AN ABSTRACT OF THE THESIS OF

Amanda Steiner for the Master of Science

in Psychology presented on December 10, 2012

Title: Training Needs Assessment for Graduate Training in I/O Psychology: What KSAO's Employers Desire When Hiring an I/O Psychologist

Abstract approved:

This study investigated the competencies that are required in most Industrial/Organizational Psychology jobs. The Society for Industrial/Organizational Psychology has guidelines for graduate programs to follow, yet little research is done to see if these guidelines fit the skills that are actually required to perform the job. Participants were 96 individuals from organizations that had hired I/O Psychologists. Surveyors were mailed a survey created from former studies by Wesolowski and Field (1987) and Blakeney, et al. (2002), the SIOP guidelines, as well as items I added to measure competencies needed in I/O Psychology. Results indicated that traditional human resource areas were highly rated. Since 1987, there has been an increase in the importance of leadership. There are some differences in what knowledge is expected to be known in master's and doctoral positions, as well as different industries. Statistical knowledge still is very important to all types of positions. Some aspects of research/measurement skills are quite important in a job, while others were rated low. SIOP lists business development skills as optional, it was found that they are quite important for the job.

TRAINING NEEDS ASSESSMENT FOR GRADUATE TRAINING IN I/O PSYCHOLOGY: WHAT KSAOS EMPLOYERS DESIRE WHEN HIRING AN I/O PSYCHOLOGIST

_____

A Thesis

Presented to the Department of Psychology

EMPORIA STATE UNIVERSITY

_____

In Partial Fulfillment

of the Requirements for the Degree

Master of Science

_____

by

Amanda Steiner

December 2012

Approved for the Department of Psychology

Approved by the Dean of the Graduate
School and Distance Education

ACKNOWLEDGEMENTS

I would like to thank my committee members: Dr. Brian Schrader, Dr. Thomas Slocombe, and Dr. George Yancey. Special thanks to my thesis chair, Dr. Yancey, for all his help and patience. Lastly, I would like to thank my friends and family for all their support and encouragement.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF TABLES (continued)

LIST OF TABLES (continued)

CHAPTER 1

REVIEW OF THE LITERATURE

Introduction

Today the curricula of Industrial/Organization Psychology graduate programs are ostensibly under the guidelines set in place by the Society for Industrial and Organizational Psychology (SIOP). These guidelines are really just suggestions, allowing each program to set up its own curriculum. SIOP has various competencies that are suggested to be taught, as well as suggested methods about how to go about teaching them. Master's and doctoral guidelines differ slightly, but overall they are very similar. The way students gain their skills may be different from one program to another. Some institutions require a thesis or dissertation. Others require an internship or a practicum. Other programs provide opportunities for students to participate in applied projects and consulting work.

To improve an existing program or before creating a new program, it is a good idea to conduct a needs assessment. After students are finished with their industrial/organization psychology graduate program, various studies (Erdwins & Buffardi, 1983; Vodanovich & Piotrowski, 1999; Erffmeyer & Mendel, 1990) have looked to see how well the competencies gained by the students in graduate school correspond with their current job duties. A needs assessment can help identify and clarify a program's goals for how to prepare students for life after graduate school. What human resource needs do our society's institutions have that Industrial/Organizational Psychology students can help them meet? By finding out the answer,

Industrial/Organizational Psychology graduate programs will be able to better prepare their students to compete in the job market and to make our institutions better.

History of Industrial/Organizational Psychology Graduate Programs

The American Psychological Association (APA) was formed in 1892 (Katzell & Austin, 1992). Out of the APA, bloomed Industrial/Organizational (I/O) psychology. I/O Psychology started out as Industrial Psychology between 1900 and 1905. It was first named industrial psychology by W. L Bryan, who mistakenly used the term industrial instead of individual. Industrial Psychology was created out of experimental psychology, differential psychology, and industrial engineering (Muchinsky, 2009). Hugo Munsterberg and Walter Dill Scott are seen as two founding fathers to the field. They were some of the first psychologists to propose test validation. From 1900 to World War I came many advancements. There were developments in measuring tools that helped identify individual differences. Progress was made in statistical techniques, such as simple and partial correlations, and regression. The use of case studies increased as well as the use of tests to study mental ability (Katzell & Austin, 1992). While various psychologists made great strides in promoting industrial psychology in the early years, the one event that really advanced the field was World War I (Muchinsky, 2009). This was the first time psychological testing was used on a large scale. The Army Alpha and Beta tests were developed to test troop's mental ability. The first research on vocational interests also took place (Katzell & Austin, 1992).

Between World War I and World War II, the first Ph.D. in Industrial Psychology was awarded in 1921 at Carnegie-Mellon. Psychological applications that were developed for the army were then used in the private sector, and consulting firms were

formed (Katzell & Austin, 1992). James Cattell formed the Psychological Corporation, which is still around today as a major test publisher. The Dictionary of Occupational Titles (DOT) was also created, and was still in use until about ten years ago, when it was replaced with the Occupational Information Network (O*NET). The Hawthorne studies were conducted at this time as well at the Western Electric Company plant. Scientific research was used to study and improve the efficiency of workers (Muchinsky, 2009).

It was also during this time between World War I and World War II that more Industrial Psychology graduate programs started popping up, but at a slow pace. In 1920, it was estimated that only 18 Industrial Psychologists existed, and that number was only 50 by 1929. In the 1920s, there were four institutions that had doctoral programs in Industrial Psychology. Much of the training was not specific and allowed the students to pick and choose their curriculum. Following 1930, five more universities developed Industrial Psychology graduate programs. Such programs were not structured the way they are today. Many students received their training in other areas of psychology. The formation of the American Association for Applied Psychology (AAAP) between 1937 and 1938 led to the growth of Industrial Psychologists, up to around 100 by 1939 (Katzell & Austin, 1992). Section D of the AAAP, Industrial and Business Psychology, was the main professional organization for Industrial Psychologists from 1937 until 1945 (Koppes, 2009).

When World War II came around, Industrial Psychologists were better prepared in the ways of testing and selection. Much work had been done between the two wars. Training methods were better, as well as appraisal methods and equipment design. Selection techniques had become more valid. These tools helped to integrate women into

the workforce. A large increase in graduate training followed World War II. Universities expanded their programs, and terminal master's programs were developed. Graduate training was still rather basic, but specialized Industrial Psychology courses were introduced. More programs were started and the number of faculty and students rose. The APA merged with the AAAP and in 1945, Division 14 for Industrial Psychology was formed by the APA (Katzell & Austin, 1992).

By 1960, Division 14 had 756 members (Katzell & Austin, 1992). Because of the civil rights movement, various laws were enacted, such as the Equal Pay Act or 1963, the Civil Rights Act of 1964, the Age Discrimination Act of 1967, and the Rehabilitation Act of 1973, to deal with inequities in the workplace based on race, color, gender, religion, national origin, age, and disabilities. These laws had a serious impact on the field of Industrial Psychology because employers were under greater pressure to ensure their employment practices were fair and valid. Motivation theories such as expectancy theory, equity theory, and goal setting theory were also developed around this time. Many more Industrial Psychology graduate programs were started and more attention was given to master's degrees. In 1965, Division 14 published guidelines for doctoral training. At this time it was argued that training was more of a scientist-professional model, and that core psychological areas were being ignored. Programs remained the same, with no change (Katzell & Austin, 1992).

In 1973, Division 14 of the APA changed its name to Industrial and Organizational Psychology. And then in 1982, the name was further changed to the Society for Industrial and Organizational Psychology (SIOP). Following the 1960s and 1970s, came the biggest growth in I/O Psychology graduate programs. By 1980, the

number of members of Division 14 was 2005. There were 88 doctoral programs in 1989, 46 offered doctorates in I/O Psychology, of which 42 were in organizational behavior, and an additional 26 programs offered a master's degree. In 1985, SIOP set the first guidelines for doctoral training programs consisting of 21 areas of competencies and five methods to achieve the competencies (Katzell & Austin, 1992). In 1994, guidelines for the education and training of master's programs were added. Today it is still SIOP that provides the guidelines for graduate training programs in I/O Psychology.

SIOP Guidelines for Graduate Training

As stated before, SIOP developed its own guidelines for training graduates in I/O psychology. In 1994, the latest set of guidelines was approved. SIOP developed the guidelines to help faculty plan and change the curricula of I/O psychology programs. There are guidelines geared toward Ph.D. as well as master's programs. While both are quite similar, there are differences as well. The master's level guidelines were developed out of the guidelines established for doctoral programs. The competencies suggested are nearly identical to those working toward a master's or doctorate. The differences between the two lie within the depth and breadth of the training. A master's requires fewer hours and therefore, will have varying educational content. Basic knowledge is expected from master's students, while advanced and high level comprehension should be demonstrated by doctoral students. The ratio of faculty members to student is typically lower in a master's program, which affects training. The competencies serve as suggestions for setting up the curriculum for a new program, not all programs will be the same or meet the guidelines completely. The path the student is on may affect the training he or she needs. Some students seek a master's degree and go to work following graduation. Other

pupils get a master's while on their way to earning a doctorate. According to Hays-Thomas (2000) there are four types of master's degrees in psychology. These four types of master's degrees are: the terminal master's degree prepares a student for employment. Research-oriented schools often prepare students to enter a doctoral program. There are those who earn a master's while earning a doctorate. And finally, some doctoral students cannot complete the training and are instead awarded a master's degree.

SIOP has organized competencies into categories. Category I includes competencies that anyone with a graduate degree in any psychology field should possess, and these are often obtained during the student's undergraduate studies. Knowledge of the history of psychology as well as of the various fields of psychology should be acquired. Data collection and analysis make up category II and includes statistics, data analysis, and research methods. The most relevant I/O Psychology competencies are covered in category III. These competencies in category III should receive the most coverage. There are twelve I/O Psychology core areas within category III, such as employee selection, work motivation, job analysis, etc. Category IV is made up of competencies that can be covered by other departments and are beneficial, yet are seen as optional. These five additional competencies include compensation and benefits, consumer behavior, industrial and labor relations, career development theory, and human performance or human factors. There are many competencies needed for a student to be successful. These tend to be generic to all graduate programs, and, therefore are not included in the SIOP guidelines. SIOP maintains that the guidelines allow flexibility to those who develop the curriculum, and focus on what should be taught and learned

To acquire these competencies, SIOP delineates five ways for students to learn. In the university setting, formal course work is most common. This can be delivered in the way of lectures, presentations, papers, etc. Working independently can also elicit learning, whether it is reading, creating projects, or other various instructions outside the classroom. Another form of instruction outside the classroom is supervised experience where the student is advised by qualified personnel. Such situations include practica and internships in which the student would receive training and gain skills in a situation where there often is not compensation. A more hands on approach to learning would be on-the-job training. This also takes place outside the classroom. The student receives instruction from an expert and has the opportunity to actually do the job and receive pay at the same time. Modeling or observation serves as the last form of teaching. Also outside of class, a qualified member of personnel models the particular behavior for the student to learn.

Problems with the guidelines. SIOP provides guidelines for the content of a program, but these guidelines can make developing a program more difficult. The core psychological domains are simply suggestions that all students with a psychology degree should have. Administrators setting up a master's program are faced with the difficulty of deciding how many and what type of core courses to include (Nagy, Schrader, & Aamodt, 2005).

Compared to a doctoral program, master's degrees require fewer hours. It is unclear which classes should be taken before starting a graduate program and which classes should be taken after an undergraduate degree. It was found that 13 programs required five core psychological courses, while 12 programs required none (Nagy,

Schrader, & Aamodt, 2005). The same problems arise with the actual I/O Psychology classes. The number of core general psychology courses directly affects the number of I/O Psychology courses that can be offered. If more core general psychology course are required, the curriculum will end up with fewer I/O Psychology courses. SIOP offers suggestions of the types of classes to offer, but unfortunately these are guidelines, not requirements, and allow for great variability among programs. Nagy, Schrader, and Aamodt (2005) have explored this diversity. They found the range of I/O Psychology classes offered was two to 11, with the majority requiring five to six. Therefore, directors must choose which classes to include. To solve this problem, a course can be split in order to capture one competency for the first half a semester and another competency for the second half of a semester. Another solution is to teach one or two seminar classes that cover many of the core competencies in breadth and then complementing those classes with classes that cover a core I/O Psychology competency in depth.

The guidelines also lack clear and specific details on theses. Should they be required? If so, of what should a thesis be composed? The same issues arise for internships. The length, definition, and requirements are all left to individual programs, as well as supervision, compensation, and many other issues.

Because of the lack of clear directions from SIOP, the programs vary in their course content and their learning approaches. However, this may not be a bad thing for it offers variety for the consumer, but on the other hand, it requires the consumer to do more research because each program is somewhat unique.

Current Program Demographics

Each I/O Psychology program varies because faculties have their own interpretation of the guidelines. According to Erffmeyer and Mendel (1990), a typical master's program in I/O Psychology takes two years and is designed to prepare students for master's-level psychology work in a number of areas. Master's programs are growing faster than doctoral programs. From 1982 to 1989 there was a threefold increase in the number of master's programs (Lowe, 1993). Most programs admit 12 to 16 new students each year and have around 14 fulltime students. The number of part-time pupils varies. Doctoral programs typically admit fewer students and have fewer part-time students. It has been found that the student-faculty ratio is typically between 3:1 and 5:1. Many students in these programs work while earning their master's. Financial aid is more likely to be given to doctoral students. When it comes to admission, doctoral students have GRE scores 50 points higher, on average, than those working toward a master's. Most programs do not release minimum test scores. Undergraduate GPA is roughly the same for both types of students, usually above a 3.0 (Lowe, 1993).

Competencies Taught and Needed

Trahan and McAllister (2002) found that there was a significant difference in the amount of coverage among the groupings of competencies. SIOP suggests that research, statistical methods, and analyzing and collecting data be given priority, and that core I/O Psychology competencies be secondary. Trahan and McAllister found that data collection and analysis, as well as statistics and research methods are covered more significantly than other areas. The core I/O Psychology competencies laid out by SIOP (1994) include employment selection, placement, and classification; performance appraisal and

feedback; job and task analysis; training: theory, program design, and evaluation; work motivation; organizational development; organization theory; small group theory and process; attitude theory; criterion theory and development; measurement of individual differences, and ethical, legal, and professional contexts. Labor unions, consumer behavior, career development, and compensation should receive the least coverage. Research showed that those competencies seen as beneficial, but not core, were covered least (Trahan & McAllister, 2002).

Trahan and McAllister (2002) surveyed recent graduates from I/O Psychology master's programs in order to find out what competencies were most important in their current job. The two researchers wanted to expand on previous research done by Erffmeyer and Mendel (1990) by expanding the number of programs surveyed as well as using the 1994 SIOP guidelines. Practitioners identified training, job analysis, and selection to be the most significant competencies used after graduation. The other core competencies were rated as moderately important. Just as SIOP suggested, labor unions, compensation, and consumer behavior were found least important by former graduate students in their current occupation. For the most part, the competencies covered in the programs fit with the needs in a job. The only exception was the high emphasis on research and statistical methods. In most programs, this was covered the most, yet former students rated it as the least used in their job (Trahan & McAllister, 2002).

