4.807, p<.009). There were no interactions of age with other demographic variables on any of these search variables. (See Table 7.)

Overall, this pattern of results suggests that younger participants were more interested in the videotaped interviews than were older participants, and that older participants were more interested in the information available through the Search Firm Reports than were younger participants. Perhaps this result can be attributed to differences in past experience between the younger

Table 7
Percent of time spent on category of information: By age

	Under 43	43 to 49	Older than 49
Interviews	34.8%*	32.6%	30.2%*
HR Information	16.8%	17.1%	17.5%
Others' Opinions	20.6%	21.4%	21.5%
Search Firm Reports	23.9%*	26.1%	27.2%*
Résumés	3.8%	2.8%	3.5%

* $p<.05$

and older participants; it is reasonable to think that younger participants would be more accustomed to receiving information via a visual medium than would older participants, and would therefore use more of their available time on this form of information than would older participants.

Level of Education. Level of education affected both time on Interviews and time on Search Firm Reports. Participants with a master's level of education (which includes MBAs) spent significantly more time on the Interviews (F=3.1, p<.04) and significantly less time on the Search Firm Reports (F=4.4, p<.01) than did participants with Ph.D.s. (See Table 8.)

Table 8
Percent of time spent on category of information: By educational level

	Ph.D.	MA/MS/MBA	BA and Less
Interviews	29.0%*	33.8%*	32.8%
HR Information	17.0%	17.1%	17.2%
Others' Opinions	22.7%	20.8%	21.0%
Search Firm Reports	28.2%*	24.9%*	25.5%
Résumés	3.1%	3.5%	3.4%

* $p<.05$

Country of Origin. The only main effect that was detected using Tukey's Honestly Significant Differences Test was the effect of country of

origin on time on Interviews. Participants from the U.S. spent significantly less time on Interviews overall than did participants from outside the U.S. (F=6.182, p<.013). There were no significant or meaningful interactions. (See Table 9.)

Table 9
Percent of time spent on category of information: By country of origin

	U.S.	Non-U.S.
Interviews	31.5%*	36.2%*
HR Information	17.3%	16.7%
Others' Opinions	21.8%	18.9%
Search Firm Reports	25.9%	24.8%
Résumés	3.4%	3.4%

* p<.05

Race. There were two main effects that were detected using Tukey's Honestly Significant Differences Test. The first is that white participants spent significantly less time on Interviews overall than did non-white participants (F=11.414, p<.001). The second is that white participants spent significantly more time on HR Information overall than did non-white participants (F=3.959, p<.047). So non-white participants were more interested than white participants in Interviews but less interested in HR Information. (See Table 10.)

Table 10
Percent of time spent on category of information: By race

	White	Non-White
Interviews	31.9%*	41.4%*
HR Information	17.3%*	13.9%*
Others' Opinions	21.3%	19.1%
Search Firm Reports	26.0%	21.6%
Résumés	3.4%	4.0%

* p<.05

There was also an interaction of race and country of origin on time on Résumés (F=5.904, p<.015) such that non-whites from the U.S. spent significantly more time (more than double the time on average) on Résumés than did non-whites from outside the U.S. (See Table 11.)

Table 11
Percent of time spent on category of information: Race by country of origin

	White/ U.S.	White/ Non-U.S.	Non-white/ U.S.	Non-white/ Non-U.S.
Interviews	31.5%	33.7%	35.2%	44.4%
HR Information	17.3%	17.4%	12.2%	14.8%
Others' Opinions	21.8%	18.9%	22.1%	17.7%
Search Firm Reports	26.0%	26.2%	24.1%	20.4%
Résumés	3.3%	3.7%	6.5%*	2.7%*

* p<.05

Sex of Participant. The only main effect that was detected using Tukey's Honestly Significant Differences Test was the effect of sex on time on Résumés. Male participants spent significantly less time on Résumés overall than did female participants (F=6.309, p<.012). There were no significant or meaningful interactions with other demographic variables. (See Table 12.)

Table 12
Percent of time spent on category of information: By sex of subject

	Men	Women
Interviews	32.5%	30.3%
HR Information	17.0%	19.1%
Others' Opinions	21.2%	22.4%
Search Firm Reports	26.0%	26.1%
Résumés	3.3%*	3.9%*

* p<.05

Condition. Participants who saw the white male Candidate A spent significantly less time on the Search Firm Reports overall than did participants who saw the black male Candidate A (F=5.1595, p<.006). This suggests that seeing the black candidate results in the participants spending more time reviewing search firm information about him. (See Table 13.)

Table 13
Percent of time spent on category of information: By Candidate A condition

	White Male	Black Male	White Female
Interviews	33%	31%	32%
HR Information	17%	18%	17%
Others' Opinions	22%	20%	22%
Search Firm Reports	24%*	28%*	26%
Résumés	4%	3%	3%

* p<.05

Myers-Briggs Type Inventory. There were no main effects for E/I, T/F, J/P or NF/NT/SF/ST. There was a correlation between score on the S/N scale and time on search firm information such that participants closer to the N side of the scale spent significantly more time on the Search Firm Reports than did participants on the S side of the scale (r=.1086, p=.007). (See Table 14.)

Summary

The overall conclusion from these results is that participants with different characteristics focus on different types of information. These individual differences variables are important in that they represent in some way the different frames with which people come to a decision-making task. The differences between what categories of information participants were interested in that are attributable to these demographic and personality differences show that these differences in frames are associated with how participants searched through this candidate information.

Table 14
Correlation of MBTI type and time spent on categories of information

	E/I	S/N	T/F	J/P
Interviews	.019	-.048	-.022	-.030
	p=.636	*p*=.239	*p*=.585	*p*=.459
HR Information	-.029	-.023	.004	.024
	p=.471	*p*=.572	*p*=.928	*p*=.561
Résumés	.008	.012	.001	.009
	p=.839	*p*=.764	*p*=.983	*p*=.831
Others' Opinions	-.014	-.048	.009	-.033
	p=.735	*p*=.234	*p*=.818	*p*=.413
Search Firm Reports	.009	.109	.016	.038
	p=.820	*p*=.007*	*p*=.699	*p*=.350

N = 615 E/I: Extroversion/Introversion T/F: Thinking/Feeling
* *p*<.05 S/N: Sensing/Intuitive J/P: Judging/Perceiving

Section 5: Effects on Candidate Ranking

Research Questions: *Were the types of transitions performed related to how likely executives were to reach the design solution? Was the time distribution among candidates related to how likely executives were to reach the design solution? Was time distribution among types of information related to how likely executives were to reach the design solution? Were individual differences or personality type related to how likely executives were to reach the design solution?*

People look through different information in different ways. The purpose of this section is to look at whether any of these differences have an impact on how the candidates are ranked. This section will look at how types of transitions, time on candidate, time on type of information, and individual differences and personality were related to candidate ranking.

Types of Transitions

There were no meaningful differences in searches which appeared to affect the accuracy of the individual's rankings of the candidates. Specifically, there were a few significant differences (see Appendix B), but the searches performed both by participants with an accurate ranking and those by participants with an inaccurate ranking were all predominantly serial. Therefore, we cannot say here that it is better to have a serial or a parallel search when gathering information to make a decision.

Time on Candidates

An analysis of the relationship between candidate search and accuracy of ranking revealed that those participants who spent more time on the top two candidates (A and B) and less time on the bottom two candidates (C and D) were more accurate than were participants who did the reverse. Individually, participants who reached the design solution ranking spent more time on Candidate A than did participants who did not (F=5.53, p<.004). Participants who reached either the design solution or placed the top and bottom two candidates in the correct places spent significantly more time on Candidate B than did participants who did not (F=15.74, p<.000). Participants who reached either the design solution or placed the top and bottom two candidates in the correct places spent significantly less time on Candidate C than did participants who did not (F=24.75, p<.000). Participants who did not reach the design solution spent significantly more time on Candidate D than did participants who reached the expert position (F=4.28, p<.01).

There was no effect of condition on candidate ranking. Rankings of candidates didn't change significantly solely as a function of the condition of Candidate A that the participants saw.

Time on Type of Information

An analysis of the relationship between category search and accuracy of ranking revealed that participants who spent more time on Interviews and less time on HR Information and Search Firm Reports were not as accurate in their rankings as were participants who spent less time on Interviews and more time on HR Information and Search Firm Reports.

