"THINKING ABOUT YOUR FUTURE JOBS OR CAREER: A QUESTIONNAIRE": SURVEY METHODOLOGY AND RESULTS

FOR *INTOCAREERS*, SPRING 2002

JOB CHARACTERISTICS IMPORTANT TO KNOW
JOB CHARACTERISTICS DEFINITELY DON'T WANT
JOB CHARACTERISTICS MOST IMPORTANT

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INTRODUCTION

The University of Oregon *INTOCAREERS* program contracted with the University of Oregon Survey Research Laboratory (OSRL) to identify the job characteristics for *INTOCAREERS'* software that would allow users to most efficiently sort through thousands of potential jobs and occupations. OSRL designed and conducted this pilot study in order to answer one basic question:

> **To what extent do certified career counselors' opinions and assessments of job characteristics "most important" to high school students match high school students' opinions and assessments of job characteristics "most important" to their future jobs or careers?**

If they match well, career counselors' opinions can be used to guide *INTOCAREERS*' software development; if not, a larger and more complex data collection effort will be required to measure students' assessments, as well as counselors'.

Working closely with the *INTOCAREERS*' representatives Dan Erdmann and Caryn Stoess, OSRL planned, designed, pretested, and printed a self-administered questionnaire to determine the extent of match between students' and counselors' assessments of 50 job characteristics.

OSRL implemented a mail-out / mail-back procedure to dispense the questionnaire to certified high school career counselors in Oregon. *INTOCAREERS* arranged for two Oregon high schools to dispense the same questionnaire to high school students in classrooms and career centers. OSRL entered the questionnaire data into a computer

program and analyzed the results to assess the extent to which students' and counselors' assessments matched.

This report summarizes the pilot study's survey methodology and results.

SURVEY METHODOLOGY

This section describes OSRL's development and implementation of the self-administered questionnaire required to collect data for this pilot study.

SURVEY INSTRUMENT

The survey instrument resulted from an intensive meeting with Dan Erdmann and Caryn Stoess to identify key concepts and areas to investigate. They chose 50 typical job characteristics and provided narrative descriptions of what those job characteristics might mean in everyday life on a job. OSRL incorporated these into a self-administered questionnaire designed to test the underlying research question.

The final instrument displayed the following information and questions for each of 50 job characteristics:

- Short job characteristic titles, such as "prestige" and "independence";
- A brief description of "What this may mean in real life on the job". For example, the prestige and independence descriptions were: "Workers in some jobs are admired, honored, and respected by people in their organization or community" and "Some jobs allow workers to do their tasks in their own way with little direction. In other jobs, supervisors tell workers what to do".
- A yes/no question about each job characteristic's importance. For example, the prestige and independence questions were: "When exploring jobs or a career, is it important for you to know whether people consider a job prestigious?" and "When exploring jobs or a career, is it important for you to know how much independence workers have?".
- For those who answered "yes", a follow-up question asked "How important is it to you?" with answer categories "very important" and "somewhat important".
- The final item for each job characteristic was a check box that allowed respondents to indicate if they "definitely do not want [that job characteristic] in a future job or career."

At the end, the questionnaire asked respondents to choose the two most important of the preceding 50 job characteristics: "If you could have any job or career you wanted, which *two* job characteristics from those above would be the most important to you?" Also, an open-ended question asked "Are there any other job characteristics important to you which we did not list above?"

OSRL staff pretested the questions for clarity, accuracy, validity, and variability of response. They also pretested the entire instrument for flow, comprehensive-ness, length, and factors which affect respondents' cooperation and attention. All items in the questionnaire were custom and original, i.e., created and tested by OSRL for this study only.