In another study (Wesolowski & Field, 1987), the researchers wanted to know about the competencies organizations expected of I/O Psychology recruits. Questionnaires were sent out to businesses that had hired I/O Psychologists or were planning to hire one within the next five years. Wesolowski and Field looked at

consulting and business organizations to see what types of I/O Psychology knowledge areas and I/O Psychology content areas they felt were important for applicants to know. I/O Psychology research areas were examined first. This was broken down into statistical issues and research and measurement issues, with each issue having sub-issues. Basic statistical concepts within statistical issues were seen as being very important for I/O Psychology recruits to know by both consulting and business organizations. Path analysis was rated as least important by both. Within research and measurement issues, businesses scored psychometric methods as most important followed by survey research methods, and test construction and usage. Consulting firms rated attitude measurement methods highest, followed by survey research methods, and psychometric methods. There was also a difference in the least important research and measurement issues among the organizations, with businesses rating personality assessment methods least important and consulting choosing research and experimental design as least important.

I/O Psychology content areas were also examined. It was found that businesses and consulting firms rated the content areas quite similarly. The two most important areas were personnel selection and placement, and performance appraisal techniques. Man-machine interaction was rated as the least important. The biggest concern the firms had was the candidate's lack of business skills. Some of the jobs were managerial positions and the participants felt that many of the recruits did not have all the business skills needed to perform well in these positions (Wesolowski, & Field, 1987).

Because I/O Psychology is similar to human resources (HR), a report on an HR curriculum was examined. Dooney, Smith, and Williams (2005) sent a survey to select members of the Society for Human Resource Management (SHRM). Members were

categorized into four groups; graduate students in HR-related programs, HR professionals, senior HR professionals, and academics teaching in HR-related programs. The researchers examined what knowledge, skills, and abilities (KSAs) each group felt was necessary for success in early, middle, and senior levels of HR careers. For the most part, all the groups were pretty similar in the KSAs they thought were important for success at various career levels. All four groups selected written communication skills, and interpersonal communication skills as being important in the early part of a career. A person in the mid-level of his or her HR career was expected to have KSAs in management of employees, and performance management, with the other top three differing among the groups. When it came to the senior career level, there was complete consensus among the groups for the top three KSAs: strategic human resource management, HR impact on mergers and acquisitions, and strategic business management and planning (Dooney et al., 2005).

Continuing with the Dooney et al. (2005) report, the four groups were asked to rate the perceived value of 25 HR graduate classes. For the most part, all groups rated the classes similarly, but there were a few differences. Graduate students felt classes had higher values than the other three groups. Strategic HR management and employment law were seen as most valued by all groups, with accounting and marketing rated as the least valued (Dooney et al., 2005).

Ryan and Sacket (1992) surveyed psychologists who were responsible for conducting individual assessments. Among these psychologists, professionals were identified as having either I/O Psychology graduate training or non-I/O Psychology graduate training, as well as having affiliation with SIOP or not. Essentially the

researchers wanted to see the differences in approaches and opinions in individual assessment. I/O Psychology professional assessors rated what areas of graduate training they found most important. Courses in assessment and diagnoses, interviewing, personality, management concepts, psychometrics, and counseling were found most important within his or her job while doing individual assessments. Job analysis and test design were seen as vital to only half of those surveyed (Ryan & Sacket, 1992).

In summary, it appears that SIOP's competencies are being used in jobs. Of the reviewed studies, data collection and analysis skills (i.e., research methods, and statistical methods and data analysis) are expected by employers and are being used by graduates in their current occupations. Other core competencies most used/required included employee selection, placement, and classification, job and task analysis, training, and measurement of individual differences. Within specific jobs the competencies varied somewhat, but for the most part these were the most common. It seems that if programs are following SIOP's guidelines, graduates should be well-prepared for the workforce.

Graduate Training Models for Psychology

When it comes to teaching, there are two common models for training in the field of psychology, the Boulder model (scientist-practitioner) and the Vail model (scholar-practitioner) (Bartels, Macan, Gutting, Lemming, & McCrea, 2005). Bartels et al. (2005) found that in 2004 there were 224 I/O Psychology programs listed on the SIOP website. Of these, 137 were of the scientist-practitioner model, 40 were mainly applied, 30 were research oriented, and 17 were identified as other. The Boulder model emphasizes clinical skills and research competencies, while the student works toward a doctorate in a university setting. Graduates are ready for work as a practitioner or in the academic

world. There were some clinical psychologists not happy with the Boulder model because too few research advances were being made and psychologists were not prepared well enough to practice, thus the Vail model was born. Such graduates receive a doctorate of psychology (PsyD) and may obtain their training at a professional school or university. Today some professional schools also award Ph.D.s. The Vail model focuses more on the applied aspects of psychology. This model is not a common trend in I/O Psychology where the Boulder model is preferred (Thompson, Garman, Horowitz, & Barr, 2005).

While most I/O Psychology programs are not modeled after the Vail model, one such program is at the Chicago School of Professional Psychology. The professional development courses focus on four areas: diversity training, research and writing skills, networking and professional integration, and self-awareness and interpersonal skills. Students who go through these courses are better able to relate to those of differing backgrounds and to build professional networks. Self-awareness skills allow these students to learn how to act in certain situations in order to achieve the best results. In order to gain these skills the students study real cases and undergo various simulated activities on which they receive feedback. Other ways students gain knowledge is through interactions. Students get to know other advanced I/O Psychology students as well as I/O Psychology professionals. This may be through projects, internships, or advice from classmates. Diversity is taught through articles outside of I/O Psychology, films, and experiential activities (Thompson et al., 2005).

The second semester of the program, students are introduced to the assessment center. Students are tested on the competencies of the program. Afterwards, each person is presented with feedback before starting an internship. The report is used to create an

action plan for the student. This is also advantageous for second year students because they are able to gain experience by conducting the assessment center (Thompson et al., 2005). Two internship courses are required. One prepares students for their first professional job. It gives students an opportunity to talk about their internships as well as discuss current challenges they may be facing. The second internship course is used to focus on the students' career goals. This is established through feedback systems. Going through 360 degree feedback allows the student to prepare for the transition into becoming a professional. The different types of feedback provide an assessment of the I/O Psychology program. At the end of the year the data can help identify areas that need changing (Thompson et al., 2005).

The Boulder model allows students to learn about scientific methods clinical skills. Students then have the opportunity to practice their research and clinical skills while being supervised by faculty. The majority of I/O Psychology program administrators identify their programs as fitting the scientist-practitioner model (Hays-Thomas, 2006).

Most I/O Psychology programs are created at the local level with no oversight by SIOP. To increase standardization, and perhaps quality of education, SIOP could require accreditation to ensure all programs are teaching what they should. However, Hays-Thomas (2006) argued that in a short two year program, it is difficult to include enough research training as well as experience. Therefore, maybe the Vail model is more practical (Hays-Thomas, 2006).

Theses and Dissertations

Beyond the work in the classroom, other projects such as a thesis or dissertation can be part of the I/O Psychology curriculum. When comparing I/O Psychology graduate programs to programs in organizational behavior/human resources (OB), Rentsch, Lowenberg, Barnes-Farrell, and Menard (1997) found a significant difference in thesis and dissertation requirements. At the master's level, 79% of the I/O Psychology programs required a master's thesis before moving on to a Ph. D., while only 10% of OB programs made a thesis mandatory. At the doctoral level, 86% of the OB programs required a dissertation and all of the I/O Psychology programs did (Rentsch et al., 1997). The master's thesis prepares a student for research projects that he or she may be required to perform on his or her job, such as test development and validation . While a thesis is required in many programs, Erffmeyer and Mendel (1990) surveyed former I/O Psychology students and found that they felt the thesis had little usefulness.

Both professors and students agreed it takes much time and effort to complete a thesis. For some students the task was so large that they never completed it (Erffmeyer & Mendel, 1990). In the cases where a student does not complete his or her thesis, the requirement is not fulfilled, and he or she does not graduate. Often, this is not because the student lacks the skills or talent, it is because of lack of time and lessening of interest. Some programs offer both a thesis and a non-thesis option (Rentsch et al., 1997).

There are advantages to completing a thesis, especially for students wanting to earn a doctorate. A thesis can be practice for a dissertation. Students learn the ways of research, and how to get it done smoothly. A thesis can be seen as a point of progress, as well as give an opportunity for publication (Law, 2004). Completing a thesis also is a

measure of a student's discipline, and commitment as well as his or her ability to complete a major project.

A thesis can be both bad and good, but as Nagy et al. (2005) pointed out, there is a lack of a clear definition on exactly what a thesis is or should be. SIOP guidelines do not specifically address the topic. Similar to the problems of choosing what courses to include in a program, program directors are left to make the decision as to whether a thesis should be required, and what it should entail (Nagy et al., 2005).

Work Experiences

Internships and Practicum. Beyond a thesis or dissertation, students can gain valuable skills through an internship or practicum. As stated earlier, there are no guidelines for I/O Psychology programs to follow in terms of training experiences. As early as 1965, internships were seen as being very desirable for gaining knowledge, but even then there was debate as to what the objectives should be, as well as over how to squeeze an internship into a two year program. Also, there was often a lack of qualified psychologists available to supervise the student interns (MacKinney, 1968). These issues persist to this day.

Each institution has its own policy on how students gain experience. One study, which was limited to scientist-practitioner programs, found that 88.3% of programs included supervised experience (internships, fieldwork, and/or practica) (Bartels, Macan, Gutting, Lemming, & McCrea, 2005). Another study with graduates of Pennsylvania State University found a practicum to be very beneficial (Lindsay, Tate, & Jacobs, 2008). For example, 97% of the participants found the practicum added important features to the I/O Psychology program and 87% thought the practicum helped them see challenges that

faced I/O psychology practitioners. Regarding job skills, 87% of those surveyed felt they learned skills that were beneficial to the job market. Not only was the practicum seen as a way to gain job skills, but also a way to gain I/O Psychology core competencies. Of those surveyed, 100% believed the practicum increased their competency in the areas of personnel recruitment, selection placement, classification, and statistical and data analysis. Over 90% believed the practicum increased their competency in the areas of job and task analysis, job evaluation and compensation, consulting and business skills, and research methods.

In some areas, internships and a practica are the only way students get exposed to certain situations. When I/O Psychologists were surveyed, they indicated they thought their program did not provide enough training in applied areas. Although the graduates get exposure, it is limited. Students often do not get to work with clients. Thus, some practicum experiences are deficient (Blakeney et al., 2002).

How do internship sites find student interns? Organizations seeking interns did so most commonly by contacting faculty in I/O Psychology programs (66% of those surveyed). Informal contacts and professional networks were responsible for recruiting in 56% of organizations. Twenty-three percent of businesses used direct mailing to professors and universities, while 26% made use of internship or career placement services. Other less frequent methods included non-SIOP placement, career fairs, and advertising in *The Industrial-Organizational Psychologist* (*TIP)* (Munson, Phillips, Clark, & Mueller-Hanson, 2004).

After recruiting students, the way organizations went about selecting interns differed. A proposed master's thesis was required in 27% of the cases, while a completed

one was found in 20%. Comprehensive exams were seen as a requirement in 8% of companies. Some (13%) were flexible when it came to education. Phone interviews were most frequent in selection procedures, followed by structured interviews that took place in person. When it came to testing, tests of personality and cognitive ability were most common. External consulting internships were more likely to use traditional interviews and cognitive ability and personality tests for selection compared to internal consulting internships (Munson et al., 2004).

In the same study (Munson et al., 2004), firms were asked to identify the three most important knowledge, skills, ability, and other characteristics (KSAOs) they sought in interns. The top KSAOs included basic statistical skills, teamwork and interpersonal skills, ability to communicate both written and orally with a business audience, and experience with the use of statistical packages. Additional intern KSAOs included interest in I/O Psychology work, specific knowledge areas, and personality traits. Those with an internship position were found to have spent the majority of their time analyzing data, developing selection assessments and training programs, creating job analyses, writing reports, and managing projects. Minimal supervision was provided and interns were expected to work independently on tasks. Feedback is necessary for improvement, yet 22% of organizations did not provide any. Each firm had its own way of presenting feedback and the frequency also varied.

Internships provide practical experience, but issues arise, such as pay. While research has shown some internships are unpaid, there are those that offer compensation. The average pay was between $18 and $20 per hour, with most internships lasting up to nine months. Each week interns were expected to work around 20 to 25 hours. Some

participants provided their interns with benefits, including insurance, conference travel and dues, and training opportunities. At the end of the internship, 29% of the organizations said that they offered qualified interns a permanent position. Successful interns were also seen as being proactive, had a high work ethic, and had good interpersonal skills (Munson et al., 2004).

Applied projects. Any applied skills needed are acquired through integrating course work with practical experience. Three important skills that can be developed in this way are research methods and quantitative skills, personnel psychology, and an I/O Psychology general foundation (Erffeyer & Mendel, 1990). It is often difficult to find organizations that meet the needs of students. Projects must be short enough to be completed in a small amount of time, yet be complicated enough for students to learn from them as well. Shoenfelt (2003) offered a set of checklists to cover to ensure successful projects. The host organization must have certain characteristics before a project can begin. A clear understanding of I/O Psychology is necessary for the organization to know what the students are capable of doing. The company must realize that they are dealing with students, and the projects must fit in line with a semester timeline. Large projects can be completed if they can be broken down into smaller ones and then put together. Also, students are busy with school, work, internships, etc. Therefore, not as much time can be dedicated to a project as would be if someone was working on it as a full or part-time job. Students are very knowledgeable, but lack experience. An organization must understand this (Shoenfelt, 2003).

The project itself must have various characteristics in order to successfully provide experience to students. As stated before, the time frame is very important. The

project must be within the capabilities of the students. It should be challenging for the students to learn from it, yet not be too complex that it cannot be completed satisfactorily. Unchallenging work will not provide any skills to be gained. Before the project begins, students often write a proposal to the company providing necessary resources needed, deadlines, and student obligations. The proposal should be reviewed by a supervisor, who then can watch over the project. A technical report is recommended at the end of the project (Shoenfelt, 2003).

Consulting. Not only do students learn from internships and applied projects, but participation in consulting projects is also beneficial (Schneider, Piotrowski, & Kass, 2007). Numerous new I/O Psychologists are involved in consulting, whether they are internal or external consultants. Therefore, more training should focus on these types of professional-client relationships (Shoenfelt, 2003). Research has found that consulting and business skills were taught in only 23% of programs through classes. Actual consulting experiences were only offered in 16% of programs (Bartels et al., 2005).