Specifically, participants who did not reach the design solution spent significantly more time on Interviews overall than did participants who placed the top two candidates and the bottom two candidates in the correct places (F=5.383, p<.005); participants who did not reach the design solution spent significantly less time on HR Information overall than did participants

who placed the top two candidates and the bottom two candidates in the correct places or who reached the design solution (F=15.1218, p<.000); and participants who did not reach the design solution spent significantly less time on Search Firm Reports overall than did participants who placed the top two candidates and the bottom two candidates in the correct places or who reached the design solution (F=7.238, p<.007).

Effects of Demographics on Candidate Rankings

There was only one finding related to basic demographic characteristics; the rest of the findings were on personality. Female participants were more accurate in their rankings than were male participants (Z=-2.8456, p<.004). There are a couple of explanations for this finding. First, it appears that this result is in part because female participants are significantly more likely to rate Candidate B high than are male participants (Z=-2.61, p<.008). Second, the candidate rankings differed as a function of an interaction between sex of subject and candidate condition. When Candidate A is the white male, Candidate D is ranked lower by women than by men (Z=-2.3427, p<.01). When Candidate A is the white female, there are no differences between the rankings by women and men. When Candidate A is the black male, Candidate B is more frequently ranked higher by women than by men (Z=-2.8775, p<.004) and Candidate C is ranked higher by men than by women (Z=-2.4748, p<.013). This suggests that men and women react differently to the different conditions of Candidate A, that these different effects have an impact on their perceptions of the other candidates, and that these differing perceptions result in females being more accurate in their candidate rankings than are males. (See Table 15.)

Table 15
Accuracy of candidate ranking: By sex of subject

	Inaccurate	Partially Accurate	Accurate
Men	66%	21%	13%
Women	49%	30%	21%

The most interesting of the findings related to accuracy has to do with the relationship between MBTI type and ranking accuracy. There is a pattern to the results that paints a clear picture about the relative accuracy of different

personality types. Intuitives are more accurate than are Sensors (Z=-3.80, p<.002), and Feelers are more accurate than are Thinkers (Z=-2.45, p<.014). It appears that Feelers are more accurate than Thinkers are because Feelers consistently rank Candidate B higher than do Thinkers (Z=-2.46, p<.01) and Thinkers rank Candidate C higher than do Feelers (Z=-3.15, p<.001). (See Table 16.)

Table 16
Relative accuracy of candidate ranking: By MBTI type

	Inaccurate	Partially Accurate	Accurate
NF	49%	37%	18%
NT	55%	20%	17%
ST	75%	18%	7%

Interestingly, there was an interaction between sex of subject and MBTI type such that MBTI type was related to accuracy for men (chi-square=16.45, p<.001) but not for women (chi-square=3.17, p<.367). For men, Intuitive/Feelers are more accurate in their rankings than are Intuitive/Thinkers, who are more accurate in their rankings than are Sensor/Thinkers. Sensor/Feelers are excluded from this analysis because of their small number (14), but they appear to be about as accurate as are Intuitive/Feelers. This difference was also borne out by the analysis of the squared differences measure. This analysis indicated that the same relationship exists when the more linear measure of accuracy of ratings is employed (NF>NT>ST; Z=11.72, p<.008). A closer look at this result suggests that the differences are in the rankings of Candidates B and C. NFs and SFs rank Candidate B high more frequently than do NTs and STs (chi-square=8.7, p<.03), while STs and NTs rank Candidate C high more frequently than do NFs and SFs (chi-square=11.54, p<.009).

Summary

Overall, there are three conclusions on transitions and time. First, participants who spend more time looking at information about the better candidates are likely to be more accurate in their candidate rankings. Second, participants who spend less time on Interviews and more time on information in the form of HR Information and Search Firm Reports are likely to be more

accurate in their candidate rankings. Third, women and Feelers are likely to be more accurate in their candidate rankings, possibly because of an increased attention to the people and personalities involved.

The pattern of results on demographics suggests two things. First, female participants are more accurate at this selection task than are male participants; second, some MBTI types are more accurate at this selection task than are other MBTI types. The explanation for the relative success of female participants in comparison with male participants and for Feelers over Thinkers perhaps inform each other. The success of female participants and of Feelers suggests that a more person-based approach to selection may be the basis for their success. Feelers are characterized as paying more attention to the personalities involved in a decision than are Thinkers. Females are also generally characterized (fairly or unfairly) as paying more attention than their male counterparts to the "personalities" involved in a decision. Perhaps in a selection decision this is exactly what is needed.

Objectively, all of the candidates were well qualified for the position, but Candidates A and B were better than Candidates C and D, and Candidate A was better than the other three. However, part of the way in which Candidate A was better had more to do with personality, interests, and drive than it did with "technical expertise." Previous documentation (Sessa, Kaiser, Taylor, & Campbell, 1998) suggests that too much of a focus on technical expertise can often be a cause of improper selection, and that more focus on "soft side" issues could significantly inform the selection process. These results say exactly that. In this study, those people who were *predisposed* to look more at "soft side" information such as personality, interests, and drive made more accurate decisions about fit.

Discussion

We have pared the considerable mass of data down to tell the story of the findings in a comprehensible way, more focused on the meaning of the patterns of results and less focused on the particular data. First, we give brief answers to the research questions. Second, we discuss candidate rankings and offer one explanation for what affects them. Third, we discuss future directions.

Research Questions

To begin, here are the answers to the research questions.

Research Question 1: Search Strategy.

• *How do executives search through information about job candidates?* Executives performed a primarily serial search.

• *Are there differences in search as a function of demographic characteristics or personality?* No, all executives performed a primarily serial search.

Research Question 2: Attention to Candidates.

• *How did executives distribute their time among candidates?* Generally equally.

• *Did this time distribution differ by demographic characteristics or personality type?* Yes. Non-whites spent more time on Candidates B and C than did whites, and non-whites from the U.S. spent more time on Candidate C than did non-whites from outside the U.S. Executives with higher Intuitive scores on the MBTI scale spent more time on Candidate A than did executives on the Sensor side of the scale. Judging executives spent more time on Candidate D than did Perceiving executives. Finally, NF executives spent less time on Candidate C than did either NT or ST executives, and NT executives spent more time on Candidate A than did ST executives.

Research Question 3: Attention to Categories of Information.

• *How did executives distribute their time among the different types of information?* Executives spent the most time on Interviews and Search Firm Reports and the least amount of time on Résumés, with HR Information and Others' Opinions in between.

• *Did executives' time distribution differ by individual differences or personality type?* Yes. Age, level of education, country of origin, race, sex, MBTI type, and condition all affected how executives distributed their time across the categories of information.

Research Question 4: Effects on Candidate Ranking.

• *Were the types of transitions performed related to how likely executives were to reach the design solution?* No. All executives performed a primarily serial search.

• *Was the time distribution among the candidates related to how likely executives were to reach the design solution?* Yes. Executives who spent more time on the better candidates were more likely to reach the design solution than were executives who spent more time on the lower ranked candidates.

• *Was time distribution among types of information related to how likely executives were to reach the design solution?* Yes. Executives who reached

the design solution spent less time on the Interviews and more time on both Search Firm Reports and the HR Information than did executives who did not reach the design solution.

• *Were individual differences or personality type related to how likely executives were to reach the design solution?* Yes. Female executives and male executives with an NF MBTI type were more likely to reach the design solution than were others.

What Affects Candidate Rankings?

The primary question asked in this study was: What affects how executives rank candidates in an executive search? There were four findings with regard to this question. Candidate ranking was shown to be affected by personality type, sex of subject, the amount of time the subject spent on the different candidates, and the amount of time the subject spent on information from the Interview, the HR Information, and the Search Firm Report.

Overall, the basic picture presented by these results is relatively simple. When looking for information, people who tend to focus on the Interviews to the detriment of their time on HR Information and Search Firm Reports are more likely to inaccurately rank the candidates. People who spend more time on the HR Information and the Search Firm Reports, and less on the Interviews, are more likely to accurately rank the candidates. Although some suggest that interviews are a good way to get information about a candidate (DeVries, 1993), this study suggests that the interview is an inconsistent way to evaluate candidates (Guion, 1991). Guion comments that, while interviews function well for public relations and for gaining some types of information about the candidates, they do not do a good job of consistently surfacing information that is needed when evaluating a candidate. Therefore, it is consistent that executives who focus more on the Interviews than they do on the more quantifiable information such as could be found in the HR Information or the Search Firm Reports are missing important aspects of the candidates needed to make a complete evaluation.