The questionnaire introduced and framed the study in this way:

> *"As you approach the end of high school, your school teachers and career center are urging you to think about the kinds of jobs or careers you might want in the future. The University of Oregon creates much of the career counseling computer software that high schools use all over the United States. As the economy changes, career counseling must adapt. Before adapting the software, we first need to find out:*
>
> ***"What job characteristics are most important to high school students?*** *When you think about which job or career best suits your talents, drives and skills, what do you think about first? When you sit in front of a computer at the career center to try to figure out future possibilities, what do you want to be sure you will not forget? What features of jobs and careers do you want the most? What features of jobs and careers do you wish to avoid?*
>
> *"This survey aims to gather systematic information to answer these questions. UO's INTOCAREERS program and Oregon Survey Research Laboratory (OSRL) have partnered for this survey. Your high school career counselors have volunteered to help. Your participation will importantly influence how high school career guidance software will be structured in the future…"*

The introduction went on to explain the expected length of the task, guarantee students anonymity, tell respondents why their participation was important, and explain how to return the completed questionnaire. Section 5 of the three-ring report binder provides a specimen questionnaire.

To conserve resources, a single questionnaire was used for both students and counselors. Counselors' mail-out package included a cover letter guaranteeing confidentiality and instructing them to answer in terms of "***Which job characteristics are most important to your <u>average</u> high school student?***" See Section 5 for facsimiles of the mail-out materials, which were personalized for each counselor.

INTOCAREERS approved the final version of the self-administered questionnaire and mail-out materials. OSRL obtained human subjects approval from the University of Oregon Committee for the Protection of Human Subjects.

HIGH SCHOOL CAREER COUNSELOR SAMPLE

INTOCAREERS supplied the names and addresses of 65 Oregon high school career counselors. One newly hired counselor identified herself to OSRL and was added her to the list, resulting in a final N = 66.

OSRL's mail-out / mail-back procedure for implementing the counselors' self-administered survey comprised a carefully timed sequence of mailings:

1. OSRL created and mailed a cover letter, questionnaire, and postage-paid return envelope to each counselor. Since *INTOCAREERS* provided mostly workplace addresses for counselors, we mailed these on a Tuesday March 12th for receipt at counselors' school mailboxes on Thursday or Friday.[1] This timing intended to allow counselors to take home the questionnaire over the weekend to complete.
2. Exactly one week later, OSRL mailed each counselor a follow-up postcard, which simultaneously thanked those who had already returned their questionnaire and urged those who did not to do so soon.
3. Three weeks after the initial mail-out, OSRL mailed non-respondents a second copy of the mail packet, with a more strongly worded cover letter urging participation.

OSRL set the cutoff date for receipt of completed questionnaires to Tuesday April 23, about six weeks after the initial mailing. OSRL developed internal mail-out and return-receipt protocols for tracking and processing counselor questionnaires.

[1] Note: The sample cover letter in Section 5 is dated March 5th. Due to delays in receiving human subjects approval, the questionnaire could not be mailed on that intended date. OSRL reprinted the personalized cover letters with the actual mail-out date.

Of the population of 66 certified Oregon high school career counselors to whom OSRL mailed questionnaires, 41 returned them by the cutoff date, resulting in a 62% response rate. Three counselors returned the questionnaire but refused to complete it, resulting in a 5% refusal rate. In telephone calls to OSRL and in notes attached to blank questionnaires, counselors' main reason for not completing the task was that they "have no average students". In other words, without a high school student in mind, they found the task impossible. In the end, 38 usable career counselor questionnaires were available for data analysis.

HIGH SCHOOL STUDENT SAMPLE

Dan Erdmann from *INTOCAREERS* met personally with the local school district's high school career counselors, explained the pilot study, and secured participation of two. He personally delivered the printed questionnaires and colorful, sealed drop boxes to the high schools.

The two volunteer teachers and career counselors administered the questionnaires to high school students. The career counselors either distributed questionnaires in their career classrooms and career centers, or set them out for students to complete in their spare time. Volunteer students completed the questionnaires anonymously.

While we anticipated receiving 400 to 500 completed student questionnaires over approximately one month, OSRL actually received just 157. Dan Erdmann delivered to OSRL two sealed drop boxes containing the high school students' completed questionnaires for data entry.

DATA ENTRY AND PROCESSING

To facilitate accurate and expeditious data entry, Project Director Tony Silvaggio programmed the survey instrument into OSRL's computer-aided telephone interviewing (CATI) system and staff members pretested it.