In order to better prepare students, more teaching is needed and more opportunities to participate in student consulting groups need to be made available (Blakeney et al., 2002). From consulting, students can gain skills in teamwork, oral communication, negotiation and conflict management, software use, and data analysis. Other various technical skills are also developed, such as job analysis, training needs analysis, and survey design. Consulting can help students get into doctoral programs as well as obtain a job. Future internships and job offers have also been made possible, not to mention the indispensible amount of learning the students gain (Shoenfelt, 2003). Participating in a consulting project allows students to increase knowledge, skills, and

abilities otherwise not attainable. Engaging in a number of projects also allows students to explore many career options (Schneider, Piotrowski, & Kass, 2007).

While consulting has many advantages, there are also disadvantages. It requires much more effort, guidance, time, supervision, and is difficult to assess. Doctoral students have time to transition from the classroom to working in the field. Master's students do not have this luxury. Therefore, more time and effort are required by the students, as well as more time and guidance by faculty. The environment where projects take place in will have a direct effect. Students that have good supervision and feedback, will in turn gain more skills. The community in which the learning setting takes place may limit opportunities. Schools within small communities could exhaust all resources. Within small communities there are only so many available projects and organizations that are worthwhile and can provide a learning experience (Schneider et al., 2007).

Whether or not to pay students is also up for debate. What is fair reimbursement? Each situation must be examined to determine what is best (Schneider et al., 2007). Many universities and businesses run into this problem. Shoenfelt (2003) found a sort compromise between the two organizations. Corporations have given tax-deductible contributions to the I/O Psychology program. In the past the funds have then been used to send students to the SIOP conferences, with expenses paid. In other instances, the team has gone to eat at a nice restaurant.

Keeping a relationship with previous organizations allows repeat business, but the company has to be found in the first place. Where can organizational hosts be found? Program alumni know the level student competencies are for particular competencies. Places where internships have occurred provide places for projects. Successful

interactions with corporations can become host businesses. Students can provide free consulting work for those who cannot afford it. Word of mouth gets around and more organizations can become interested. Faculty can get out into everyday settings and spread the word (Shoenfelt, 2003).

Once found, a corporation has responsibilities to the project. An organization must be willing to give students supervision or at least an employee to communicate between the students and the business. Resources are often needed and should be provided by the organization. Whether it is office space, access to employees, and/or equipment, all necessary resources need to be made available (Shoenfelt, 2003). After every project, the student should receive feedback and an evaluation should take place. Students will not learn if their performance is not assessed (Schneider et al., 2007).

Participants involved in consulting indicated that administrative activities were most time consuming. When it comes to consulting, there may need to be separate guidelines for education and training (Blakeney et al., 2002). There are consulting principles by which consultants abide. The identity of the client has slightly different definitions between that of SIOP and the Consulting Principles. I/O Psychologists also need additional training in legal issues (Campbell, 2002).

Needs Assessment

Because this research project will assess the training needs of I/O Psychology graduate programs, some discussion of what a needs assessment is and what it should entail would be helpful. Before the curriculum can be crafted for a graduate program, or any type of training program for that matter, it is crucial that a needs assessment be done first. Completing a needs assessment will make the program more successful. A needs

assessment may be used for a variety of reasons, such as identifying curriculum needs, providing feedback, diagnosing problems, or assessing learning (Grant, 2002). An educational needs assessment is used to identify the objectives needed to be accomplished in a program (Popham, 1971). An assessment alone will not improve education. Learning must be planned, reinforced, and relevant (Grant, 2002). A successful needs assessment has many steps. First, a needs assessment must have organizational support. Following this, an organizational analysis must be conducted. Next is a requirements analysis to identify the participants who will supply information and pick the methods for the needs assessment. Next, the content needs to be chosen, related to what the graduates need to know following graduation. Lastly, a person analysis is used to reveal individual student strengths and weaknesses and training needs (Goldstein & Ford, 2002).

The focus of this thesis will be on identifying the content and skills graduates need to possess following graduation. As the reader peruses this section on needs assessment, it may help to think of the many I/O Psychology graduate programs as separate training departments, with SIOP as the central human resources department that provides guidance. The businesses that employee I/O Psychologists can be thought of as the client organization that wants its training departments to develop employees who will possess the appropriate knowledge, skills, abilities, and other characteristics (KSAOs) for their I/O psychology jobs so they can perform better. This metaphor will be employed throughout this section of the literature review. This needs assessment could be used by SIOP to improve its educational guidelines for all of the I/O Psychology programs so that

client organizations will get I/O Psychologists with the KSAOs needed to fulfill their job requirements and to help their organizations achieve their missions.

Gaining organizational support for the needs assessment. Goldstein and Ford (2002) warned against moving ahead with a needs assessment (and training itself) until organizational support for the needs assessment has been built, not only at the top of the organization, but throughout the organization. In the case of I/O Psychology, organizational support would include a large number of stakeholders. SIOP would be involved, as well as businesses that hire I/O Psychologists, and universities that have I/O Psychology programs. Without support from all, the process will not be effective (Goldstein & Ford, 2002). Establishing a relationship with SIOP will be important. Some of SIOP's resources may need to be used. To gain support from hiring organizations, I explained to them the importance of the assessment before bombarding them with a questionnaire. I needed to explain why the needs assessment was being done (Goldstein & Ford, 2002). For things to go smoothly, I needed a plan consisting of how long the needs assessment would take, what I hoped to learn, and any help I needed. Cooperation is essential for the needs assessment process to unfold effectively (Goldstein & Ford, 2002).

Organizational analysis in a needs Assessment. One type of organizational analysis is to ascertain the organization's strategic goals and how employee development can help attain those goals. For example, if an organization is heading in a new strategic direction, then its employees may need to develop new KSAOs to help it move in that new direction (Goldstein & Ford, 2002). For this study, the organization(s) were the firms hiring the I/O Psychologists. I wanted to find out if there were new KSAOs required of

all I/O Psychology jobs because of changes in the business environment, such as globalization. If the organizations that hire I/O Psychologists want to do a better job of exploiting foreign markets, what new KSAOs will that I/O Psychologist need to help his or her company move in that direction.

I also wanted to find out if the different types of organizations (e.g., large bureaucracies, smaller consulting firms, educational institutions) require different KSAOs from their I/O Psychologists because of their different missions. If there are large differences, this knowledge may help the developers of I/O Psychology programs consider more carefully for what kind of organization they want to prepare their graduates. A curriculum may need to be tailored for a particular I/O Psychology job market.

Another type of organizational analysis is to find out how open the organization is to new learning. If employees are not encouraged to use their newly learned skills, then the trainer will need to work on removing these obstacles before proceeding with training. In other words, there should be a positive climate for the transfer of knowledge (Goldstein & Ford, 2002). If a graduate cannot take what he or she has learned and use it in the place of work, what is the point? When an organization reports that a particular KSAO is not important for an I/O Psychology job, this may mean that the organization is not comfortable letting the I/O Psychologist operate in that domain, even if he or she would be able to bring considerable expertise. An example might be compensation, where the psychologist's knowledge of motivation theory and statistics could prove useful, but the organization may not want psychologists in that function. Before adding compensation to the curriculum, such prejudices need to be addressed.

Requirements analysis. A requirements analysis is another step in a needs assessment that precedes data collection. The needs analyst first needs to define the scope of his or her needs assessment study by asking what jobs will be examined (Goldstein & Ford, 2002). I explored jobs for which an I/O Psychology background is helpful. That will take in a variety of jobs because I/O Psychologists are qualified for a variety of positions. Therefore, I needed to ask each participant for the title of the I/O Psychologist job.

The needs analyst next needs to determine who in the organization has knowledge of the I/O Psychology position(s) and how he or she is going to obtain information about the position from those in the know (Goldstein & Ford, 2002). As the needs analyst, I decided how many participants I needed, who got the survey, and what questions I needed to ask before beginning my data collection.

Goldstein and Ford (2002) suggested analyzing future training needs as well as current training needs. I needed to decide the medium in which I wanted to obtain the information. When choosing a method, it is important that it is valid, reliable, able to identify all needs, and free from biases (Grant, 2002). There are likely to be problems at some point. I needed to try to anticipate them and find ways to resolve them. I developed a protocol of how to collect the data in the needs assessment (Goldstein & Ford, 2002). This made the process run more smoothly once I got started.

Content-what is to be learned. The process usually begins with specifying the tasks that are required for the job (Goldstein & Ford, 2002). This is similar to a job analysis, what knowledge, skills, and abilities (KSAs) should the students have upon graduation? (Yorges, 2000). Identifying the KSAs is crucial because, this is what each

program should be teaching its students. A task analysis comes first, which involves specifying all tasks involved in completing a job (Goldstein & Ford, 2002). In identifying the tasks, there are specifications to be followed. It is important to recognize what will be done, how, why, and by whom. There may be numerous tasks at the end, and so it may be useful to determine task clusters to organize the data. Next, the needs analyst will need to link the KSAs to the tasks. Finally, the needs analyst will need to determine which are most important, performed most frequently, and are hardest to learn (Goldstein & Ford, 2002). Fortunately, SIOP has already done a great deal of this work in coming up with the content areas, research skill areas, and measurement areas in which an I/O Psychologist should be competent. However, my data may help graduate schools choose the competencies on which they need to focus the most attention. This is also the chance for organizations to select the most important qualities they feel graduates should have. By identifying the activities within the job, this will allow the selection of courses that will be most appropriate for all programs (Schippmann, Schmitt, & Hawthorne, 1992).

Person analysis. This component of a needs assessment involves examining employee performance to determine employee strengths that may need augmentation with additional training or employee weaknesses that may need to be overcome with additional training. I will not be conducting a person analysis because that would require me to collect job performance data for a number of I/O Psychologists and that is beyond the scope of this study.

Another type of person analysis is to simply ask employees what training they feel they need the most. While I could conduct this type of analysis, I wanted to focus my

needs assessment on the observations and opinions of the employers rather than the employees. My goal was to see what organizations expect from graduates.

Graduates of I/O Psychology Programs

After graduation, students have several options for employment. According to Pritchard, Hart, and Fuentes (1989), there are six categories of career options for graduates of I/O Psychology. Theses six categories include, research firms, consulting firms, single organizations, government, teacher-oriented colleges, and research-oriented universities. Research firms conduct research for various agencies and are non-profit. Consulting firms sell professional services to others and are profit making. I/O Psychologists who work in single organizations use their knowledge to help this one particular organization to function better. Governmental jobs take place in either a research laboratory or in setting similar to single organizations. A teaching-oriented college focuses on teaching and has lower expectations for research and publishing. Research-oriented universities focus on research and publication. Each type of work varies by the degree of pressure, travel time, work variety, research orientation, amount of research, time flexibility, teaching and mentoring, and recognition in the scientific community. Some areas require high levels of these characteristics, while others require low levels (Pritchard, Hart, & Fuentes, 1989).

Only after a graduate of an I/O Psychology program is employed in one of these six settings can a researcher examine how well the I/O Psychology curriculum prepared the new professional. In a study done by Erdwins and Buffardi (1983), 83% of the students surveyed felt their education had prepared them for employment. I/O Psychology students believed that their practica, methodology courses, and industrial

content courses were the most relevant. Advanced general psychology was seen as the least useful by all graduates. Most were fairly satisfied with their master's training (Edwards & Buffardi, 1983).

Vodanovich and Piotrowski (1999) surveyed master's and doctoral graduates and found most of them had received training in assessment techniques. However, they felt they were not that well trained on specific tests. The researchers suggested that the way to gain this knowledge is to look outside the classroom. Any additional knowledge will only help prepare for employment.

In another study of I/O Psychology graduates from a single program, Erffmeyer and Mendel (1990) found that most students felt the program prepared them well for future employment. Of the graduate courses taken, personnel psychology was ranked the most important for one's first and current job. While the rankings shifted depending on whether it was for first job or present employment, the next three courses were training in industry, equal employment opportunities, and psychometrics. Somewhat similar to Edwards and Buffardi's 1983 finding about advanced general psychology, advanced social psychology ranked last in importance in Erffmeyer and Mendel's study. Internships were not required in this program, but 52% of the students had taken them and found them very useful. Within six months, 90 % of those surveyed had secured permanent work.

Purpose of This Study

It is clear that no two graduate programs in I/O Psychology are the same. Without specific guidelines, each institution can teach whatever it chooses, within limits. This may cause problems. Each student is not educated the same. What graduate programs

should be doing is preparing students for work. Not enough research has examined whether programs are getting graduates ready for their professional endeavors. This study will examine the competencies employers view as important. Hopefully, these needs assessment data will help program administrators develop programs curricula that make students better prepared and employers who hire I/O Psychologists more pleased with their results.

Graduate programs in I/O Psychology have guidelines set by SIOP. However, these guidelines are not enforced. Each graduate program interprets the guidelines in its own way. This makes each program unique, but it also allows for students to be taught many competencies with no consensus. I want to compare the competencies employers articulate to the SIOP guidelines. This study will be a continuation of the research done by Wesolowski and Field (1987). These two researchers did their work before 1994, when SIOP developed its current guidelines for education. I want to see if there are any changes in the KSAOs organizations desire from I/O psychologists. I also want to expand the research to include applicants with master's degrees in addition to those with doctorates, and explore the different needs of different types of organizations. I am curious to see if SIOP suggestions match up with employers' wants.

Hypotheses

Hypothesis 1. The following five traditional human resource areas - selection, performance appraisal, job analysis, legal and ethical issues, and training - will be rated as the most important content areas by individuals performing the job. The rationale for this hypothesis is that these were the top rated content areas in Wesolowski and Field's 1987 study.

Hypothesis 2. The importance of knowing multivariate statistics will be more important for doctoral positions than for master's level positions. The rationale for this hypothesis is that I/O psychologists with Ph.D.'s receive more training in advanced statistical techniques, and such jobs requiring a Ph.D must also require greater knowledge of advanced statistical techniques such as multivariate statistics.

Hypothesis 3. Personality and intelligence assessment will be the least important measurement concerns. The rationale for this hypothesis is that personality assessment was the least importance measurement skill in Wesolowski and Field's 1987 study, while intelligence assessment was not even an item on their 1987 survey.

Hypothesis 4. Business development skills will be more important for I/O psychologists who work in consulting than for those who work in government or in industry. The rationale for this hypothesis is that I/O psychologists who work for large government or industry bureaucracies serve a single client. I/O psychologists who work for a consulting firm, on the other hand, must work for an ever changing series of clients. The former do not need to worry as much about soliciting business to keep their jobs, but in a consulting firm, being able to bring in clients is the coin of the realm. For a consulting firm, it may be an I/O psychologist's most important skill.

Hypothesis 5. Within government and industrial organizations, the larger organizations will rate multivariate statistical methods and research/measurement methods as more important when employing an I/O psychologist than the smaller organizations. The rationale for this hypothesis is that the larger government agencies and for-profit companies have more financial and human resources to commit to research. Smaller organizations seldom have departments devoted to personnel research. Thus,

when hiring an I/O psychologist, the larger organizations may stress the importance of the candidates' statistical and research skills more than the smaller organizations.

CHAPTER 2

METHOD

Participants

To study what competencies are most important for I/O psychologists to have on the job, I surveyed both supervisors of I/O psychologists and working I/O psychologists. Out of the 673 participants who received a survey, 97 responded, a 14% response rate. In addition to the survey, every participant also received an informed consent document (see Appendix A).