People also tend to spend more time on the candidates they end up ranking higher. It appears that people reach an initial impression from a small amount of information, and then go on to confirm their impression. They do this by spending a lot of time on the candidates they end up ranking high, and spending less time on the candidates they end up ranking low. People would do better to spend more time on the candidates they are not inclined toward, rather than focusing on the candidates to whom they are initially drawn. Avoiding focusing on candidates you are initially drawn to may help to

reduce the possibility of having a skewed view of the candidates and help to increase the possibility of making an accurate ranking of the candidates.

But who is drawn to the better candidates? Apparently women and people whose personality predisposes them to be more focused on the interpersonal are drawn to the better candidates in this simulation. Why are they drawn to these better candidates? It is difficult to tell. There are few differences between information searches made by participants who make accurate rankings and those who make inaccurate rankings. There are no differences in the search strategies; people who are accurate rankers are just as likely to have a serial search pattern as are those who are inaccurate rankers. Perhaps they know what to pay attention to in hiring. Perhaps their perspective on what is important is closer to that of the design solution than is the perspective of the other participants. Perhaps they are just better at figuring out what is important in a particular job, and focusing on the relationship between the candidate's qualifications and the needs of the particular position in the company at that time.

With regard to either candidate or category search, there were few differences. Participants who scored as Intuitives on the MBTI spent more time on the best candidate than did participants who scored as Sensors, and NFs spent less time on Candidate C than did either STs or NTs. With regard to category search, women spent more time on Résumés than did men, but time on Résumés was not shown to directly affect accuracy of ranking. People who scored as Intuitives on the MBTI spent more time on the Search Firm Reports than did participants who scored as Sensors on the MBTI, and time on the Search Firm Reports was related to accuracy of ranking. So, Intuitives spend more time on the Search Firm Reports, and people who spend more time on the Search Firm Reports are more accurate in their ranking of the candidates.

Though the information search results do tell us that there were some differences in how people looked for and through the information provided to them, these differences do not indicate why certain types of people were drawn to certain candidates, why certain types of people spent more time on different information, nor why certain types of people were more accurate in their rankings. These data cannot tell us why the different people are acting differently and making different choices, but they do suggest who is more accurate in their ranking of candidates.

Women in general and men with an interpersonal predisposition, specifically those who score as NFs on the MBTI, are more accurate in their candidate rankings than are anyone else. Women are equally accurate in the

ranking regardless of personality type, but men are significantly more accurate when they are NFs than when they are NTs or STs. This accuracy is independent of search strategy, though we know that Intuitives spend more time on the Search Firm Reports than do Sensors. So, why are these people more accurate?

There are two primary explanations for this phenomenon. First, people who fit these profiles may be more attuned to the interpersonal aspects of selection, whatever information they are exposed to. They may pay more attention to what they perceive outside of the standard "candidate search" framework and are willing to put weight in these perceptions, which may be difficult to articulate or justify, while at the same time attending to the more traditional information such as is contained in the Search Firm Reports. Perhaps they are going through basically the same process that the unsuccessful rankers are, but they see the candidate differently based on different interpretations of the same material coming from their different perspective.

One explanation is that the schemas which people bring to these activities are really what are driving both their initial impression of the candidates and their final ranking of the candidates. If people come to the task with schemas in their minds for what they are looking for, they may find it, whether or not the person who matches their schema is the most optimal candidate for that particular position. It would not be surprising to find that people with different personality types have different schemas for what would make a good leader in this case.

Future Directions: Naturalistic Decision Making and Image Theory

Both Naturalistic Decision Making and Image Theory offer a perspective that may be particularly useful in this context. Naturalistic Decision Making (Zsambok, 1997) and Image Theory (Beach & Mitchell, 1998) suggest that we should focus more on how the situation is interpreted by the executives making the decisions and on the basic moral and attitudinal orientations that these executives bring to the decision-making process than on the specific information they look at or the particular process they choose to make their decision. (See Appendix C for more information on decision-making theory.) This perspective is consistent with the results, which suggest that it is not what information the executives look at as much as it is the way they structure the selection and perceive the candidates that affects the eventual outcome of the selection.

Based on these results, and the directions provided by Naturalistic Decision Making and Image Theory, we suggest that some investigation into

the general perceptions of each of the candidates be undertaken. We must understand how the candidates are characterized before we can begin to explain the rankings. It would also be very useful to see if there was any consistency in how the different candidates were characterized, or if people with different demographic and personality characteristics characterize them differently, as we guess is the case. These differences in characterizations could then be used to help identify differences that may be related to executives' schemas.

It would also be useful to look at the group's decision-making processes to gain a greater understanding of what attributions and characterizations were being made about the candidates, and to see if these characterizations are reliably related to attributes of either the individuals or of the groups.

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Appendix A
The Peak Selection Simulation

In late 1991, the Center for Creative Leadership began a sustained effort to better understand the dynamics of executive selection. A major impetus for launching this program was the perception that performance of top-level leaders and their organizations was in a state of decline. In early 1993, CCL began working on a research/training simulation to (1) give senior-level executives a realistic experience in handling group selection decisions and (2) provide research data on decision-making by executive teams. In November 1995 this simulation was installed as a major component of Leadership at the Peak (LAP), a development program for senior-level executives. This appendix describes the Peak Selection Simulation (PSS).

Our Mission

Our goal was to create a context-rich experience where senior executives could grapple with selection issues very similar to those they face in their home organizations. In this process they would confront difficulties typical of decision-making by any individual or team, regardless of task. We wanted to create a research/training simulation that would allow us tight control over variables that would satisfy multiple research perspectives on choice behavior, while at the same time furnishing us with real examples of how executives and executive teams make decisions. The research would be designed around the issues of context, process, and people. Is organizational context considered in making selection decisions? What individual and group processes lead to the most effective decisions? What leadership characteristics influence those outcomes?

The training simulation would accommodate certain realities common to senior-level teams: (1) a differential distribution of information because no one individual knows everything needed to make the best decision, (2) an external criteria that leaves no doubt as to desired outcome, and (3) high stakes. The learning points for the executives would focus on both individual and group choice behavior, as well as principles of executive selection.

Development of the Simulation

When a phenomenon is not well understood (in this case, executive selection) the realism of the simulation needs to be high so that relevant and irrelevant variables can be distinguished. Our focus on developing this realism included the following:

Field Surveys. Field interviews with search firms and senior executives gave us numerous ideas about executive character and what is actually considered in executive selection. For the most part, our candidates are modeled on well-known senior executives, each with a distinct personality, personal background, and qualifications.

Organizational Environment. The company background was furnished by Looking Glass, Inc., a large-scale behavioral simulation already used at the Center for Creative Leadership. Created in the late 1970s and updated in 1991, Looking Glass is an exceptionally accurate and detailed simulated company which was based in a close look at products and technology, plant visits, an understanding of basic manufacturing processes, interviews with glass industry managers, a scouring of trade journals, and a "feel" for its environmental problems.

Design Solution

To crystallize learning and provide criteria for measurement, we established a preferred ranking of candidates in descending order of fit. To assume all candidates are equal would invalidate the framework for selection; there would be no best decision to make. In the world of executive selection, all choices are not equally good. The world of executive selection is hit-or-miss; if you didn't get it right, you got it wrong.

Our design solution was based on an organizational and job assessment of both the company and the division, specification of candidate requirements, and assessment of the four candidates, matching the qualifications of the candidates to the organizational needs. All materials, including the candidate information, were developed and written based on this model. Candidates would display strengths, weaknesses, and derailment factors and would vary in fit to this particular organization and job.

Since they are all the "cream of the crop," each candidate is outstanding in one respect or another. One resembles the typical participant in the program, Leadership at the Peak. Another fits the current "solution" reported so widely in the popular press, the outsider brought in to shake up the organization. A third candidate is the "quiet, non-administrative sleeper." And the fourth is a highly competent, creative renegade who has derailed during his time with Looking Glass.

We then called upon experts to verify our solution. This small panel performed organizational and job assessments, outlined the candidate specifications, and assessed the candidates in terms of those specifications. Two caveats should be noted. Unlike the LAP participants who work against a

deadline, these experts spent as much time as needed in reading the materials. Second, they did not access information using the multimedia presentation; instead they used the written materials, which they could read and re-read as much and as often as they wanted. They did in fact verify the design solution as the "best" solution available given the organizational requirements and the position to be filled.