Upon receipt of returned questionnaires, an editor reviewed each one. The editor checked off counselors from the mailing list. The editor sequentially numbered each returned student questionnaire. Before giving the returned questionnaires to coders, the editor examined each one for potential problems to ensure consistent resolutions.

Specially trained OSRL coders accomplished data entry in CATI. Data entry took place within one day of OSRL receiving each counselor's returned questionnaire and within two to three days of receiving the batches of student questionnaires.[2]

As coders entered the data, the CATI program automatically eliminated out-of-range responses and wild codes by validating each response interactively and not allowing inappropriate responses to be entered. Coders recorded no identifying information from the questionnaire data, to ensure counselors' absolute confidentiality. Since the student questionnaires were anonymous, no special steps were required to protect their identities.

SAMPLE AND SAMPLING ERROR

This pilot study's purpose was primarily descriptive – to determine whether differences existed between career counselors' and high school students' assessments of job characteristics when students explore jobs and careers. For this reason, a rigorous assessment of sampling error is unnecessary. Nonetheless, we present it below in the interest of thoroughness and to lay the groundwork for a future, more rigorous study.

With its very good response rate, despite being a difficult task, the career counselors' sample can be considered generalizable to the population of certified Oregon high school career counselors.

Survey sampling errors are calculated to assist data users in assessing how much confidence to place in a particular survey result. Large random samples reduce sampling error. Results for survey questions in which there is low variability also have less sampling error; for example, a variable with a 50/50 proportional split has wider confidence intervals than a variable with a 5/95 proportional split.

For a population of N = 66, the number of completed questionnaires needed to achieve 95% confidence intervals is 56. For this pilot study of n = 38, the sampling error is $\pm$10.4 percentage points on a variable with a 50/50 proportional split (at the 95% confidence level). This means that the true population value lies between 39.6% and 60.4%. For a variable with a 5/95 proportional split, the sampling error is $\pm$4.5 percentage points, meaning that the true population value lies between 45.5% and 54.5%.

[2] In the latter half of 2002, OSRL will implement advanced scanning software to accomplish data entry from self-administered questionnaires.

The high school students' sample, however, is strictly a sample of convenience. The results from it are not generalizable to any known population and are used here for descriptive and exploratory purposes only.

SURVEY ANALYSIS AND RESULTS

To answer the basic research question (To what extent do certified career counselors' opinions and assessments of job characteristics "most important" to high school students match high school students' opinions and assessments of job characteristics "most important" to their future jobs or careers?), we present this pilot study's results in several ways.

Section 2 of the three-ring binder provides embedded "topline" frequency results for all items in the questionnaire across both samples. Section 3 contains respondents' narrative answers to open-ended questions; these include job characteristics important to respondents that were not among the 50 provided as well as marginal notes from respondents. Section 4 presents cross-tabulations of each question by respondent type, counselor or student, with chi squares to assess the significance of any differences observed.

To analyze the survey results, we used two basic tools: crosstabulations and t-tests. We begin by describing both.

CROSSTABULATIONS

Crosstabulations simultaneously cross-classify respondents' answers to two survey questions, an independent and a dependent variable. In this case, respondent type (student or counselor) is the independent variable, which is used to cross-classify each survey question, the dependent variables.

Section 4 of the three-ring binder provides detailed crosstab results for each of the 50 job characteristics. The first set summarizes the results for job characteristics' importance. The second set summarizes results for "definitely not wanting" certain job characteristics in a future job or career. The third set summarizes results for the "most important" job characteristics.

To simplify analysis and presentation of results, we recoded the two "importance" questions for each job characteristic into one. Respondents were first asked if an item was important, "yes" or "no". If they answered "yes", a follow-up question asked if it

was very important or somewhat important. We combined these two questions into a single variable, indicating: 1 = "not important", 2 = "somewhat important", and 3 = "very important".

The crosstabulation results include counts and percentages for each column. The first column shows counselors' results and the second column shows students' results. These enable readers of this report to see how many counselors and how many students assessed each job characteristic as "not important", "somewhat important", and "very important". The crosstabulations also enable readers to quickly see how many do not want certain job characteristics in a future job or career. Note that the counts (n's) vary somewhat across the "importance" crosstabs by the number who checked "I do not want this in a job" and by the number who skipped a question.