Of the 97 participants who responded, 7% had only a bachelor's degree, 41% had a master's degree, and 52% had a doctorate. When examining the type of degree, 89% had an I/O psychology degree and 11% did not. Thirty-two percent worked for a consulting firm, 30% for an industrial company, 26% worked in academia, and 12% worked for the government. When asked whether they were describing their own job or the job they supervised, 69% responded that they were describing their own job and 31% responded they were describing the job they supervised. Regarding the size of the organizations in which the participants worked, the average organization had 21,912 employees. This is because of a few large companies, nine that had over 200,000 employees. The median organization only had 550 employees. It seems there were a few large organizations that skewed the data. This can be seen in the large standard deviation of 58,078 and the range of organizations from one to 280,000.

Measures

Demographics. Six questions were asked: job title of the typical I/O Psychology position, whether it was a master's or a Ph.D. level positions, the size of the organization,

the type of organization, the participant's job title, and the participant's level of education (see Appendix B).

Importance of content areas. This measure, as well as the next two measures, were inspired by Wesolowski and Field's 1987, study which asked employers who hire I/O Psychologists to rate the importance of a variety of knowledge areas. Wesolowski and Field started with 17 content areas. For my study, 21 content items were examined because these are the content areas deemed most important by SIOP's educational guidelines. The participants were asked to rate how important it was for a new I/O psychologist to have knowledge of each content area to succeed. A six-point Likert scale was used to measure importance with a higher score indicating greater importance. A score of one equaled very unimportant and a score of six equaled very important. Because each item was viewed as an interesting variable by itself, the items were not summed to produce an overall variable. This measure can be seen in Appendix C.

Importance of statistical methods. These variables were measured with 14 items (see Appendix D). I used Wesolowski and Field's (1987) 10 items as a starting point. I then added four advanced statistical methods that they had neglected: multiple regression, MANOVA, log linear analysis, and discriminant analysis. The participants were asked to rate how important it was for a new I/O Psychologist to have knowledge of each statistical method to succeed. The same six-point Likert scale that was used for the I/O Psychology content variables was used to measure importance. Because each item was viewed as an interesting variable by itself, the items were not summed to produce an overall variable.

Importance of research/measurement methods. These variables were measured with 9 items (see Appendix E). I again used Wesolowski and Field's (1987) seven items as a starting point and then added two items. I added latent trait and item response theory because that was a relatively new area in 1987 but plays an important role in psychometrics today. I also added intellectual assessment because it was not on the 1987 survey and I felt it should to go along with personality assessment. The participants were asked to rate how important it was for a new I/O Psychologist to have knowledge of each research/measurement method to succeed. The same six-point Likert scale was used to measure importance with a higher score indicating greater importance. Because each item was viewed as an interesting variable by itself, the items were not summed to produce an overall variable.

Importance of business skills. These variables were measured with 8 items (see Appendix F). These items did not appear in Wesolowski and Field's (1987) study. However, one of the results from open-ended questions in Wesolowski and Field's study was that I/O Psychologists often lacked important business skills. The list of business skills I measured came mainly from previous research done by Blakeney et al (2002). The participants were asked to rate how important it was for a new I/O Psychologist to possess each business skill to succeed. The same six-point Likert scale was used to measure importance. Because each item was viewed as an interesting variable by itself, the items will not be summed to produce an overall variable.

Procedure

Before proceeding with any data collection, I first made sure that my research plans were approved by the university's Institutional Review Board (See Appendix G).

A total of 673 surveys were sent out. There were 374 emailed and 299 sent via regular mail. The response rate was better for mail; 73 out of 299 surveys completed for a response rate of 24%, than it was for email; 24 out of 374 surveys completed for a response rate of 6%. The total response rate was 14%. Part of the problem was that there were some addresses that were no longer in use. Of these, 52 were sent back from physical mail addresses and 84 emails were returned.

To obtain participant addresses, several techniques were used. The SIOP website was first utilized. SIOP lists open positions from various companies. I was able to obtain information from the listing. The SIOP listing had an email addresses, postal addresses, company information, and/or company website addresses. For those listings that had no address, I got the company name, as well as the city and state, and Googled the company. From there I was often able to find an email or physical address to send the survey.

In addition to the SIOP website, I also used old SIOP publications, *The Industrial-Organizational Psychologist (TIP)*, to get information on companies that advertised in *TIP*. I figured the chances were pretty good that these companies also hired at least one I/O psychologist. Most of the advertisements had little information, so I once again Googled the company to obtain addresses to send my surveys out.

Next, I obtained lists of previous graduates from I/O Psychology graduate programs. The SIOP website provides a list of I/O Psychology graduate programs that have registered with the organization. From there I Googled each program located within the United States that was listed. Each program had a website and several of them listed previous graduates along with their contact information. I was able to send out surveys to previous students from nine programs.

For those participants for whom I had both an email and postal address, I first sent them a survey in the mail and then sent them reminder emails. Participants for whom I only had an email address also received a reminder email as well.

CHAPTER 3

RESULTS

Analyses of Hypotheses

The first hypothesis was that the traditional human resource areas - selection, performance appraisal, job analysis, legal and ethical issues, and training - would be rated as the most important content areas. The reason for this hypothesis was that these were the top rated content areas in Wesolowski and Field's 1987 study. This hypothesis was somewhat supported. For example, ethical, legal, and professional contexts was rated as the second most important content area; employee selection, placement, and classification was rated as the third most important content area; and job and task analysis was rated as the fourth most important content area. However, performance appraisal and feedback was only the sixth most important content area; and training (theory, program design, and evaluation) was only the ninth most important content area. The most important content area was leadership and management. The traditional human resource areas remain important, but what really stuck out was the rise in importance of leadership and management theories. In 1987, leadership ranked tenth in a list of 25. In 2011, it is ranked first.

The second hypothesis was that the importance of knowing multivariate statistics would be more important for doctoral positions than for master's level positions. This hypothesis was supported. An ANOVA was used because three levels of the independent variable emerged during data collection: doctoral positions, masters level positions, and positions that were open to both degrees. The mean importance of knowing multivariate statistics was highest for doctoral positions (M = 4.94), next highest for positions that

were open to both degrees (M = 4.17), and lowest for master's level positions (M = 3.29). The ANOVA was significant ($F(2,78) = 9.54$, $p < .001$). Tukey post hoc analyses revealed that the importance of knowing multivariate statistics was significantly higher for doctoral positions compared to master's level positions. However, the importance of knowing multivariate statistics for positions that were open to both degrees was not significantly less important than doctoral positions, nor was it significantly more important than master's level positions.

The third hypothesis was that personality and intelligence assessment would be the least important measurement concerns. The reason for this hypothesis was that personality assessment was the least importance measurement skill in 1987, and intelligence assessment was not even an item on the 1987 survey. While this hypothesis was not supported, personality assessment was only rated as the fifth most important measurement skill out of nine skills. It has gained somewhat in importance since 1987. Intelligence assessment was rated as the eighth most important measurement skill out of nine skills. The least important measurement skill was knowing how to apply latent trait and item response theory.

The fourth hypothesis was that business development skills would be more important for I/O Psychologists who work in consulting than for those who work in government or in industry. This hypothesis was somewhat supported. The mean importance of business development skills was highest for I/O Psychologists who work in consulting (M = 4.71). The ANOVA revealed significant differences ($F(3,92) = 5.04$, $p < .01$). However, Tukey post hoc analyses revealed that the mean importance of business development skills for I/O Psychologists who work in consulting was not significantly

greater than the mean importance of business development skills for I/O Psychologists who work in industry (M = 4.55), but it was significantly greater than the mean importance of business development skills for I/O Psychologists who work in either government (M = 3.36) or education (M = 3.72).

The fifth hypothesis was that within government and industrial organizations, the larger organizations would rate multivariate statistical methods and research/measurement methods as more important when employing an I/O Psychologist than the smaller organizations. The first step in this analysis was to eliminate the consulting and education positions. Then correlations were calculated between organizational size and the importance of multivariate statistical methods (r = .44, p < .05) and the nine research/measurement methods: research/experimental design (r = .43, p < .05), classic psychometric methods (r = .39, p < .05), latent trait and item response theory (r = .14, p > .05), test construction (r = .35, p < .05), personality assessment (r = .21, p > .05), intelligence assessment (r = .26, p > .05), survey research methods (r = .24, p > .05), attitude measurement methods (r = .19, p > .05), and sampling theory (r = .53, p < .01).

Five of the ten correlations were significant and every correlation was positive, which indicates that the larger government agencies and for-profit companies are somewhat more interested in personnel research than the smaller organizations that may lack sufficient resources to carry out much of their own research.

Descriptive Statistics of the Importance of Various Content Areas and Skills

The data presented in Table 1 examines the mean importance of 21 different I/O Psychology areas today as compared to the Wesolowski and Field (1987) study that

surveyed 17 I/O Psychology content areas. A six-point Likert scale was used to measure importance with a higher score indicating greater importance. The sample size for the current study was 97 participants, while the sample size for the 1987 study was 53 participants.

In 2011, leadership and management theories (*M* = 5.06) was rated the highest among the respondents, followed closely by ethical, legal, and professional contexts (*M* = 5.04). Back in 1987, employee selection, placement, and classification (*M* = 5.3) and performance appraisal (*M* = 5.1) were rated as the top two. In both studies, consumer behavior was rated low (*M* = 2.77 in 2011 and *M* = 2.6 in 1987). In 1987, human performance and human factors received the lowest score (*M* = 2.5).

Table 2 compares 2011 data with 1987 data on the importance of 14 statistical methods. In Wesolowski and Field's (1987) research, ten statistical methods were analyzed. Basic statistical concepts (descriptive statistics) were clearly rated the most important in both studies (*M* = 5.30 in 2011 and *M* = 5.2 in 1987), followed by univariate methods (*M* = 4.60 in 2011 and *M* = 4.9 in 1987). In 2011 and 1987, a number of multivariate techniques hovered around an average of three (slightly unimportant). Multiple regression (*M* = 4.28 in 2011) was rated as the most important multivariate technique.

In Table 3, the importance of nine research and measurement skills from the 2011 study are compared to seven research and measurement skills from the 1987 study. In both years, survey research methods (*M* = 5.05 in 2011 and *M* = 5.1 in 1987) and classic psychometric methods (*M* = 4.91 in 2011 and *M* = 5.3 in 1987) were rated highest.

Table 1

Mean Importance of 21 Content Areas in 2011 Compared to 1987

	2011			1987	
	N	**M**	**SD**	**N**	**M**
1. Attitude Theory	95	3.64	1.48	53	4.0
2. Career Development Theory	95	3.81	1.41	na	na
3. Compensation & Benefits	94	3.39	1.68	53	3.8
4. Core Competencies Analysis	94	4.60	1.24	na	na
5. Consumer Behavior	95	2.77	1.42	53	2.6
6. Criterion Theory & Development	94	4.50	1.38	na	na
7. Employee Selection, Placement, & Classification	96	4.92	1.53	53	5.3
8. Ethical, Legal, & Professional Contexts	96	5.04	1.30	53	4.8
9. Health & Stress in Organizations	96	3.47	1.49	53	3.1
10. Human Performance/Human Factors	95	3.77	1.50	53	2.5
11. Industrial & Labor Relations	96	3.64	1.52	53	3.2
12. Job & Task Analysis	96	4.86	1.20	53	4.9
13. Judgment & Decision Making	95	4.53	1.17	53	3.7
14. Leadership & Management	96	5.06	1.10	53	4.2
15. Organizational Development	95	4.63	1.32	53	4.4
16. Organization Theory	95	4.19	1.35	53	4.4
17. Performance Appraisal & Feedback	96	4.72	1.34	53	5.1
18. Small Group Theory & Processes	96	3.89	1.34	53	4.1
19. Strategic Management	95	4.23	1.45	na	na
20. Training: Theory, Program Design, & Evaluation	96	4.59	1.28	53	4.7
21. Work Motivation	96	4.73	1.21	53	4.6

Note: “na” means that the 1987 survey did not provide that choice.

Table 2

Mean Importance of Statistical Knowledge in 2011 Compared to 1987

	2011			1987	
	N	**M**	**SD**	**N**	**M**
1. Statistical Computer Packages (SPSS, SAS)	96	4.49	1.62	53	4.6
2. Basic Statistical Concepts (descriptive statistics)	97	5.30	1.16	53	5.2
3. Univariate Methods (t-tests, ANOVA, correlation)	97	4.60	1.57	53	4.9
4. Non-parametric methods (chi-square)	97	3.95	1.64	53	3.7
5. Multivariate Methods (in general)	88	4.07	1.65	53	4.0
a. Multiple Regression	97	4.28	1.69	na	na
b. Factor Analysis	97	4.03	1.67	53	4.1
c. MANOVA	97	3.43	1.53	na	na
d. Structural Equation Modeling	97	3.28	1.53	53	2.6*
e. Log Linear Analysis	95	2.96	1.36	na	na
f. Cluster Analysis	97	3.24	1.39	53	3.5
g. Discriminant Analysis	97	3.27	1.43	na	na
h. Multidimensional Scaling	97	3.11	1.37	53	2.9
i. Time Series Analysis	96	3.10	1.43	53	2.6

* In 1987, “Path Analysis” was the choice

Note: “na” means that the 1987 survey did not provide that choice.

Table 3

Mean Importance of Research/Measurement Skills in 2011 Compared to 1987

	2011			1987	
	N	**M**	**SD**	**N**	**M**
1. Research/Experimental Design (including quasi designs)	96	4.27	1.59	53	4.4
2. Classic Psychometric Methods (reliability, validity)	97	4.91	1.47	53	5.3
3. Latent Trait & Item Response Theory	97	3.46	1.49	na	na
4. Test Construction	96	4.56	1.53	53	4.8
5. Personality Assessment Methods	97	4.33	1.57	53	4.3
6. Intelligence Assessment Methods	97	4.12	1.53	na	na
7. Survey Research Methods (questionnaire development)	97	5.05	1.20	53	5.1
8. Attitude Measurement Methods	97	4.35	1.49	53	4.9
9. Sampling Theory (designing & drawing samples)	97	4.33	1.47	53	4.3

Note: “na” means that the 1987 survey did not provide that choice.

In 2011, latent trait and item response theory (M = 3.46) received the lowest score. It was not an option in 1987.

Table 4 explores the importance of eight business skills for I/O Psychologists. None of these items were included in the 1987 study. The three most important skills were making presentations (M = 5.42), project management (M = 5.36), and report writing (M = 5.22). None of the skills were rated as unimportant. Even the least important skill, business development, had an average score of 4.25.

Importance of Content Areas and Skills by the Participants' Education Level

Because of the large number of statistical analyses run for my exploratory analyses, I set my alpha level to .01. The majority of the 97 respondents in this study had a doctorate (52%). Forty-one percent had a master's degree, and 7% had earned a bachelor's degree.