Training Sequence

Prior to their arrival on a Sunday to begin the five-day program, the participants are provided with extensive information about the company, Looking Glass, Inc. This prework includes a brochure describing its products, its history, and a proposed ten-year strategic plan.[1] They are also provided a one-page résumé on each of the four candidates. They are asked to not discuss this material. Following an introduction to the simulation on Monday afternoon, the participants are greeted on video by the "CEO" of Looking Glass who sets their task: to choose a president for the Advanced Products Division. This division manufactures fiber optics, capacitors, and liquid crystal display glass. Since a major refocusing of Advanced Products is proposed in the ten-year plan, the position of president is to a great extent a new job. The candidate selected must be capable of redefining the job.

Following a tutorial on the computer search program, each participant is given one hour to examine the four candidates through interactive multimedia presentation. Sitting before a monitor, the participants are presented a screen menu that provides all the candidate information. By operating a computer mouse, the user may listen and watch an interview of each candidate with a variety of questions which were asked of all candidates, may listen to audio tapes of opinions about the candidate (both solicited and unsolicited), may look at their résumés, may look at HR information, and may look at information compiled about each candidate by a search firm. This CD-ROM multimedia presentation does not force a linear, sequential interaction. Event-driven programming coupled with TV-quality video adapts to each individual

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[1] Although participants are not involved with the problems of the original Looking Glass simulation used at CCL, they are never far from the world of a glass company—its finances, its color, its competitive challenges, its products, its revered history. Looking Glass faces an uncertain future. Competitors have taken important business. A draft ten-year plan proposes fundamental changes, greater global involvement, the sale of one division, and more. An investment banking firm in London and a New York management consultant believe Looking Glass will lose position if major changes are not made.

learning style. The user, not the developer, determines the sequence of events. Through an "intelligent" database, the computer tracks how long users have spent on each piece of information and the sequence in which they looked at the information.

One year in development, this multimedia presentation required the skills of a user interface designer, a graphics designer, a programmer, and a multimedia specialist. Their main challenge lay in designing an interface for users who are not computer-savvy (in several cases, the participants had had no previous experience with a mouse). We found that senior-level executives are not people who use personal computers frequently. Extensive testing with selected program participants was conducted throughout the spring and summer of 1995 before a "friendly" interface was completed.

The candidates, three from within the company, one from outside, come from different glass industry careers. One is from marketing, another from manufacturing, a third from finance, the fourth a scientist whose career is entirely in research and development. Each enjoys many virtues, but each is lacking in one respect or another. There are three versions of one candidate: a white female, a black male, and a white male. Career background is not changed because of race or gender. According to a rotation scheme made one week prior to the program, this candidate is varied depending on group racial or gender composition.

The four candidates are given exhaustive profiles, including résumés, family background, education, hobbies, news articles, solicited and unsolicited references, and more. Following are brief descriptions of the four candidates.

Candidate A came to Looking Glass, mid career, from an air freight business. He is visionary, charismatic, risk-taking, persuasive, and creative—very much the "transformational" leader all the rage in the current management books written by corporate gurus. We know that he is a maverick and a renegade who derailed in a previous high-level position within another division of Looking Glass (and a little voice tells us that perhaps he also derailed from his previous position, but we don't really have any data to support this). Apparently he learned a lot from his derailment, and is a much better leader and team player because of it; he no longer makes "end runs" around other executives. We also know that he was an unusual child, reading Faust and Rilke, and he knew Wagner's "Ring" cycle by the time he was fourteen.

Candidate B is the quintessential "sleeper" candidate. He is described as quiet, thoughtful, creative, extremely intelligent, and well liked and loved by

his staff. He is a career "Looking Glasser," coming up through the engineering ranks with a Ph.D. in chemical engineering and a string of academic publications. Despite this academic background he can speak many corporate "languages" including R&D, manufacturing, and corporate. Despite coming from a background that rewards product and technology myopia, he is quite able to scan a broad horizon and change policies. He "looks" like an executive. He is good-looking, tall, broad shouldered, and has snow-white hair. He excelled in basketball as a teenager. We even know that his older sister calls him "Teddy Bops," especially in company.

Candidate C is a native of Poland whose family fled to the Netherlands when the Communists took over after World War II. We know "his fondest memories are his mother's language drills and her Polish beet soup with sour cream." Before he became an executive in the glass industry, Candidate C managed the corporate syndicate department at a London investment banking firm where he specialized in the financing needs of high-technology companies. Later in his career his company invested in specialized fiber optics for photodynamics technology (PDT). We are told that "PDT combines a light-activated compound (a drug), a light source, and a fiber optic delivery system to identify and deactivate abnormal cells and viruses." There is, of course, much more about Candidate C but not a single "fact" that could not find a real-world analogue.

We learn that Candidate D took no interest in high school athletics but was a good student "who cut a graceful figure on the dance floor." Following military service in Vietnam, he married a beauty queen who was nearly selected as a Playboy centerfold. His résumé tells us that among his many accomplishments at Looking Glass he improved "cullet processing through several advanced procedures, including impact crushing, magnetic separation, and air separation; plant scrap loss was reduced from $125,000 per year to $80,000 after one full year."

Participants are given wide discretion in the one-hour computer search. They could ignore self-report information and read only references and descriptions of candidates by others. They could dwell on news articles and unsolicited references, spending little or no time on résumés. They could watch the candidates, each in business dress, answer a variety of questions. The choice was theirs. To read and digest every item in this presentation would require on average two-and-one-half hours, which they were not allowed, so they could only look at a portion of the information that was available to them.

Given freedom of choice to examine what they wish, each participant comes away with a unique "information profile" which has been recorded by the computer program. These profiles represent the "resources" they bring into the decision-making meeting. These profiles are also the major impetus for the study presented here.

On the afternoon following the computer search of the simulation (generally a Tuesday), the participants meet in small groups of four to seven members where they are given forty-five minutes to discuss and rank the candidates, top to bottom. These sessions are videotaped. When the discussion ends, the group ranks the four candidates and completes two questionnaires about the group's process and changes in their ranking patterns from their own individual preferences to the group's decision. Debriefings by observers begin immediately. First there is a debriefing of all program participants which takes about thirty minutes. This debriefing is followed by a two-hour meeting of each small group with the debriefer, during which time the videotape of the group process is shown and the group's performance is discussed. A further debrief of how each participant did both individually and as a member of the group is included in the comprehensive feedback session on Thursday for each participant.

Measurement

The Peak Selection Simulation includes measurement at three levels: the individual, the individual within a team, and the team as a whole. There are two main research uses for these data. First, the data show how selection decisions are made and the variables that influence the quality of the decision. Second, the data give information about characteristics of leaders and their behavior, at the individual level of analysis. These data will be used to examine how individual characteristics of leaders are related to important organizational outcomes.

Appendix B
Descriptive Statistics

The purpose of this section is to describe interrelationships among the individual differences variables and among the dependent variables included in this study.

Individual Differences

Significant Relationships by Demographic Category

The basis for the following analyses is an examination of distributions using non-parametric statistical methods. For those who are not familiar with this type of analysis, when working with nominal or ordinal data (as opposed to interval data with which you can use standard parametric methods such as analysis of variance and regression), it is necessary to use non-parametric statistical methods to examine differences in the distributions of the variables of interest. Nominal data are generally characterized as categorical. In a nominal scale all points on the scale are characterized as being equivalent (e.g., sex, race, country of origin). In an ordinal scale the numbers indicate when one option is to a greater degree than another option (i.e., good, better, best). However, an ordinal scale does not have equivalent differences between scale points, so all one can say is that one point is higher than another, not how much higher it is (as would be true in an interval scale). Because neither nominal nor ordinal scales have the quality of equal intervals between points on a scale, nominal and ordinal scales must be analyzed by looking at the distributions on the variables of interest, rather than looking at the means and standard deviations on the scales. Means and standard deviations are meaningless for nominal data because the numbers are meaningless; therefore, means and standard deviations based on distributions are also meaningless. Means and standard deviations have little meaning for ordinal data because the intervals between the points on the scale are not the same. Though means based on ordinal data can describe which groups are higher and lower on a particular ordinal scale, differences in the means are not meaningful because the intervals between points are not the same. Also, the standard deviations for ordinal scales are not meaningful because the intervals between the points on the ordinal scale are not equal.