Pearson's chi square tests of significance follow each crosstabulation in Section 4. They indicate whether each crosstab's results show significant differences between students and counselors. The actual values of Pearson's chi square are less important to examine than their asymptotic significance levels. For the latter, a value of .05 or less indicates a significant difference between groups. However, the vastly different sample sizes for students (n = 157) and counselors (n = 38) hamper the ability of Pearson's chi square to achieve significant results. For this reason, we also separately present "nearly significant" results, i.e., chi square values of greater than .05 but less than .10.

T-TESTS

After recoding the two "importance" variables for each of the 50 job characteristics, we also conducted t-tests to assess the significance of differences between counselors and students. T-tests treat the recoded importance variables as continuous variables (whereas chi square tests treat them as categorical variables). T-tests add to this analysis by taking into account the variation in respondents' answers.

We first conducted Levene's test to ascertain whether to apply t-tests which assume equal variances between students and counselors or to apply t-tests which assume unequal variances between the two groups. We intertwine t-test and crosstab results in the analyses below. Due to the complexity of interpreting the t-test results, we do not provide them in the three-ring binder, but they are available on request. Instead, we present the t-test results in a summary, narrative manner below.

RESULTS FOR "WHAT JOB CHARACTERISTICS ARE IMPORTANT TO KNOW"

In this section we summarize the results of high school students' and career counselors' answers to questions about which of 50 job characteristics are important for students to know when exploring jobs or a career.

The crosstabulation results show significantly different chi square values ($p \leq .05$) between counselors and student on eight items and "nearly significant differences on seven more items. These are listed below, in order from most-to-least significant. Commentary beside each item explains the nature and direction of the largest differences observed.

- Checking accuracy ($p < .01$); 33% of students said this was "not important" compared to 58% of counselors, and 22% of students said this was "very important" compared to 3% of counselors.
- Indoors *vs.* outdoors ($p < .01$); 27% of students said this was "very important" compared to 43% of counselors, and 27% of students said this was "not important" compared to 3% of counselors.
- Working with children ($p = .01$); 31% of students said this was "somewhat important" compared to 52% of counselors, and 35% of students said this was "not important" compared to 9% of counselors.
- Conditions of the work environment ($p = .026$); 69% of students said this was "very important" compared to 44% of counselors, and 8% of students said this was "not important" compared to 15% of counselors.
- Variety ($p = .028$); 56% of students said this was "very important" compared to 31% of counselors.
- Health and safety ($p = .029$); 50% of students said this was "very important" compared to 35% of counselors.
- Maintaining and repairing things ($p = .033$); 19% of students said this was "very important" compared to 33% of counselors, and 41% of students said this was "not important" compared to 18% of counselors.
- Plants, animals and nature ($p = .036$); 42% of students said this was "very important" compared to 19% of counselors.

Nearly significant results ($p > .05$ and $\leq .10$) were found for these seven items:

- Responsibility (p = .059); 62% of students said this was "very important" compared to 47% of counselors, and 8% of students said this was "not important" compared to 22% of counselors.
- Amount and kind of travel (p = .069); 57% of students said this was "very important" compared to 35% of counselors.
- Accuracy and details (p = .070); 48% of students said this was "very important" compared to 32% of counselors.
- Working with abstract ideas (p = .076); 29% of students said this was "very important" compared to 16% of counselors, and 28% of students said this was "not important" compared to 48% of counselors.
- Resolving conflict and negotiating (p = .084); 25% of students said this was "not important" compared to 44% of counselors, and 47% of students said this was "somewhat important" compared to 32% of counselors.
- Using science (p = .087); 57% of students said this was "not important" compared to 41% of counselors.
- Analytical thinking (p = .105); 38% of students said this was "very important" compared to 20% of counselors.