Table 5 organizes the importance of the 21 I/O Psychology content areas by the level of education of the person filling out the survey. Only two statistically significant differences emerged. The respondents with a doctorate rated knowing criterion theory and development as more important compared to the respondents with a masters degree ($F(2,90) = 9.64$, $p < .01$). A Tukey post hoc analysis revealed that the respondents with a bachelor's degree fell in between. Conversely, the respondents with a master's degree rated knowing strategic planning as more important compared to the respondents with a doctoral degree ($F(2,91) = 6.89$, $p < .01$). A Tukey post hoc analysis revealed that the respondents with a bachelor's degree fell in between.

The respondents' educational level had a greater impact on their ratings of the importance of statistical methods, as can be seen in Table 6. The respondents with a

Table 4

Descriptive Statistics for the Importance of Business Skills

	N	M	SD
1. Administrative Management (planning, budgeting)	97	4.46	1.28
2. Business Development	96	4.25	1.36
3. Conflict Management	96	4.55	1.24
4. Making Presentations	97	5.42	0.80
5. Personal Professional Development	97	4.97	0.99
6. Personnel Management (recruiting, coaching)	97	4.42	1.37
7. Project Management	96	5.36	0.77
8. Report Writing	97	5.22	1.03

Note: These items were not included on the 1987 survey.

Table 5

Importance of I/O Psychology Content Areas by Education Level

	BA/BS M	MA/MS M	Ph.D. M
1. Attitude Theory	4.00	3.55	3.70
2. Career Development Theory	4.00	3.95	3.70
3. Compensation & Benefits	4.17	3.84	2.96
4. Core Competencies Analysis	4.67	4.50	4.65
5. Consumer Behavior	3.67	3.08	2.44
6. Criterion Theory & Development *	4.33	3.81 $_{b}$	5.02 $_{a}$
7. Employee Selection, Placement, & Classification	4.67	4.85	5.00
8. Ethical, Legal, & Professional Contexts	5.33	5.03	5.04
9. Health & Stress in Organizations	3.50	3.46	3.52
10. Human Performance/Human Factors	4.17	4.05	3.52
11. Industrial & Labor Relations	3.00	4.05	3.42
12. Job & Task Analysis	4.33	4.64	5.10
13. Judgment & Decision Making	4.50	4.85	4.27
14. Leadership & Management	5.00	5.10	5.02
15. Organizational Development	4.33	4.90	4.43
16. Organization Theory	4.00	4.23	4.14
17. Performance Appraisal & Feedback	4.50	4.74	4.70
18. Small Group Theory & Processes	3.50	3.85	3.96
19. Strategic Management *	4.17	4.85 $_{a}$	3.76 $_{b}$
20. Training: Theory, Program Design, & Evaluation	3.50	4.87	4.52
21. Work Motivation	4.67	4.74	4.74

* $p < .01$ for ANOVA, alphabetic subscripts designate which means are significantly different using a Tukey post hoc test with $p < .01$

Table 6

Importance of Statistical Methods by Education Level

	BA/BS	MA/MS	Ph.D.
	M	**M**	**M**
1. Statistical Computer Packages (SPSS, SAS) *	4.14	3.51 $_{b}$	5.30 $_{a}$
2. Basic Statistical Concepts (descriptive statistics) *	4.71	4.72 $_{b}$	5.82 $_{a}$
3. Univariate Methods (t-tests, ANOVA, correlation) *	4.00	3.77 $_{b}$	5.32 $_{a}$
4. Non-parametric methods (chi-square) *	3.86	3.00 $_{b}$	4.70 $_{a}$
5. Multivariate Methods (in general) *	3.86	3.09 $_{b}$	4.50 $_{a}$
a. Multiple Regression *	3.86	3.26 $_{b}$	5.12 $_{a}$
b. Factor Analysis *	3.71	3.12 $_{b}$	4.76 $_{a}$
c. MANOVA *	3.43	2.64 $_{b}$	4.02 $_{a}$
d. Structural Equation Modeling *	3.29	2.64 $_{b}$	3.78 $_{a}$
e. Log Linear Analysis	3.17	2.49	3.31
f. Cluster Analysis	3.57	2.82	3.52
g. Discriminant Analysis	3.71	2.82	3.56
h. Multidimensional Scaling	3.57	2.82	3.28
i. Time Series Analysis	3.57	2.92	3.18

* $p < .01$ for ANOVA, alphabetic subscripts designate which means are significantly different using a Tukey post hoc test with $p < .01$

doctorate rated all five types of statistical methods higher in importance than the respondents with a master's degree. Again, respondents with a bachelor's degree fell in between. That was true for statistical software ($F(2,93) = 18.41$, $p < .01$), descriptive statistics ($F(2,93) = 13.72$, $p < .01$), univariate inferential statistics ($F(2,93) = 14.16$, $p < .01$), non-parametric statistics ($F(2,93) = 15.09$, $p < .01$), and multivariate statistics ($F(2,85) = 15.03$, $p < .01$). Tukey post hoc analyses revealed that the respondents with a bachelor's degree fell in between in their importance ratings for all five methods.

Regarding differences in the importance of research and measurement skills, depicted in Table 7, the respondents with a doctorate rated these skills higher in importance than did the respondents with either a master's degree or a bachelor's degree. This was true for research methods ($F(2,92) = 15.69$, $p < .01$), classic psychometric methods ($F(2,93) = 14.13$, $p < .01$), test construction ($F(2,92) = 9.73$, $p < .01$), personality assessment ($F(2,93) = 4.91$, $p < .01$), intelligence assessment ($F(2,93) = 5.87$, $p < .01$), survey research methods ($F(2,93) = 7.14$, $p < .01$), and sampling theory ($F(2,93) = 8.83$, $p < .01$). Tukey post hoc analyses revealed that the differences were always between those with doctorates and those with master's degrees or a bachelor's degree.

Table 8 depicted differences in the importance of business skills by education level. Only one significant difference emerged. The respondents with a doctorate rated report writing higher in importance than did the respondents with either a master's degree or a bachelor's degree ($F(2,93) = 8.23$, $p < .01$), as revealed with a Tukey post hoc analysis.

Table 7

Importance of Research/Measurement Skills by Education Level

	BA/BS M	MA/MS M	Ph.D. M
1. Research/Experimental Design (including quasi designs) *	3.57 $_{b}$	3.39 $_{b}$	5.02 $_{a}$
2. Classic Psychometric Methods (reliability, validity)*	3.71 $_{b}$	4.26 $_{b}$	5.56 $_{a}$
3. Latent Trait & Item Response Theory	3.00	3.03	3.90
4. Test Construction *	3.29 $_{b}$	4.03 $_{b}$	5.14 $_{a}$
5. Personality Assessment Methods *	3.00 $_{b}$	4.05 $_{b}$	4.70 $_{a}$
6. Intelligence Assessment Methods *	2.86 $_{b}$	3.77 $_{b}$	4.54 $_{a}$
7. Survey Research Methods (questionnaire development) *	4.14 $_{b}$	4.69 $_{b}$	5.44 $_{a}$
8. Attitude Measurement Methods	3.71	4.00	4.72
9. Sampling Theory (designing & drawing samples) *	4.00	3.67 $_{b}$	4.88 $_{a}$

* $p < .01$ for ANOVA, alphabetic subscripts designate which means are significantly different using a Tukey post hoc test with $p < .01$

Table 8

Importance of Business Skills by Education Level

	BA/BS	**MA/MS**	**Ph.D.**
	M	**M**	**M**
1. Administrative Management (planning, budgeting)	4.57	4.74	4.20
2. Business Development	4.14	4.54	4.06
3. Conflict Management	4.79	4.95	4.20
4. Making Presentations	5.29	5.20	5.60
5. Personal Professional Development	4.86	4.82	5.10
6. Personnel Management (recruiting, coaching)	4.43	4.85	4.06
7. Project Management	4.71	5.41	5.41
8. Report Writing *	4.29 $_{b}$	4.92 $_{b}$	5.56 $_{a}$

* $p < .01$ for ANOVA, alphabetic subscripts designate which means are significantly different using a Tukey post hoc test with $p < .01$

.Importance of Content Areas and Skills by Participants' Type of Degree

Eighty-nine percent of the respondents had a degree in I/O Psychology and 11% did not. Because of the small sample size of the latter group, only one statistically significant difference emerged between these two groups.

Table 9 illustrates how these two groups differed in rating the importance of the 21 I/O psychology content areas. The only significant difference between the two groups was the ratings for human performance and human factors where those without an I/O Psychology degree thought knowledge of this area was more important ($t(93) = -2.84$, $p < .01$). In Tables 10-12, no statistically significant difference emerged between these two groups.

Importance of Content Areas and Skills by the Organizational Size

Of the surveys returned, 87 participants reported the number of employees in their organizations and ten did not. The average organizational size was 21,912 full time equivalent employees. However, the median was only 550. The standard deviation was 58,078. Five of the companies had over 200,000 employees, while 49 businesses had 1,000 or fewer people working for them.

There were no significant relationships (with alpha set at .01) between organizational size and the importance of I/O Psychology content areas, statistical methods, research and measurement methods, or business skills. The correlation coefficients between organizational size and these variables appear in Tables 13-16.

Importance of Content Areas and Skills by the Type of Organization

The respondents were asked to categorize the type of organization for which they (or the I/O Psychologists under them) worked. Consulting organizations had the most

Table 9

Importance of I/O Psychology Content Areas by Type of Degree

	I/O Psy	**Not I/O Psy**
	M	**M**
1. Attitude Theory	3.64	3.70
2. Career Development Theory	3.75	4.30
3. Compensation & Benefits	3.41	3.22
4. Core Competencies Analysis	4.54	5.10
5. Consumer Behavior	2.72	3.20
6. Criterion Theory & Development	4.50	4.50
7. Employee Selection, Placement, & Classification	4.90	5.10
8. Ethical, Legal, & Professional Contexts	5.07	4.80
9. Health & Stress in Organizations	3.43	3.80
10. Human Performance/Human Factors *	3.62	5.00
11. Industrial & Labor Relations	3.64	3.60
12. Job & Task Analysis	4.90	4.60
13. Judgment & Decision Making	4.49	4.80
14. Leadership & Management	5.00	5.60
15. Organizational Development	4.54	5.40
16. Organization Theory	4.11	4.90
17. Performance Appraisal & Feedback	4.74	4.50
18. Small Group Theory & Processes	3.81	4.50
19. Strategic Management	4.15	4.90
20. Training: Theory, Program Design, & Evaluation	4.62	4.40
21. Work Motivation	4.70	5.00

* $p < .001$ for independent samples t-test

Table 10

Importance of Statistical Methods by Type of Degree

	I/O Psy M	Not I/O Psy M
1. Statistical Computer Packages (SPSS, SAS)	4.53	4.18
2. Basic Statistical Concepts (descriptive statistics)	5.37	4.73
3. Univariate Methods (t-tests, ANOVA, correlation)	4.67	4.00
4. Non-parametric methods (chi-square)	3.95	3.91
5. Multivariate Methods (in general)	4.09	3.91
a. Multiple Regression	4.31	4.00
b. Factor Analysis	4.03	4.00
c. MANOVA	3.38	3.82
d. Structural Equation Modeling	3.23	3.64
e. Log Linear Analysis	2.90	3.36
f. Cluster Analysis	3.16	3.82
g. Discriminant Analysis	3.19	3.91
h. Multidimensional Scaling	3.06	3.55
i. Time Series Analysis	3.01	3.82

Table 11

Importance of Research/Measurement Skills by Type of Degree

	I/O Psy **M**	**Not I/O Psy** **M**
1. Research/Experimental Design (including quasi designs)	4.33	3.80
2. Classic Psychometric Methods (reliability, validity)	4.98	4.36
3. Latent Trait & Item Response Theory	3.42	3.82
4. Test Construction	4.64	4.00
5. Personality Assessment Methods	4.31	4.45
6. Intelligence Assessment Methods	4.12	4.18
7. Survey Research Methods (questionnaire development)	5.13	4.45
8. Attitude Measurement Methods	4.35	4.36
9. Sampling Theory (designing & drawing samples)	4.34	4.27

Table 12

Importance of Business Skills by Type of Degree

	I/O Psy	**Not I/O Psy**
	M	**M**
1. Administrative Management (planning, budgeting)	4.52	4.00
2. Business Development	4.22	4.45
3. Conflict Management	4.53	4.68
4. Making Presentations	5.47	5.09
5. Personal Professional Development	4.95	5.09
6. Personnel Management (recruiting, coaching)	4.41	4.55
7. Project Management	5.42	4.91
8. Report Writing	5.27	4.82

Table 13

Correlations between Importance of I/O Psychology Content Areas and Organizational Size

	Organizational Size
1. Attitude Theory	-0.22
2. Career Development Theory	-0.24
3. Compensation & Benefits	-0.12
4. Core Competencies Analysis	.15
5. Consumer Behavior	.07
6. Criterion Theory & Development	.21
7. Employee Selection, Placement, & Classification	-0.10
8. Ethical, Legal, & Professional Contexts	.02
9. Health & Stress in Organizations	-0.20
11. Industrial & Labor Relations	.01
12. Job & Task Analysis	.04
13. Judgment & Decision Making	.12
14. Leadership & Management	.05
15. Organizational Development	.10
16. Organization Theory	.07
17. Performance Appraisal & Feedback	-0.10
18. Small Group Theory & Processes	-0.15
19. Strategic Management	.15
20. Training: Theory, Program Design, & Evaluation	.03
21. Work Motivation	-0.11

Table 14

Correlations between Importance of Statistical Methods and Organizational Size

	Organizational Size
1. Statistical Computer Packages (SPSS, SAS)	.09
2. Basic Statistical Concepts (descriptive statistics)	.11
3. Univariate Methods (t-tests, ANOVA, correlation)	.08
4. Non-parametric methods (chi-square)	.07
5. Multivariate Methods (in general)	.13
a. Multiple Regression	.10
b. Factor Analysis	.12
c. MANOVA	.15
d. Structural Equation Modeling	.09
e. Log Linear Analysis	.08
f. Cluster Analysis	.20
g. Discriminant Analysis	.18
h. Multidimensional Scaling	.10
i. Time Series Analysis	.18

Table 15

Correlations between Importance of Research/Measurement Methods and Organizational Size

	Organizational Size
1. Research/Experimental Design (including quasi designs)	.13
2. Classic Psychometric Methods (reliability, validity)	.04
3. Latent Trait & Item Response Theory	.02
4. Test Construction	.10
5. Personality Assessment Methods	.00
6. Intelligence Assessment Methods	.04
7. Survey Research Methods (questionnaire development)	.05
8. Attitude Measurement Methods	-0.01
9. Sampling Theory (designing & drawing samples)	.19

Table 16

Correlations between Importance of Business Skills and Organizational Size

	Organizational Size
1. Administrative Management (planning, budgeting)	.02
2. Business Development	.07
3. Conflict Management	.13
4. Making Presentations	.11
5. Personal Professional Development	.08
6. Personnel Management (recruiting, coaching)	.00
7. Project Management	.12
8. Report Writing	.11

representation (32%), followed by industrial organizations (30%), educational organizations (26%), and government organizations (12%).