Having stated this, if one wanted to see if there were differences in religion (nominal data) as a function of the sex of the subject (also nominal

data), one would look at the distribution to see if the distributions of the sexes across the religions differed. After one knew if the distributions differed for men and for women, one would look to see exactly where the differences were between the sexes by religion (Catholic, Protestant, Buddhist, Muslim, etc.). Once one had pinpointed the differences one could state that the distributions of the group differed, and one could say which categories the differences were in. This is exactly what the following analyses are doing.

The data will be displayed so that you can look at both the counts and the standardized adjusted residual for each cell. The counts are simply the number of participants in each cell, and the standardized adjusted residual is the equivalent of a *Z* score which requires a level of +/- 1.96 to achieve significance at the .05 level.

Number Z Score	Men	Women
Variable X	40	5
	*2.6**	*-2.6**
Variable Y	100	20
	.5	*-.5*

* $p<.05$

Age. Age was divided into three groups by naturally occurring divisions in the data: under 43, between 43 and 49, and over 49. Among the other individual differences variables, age was related to degree level, with significantly more of the under 43 group holding a degree of BA or less, and significantly fewer of the under 43 group holding a Ph.D. Also, the over 49 group had a significantly high number of Ph.D.s. Overall significance of Cramér's *V* was .0009, indicating that this distribution was significantly different than would be expected by chance. This suggests that the under 43 group is disproportionately less educated than are the older age groups, particularly the over 49 age group which had a disproportionate number of Ph.D.s. (See Table B1.)

Age was also related to level in the company, with fewer of the under 43 group at the CEO level and more of the under 43 group at the upper-middle management level. Similarly, in the 43 to 49 group, fewer were at the upper-middle management level. This distribution was significantly different than would be expected by chance (Cramér's $V = .01$). This suggests that

those in the under 43 age group were at lower levels in their home company than were the other age groups, and that the 43 to 49 age group was skewed toward the higher levels in their home company. (See Table B2.)

Table B1
Relationship between age and education

Number *Z* Score	Ph.D.	MA/MS/MBA	BA and Less
Under 43	15	83	88
	*-3.7**	*.2*	*2.5**
43 to 49	32	65	65
	.6	*1.1*	*-1.6*
49 and Older	40	67	63
	*3.2**	*-1.4*	*-.9*

* $p<.05$

Table B2
Relationship between age and level in the organization

Number *Z* Score	Under 43	43 to 49	49 and Older
CEO	46	63	58
	*-2.2**	*1.1*	*1.2*
Executive	120	118	100
	.8	*.3*	*-1.1*
Upper-middle	18	4	10
Management	*2.7**	*-2.7**	*.0*

* $p<.05$

There was also a relationship between age and sex of subject. In the under 43 age group there were fewer men and more women than would be expected by chance. Also, in the over 49 age group there were significantly more men and significantly fewer women than would be expected by chance. This distribution was significantly different than would be expected by

chance (Cramér's $V = .004$). This suggests that age is in some part confounded with sex because the distribution of the sexes across age is such that men are found more frequently in the older age groups, while women are found more frequently in the younger age groups. (See Table B3.)

Table B3
Relationship between age and sex of subject

Number Z Score	Under 43	43 to 49	49 and Older
Men	149	163	156
	*-3.2**	*.8*	*2.4**
Women	37	22	14
	*3.2**	*-.8**	*-2.4**

* $p<.05$

When age was controlled for, sex of participant was related to level in home company for the under 43 age group (in the 43 to 49 and 49 and older age groups, there was no significant relationship between level in home company and sex of participant, in part because there were so few women in these age categories). Women were significantly underrepresented in the CEO category and significantly overrepresented in the upper-middle management category. At the same time, men were significantly overrepresented in the CEO category and were significantly underrepresented in the upper-middle management category. The statistical probability of this pattern happening by chance is less than .000001%. (See Tables B4, B5, and B6.)

This finding was unexpected. Companies who send their leaders to CCL are considered progressive and encouraging of women executives. However, the extremity of this finding is consistent with the hypothesis that the glass ceiling is still solidly in place despite claims to the contrary, even in progressive companies.

Sex. There was a relationship between sex and being a Sensor or an Intuitive on the MBTI. Male participants were more frequently Sensors and less frequently Intuitors, while female participants were more frequently Intuitors and less frequently Sensors. Overall significance of Cramér's *V* was .004, indicating that this distribution was significantly different than would be

expected by chance. This suggests that, at this level in a corporation, females are more frequently Intuitors and males are more frequently Sensors. (See Table B7.)

Table B4
Age: Under 43

Number *Z* Score	Men	Women
CEO	43	3
	*2.6**	*-2.6**
Executive	98	22
	.6	*-.6*
Upper-middle	7	11
Management	*-4.7**	*4.7**

* $p<.05$

Table B5
Age: 43 to 49

Number *Z* Score	Men	Women
CEO	55	8
	-.2	*.2*
Executive	104	14
	.0	*.0*
Upper-middle	4	0
Management	*.7*	*-.7*

Table B6
Age: 49 and older

Number *Z* Score	Men	Women
CEO	52	6
	-.7	*.7*
Executive	93	7
	.8	*-.8*
Upper-middle	9	1
Management	*-.2*	*.2*

Table B7
Relationship between sex of subject and Sensor/Intuitive identification

Number *Z* Score	Sensor	Intuitive
Men	234	302
	*2.8**	*-2.8**
Women	22	59
	*-2.8**	*2.8**

* $p<.05$

Race. There was a relationship between race and being a Judger or a Perceiver on the MBTI. Whites were significantly more likely to be Perceivers and significantly less likely to be Judgers, while non-whites were significantly more likely to be Judgers and significantly less likely to be Perceivers. Overall significance of Cramér's *V* was .02, indicating that this distribution was significantly different than would be expected by chance. (See Table B8.)

Level of Education. There was a relationship between level of education and being a Judger or a Perceiver on the MBTI. The distribution in this sample indicated that people with a Ph.D. were more frequently Judgers and less frequently Perceivers, while people with a BA or less were less frequently Judgers and more frequently Perceivers. Overall significance of

Cramér's *V* was .05, indicating that this distribution was significantly different than would be expected by chance. (See Table B9.)

Table B8
Relationship between race of subject and Judger/Perceiver identification

Number Z Score	Judger	Perceiver
White	292	201
	*-2.3**	*2.3**
Non-white	29	8
	*2.3**	*-2.3**

* $p<.05$

Table B9
Relationship between education and Judger/Perceiver identification

Number Z Score	Judger	Perceiver
Ph.D.	60	26
	*2.0**	*-2.0**
MA/MS/MBA	146	90
	.6	*-.6*
BA and Less	118	97
	*-2.1**	*2.1**

* $p<.05$

Country of Origin. There were a number of relationships between country of origin and other independent variables. First, there was a relationship between country of origin and race. Non-U.S. participants were more frequently non-whites than were U.S. participants. Overall significance of Cramér's *V* was .0001, indicating that this distribution was significantly different than would be expected by chance. This suggests both that the sample of non-whites is disproportionately of a non-U.S. origin, as well as that those participants not from the U.S. are disproportionately non-white (see the description of the sample for the distribution by country). (See Table B10.)

Table B10
Relationship between race of subject and country of origin

Number Z Score	White	Non-white
U.S.	406	12
	*7.1**	*-7.1**
Non-U.S.	88	25
	*-7.1**	*7.1**

* $p<.05$

A second relationship is between country of origin and level of education. Non-U.S. participants more frequently had a BA and below, while U.S. participants had a BA and below less frequently. Overall significance of Cramér's *V* was .02, indicating that this distribution was significantly different than would be expected by chance. This suggests that in this sample the U.S. participants have disproportionately more education than did the non-U.S. participants. (See Table B11.)

Table B11
Relationship between country of origin and education

Number Z Score	Ph.D.	MA/MS/MBA	BA and Less
U.S.	72	190	158
	*1.4**	*1.1*	*-2.2**
Non-U.S.	14	47	58
	- 1.4	*-1.1*	*2.2**

* $p<.05$

A third relationship is between country of origin and sex of subject. A higher percentage of U.S. participants were female than non-U.S. participants. Overall significance of Cramér's *V* was .02, indicating that this distribution was significantly different than would be expected by chance. Overall this suggests that, despite difficulties with the glass ceiling in the U.S.,

women in the U.S. are more likely to attend this program than women not from the U.S. (See Table B12.)