T-test results showed that counselors and students differed significantly ($p \leq .05$) on 18 of the 50 items (36%). An additional six items approached significance (18%). The t-test results closely matched the crosstab results. All items that showed significant crosstab results also showed significant t-test results. All but one item on the "nearly significant" crosstab list also showed significant t-test results.

The following 14 items showed both significant t-test differences and significant chi squares: checking accuracy; indoors vs. outdoors; working with children; work conditions; variety; health and safety; maintaining and repairing things; plants, animals and nature; responsibility; amount and kind of travel; accuracy and details; working with abstract ideas; using science; and analytical thinking. The only item that did not emerge with a significant t-test was "resolving conflict and negotiating". Given the sheer number of tests conducted, this could have occurred by chance alone.

Importantly, four items showed significant t-test results that did <u>not</u> show significant chi square results, namely: community service; whether a job uses math; length of training; and income and pay. This indicates that the variation, or distribution of results, was meaningfully different between students and counselors on these items.

Below we describe the crosstab results for these four additional job characteristics. We present Pearson's chi square asymptotic significance levels in parentheses. Where they add new information, we also present the likelihood ratio's asymptotic significance levels in parentheses.

- Community service (p = .18); 37% of students said this was "somewhat important" compared to 53% of counselors, and 35% of students said this was "not important" compared to 24% counselors.
- Whether a job uses math (p = .17); 37% of students said this was "very important" compared to 55% of counselors, and 23% of students said this was "not important" compared to 15% of counselors.
- Length of training (p = .23; likelihood ratio p = .17); 65% of students said this was "very important" compared to 76% of counselors, and 10% of students said this was "not important" compared to 3% of counselors.
- Income and pay (p = .15; likelihood ratio p = .055); 73% of students said this was "very important" compared to 86% of counselors, and 7% of students said this was "not important" compared to zero counselors.

In sum, the t-tests added four more items to the list of important job characteristics that are significantly different between students and counselors. The t-tests also removed one item that was marginally significant to begin with. Therefore, in all, 18 of the 50 items (36%) that high school students answered about job characteristics important to know when they explored jobs or a career differed significantly from what career counselors' answered on their behalf.

RESULTS FOR "DEFINITELY DO NOT WANT THAT JOB CHARACTERISTIC"

The third question for each job characteristic was a check box that respondents marked if they definitely did not want that job characteristic in a future job or career. Since these were truly categorical variables, only crosstabulations were calculated. The results (beginning on page 26 of Section 4) showed just three significant differences between students and counselors. These are described below.

- Information gathering (p = .009); 20% of students said they did not want this in a job, but just 3% of career counselors said they would not want it.
- Working with children (p = .016); 18% of students said they did not want this in a job, but just 3% of career counselors said they would not want it.

- Operating vehicles (p = .025); 27% of students said they did not want this in a job, but just 10% of career counselors said they would not want it.

Six other crosstab results in this series could be described as "near significant", namely:

- Coaching (p = .06); 13% of students said they did not want this in a job, but 3% of career counselors said they would not want it.
- Accuracy and details (p = .08); just 10% of students said they did not want this in a job, but 21% of career counselors said they would not want it.
- Caring for people (p = .09); 19% of students said they did not want this in a job, but just 8% of career counselors said they would not want it.
- Teach others (p = .09); 11% of students said they did not want this in a job, but just 3% of career counselors said they would not want it.
- Activity (p = .11); 6% of students said they did not want this in a job, but no career counselors said would not want it.
- Stress (p = .12) 18% of students said they did not want this in a job, but just 8% of career counselors said they would not want it.

Thus, in all but one case, career counselors under-estimated what high school students did not want in a job.

RESULTS FOR "JOB CHARACTERISTICS MOST IMPORTANT"

At the end, the questionnaire asked respondents "If you could have any job or career you wanted, which *two* job characteristics from those above would be the most important to you?" We coded these open-ended answers to match the code categories of the preceding 50 job characteristics.

Few items showed double-digits. By this point in the questionnaire, many respondents seemed exhausted, for fully 24% left "most important" blank and 25% left "second most important" blank.