Table 17 explores the importance of the 21 I/O Psychology content areas by organizational categories. One significant difference emerged for compensation and benefits ($F(3,90) = 4.02$, $p < .01$). A Tukey post hoc analysis revealed that knowledge of compensation and benefits is more important for I/O Psychologists working in industry compared to those working as external consultants. Those working in government or education fell in between.

No statistically significant differences emerged between I/O Psychologists working in the four types of organizations related to the importance of statistical methods or research and measurement methods. These results are presented in Tables 18 and 19.

Table 20 depicts the importance of nine business skills across the four organizational settings. The only significant difference found was the importance of business development skills ($F(3,92) = 5.04$, $p < .01$). A Tukey post hoc analysis revealed that business development skills is more important for I/O Psychologists working in consulting or industry compared to those working in government. Those working in education fell in between.

Importance of Content Areas and Skills by the Degree Required for the Job

For the job he or she was rating, each respondent was asked what type of degree was required. A doctorate was required for 39% of the jobs, a master's degree was required for 38% of the jobs, and either a master's degree or a doctorate was acceptable for 23% of the jobs. I was interested in whether the type of education required to fill a position was related to what kind of knowledge and skills were deemed important.

Table 17

Importance of I/O Psychology Content Areas by Organizational Categories

	Organization Category			
	Government Mean	**Consulting Mean**	**Industry Mean**	**Education Mean**
1. Attitude Theory	3.50	3.58	3.57	3.88
2. Career Development Theory	3.25	3.77	3.96	3.96
3. Compensation & Benefits *	3.17	2.77	4.22	3.36
4. Core Competencies Analysis	5.09	4.67	4.61	4.28
5. Consumer Behavior	2.42	2.45	3.32	2.71
6. Criterion Theory & Dev.	4.45	4.58	4.07	4.88
7. Employee Selection, Placement, & Classification	4.25	5.13	4.96	4.92
8. Ethical, Legal, & Prof. Contexts	4.50	4.81	5.32	5.28
9. Health & Stress in Org	2.83	3.26	3.29	4.24
10. Human Perf./Human Factors	3.83	3.57	3.61	4.16
11. Industrial & Labor Relations	4.08	3.65	3.57	3.48
12. Job & Task Analysis	5.50	5.06	4.46	4.76
13. Judgment & Decision Making	4.42	4.52	4.67	4.44
14. Leadership & Management	4.67	5.10	4.89	5.40
15. Organizational Development	3.83	4.93	4.54	4.76
16. Organization Theory	3.42	4.32	4.04	4.56
17. Perf. Appraisal & Feedback	3.83	4.84	4.75	4.96

	Organization Category			
	Government Mean	**Consulting Mean**	**Industry Mean**	**Education Mean**
18.Small Group Theory & Processes	3.33	3.94	3.50	4.52
19.Strategic Management	3.67	4.23	4.46	2.24
20.Training: Theory, Program Design, & Evaluation	4.58	4.23	4.61	5.04
21.Work Motivation	3.92	4.84	4.75	4.96

*p <.01 for ANOVA, alphabetic subscripts designate which means are significantly different using a Tukey post hoc test with $p < .01$

Table 18

Importance of Statistical Methods by Organizational Categories

	Organization Category			
	Government Mean	**Consulting Mean**	**Industry Mean**	**Education Mean**
1. Statistical Computer Packages (SPSS, SAS)	4.67	4.48	3.92	5.04
2. Basic Statistical Concepts (descriptive statistics)	5.25	5.52	4.93	5.48
3. Univariate Methods (t-tests, ANOVA, correlation)	4.50	4.61	4.10	5.20
4. Non-parametric methods (chi-square)	4.17	3.90	3.31	4.64
5. Multivariate Methods (in general)	3.75	4.04	3.68	4.67
a. Multiple Regression	3.67	4.42	3.93	4.80
b. Factor Analysis	3.33	4.13	3.62	4.72
c. MANOVA	2.75	3.52	3.00	4.16
d. Structural Equation Modeling	2.92	3.29	2.86	3.90
e. Log Linear Analysis	2.55	2.87	2.79	3.44
f. Cluster Analysis	3.00	3.10	3.34	3.40
g. Discriminant Analysis	2.92	3.23	3.31	3.44
h. Multidimensional Scaling	2.67	2.97	3.17	3.44
i. Time Series Analysis	2.55	2.87	3.34	3.36

Table 19

Importance of Research/Measurement Methods by Organizational Categories

	Organization Category			
	Government Mean	**Consulting Mean**	**Industry Mean**	**Education Mean**
1. Research/Experimental Design (including quasi designs)	3.83	4.30	4.00	4.76
2. Classic Psychometric Methods (reliability, validity)	5.08	5.03	4.55	5.08
3. Latent Trait & Item Response Theory	3.25	3.65	3.07	3.80
4. Test Construction	4.75	4.77	4.07	4.80
5. Personality Assessment Methods	3.58	4.90	4.07	4.28
6. Intelligence Assessment Methods	3.50	4.74	3.83	4.00
7. Survey Research Methods (questionnaire development)	4.92	5.16	4.93	5.12
8. Attitude Measurement Methods	3.75	4.71	4.10	4.48
9. Sampling Theory (designing & drawing samples)	4.25	4.32	4.21	4.52

Table 20

Importance of Business Skills by Organizational Categories

	Organization Category			
	Government Mean	**Consulting Mean**	**Industry Mean**	**Education Mean**
1. Administrative Management (planning, budgeting)	4.00	4.35	4.97	4.24
2. Business Development *	3.36 $_{b}$	4.71 $_{a}$	4.55 $_{a}$	3.72
3. Conflict Management	4.00	4.23	5.03	4.62
4. Making Presentations	5.25	5.29	5.48	5.60
5. Personal Professional Development	4.25	5.16	4.90	5.16
6. Personnel Management (recruiting, coaching)	3.75	4.35	4.72	4.48
7. Project Management	5.67	5.32	5.43	5.20
8. Report Writing	5.50	5.52	4.83	5.16

* $p < .01$ for ANOVA, alphabetic subscripts designate which means are significantly different using a Tukey post hoc test with $p < .01$

As can be seen in Table 21, significant differences emerged for compensation and benefits ($F(2,84) = 6.11$, $p < .01$) and criterion theory and development ($F(2,85) = 4.90$, $p < .01$). For jobs that required a master's degree, knowledge of compensation and benefits was more important compared to jobs requiring a doctorate or a master's or a doctorate, as revealed with a Tukey post hoc analysis. Conversely, for jobs that required a doctorate, knowledge of criterion theory and development was more important compared to jobs requiring a master's degree. Jobs requiring either a master's degree or a doctorate fell in-between, as revealed with a Tukey post hoc analysis.

The expected knowledge of statistical methods differed a great deal depending on the degree required for the job. As Table 22 illustrates, for jobs that require a Ph.D., knowledge of all types of statistics is more important: statistical software ($F(2,86) = 10.39$, $p < .01$), descriptive statistics ($F(2,87) = 5.25$, $p < .01$), univariate inferential statistics ($F(2,87) = 7.36$, $p < .01$), non-parametric statistics ($F(2,87) = 10.59$, $p < .01$), and multivariate statistics ($F(2,78) = 9.54$, $p < .01$). Tukey post hoc analyses revealed that jobs that require either a doctorate or masters sometimes fell in between in their importance ratings and sometimes aligned with the doctoral positions.

The only significant difference in the importance of research and measurement methods for jobs requiring different degrees was knowing about research and experimental designs ($F(2,86) = 7.13$, $p < .01$). As Table 22 depicts, this type of knowledge is more important for jobs that require a Ph.D. compared to those that only require a master's degree. A Tukey post hoc analysis revealed that jobs that require either a doctorate or masters fell in between in their importance ratings.

Table 21

Importance of I/O Psychology Content Areas by Required Degree for the Job

	Required Degree		
	MA/MS Mean	**PhD Mean**	**MA/MS or PhD Mean**
1. Attitude Theory	3.67	3.74	3.24
2. Career Development Theory	4.00	3.89	3.24
3. Compensation & Benefits *	4.09 $_{a}$	3.03 $_{b}$	2.71 $_{b}$
4. Core Competencies Analysis	4.53	4.83	4.55
5. Consumer Behavior	3.06	2.80	2.24
6. Criterion Theory & Development *	3.97 $_{b}$	4.94 $_{a}$	4.76
7. Employee Selection, Placement, & Classification	5.00	4.89	4.86
8. Ethical, Legal, & Professional Contexts	5.36	5.06	4.62
9. Health & Stress in Organizations	3.48	3.94	2.76
10. Human Performance/ Human Factors	3.84	3.94	3.33
11. Industrial & Labor Relations	4.00	3.43	3.33
12. Job & Task Analysis	4.88	4.86	5.00
13. Judgment & Decision Making	4.70	4.68	4.10
14. Leadership & Management	4.79	5.40	4.90
15. Organizational Development	4.51	5.09	4.05
16. Organization Theory	4.00	4.63	3.67
17. Performance Appraisal & Feedback	4.91	4.83	4.19
18. Small Group Theory & Processes	3.82	4.37	3.33
19. Strategic Management	4.45	4.31	3.70
20. Training: Theory, Program Design, & Evaluation	4.73	4.60	4.38
21. Work Motivation	4.88	4.83	4.24

* $p < .01$ for ANOVA, alphabetic subscripts designate which means are significantly different using a Tukey post hoc test with $p < .01$

Table 22

Importance of Statistical Methods by Required Degree for the Job

	Required Degree		
	MA/MS Mean	**PhD Mean**	**MA/MS or PhD Mean**
1. Statistical Computer Packages (SPSS, SAS) *	3.68_{b}	5.21_{a}	4.90_{a}
2. Basic Statistical Concepts (descriptive statistics) *	4.85_{b}	5.66_{a}	5.57
3. Univariate Methods (t-tests, ANOVA, correlation) *	3.88_{b}	5.17_{a}	4.90_{a}
4. Non-parametric methods (chi-square) *	3.15_{b}	4.77_{a}	4.05
5. Multivariate Methods (in general) *	3.29_{b}	4.94_{a}	4.17
a. Multiple Regression *	3.41_{b}	5.11_{a}	4.52
b. Factor Analysis *	3.29_{b}	4.80_{a}	4.19
c. MANOVA *	2.74_{b}	4.34_{a}	3.29
d. Structural Equation Modeling *	2.74_{b}	4.09_{a}	3.14
e. Log Linear Analysis *	2.55_{b}	3.54_{a}	2.85
f. Cluster Analysis *	2.79_{b}	3.80_{a}	3.14
g. Discriminant Analysis	2.88	3.77	3.24
h. Multidimensional Scaling	2.85	3.49	3.14
i. Time Series Analysis	2.71	3.60	3.10

* $p < .01$ for ANOVA, alphabetic subscripts designate which means are significantly different using a Tukey post hoc test with $p < .01$

Table 23

Importance of Research/Measurement Methods by Required Degree for the Job

	Required Degree		
	MA/MS Mean	**PhD Mean**	**MA/MS or PhD Mean**
1. Research/Experimental Design (including quasi designs) *	3.71 $_{b}$	5.00 $_{a}$	4.43
2. Classic Psychometric Methods (reliability, validity)	4.47	5.49	5.05
3. Latent Trait & Item Response Theory	3.09	3.94	3.67
4. Test Construction	4.15	4.94	4.76
5. Personality Assessment Methods	4.38	4.49	4.33
6. Intelligence Assessment Methods	4.12	4.31	4.19
7. Survey Research Methods (questionnaire development)	4.76	5.34	5.14
8. Attitude Measurement Methods	4.21	4.63	4.24
9. Sampling Theory (designing & drawing samples)	3.88	4.89	4.29

* $p < .01$ for ANOVA, alphabetic subscripts designate which means are significantly different using a Tukey post hoc test with $p < .01$

There were no significant differences in the importance of business skills based on the degree required for the job. These results appear in Table 24.

Importance of Content Areas and Skills by the Job the Participants were Rating

The participants were asked whether they were rating an I/O Psychology job that was their own job, or a job that they supervised. The majority (69%) said they were rating their own job, while 31% were rating a job they supervised. Table 25 depicts the importance of the 21 I/O Psychology content areas for those rating their own jobs versus those rating a job they supervise. There were no significant results.

In Table 26 the importance of statistical methods for those rating their own jobs versus those rating a job they supervise are depicted. There were two significant results. Those rating a job they supervise felt that factor analysis ($t(94) = -2.99$, $p < .01$) and discriminant analysis ($t(94) = -3.14$, $p < .01$) were more important compared to those rating their own jobs.

In Table 27 the importance of research and measurement methods for those rating their own jobs versus those rating a job they supervise are depicted. There was one significant result. Those rating a job they supervise felt that personality assessment ($t(94) = -2.71$, $p < .01$) was more important compared to those rating their own jobs.

Table 28 depicts the importance of business skills for those rating their own jobs versus those rating a job they supervise. There were no significant results.