Table B12
Relationship between country of origin and sex of subject

Number Z Score	Men	Women
U.S.	360	64
	*-2.2**	*2.2**
Non-U.S.	112	9
	*2.2**	*-2.2**

* $p<.05$

Summary

These patterns of relationships among the individual differences variables make a couple of things about this sample very apparent. First, the women in this sample are both younger and at a lower level in their home companies than are the men in this sample. For the research this means that analyses of the dependent variables must check for interactions among age, sex, and level in home company. Practically, this result suggests that there may be a change coming in who is running companies. If more of the people in the youngest age group coming to LAP are women, then this suggests that more women may begin to show up in the higher levels of companies.

Another important point to remember is that two-thirds (67.5%) of the non-white participants included in this study do not identify the U.S. as their country of origin. In other words, 21% of non-U.S. participants identified themselves as non-white. Practically, this suggests two things. First, that the non-white population attending LAP is predominantly non-U.S.; and second, that a higher percentage of the non-U.S. population than the U.S. population attending LAP is non-white.

Dependent Variables

Interrelationships Among Search Variables

The purpose of this section is to describe interrelationships among the different search variables. To facilitate comprehension of the variety of relationships among the independent variables, the relationships will be discussed one search category at a time. It is anticipated that there will be some interrelationships between search strategy variables, candidate search variables, and category search variables.

Significant Relationships by Category. The time spent on the different candidates and the different categories of information are all presented as percentages of the total time in search. Therefore, the percent of time spent on each of the candidates is dependent on the time spent on each of the other candidates. Similarly, the percent of time spent on each of the categories of information is dependent on the time spent on each of the other categories of information. Because of these relationships, it makes no sense to talk about the relationship between the time on Candidate A and Candidate C, or on the relationship between the absolute amount of time spent on Interviews and on Others' Opinions.

Candidate by Category. There were significant and positive relationships between time spent on Candidate D and HR Information (r=.141, p<.001) and Others' Opinions (r=.141, p<.001), and a significant and negative relationship between time spent on that candidate and time spent on the Search Firm Report (r=-.229, p<.001). Therefore, participants who spent more time on Candidate D spent more time on HR Information and Others' Opinions and less time on the Search Firm Report.

There was a significant and negative relationship between time spent on Candidate C and time spent on HR Information (r=-.296, p<.001), but there was a positive relationship between time on this candidate and time spent on the Search Firm Report (r=.293, p<.001). The negative relationship between time spent on Candidate C and time on HR Information was anticipated because this candidate has no information in his HR Information folder. Similarly, it was anticipated that there would be an increase in time on the Search Firm Report for this candidate because of the lack of information in the HR Information folder.

There was a significant and positive relationship between time spent on Candidate B and time spent on HR Information (r=.117, p<.004), but there was a negative relationship between time spent on this candidate and the Search Firm Report (r=-.207, p<.001). Therefore, participants who spent

more time on Candidate B spent more time on HR Information and less time on the Search Firm Report.

Finally, there was a significant and negative relationship between time spent on Candidate A and time spent on Others' Opinions (r=-.166, p<.001), but there was a significant and positive relationship between time spent on this candidate and time spent on the Search Firm Report (r=.132, p<.001). Therefore, participants who spent more time on Candidate A spent less time on Others' Opinions and more time on the Search Firm Report. (See Table B13.)

Table B13
Correlation of time on candidate with time on category of information

	Candidate A	Candidate B	Candidate C	Candidate D
Interviews	-.011	.052	-.020	-.015
	p=.781	p=.193	p=.622	p=.704
Résumés	-.070	-.029	.053	.040
	p=.083	p=.467	p=.190	p=.327
HR Information	.048	.117	-.296	.141
	p=.233	p=.004*	p=.001*	p=.001*
Others' Opinions	-.166	.073	-.050	.141
	p=.001*	p=.070	p=.216	p=.001*
Search Firm Report	.132	-.207	.293	-.229
	p=.001*	p=.001*	p=.001*	p=.001*

* p<.05

Candidate by Search Strategy and Category by Search Strategy. Though the analyses were run, there is no meaningful interpretation of the relationships between percent of time on candidate or category of information and percent of different types of searches.

Summary

This pattern of relationships suggests that all types of information were not equally interesting to participants for all candidates. There was little variability in focus on some types of information. For example, participants focused on the Interview and the Résumé information for all candidates. In fact, a lot of time was spent on the Interview for all candidates, while little

time was spent on the Résumé for all candidates. On the other hand, there was a great deal of variability in focus on HR Information, Others' Opinions, and Search Firm Report for the different candidates. For example, the Search Firm Report was focused on more for Candidates A and C, and less for Candidates D and B. Also, Others' Opinions was focused on less for Candidate A, while it was focused on more for Candidate D.

Appendix C
Literature Review

Though there are many ways to discuss selection as a topic, this research treats selection as a special case of decision-making. Selection is fundamentally about making a decision. Whether the decision is about which kind of apple to buy or what person to place in the executive suite, each decision has components that relate to other decision-making processes. Executive selection can be viewed as a specialized case of decision-making in which attributes of the applicant are weighed against a series of considerations including (but not restricted to) the requirements of the position and the needs of the organization.

Because executive selection is fundamentally a decision-making process, it is important that the selection process be investigated as a case of a decision-making process. By looking at executive selection through a decision-making lens we are able to apply the basic decision-making literature, which should be of some help in understanding how the decision (executive selection) gets made and what could possibly be done (based on what we know about how to make decisions generally) to help aid the selection process. Therefore, the following literature review will discuss executive selection as a special case of decision-making; the importance of information search in decision-making; the impact of task effects on information search and decision-making; and the relationship between individual differences, personality, and search.

Executive Selection As a Decision-making Task

Selection, whether it is being done for a line position or for an executive suite position, is generally approached from a classical selection perspective, which is frequently based on a mass-production model of selection (Sackett, 1992). Executive selection is often characterized by a process that includes many steps, a large portion of which differ from classical selection (DeVries, 1993). The first step is often an organizational needs assessment that includes an examination of both the internal and external environments. The second step is an analysis of the requirements of the position. The third step is an analysis of the candidate requirements. The fourth step is the construction of the candidate pool. The fifth step is the selection itself.

Though these steps specifically refer to the selection of an individual for a particular position within an organization, they are basically descriptive of the steps in a pretty general decision-making process. This type of basic

decision-making process has been described in many different ways for many different topics, from more economic models of decision-making (Abelson & Levi, 1985) to more naturalistic models (Beach & Mitchell, 1998; Zsambok, 1997).

Though Rational Choice and Subjective Expected Utility models of decision-making are interesting in their more economic view of decision-making processes (Abelson & Levi, 1985), they do not do a good job of explaining selection at the executive level (Zsambok, 1997). Selection for executives is an especially complicated decision-making case which lends itself more to a Naturalistic Decision Making (Zsambok, 1997) or Image Theory (Beach & Mitchell, 1998) paradigm, because selection requires decision-making based on things other than quantifiable, factual information (which form the base for Rational Choice Theory and Subjective Expected Utility models). Selection at the executive level requires the use of some information that is quantifiable (hard-side), such as level of education or number of years in a previous position, but much critical information such as relationships with others and desire to achieve in any position is unquantifiable (soft-side). Also, it is frequently necessary in selections for executive-level positions to rely on gut feelings or impressions or political information, none of which Rational Choice Theory includes explicitly in the decision-making process. Unlike selecting for positions such as data entry or police work for which there are exams that do a good job of evaluating an individual's competencies in the dimensions most important for the job, for executives there is little agreement on what specifically executives should excel, and there are no tests that adequately assess executives on these dimensions.

Also complicating executive selection is that often either the group of people or the individual making the selection has not specified ahead of time what characteristics they are looking for in a candidate (Sessa et al., 1998). They know that they have a position to fill, they know what the title is, and they probably have a general idea of what area of work the position controls (manufacturing, sales, research and development, etc.). Unfortunately, they generally haven't done a good job of specifically defining what an individual will actually *do*. There are seldom job analyses for the positions the executives are being hired to fill, so even that level of general detail is missing to give the selection team some guidance. As a result you have an executive team trying to select someone for a complex job using no criteria specific enough to add some objective structure to the selection.