On just one item did high school students and career counselors agree upon for both "most important" and "second most important" - namely, "income and pay". Fifty-four percent of counselors and 20% of students chose income and pay as most or second-most important. Other items that counselors and students agreed upon were independence (15% of counselors, 8% of students), responsibility (10% of counselors,

8% of students), think creatively (10% of counselors, 8% of students), and prestige (8% of counselors, 2% of students).

In a reverse manner, however, high school students and career counselors agreed on a dozen job characteristics as being "not most important". That is, the items in the first column of Table 1 were checked neither by high school students nor by career counselors as "most important" if high school students could have any job or career they wanted. Similarly, high school students and career counselors agreed that another dozen job characteristics were "not second most important". Interestingly, five items in this group of 12 overlapped the first group of 12; they are bolded in the second column of Table 1.

TABLE 1: JOB CHARACTERISTICS LISTED NEITHER "MOST IMPORTANT" NOR "SECOND MOST IMPORTANT" BY STUDENTS AND COUNSELORS

Not "Most Important"	Not "Second Most Important"
Check accuracy	**Check accuracy**
Information gathering	Enterprise
Maintain and repair things	**Information gathering**
Manual dexterity	**Maintain and repair things**
Operate machines	**Manual dexterity**
Physical activity	Math
Prestige	**Operate vehicles**
Provide advice & consultation	Operate machines
Reading	Organize
Resolve conflict & negotiate	Problem solving
Shift work	Sell things
Work with abstract ideas	Supervise

Note: Bolded items in the second column duplicate items in the first column.

The results also show six job characteristics that counselors thought would be most or second-most important to students, but no students selected them at all. These were advancement opportunity, annual job outlook, communication, community service, length of training, and long-term job outlook. Fully six counselors chose length of training as second most important, and no students chose as either most or second most important.

On the other hand, three or more students chose a dozen job characteristics as most or second-most important, but no counselors selected them at all. These were activity,

artistic, care for people, health and safety, indoors vs. outdoors, stress, supervise, travel, urban or rural, variety, work conditions, and work with abstract ideas.

CONCLUSIONS

This research began with an overarching research question: "To what extent do certified career counselors' opinions and assessments of job characteristics most important to high school students match high school students' opinions and assessments of job characteristics most important to their future jobs or careers?"

The pilot study's results revealed differences between career counselors' and high school students' assessments of job characteristics, and those differences are both statistically and substantively significant. Summarizing,

- Between 16% and 30% of the job characteristics high school students said were important for them to know when exploring jobs differed significantly from counselors' opinions of what the "average" student would say.
- Career counselors missed between 6% and 18% of job characteristics high school students did not want in a job, and they consistently under-estimated the degree to which students did not want them.
- Career counselors accurately assessed just one job characteristic that students would think most important in a job and, by exclusion, they accurately determined five job characteristics that high school students did not view as most important. Nearly all job characteristics that counselors thought would be most important did not match students' choices.

The wide array of differences in counselors' and students' assessments indicates that counselors and students assess job characteristics quite disparately. These differences further suggest that career counselors cannot adequately report students' assessments.

Our interpretation must not ignore, however, counselors' anecdotal complaints about the nature of the survey task, which asked them to speak on behalf of the "average" student. If the questionnaire had asked counselors to predict specific students' assessments, or specific types of students' assessments, their reports may have been more accurate. Only further research can determine if this supposition is true.

Importantly, the degree to which career counselors are "in touch" with high school students is not this pilot study's primary concern. However, counselors will continue to

mediate students' interactions with career-related software even if they remain out of touch with the students using it. Because of this, further research might examine how counselors' differing approaches to students' job and career exploration inhibit or interfere with students' own approaches.

The differences between high school students and their career counselors revealed by this pilot study are substantial enough to warrant separate future data collection endeavors for the two groups, using distinct instruments. For example, this pilot study suggests that a new instrument for career counselors should provide vignettes or stories about different types of students, instead of asking about the "typical" or "average" student. A new students' instrument could continue to be designed to elicit what they find important in exploring jobs and careers; however, on the basis of the findings reported above, the instrument could be shortened to fewer than 50 job characteristics.