Table 24

Importance of Business Skills by Required Degree for the Job

	Required Degree		
	MA/MS Mean	**PhD Mean**	**MA/MS or PhD Mean**
1. Administrative Management (planning, budgeting)	4.74	4.03	4.38
2. Business Development	4.38	4.20	3.75
3. Conflict Management	4.94	4.13	4.52
4. Making Presentations	5.32	5.51	5.52
5. Personal Professional Development	5.00	5.03	4.76
6. Personnel Management (recruiting, coaching)	4.65	4.17	4.33
7. Project Management	5.50	5.37	5.25
8. Report Writing	4.91	5.46	5.33

Table 25

Importance of I/O Psychology Content Areas by Type of Job the Participant was Rating

	My Job **Mean**	**A Job I Supervise** **Mean**
1. Attitude Theory	3.75	3.40
2. Career Development Theory	3.78	3.87
3. Compensation & Benefits	3.67	2.87
4. Core Competencies Analysis	4.48	4.87
5. Consumer Behavior	2.81	2.70
6. Criterion Theory & Development	4.38	4.73
7. Employee Selection, Placement, & Classification	4.78	5.27
8. Ethical, Legal, & Professional Contexts	5.02	5.10
9. Health & Stress in Organizations	3.60	3.20
10. Human Performance/ Human Factors	3.91	3.43
11. Industrial & Labor Relations	3.82	3.27
12. Job & Task Analysis	4.86	4.90
13. Judgment & Decision Making	4.63	4.30
14. Leadership & Management	5.12	4.90
15. Organizational Development	4.69	4.47
16. Organization Theory	4.23	4.03
17. Performance Appraisal & Feedback	4.71	4.80
18. Small Group Theory & Processes	3.91	3.77
19. Strategic Management	4.42	3.77
20. Training: Theory, Program Design, & Evaluation	4.69	4.33
21. Work Motivation	4.72	4.73

Table 26

Importance of Statistical Methods by Type of Job the Participant was Rating

	My Job **Mean**	**A Job I Supervise** **Mean**
1. Statistical Computer Packages (SPSS, SAS)	4.25	4.97
2. Basic Statistical Concepts (descriptive statistics)	5.23	5.43
3. Univariate Methods (t-tests, ANOVA, correlation)	4.45	4.87
4. Non-parametric methods (chi-square)	3.74	4.37
5. Multivariate Methods (in general)	3.83	4.56
a. Multiple Regression	3.98	4.87
b. Factor Analysis *	3.68 $_{b}$	4.73 $_{a}$
c. MANOVA	3.18	3.93
d. Structural Equation Modeling	3.02	3.80
e. Log Linear Analysis	2.72	3.41
f. Cluster Analysis	2.98	3.73
g. Discriminant Analysis *	2.95 $_{b}$	3.90 $_{a}$
h. Multidimensional Scaling	2.89	3.53
i. Time Series Analysis	2.98	3.31

* $p < .01$ for an independent samples t-test

Table 27

Importance of Research/Measurement Methods by Type of Job the Participant was Rating

	My Job Mean	**A Job I Supervise Mean**
1. Research/Experimental Design (including quasi designs)	4.20	4.40
2. Classic Psychometric Methods (reliability, validity)	4.74	5.23
3. Latent Trait & Item Response Theory	3.23	3.90
4. Test Construction	4.46	4.73
5. Personality Assessment Methods *	4.03 $_{b}$	4.93 $_{a}$
6. Intelligence Assessment Methods	3.91	4.60
7. Survey Research Methods (questionnaire development)	4.92	5.30
8. Attitude Measurement Methods	4.12	4.83
9. Sampling Theory (designing & drawing samples)	4.18	4.60

* $p < .01$ for an independent samples t-test

Table 28

Importance of Business Skills by Type of Job the Participant was Rating

	My Job **Mean**	**A Job I Supervise** **Mean**
1. Administrative Management (planning, budgeting)	4.64	4.17
2. Business Development	4.24	4.34
3. Conflict Management	4.70	4.28
4. Making Presentations	5.47	5.33
5. Personal Professional Development	4.98	4.93
6. Personnel Management (recruiting, coaching)	4.58	4.17
7. Project Management	5.35	5.37
8. Report Writing	5.26	5.10

CHAPTER 4

DISCUSSION

The results of this survey can guide I/O Psychology students when they are in school, and once they start working toward the skills and areas of knowledge that are most valued in the workplace. These results can also guide I/O Psychology graduate programs in their decisions about curriculum development as they prepare their students for life after graduate school. Because a discussion of the results found in 28 tables could be a little bit overwhelming for both the author and the readers, the discussion has been divided into four sections: I/O Psychology content areas, statistical knowledge, research/measurement skills, and business skills.

I/O Psychology Content Areas

The first hypothesis was that the industrial side of I/O Psychology which stresses traditional human resource content areas would be more valued by employers. This is what Wesolowski and Field found in their 1987 study. The first hypothesis was somewhat supported. Traditional human resource areas were well represented in the top ten. Ethical, legal, and professional contexts was second in importance; employee selection, placement, and classification was third; job and task analysis was fourth; performance appraisal and feedback was sixth; core competencies analysis was eighth; and training was ninth. However, the biggest change from 1987 to 2011 was the importance of leadership. Today it is ranked number one, while in 1987 it was ranked tenth. Other organizational psychology content in the top ten were work motivation in the fifth spot, organizational development in the eighth spot, and judgment and decision making in the tenth spot.

This increase in the importance of leadership theories to practicing I/O Psychologists may be due to the recent explosion in companies using executive coaches. In recent years there has been an increase in the use of executive coaches within organizations. The primary reason for hiring most coaches is to better develop leadership, whether that be to strengthen already good leaders, or to improve those who were lacking. Bolt (2006) found that 71% of the senior executive teams and 43% of chief executive officers had worked with a coach. Within the organizations, 63% planned to increase their use of coaches, and 92% of leaders planned on using a coach again. Many I/O psychologists are probably entering this lucrative field of consulting.

When the importances of the I/O Psychology content areas were analyzed by the different demographic variables, a number of interesting findings emerged. For example, I/O psychologists with Ph.D.s must know more about criterion development, while I/O Psychologists with master's degrees must know more about strategic planning. This difference is probably due to Ph.D. psychologists being more likely to have research oriented positions and masters level psychologists more likely to have administrative positions.

I/O Psychologists working in industrial setting rated knowledge of compensation and benefits as more important. I/O Psychologists do not consult in this area very much. In governmental or educational settings, the compensation plans are somewhat rigid. However, in private industry compensation and benefits are important tools for strategic human resource management. Compensation and benefits are more important for master's level I/O Psychology jobs, probably because they are more administrative in nature.

For masters-level positions, the five most important content areas were: ethical, legal, & professional contexts; employee selection, placement, & classification; performance appraisal and feedback; job and task analysis; and work motivation. Other than work motivation, there is a strong emphasis on industrial psychology topics that focus on nuts and bolts human resources issues. Perhaps that is what master's level students and graduate programs should focus more on these issues. Nagy, Schrader, and Aamodt (2005) found that masters level I/O Psychology programs offer from two to eleven I/O Psychology classes, with the majority requiring five to six. If a master's level I/O Psychology program does not offer some of the five classes listed above, perhaps they should consider doing so.

On the other hand, for Ph.D. level positions, the five most important content areas were leadership and management; organizational development; ethical, legal, and professional contexts; criterion theory and development; and employee selection, placement, and classification. The top two are organizational psychology topics that are less nuts and bolts and focus more on a systemic understanding of organizations. Thus, Ph.D. students and Ph.D. programs should require a balance of industrial and organizational psychology topics, which will take more years to master.

Statistical Knowledge

As was true in Wesolowski and Field's (1987) research, knowledge of basic statistical concepts (descriptive statistics) was rated the most important. While not all I/O Psychologists have to be expert statisticians, they need to be comfortable working with numbers. Knowledge of statistics has been found to be essential in many positions (Brinley, Durley, & Muoz, 2004). Because of this, statistical classes should remain a

large part of the curriculum, no matter which type of degree he or she is seeking. Statistical classes are part of category II in SIOP's guidelines. This knowledge is vital after graduation.

When the importances of different statistical methods were analyzed by the different demographic variables, a number of interesting findings emerged. For example, the second hypothesis was that multivariate statistics would be more important for doctoral positions than for master's level positions. Not surprisingly, this hypothesis was supported. The likelihood is that, as stated before, more doctoral positions are in research, and, therefore, it would be important for them to know sophisticated ways to interpret their results.

Part of the fifth hypothesis was that within government and industrial organizations, the larger organizations would rate multivariate statistical methods as more important when employing an I/O Psychologist than the smaller organizations. This hypothesis was supported ($r = .44$, $p < .05$). One possible explanation for this finding is that larger organizations have more financial and human resources to carry out their own research.

One implication of these findings for students is that it is important when starting graduate school for students to know what they want to do with their degree. Students seeking a doctorate should be aware that they will need to master sophisticated statistical techniques in order to graduate. Students working on a master's degree will not have to learn nearly as much about statistics, but those students should be aware that this lack of knowledge about statistics could put them at a professional disadvantage. Those students should be encouraged to continue their statistical education beyond graduate school if

they want to become more marketable in their chosen profession. This may prove to be especially true in the larger organizations which conduct more personnel research.

For graduate programs, there clearly are differences in the statistical knowledge master's and doctoral graduates are expected to master. Master's programs are not expected to provide their students with the same level of statistical sophistication as doctoral programs. However, as Hays-Thomas (2000) indicated, there are four types of master's degrees. These are the terminal master's degree that prepares a student for employment, a research-oriented degree that often prepares students to enter a doctoral program, the student who earns a master's degree while earning a doctorate, and some doctoral students cannot complete their doctoral training and are instead awarded a master's degree. It is likely that the statistics taught in the latter three situations will be more advanced than it will be in a terminal master's degree program, which will probably just offer a single statistics class. Each program should cater its curriculum to the type of degree it offers and to the needs of its students.

Research/Measurement Skills

As was true in Wesolowski and Field's 1987 study, survey research methods and classic psychometric methods were rated highest. The third hypothesis was that personality and intelligence assessment would be the least important measurement concerns because personality assessment was the least importance measurement skill in Wesolowski and Field's 1987 study and intelligence assessment was not even an item on their 1987 survey. This hypothesis was not fully supported. Personality assessment was rated as the fifth most important measurement skill out of nine skills. It has gained somewhat in importance since 1987. On the other hand, intelligence assessment was rated

as the eighth most important measurement skill out of nine skills. The least important measurement skill was knowing how to apply latent trait and item response theory.

The increase in the importance of personality assessment to practicing I/O Psychologists may be due to the breakthrough research in the five factor model of personality. Not only has this model helped to predict job performance, it has also been found to predict effective leadership (Judge, Bono, Ilies, & Gerhardt, 2002; McCormick & Burch, 2008). Perhaps one of the reasons I/O Psychologists are more interested in leadership theories today, as was noted earlier, is that I/O Psychologists are enjoying greater success in identifying the traits required for successful leader selection and development.

In 1990, Howard estimated the percentage of SIOP members conducting individual psychological assessments (IPA) to be about 33%. In a recent article, Silzer and Jeanneret (2011) wrote, “We suspect that over the last 20 years the number of I/O Psychologists conducting individual assessments has noticeably increased. IPA is now routinely offered by consulting firms and independent consultants as part of assessment services,” (p.270). In a related article, Jeanneret and Silzer (2011) noted that their book, Individual Psychological Assessment (1998), “is one of the top selling SIOP books,” (p. 350). The increase in the importance of personality assessment from 1987 to 2011 found in my research would seem to support Silzer and Jeanneret’s supposition. Perhaps this change in practice was spurred by the breakthrough research on the five factor model of personality during the 1980s and 1990s (Silzer & Jeanneret, 2011).

When the importance of different research and measurement skills were analyzed by work setting, the importance of personality and intelligence assessment was highest

for I/O Psychologists working as consultants, although the differences were not statistically significant (Table 19). This is in keeping with Silzer and Jeanneret's (2011) comment about the increased use of IPA by consultants.

Part of the fifth hypothesis was that within government and industrial organizations, the larger organizations would rate research/measurement skills as more important when employing an industrial/organizational psychologist than the smaller organizations. This hypothesis was supported for skills in sampling theory ($r = .53$, $p < .01$), research/experimental design ($r = .43$, $p < .05$), classic psychometric methods ($r = .39$, $p < .05$), and test construction ($r = .35$, $p < .05$). One possible explanation for these results is that the larger government agencies and for-profit companies are somewhat more interested in personnel research than the smaller organizations because the latter may lack sufficient resources to carry out much of their own research.

Finally, Ph.D. I/O Psychologists rated seven of the nine research and measurement skills as significantly more important to them in their jobs than master's level I/O Psychologists (Table 7). However, only one significant difference emerged in the importance of the nine research and measurement skills when comparing master's level jobs to Ph.D. level jobs, experimental designs (Table 23). I am not sure why there is a disconnect between these two tables.

One implication of these findings for graduate students in I/O Psychology is that they may want to learn more about IPA. While SIOP recognizes individual assessment as an "area of competence" that should be developed in Ph.D. I/O Psychology programs, Silzer and Jeanneret's (2011) observed, "We know of few Ph.D. level graduate programs in I/O Psychology that offer individual assessment courses or experiences," (p.289). They

go one to say that one reason is probably because the faculty are not qualified to teach IPA. Thus, students may need to pick up these skills elsewhere, probably in clinical psychology classes or consulting internships where IPA is performed. These skills could prove lucrative for an I/O Psychologist. Moses (2011) estimates an average billing cost of $7,000 for assessing an executive. To earn that money, eight or more hours would need to be invested, including prework of examining 360 degree appraisal data and other sources of information about the executive.

Relatedly, graduate programs in I-O psychology that want to differentiate themselves in the educational marketplace from other programs may want to consider offering a class on IPA. Two examples of I/O Psychology programs that offer such a class are the University of Akron and Baruch College, CUNY.

For the other research and measurement skills, master's level students should be aware that future employers expect I/O Psychologists to know about survey research and classic psychometric methods. Doctoral students will, of course, have higher expectations placed on them to learn how to conduct research proficiently. This includes critical thinking, coming up with hypotheses, manipulating variables, choosing experimental designs, establishing the reliability and validity of measures, choosing sampling procedures, knowing how to measure the relationship between variables, and so on (SIOP, 1999). As the SIOP guidelines explain, master's level students may need more guidance in complex situations involving these methods (SIOP, 1994).

Business Skills

None of the eight business skills were included in Wesolowski and Field's 1987 study. The three most important skills were making presentations, project management,

and report writing. None of the skills were rated as unimportant. Even the least important skill, business development, had a high average score.

When the importance of different research and measurement skills were analyzed by the different demographic variables, a number of interesting findings emerged. For example, the fourth hypothesis was that I/O psychologists working as consultants would rate the importance of business development skills higher than I/O psychologists working anywhere else. While this was true, the importance of business development skills for I/O Psychologists working as consultants was not statistically greater than that for I/O Psychologists working in industry. Whether working in a large company or for a smaller consulting firm, I/O Psychologists who work in the for-profit world must be more concerned about business development compared to academicians and government workers.

One implication of these findings for students is that while SIOP lists theses additional skills as optional, clearly they are important. As Brinley, Durley, and Muoz (2004) found professionals recommend students take as many additional business classes as they can. For graduate programs, it would be beneficial to add more classes that teach skills within the business arena.

The three most important business skills were making presentations, project management, and report writing. Fortunately, many of these skills are taught across the curriculum. For example, students often have to make presentations and write reports in several classes. And the students who have to write an thesis or a dissertation receive a great lesson in project management.

Conclusion

It seems as times change, so should knowledge. While many similarities were found between this study and Wesolowski and Field's 1987 study, differences also emerged. Are the differences big enough to suggest major changes in SIOP's educational guidelines? The answer to that question is difficult. Not all the items from this study were included in the 1987 study, making exact comparisons impossible. But this study was a start. More research needs to be done to illuminate how graduate programs need to evolve to stay relevant to today's work world.

References

Bartels, L., Macan, T., Gutting, B., Lemming, M., & McCrea, R. (2005). Teaching the practitioner side of the scientist-practitioner model. *The Industrial-Organizational Psychologist, 42(3),* 58-64.

Blakeney, R., Broenen, R., Dyck, J., Frank, B., Glenn, D., Johnson, D., & Mayo, C. (2002). Implications of the results of job analysis of I-O psychologists. *The Industrial-Organizational Psychologist, 39*(4), 29-37.