Because there is generally no objective structure or criteria set up before the search and evaluation of candidates commences, it is difficult for executive hiring teams to decide who among the candidates is "best." Best inevitably means different things to different members of the hiring team. This is another way that executive selection represents a complicated decision-making task. Frequently for decision-making in life (as opposed to in the lab) there is no objectively best answer; there are simply different answers which each have positive and negative aspects. The domain of executive selection is similar. Unlike lower-level jobs for which there may be specific and quantifiable selection criteria, in the case of high-level executives the criteria are incomplete at best, and controversial at worst. The controversy would come from different people who have different perspectives on the most critical criteria on which to base a selection decision, as well as on what criteria may be used in the selection process.

As described with regard to executive selection decisions, individuals who are making decisions are often unsure of the parameters of the decision; though they may know generally what they want, they may be unsure of what the possible outcomes are, unsure of how to determine which outcome best represents what they want, unsure of what the information they have means, and unsure of the relationship between the available alternatives and what they want. In selection decisions especially, individuals may be unsure of the relative importance of different attributes of the alternatives. For all of these reasons, the decision-making paradigms suggested by theories on Naturalistic Decision Making (Zsambok, 1997) and Image Theory (Beach & Mitchell, 1998) provide a better framework for understanding how decisions are made in the more contextually less than laboratory conditions of the cut-and-dried world of executive selection.

Naturalistic Decision Making. Naturalistic Decision Making (NDM; Zsambok, 1997) is characterized by a focus on decision-making by experienced people in real contexts. As opposed to Rational Choice Theory (Abelson & Levi, 1985), which requires that all information be known and that all possible options be known, NDM allows for individuals or groups making decisions to not know all of the information and to not be aware of all of the options. The study of NDM is defined as "how experienced people, working as individuals or groups in dynamic, uncertain, and often fast-paced environments, identify and assess their situation, make decisions and take actions" (Zsambok, 1997, p. 5). Another critically important aspect of NDM is that there is more focus on the framing of the situation and on the identification of important contextual factors than on the outcome. Though the

decision is important, in many ways the framing of the decision-making context drives the eventual decision in a way that no information can. Therefore, NDM is a good framework from which to view selection because it is focused more on understanding the context in which the decision is being made and what information is actually being used, rather than what information should be used in making the decision.

Similarly, Image Theory (Beach & Mitchell, 1998) looks at parts of the decision-making process beyond the quantifiable Subjective Expected Utility models (Abelson & Levi, 1985). Image Theory focuses on both the internal and external contexts in which the decision is being made. In addition to the critical questions concerning the situation and the desired outcome, Image Theory also focuses on the individual's drives. Beach and Mitchell (1998) suggest that Subjective Expected Utility models have not been supported widely because, in addition to assuming that all relevant information is known and all choices are understood, they also assume that people are primarily driven by monetary considerations. One weakness of Subjective Expected Utility models that Image Theory addresses is the lack of attention to motives, emotions, and past experiences in decision-making. Beach and Mitchell note that it is often emotions, motives, and past experiences that have a critical impact on both the decision-making process and the final decision.

Because selection in general and executive selection in particular are both so fraught with the aspects with which both Rational Choice Theory and Subjective Expected Utility models have difficulty (e.g., lack of total information, emotions in the mix), it makes more sense to think of executive selection in NDM or Image Theory terms. This includes a focus on the context, the personalities of the individuals involved, and the structuring of the decision.

Decision-making Steps. Even with NDM (Zsambok, 1997) and Image Theory (Beach & Mitchell, 1998) models of decision-making, there are certain steps that are performed whenever decisions are made. Though individuals may be unsure about what they want or what the information means, they must go through three basic steps when making a decision. These steps are not exhaustive of all possible steps in a decision, they are just the minimal steps required in any decision-making process (Abelson & Levi, 1985; Beach & Mitchell, 1998; Zsambok, 1997). First, the decision to be made must be identified, the situation must be framed. Individuals must know that they have to make a decision, and they have to know what the decision is about. This framing of the situation is critical to setting up the decision-

making process. Second, the individual must search for information. This search can be done either internally (within the individual's memory) or externally (relying on resources outside the individual). This search is affected both by the individual's own biases and by how the individual has framed the decision in his or her own mind. Third, a decision must be made. The individual must come to some conclusion (even if it is that there is no conclusion) and then make a decision about implementation (which can also be a decision to not implement).

Decision-making Strategies. Within these three steps there are a variety of strategies that are frequently used. Research has shown that there are certain specific decision-making strategies that are commonly used in the decision-making process (Payne, Bettman, & Johnson, 1993). This does not mean that everyone uses these strategies all of the time, but that these strategies are frequently good descriptors of how people go about making decisions.

Generally, strategies are described as being compensatory or noncompensatory in nature. Compensatory strategies allow tradeoffs between different attributes in the decision-making process. For example, if the decision-makers aren't sure which attribute is most important, they may be more likely to just add the scores on the attributes together to arrive at a total score for each alternative. Noncompensatory strategies do not allow tradeoffs between different attributes in the decision-making process. For example, if the decision-maker thinks that one attribute is critical, then he or she may eliminate any alternative that doesn't meet a minimum level on that attribute.

Some strategies are more common than others in decision-making. Among the most common are the Additive Decision Strategy, the Equal Weight Heuristic, the Satisficing Strategy, the Elimination by Aspects Strategy, and the Frequency of Good and Bad Features Heuristic (Payne et al., 1993).

• *Additive Decision Strategy.* This strategy examines all attributes of the candidates, and scores on all attributes are added together resulting in one score for each candidate. All attributes are not necessarily given equal weight. This compensatory strategy allows for high scores on one attribute to compensate for low scores on another attribute (Payne et al., 1993).

• *Equal Weight Heuristic.* This strategy examines all attributes and gives equal weight to all attributes. Scores for each attribute are added together resulting in one score for each candidate. This is a compensatory strategy that allows for high scores on one attribute to compensate for low scores on another attribute (Payne et al., 1993).

• *Satisficing Strategy.* In this strategy attributes are considered one at a time, in the order in which they appear. The score for each candidate on each attribute is compared with a predetermined lowest acceptable score for each attribute. The first candidate who has scores above the cutoff for all attributes is the choice, and the evaluation of candidates often ends there. This is a noncompensatory strategy because high scores on one attribute cannot compensate for low scores on another attribute (Payne et al., 1993).

• *Elimination by Aspects Strategy.* In this strategy the first order of business is to determine the order of importance among the attributes and the acceptable score level for each attribute. Once that is done, the candidates are evaluated by comparing their attribute scores to the cutoff scores for each of the attributes, beginning with the most important attribute. As candidates do not meet the cutoff levels for the most important attributes, they are eliminated from consideration. It is elimination by aspects (attributes) because candidates are eliminated from consideration because they do not meet the cutoff level for a particular attribute (Payne et al., 1993).

• *Frequency of Good and Bad Features Heuristic.* In this strategy, decision-makers evaluate the candidates based on the frequency of good and bad information about them. Decision-makers decide what they consider a good or a bad feature and then evaluate candidates based on how many good and bad features the candidates have (Payne et al., 1993).

• *Combined Strategies.* Probably the most common strategy for decision-making is a combined strategy. Decision-makers often use one strategy to eliminate alternatives in the beginning, and then use a different strategy to decide between the alternatives they have not eliminated. For example, a decision-maker may use the Elimination by Aspects Strategy in the beginning to determine which of the candidates are basically acceptable, and then may use the Frequency of Good and Bad Features Heuristic to make a decision between candidates they feel are roughly equal (Payne et al., 1993).

Different decision strategies suggest different information search strategies. The Additive Decision Strategy, the Equal Weight Heuristic, and the Frequency of Good and Bad Features Heuristic require a more extensive search because the decision is based on an evaluation of the alternatives across the different attributes. The Elimination by Aspects Strategy and Satisficing Strategy require less search because the decision is being made primarily attribute by attribute, and therefore they do not require an extensive search of all information for every alternative.

Information Search: Effects on Decision-making

One critical aspect of the decision-making process is how information is searched, what information is focused on, and what information is retrieved for use in the decision-making process. What type of search is made and what biases might have been present in the search as a result of biases in the searcher are both critical to the final decision, as the decision is likely to be based at least in part on information uncovered during the information search phase of the decision-making process (Kersholt, 1992; Payne et al., 1993; Svenson, 1979).

The research that has been done describing information search has been fairly elementary. An example of this genre is Payne (1976). In this experiment, Payne presented participants with a choice board which had two, six, or twelve options (such as apartments), and four, eight, or twelve categories of information (square footage, number of bedrooms, number of bathrooms, etc.). Participants were asked to make a decision among the options. Participants' information search was identified using one of two process tracing techniques: explicit information search or verbal protocols. Payne found that the most critical aspect of the decision process for the information search was task complexity. When faced with fewer options, participants searched a larger, constant amount of information across all options. When faced with more options, participants were more likely to use a decision strategy such as the Elimination by Aspects Strategy, which allowed them to eliminate options with little information search. Interestingly, individuals differed widely in their information search patterns. However, none of these differences were attributable to demographic differences; Payne speculated that the differences in search patterns should be attributed to differences in participants' mental representations or biases about the decision, rather than to specific demographic characteristics.

Transitions. One way information search has been described is in terms of transitions from one piece of information to another. These transitions are generally described as being either serial (within decision options but between attributes of each option) or parallel (within attributes of each option but between options). These transitions are identified by identifying the option and attribute for the *nth* piece of information, and the option and attribute for the *nth + 1* piece of information. If the option is the same, the transition is described as serial. If the attribute is the same, the transition is described as parallel (Payne, 1976).

This way of describing information search is useful because it helps us to get an idea of what types of decision-making strategies people might be

using. For example, if people are doing a search that has them looking at all of one type of information for all options before going on to the next type of information (e.g., looking through all Résumés before going on to the Interviews), they may be using a primarily noncompensatory decision-making strategy. Alternatively, if they are looking at all information for one option (such as Candidate D) before going on to another option (such as Candidate C), it is possible that they are primarily using some sort of compensatory strategy. It is important to be able to distinguish between the strategies because a compensatory strategy allows the decision-maker to use high levels on one characteristic to compensate for low levels on another characteristic, while a noncompensatory strategy does not allow this freedom and may result in the elimination of different decision-making options.

Time. Another way to describe information search is in terms of amount of time spent on different information. For example, knowing that 12% of time was spent on Candidate D while 36% of time was spent on Candidate A gives the researcher an idea of which candidate the subject thought was more important to focus on, perhaps because the subject thought that the candidate was more interesting or because the subject thought that the candidate was more difficult to assess. Similarly, it is meaningful to know if 12% of time was spent on information of one type (e.g., HR Information) while 36% of time was spent on information of another type (e.g., Interviews).

Task Effects

Complexity. One of the aspects of a decision-making task most critical to the information search process is the complexity of the decision-making task. The number of options and the number of attributes are critical to the complexity of a task. Options are the possible choices in the decision (in PSS, the four candidates). Attributes are the different categories of information about the options (in PSS these are the Candidate Interview, Résumé, HR Information, Others' Opinions, and Search Firm Report). The number of options has been shown to be related to the choice of decision strategies (Billings & Marcus, 1983; Hjorland, 1984; Kersholt, 1992; Svenson, 1979) and to extent of search of the information available (Payne et al., 1993). Making a decision between two options is generally approached using a compensatory strategy and searching a lot of information about the two options, but making a decision between a number of different options often results in a noncompensatory strategy being employed and less depth of information search about each of the alternatives. Neither strategy is better than the other, they are just different ways of going about making a decision

between alternatives. This tendency is sensible as decision-makers can generally do a fairly thorough evaluation of two options, while they would be unable to thoroughly evaluate many more options simultaneously. Unfortunately, the largest number of options that can be handled before decision-makers alter their strategy from compensatory to noncompensatory has not been identified because people differ so widely in their ability to handle decision-making tasks (Payne et al., 1993).

The number of attributes on which there is information available also affects the decision-making process (Hjorland, 1984; Kersholt, 1992; Svenson, 1979). There appears to be a finite limit to the amount of information decision-makers can process about any given alternative. When there is too much information available, decision-makers get overloaded and are unable to process all available information. As the amount of available information goes up, decision-makers limit their information acquisition either through eliminating options based on one attribute (Elimination by Aspects Strategy), by not considering the relative importance of the different attributes (Equal Weight Heuristic), or by simply reducing the amount of information to which they attend (Payne et al., 1993).

Making a decision between two options with two quantifiable attributes is a fairly straightforward task. As is the case in PSS, making a decision among four candidates who are qualitatively different (male/female, black/white, U.S./non-U.S.), with five different attribute classes (Interview, Résumé, HR Information, Others' Opinions, and Search Firm Report), each with at least three attribute subclasses (for Résumé: Work History, Education, and Community Activities) is a much more difficult task.

Information Display. Information display has been shown to have a critical effect on how the information acquisition process will proceed. Bettman and Kakkar (1977) demonstrated that the acquisition of information is consistent with the presentation format. They found that when the information is presented primarily in relation to the options, people will do an option-based search. When the information is presented in terms of the attributes, people will do an attribute-based search. It is as if the presentation is giving the people a frame by which to evaluate the information, and the people are unlikely to change that frame and look at the information in a different way. In PSS, the layout suggests an option-based search rather than an attribute-based search, because the focus of the base screen (see Appendix A) into which the subject enters is on the candidates. This set-up was initially chosen because it was easy for subjects to understand. In the base screen both the list of the candidates and the list of information categories (attributes) appears.

The list of information categories is horizontal across the top, and the list of candidates is vertical up from the bottom of the screen (see Figure 1, p. 5). However, as soon as the decision-maker enters a screen for a candidate, all other candidates disappear, though all information categories are still listed at the bottom of the screen. This means that the subject is in effect encouraged or induced (though not specifically directed) to look through the information one candidate at a time simply through the physical structure that presents the information. To look at information about a different candidate, the decision-maker must decide explicitly to call up all of the candidates' pictures, and from there move to the other candidate. In this way serial searches (within candidate) are facilitated, while parallel searches (within category, between candidate) are hampered. It is possible to look by technique through the candidates, but it requires much more work and movement on the part of the participant. A screen design in which a grid simultaneously displays all candidates and all techniques would be more encouraging of search patterns other than serial.

Individual Differences, Personality, and Search

The information search itself may also be affected by a wide variety of individual differences. For example, it has been shown that attributional complexity (Murphy, 1994), need for cognition (Verplanken, 1993), decisional framing (Pinkley, Griffith, & Northcraft, 1995), age (Johnson, 1990), decision strategy (Stokmans, 1992), and knowledge (Devine & Kozlowski, 1995) all affect information search. There has also been some suggestion that both demographic characteristics and personality would affect information search (Payne et al., 1993). We therefore decided to examine the three different searches (search strategy, candidate search, category search) to see if particular individual differences collected during LAP affected the searches. The individual differences included in this research include age, sex, country of origin, race, level in home company, and highest degree obtained. Sex, country of origin, and race have not been shown in the past to affect information search but were included because of some arguments that effects are anticipated (Payne et al., 1993). Age has been shown to affect information search (Johnson, 1990). There were no direct measures for either need for cognition or for knowledge, but it is hoped that highest degree can be used as a proxy for need for cognition in some form, and that level in the company can serve as a proxy for knowledge about the business. Search strategies were also evaluated to determine whether people who reach the design solution in

PSS had a search strategy that was different from those who did not reach the design solution.

Heuristics and Biases. In addition to information display and other task characteristics, individual differences also affect how information is searched. People are generally affected by a variety of conditions during their decision-making process. Personal orientations and beliefs can have a critical effect on how information is searched, perceived, understood, and processed. For example, an executive selection team member from marketing may believe that the selection should be made in large part based upon the executive's understanding of the needs of the marketing department to sell and therefore make money for the company. On the other hand, an executive selection member from research may believe that the position requires that the executive selected understand and appreciate the needs of the research department, which is creating those products that the marketing department sells. Though both members would probably agree that each position has merit and that the executive should understand both points of view, each will inevitably look at the executives being evaluated through their own lens (London & Sessa, 1999). Their different perspectives, which can be called biases, will affect how they see and hear and understand the information they are given, as well as actually affect what they take in during the decision-making process.

Personality. Another individual difference that may affect both the search process specifically and decision-making in general is personality. Though Payne (1976) talked about potential effects of demographic differences such as sex and race, one aspect of difference among participants that he did not talk about was personality type.

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