Bolt, J. (2006, April 10). Coaching: The fad that won't go away. Retrieved from http://www.fastcompany.com/resources/learning/bolt/041006.html

Campbell, W. J. (2002). Consideration of consulting psychology/organizational educational principles as they relate to the practice of industrial-organizational psychology band the Society for Industrial and Organizational Psychology's education and training guidelines. *Consulting Psychology Journal: Practice and Research, 54,* 261-274. doi: 10.1037/1061-4087.54.4.261

Cascio, W. F., & Aguinis, H. (2008). Research in industrial and organizational psychology from 1963 to 2007: Changes, choices, and trends. *Journal of Applied Psychology, 93,* 1062-1081. doi: 10.1037/0021-9010.93.5.1062

Dooney, J., Smith, N., & Williams, S. (2005). SHRM graduate HR curriculum study. Alexandria, VA: Society for Human Resource Management.

Erdwins, C. J., & Buffardi, L. C. (1983). Employment of recent MAs in psychology: A middle rung on the career ladder. *Professional Psychology: Research and Practice, 14,* 112-117. doi: 10.1037/0735-7028.14.1.112

Erffmeyer, E. S., & Mendel, R. M. (1990). Master's level training in industrial/organizational psychology: A case study of the perceive relevance of graduate training. *Professional Psychology: Research and Practice, 21,* 405-408. doi: 10.1037/0735-7028.21.5.405

Goldstein, I. L., & Ford, L. K. (2002). *Training in Organizations*. California: Wadsworth.

Grant, J. (2002). Learning needs assessment: Assessing the need. *BMJ: British Medical Journal, 324* (7330), 156-159. Retrieved from http://library.jccc.edu.ezproxy.jccc.edu/

Hays-Thomas, R. L. (2000). The silent conversation: Talking about the master's degree. *Professional Psychology: Research and Practice, 31,* 339-345. doi: 10.1037//0735-7028.31.3.339

Hays-Thomas. R. L. (2006). Challenging the Scientist-Practitioner model: Questions about I-O education and training. *The Industrial-Organizational Psychologist, 44*(1), 47-53.

Howard, A. (1990). *The multiple facets of industrial-organizational psychology: membership survey results.* Bowling Green, OH: SIOP.

Jeanneret, R., & Silzer, R. (2011). Individual psychological assessment: A core competency for industrial-organizational psychology. *Industrial and Organizational Psychology: Perspectives on Science and Practice, 4*(3), 342-351.

Judge, T. A., Kammeyer-Mueller, J., & Bretz, R. D. (2004). A longitudinal model of sponsorship and career success: A study of industrial-organizational psychologists. *Personnel Psychology, 57,* 271-303. doi: 10.1111/j.1744-6570.2004.tb02492.x

Katzell, R. A., & Austin, J. T. (1992). From then to now: The development of Industrial-Organizational psychology in the united states. *Journal of Applied Psychology, 77,* 803-835. doi: 10.1037/0021-9010.77.6.803

Koppes, L. L. (2009). *A brief history of the Society for Industrial and Organizational Psychology, Inc.-A division of the APA.* Retrieved from http://www.siop.org/History/historynew.aspx

Law, B. M. (2004). Pre-doctoral master's degrees provide research experience. *GradPSYCH, 2.* Retrieved from http://www.apa.org/gradpsych/2004/09/enroute.aspx

Lindsay, D. R., Tate, B. W., & Jacobs, R. R. (2008). Practicum: A teaching tool to highlight the scientist-practitioner model. *The Industrial-Organizational Psychologist, 45*(3), 39-47.

Lorig, A. N. (1958). A non-thesis program for masters' candidates. *The Accounting Review, 33,* 126-128.

Lowe, R. H. (1993). Master's programs in industrial/organizational psychology: Current status and a call for action. *Professional Psychology: Research and Practice, 24,* 27-34. doi: 10.1037/0735-7028.24.1.27

MacKinney, A. C. (1968). The master's degree in industrial psychology. *American Psychologist, 23,* 342-356. doi: 10.1037/h0026131

McCormick, I., & Burch, G. S. J. (2008). Personality-focused coaching for leadership development. *Consulting Psychology Journal: Practice and Research, 60,* 267-278. doi: 10.1037/1065-9293.60.3.267

Moses, J. (2011). Individual psychological assessment: You pay for what you get. *Industrial and Organizational Psychology: Perspectives on Science and Practice, 4*(3), 334-337.

Muchinsky, P. M. (1973). Graduate training in industrial psychology: One more time. *Professional Psychology, 4,* 286-295. Doi: 10.1037/h0035753

Muchinsky, P. M. (2009). *Psychology applied to work (9th edition).* Summerfield, NC: Hypergraphic Press.

Munson, L. J., Phillips, G., Clark, C. C., & Mueller-Hanson, R. (2004). Everything you need to know about I-O internships: Results from the 2003 SIOP internship survey. *The Industrial-Organizational Psychologist, 42*(1), 117-126.

Nagy, M. S., Schrader, B. W., & Aamodt, M. G. (2005). Educational training for masters degree programs in industrial-organizational psychology. *The Industrial-Organizational Psychologist, 43*(2), 89-96.

Popham, W. J. (1971). Educational needs assessment. *Curriculum Theory Network, 22-32,* Blackwell: Ontario.

Pritchard, R. D., Hart, D. E., & Fuentes, R. R. (1989). Making career decisions in I/O psychology. *The Industrial-Organizational Psychologist, 26*(3), 25-30.

Rentsch, J. R., Lowenberg, G., Barnes-Farrell, J., & Menard, D. (1997). Report on the survey of graduate programs in industrial/organizational psychology and organizational behavior/human resources. *The Industrial-Organizational Psychologist, 35*(1), 49-68.

Ryan, A. M., & Sackett, P. R. (1992). Relationships between graduate training, professional affiliation, and individual psychological assessment practices for personnel decisions. *Personnel Psychology, 45*,363-387.doi: 10.1111/j.1744-6570.1992.tb00854.x

Schippman, J. S., Schmitt, S. D., & Hawthorne, S. L. (1992). I/O work roles: Ph. D. vs. Master's level practitioners. *The Industrial-Organizational Psychologist, 29*(4), 35-39.

Schneider, S., Piotrowski, C., & Kass, S. J. (2007). Training masters students through consulting experiences: Benefits and pitfalls. *Organization Development Journal, 25*(1), 47-55. Retrieved from http://www.emporia.edu/libsv/databases/alphabetic.php

Shoenfelt, E. L. (2003). Education & training in I-O psychology: Utilizing applied projects in I-O graduate training: A checklist to help ensure successful experiences. *The Industrial-Organizational Psychologist, 41*(2), 109-115.

Silzer, R. & Jeanneret, R. (2011). Individual psychological assessment: A practice and science in search of common ground. *Industrial and Organizational Psychology: Perspectives on Science and Practice, 4*(3), 270-296.

Steinheider, B., Constanza, D. P., Kisamore, J. L., & Reiter-Palmon, R. (2006). Leaving the psychology tower: Nontraditional programs in I-O psychology. *The Industrial-Organizational Psychologist, 43*(4), 83-89.

Thompson, J., Garman, A., Horowitz, M., & Barr, M. (2005). The Chicago school I-O program: Application of the Vail model to graduate I-O education. *The Industrial-Organizational Psychologist, 42*(2), 106-111.

Trahan, W. A., & McAllister, H. A. (2002). Master's level training in industrial/organizational psychology: Does it meet the SIOP guidelines? *Journal of Business and Psychology, 16,* 457-465. doi: 10.1023/A:1012881209342

Vodanovich, S. J., & Piotrowski, C. (1999). Training in personnel selection assessment: Survey of I/O programs. *Journal of Instructional Psychology, 26*(3), 201-205. Retrieved from http://www.emporia.edu/libsv/databases/alphabetic.php

Wesolowski, M. A., & Field, H. S. (1987). Recruiting and selecting Ph.D. graduates by business and consulting organizations. *The Industrial-Organizational Psychologist, 25*(91), 17-27.

Yorges, S. L. (2000). Outcomes assessment for I-O psychology graduate programs. *The Industrial-Organizational Psychologist, 37*(3). Retrieved from http://www.emporia.edu/libsv/databases/alphabetic.php

Appendix A

Informed Consent Document

INFORMED CONSENT DOCUMENT

The Department of Psychology, Art Therapy, Rehabilitation, and Mental Health Counseling at Emporia State University supports the practice of protection for human subjects participating in research and related activities. The following information is provided so that you can decide whether you wish to participate in the present study. You should be aware that even if you agree to participate, you are free to withdraw at any time, and that if you do withdraw from the study, you will not be subjected to reprimand or any other form of reproach. Likewise, if you choose not to participate, you will not be subjected to reprimand or any other form of reproach.

Currently graduate programs in Industrial/Organizational (I/O) psychology have guidelines for their curriculum. These are not requirements. As a result each program differs and students from each program have different KSAOs they are taught. As an employer of an I/O psychologist you can help identify what skills are most important.

I want to each I/O psychology student to be taught the KSAOs that employers are seeking in applicants. In studying what skills employers are seeking in I/O psychologists, I hope to change the guidelines for graduate schools. Without this research, there will be no consensus amongst graduate guidelines.

The data you provide will remain anonymous. You will place the completed survey into the return envelope, and it will come to me. No information will link you to your answers.

If you have any questions concerning the procedure please contact me, Amanda Steiner at asteine1@emporia.edu or 620-381-1114, or my advisor Dr. George Yancey at gyancey@emporia.edu or 620-341-5839.

"I have read the above statement and have been fully advised of the procedures to be used in this project. I have been given sufficient opportunity to ask any questions I had concerning the procedures and possible risks involved. I understand the potential risks involved and I assume them voluntarily. I likewise understand that I can withdraw from the study at any time without being subjected to reproach."

In completing the following survey, you give your consent.

THIS PROJECT HAS BEEN REVIEWED BY THE EMPORIA STATE UNIVERSITY

INSTITUTIONAL REVIEW BOARD FOR TREATMENT OF HUMAN SUBJECTS.

Appendix B

Demographics

Demographics

Instructions: Please answer the following questions about yourself and about the position for which you might hire someone with an industrial-organizational psychology degree. The questions about you and your organization are in the left column and the questions about the position are in the right column. If any question makes you uncomfortable, simply leave it blank.

1. What is your job title?

2. What is your highest level of education?
   Check the appropriate box

   ☐ BA/BS

   ☐ MA/MS

   ☐ Ph.D.

3. Do you have a degree in industrial-organizational psychology?
   Check the appropriate box

   ☐ Yes, I do

   ☐ No, I do not

4. Approximately, how many people does your organization employ full time?

5. In which category does your organization best fit?
   Check the appropriate box

   ☐ Government

   ☐ Consulting

   ☐ Industry

   ☐ Education

6. What is a typical **job title(s)** for which your organization would hire an employee with a graduate degree in industrial-organizational psychology?

7. For an employee with that job title, does your organization usually employ someone with a master's degree or someone with a doctoral degree?
   Check the appropriate box

   ☐ MA/MS

   ☐ Ph.D.

8. In the questions that follow on the next three pages, will you be describing the skills and knowledge needed for your job or for a job that you supervise?

   ☐ My job

   ☐ A job I supervise

Before you complete the rest of this survey, I would like to Thank You. I know your time is valuable and I appreciate your help very much!

Appendix C

I/O Psychology Content Areas

I/O Psychology Content Areas

Instructions: Please rate how important it is for an Industrial/Organizational Psychologist with the job title listed on the previous page to have **knowledge of a particular content area** to succeed in your organization by circling the appropriate number between 1 (very unimportant) and 6 (very important) for each content area.

Content Areas **Ratings**

	Very Unimportant	**Unimportant**	**Slightly Unimportant**	**Slightly Important t**	**Important**	**Very Important**
1. Attitude Theory	1	2	3	4	5	6
2. Career Development Theory	1	2	3	4	5	6
3. Compensation & Benefits	1	2	3	4	5	6
4. Core Competencies Analysis	1	2	3	4	5	6
5. Consumer Behavior	1	2	3	4	5	6
6. Criterion Theory & Development	1	2	3	4	5	6
7. Employee Selection, Placement, & Classification	1	2	3	4	5	6
8. Ethical, Legal, & Professional Contexts	1	2	3	4	5	6
9. Health & Stress in Organizations	1	2	3	4	5	6
10. Human Performance/Human Factors	1	2	3	4	5	6
11. Industrial & Labor Relations	1	2	3	4	5	6
12. Job & Task Analysis	1	2	3	4	5	6
13. Judgment & Decision Making	1	2	3	4	5	6
14. Leadership & Management	1	2	3	4	5	6
15. Organizational Development	1	2	3	4	5	6
16. Organization Theory	1	2	3	4	5	6
17. Performance Appraisal & Feedback	1	2	3	4	5	6
18. Small Group Theory & Processes	1	2	3	4	5	6
19. Strategic Management	1	2	3	4	5	6
20. Training: Theory, Program Design, & Evaluation	1	2	3	4	5	6
21. Work Motivation	1	2	3	4	5	6

Appendix D

Statistical Methods

Statistical Methods

Please rate how important it is for a new Industrial/Organizational Psychologist to have knowledge of a particular statistical method to succeed in your organization by circling the appropriate number between 1 (very unimportant) and 6 (very important) for each statistical area.

Statistical Areas	**Ratings**					
	Very Important					**Very Unimportant**
1. Statistical Computer Packages (SPSS, SAS)	1	2	3	4	5	6
2. Basic Statistical Concepts (descriptive statistics)	1	2	3	4	5	6
3. Univariate Methods (t-tests, ANOVA, correlation)	1	2	3	4	5	6
4. Non-parametric methods (chi-square)	1	2	3	4	5	6
5. Multivariate Methods (in general)	1	2	3	4	5	6
a. Multiple Regression	1	2	3	4	5	6
b. Factor Analysis	1	2	3	4	5	6
c. MANOVA	1	2	3	4	5	6
d. Structural Equation Modeling	1	2	3	4	5	6
e. Log Linear Analysis	1	2	3	4	5	6
f. Cluster Analysis	1	2	3	4	5	6
g. Discriminant Analysis	1	2	3	4	5	6
h. Multidimensional Scaling	1	2	3	4	5	6
i. Time Series Analysis	1	2	3	4	5	6
j. Other (please specify)	1	2	3	4	5	6

Appendix E

Research/Measurement Methods

Research/Measurement Methods

Please rate how important it is for a new Industrial/Organizational Psychologist to have knowledge of a particular research/measurement area to succeed in your organization by circling the appropriate number between 1 (very unimportant) and 6 (very important) for each research area.

Research/Measurement Areas	**Ratings**					
	Very Unimportant					**Very Important**
1. Research/Experimental Design (including quasi designs)	1	2	3	4	5	6
2. Classic Psychometric Methods (reliability, validity)	1	2	3	4	5	6
3. Latent Trait & Item Response Theory	1	2	3	4	5	6
4. Test Construction	1	2	3	4	5	6
5. Personality Assessment Methods	1	2	3	4	5	6
6. Intelligence Assessment Methods	1	2	3	4	5	6
7. Survey Research Methods (questionnaire development)	1	2	3	4	5	6
8. Attitude Measurement Methods	1	2	3	4	5	6
9. Sampling Theory (designing & drawing samples)	1	2	3	4	5	6

Appendix F

Business Development Skills

Business Skills

Please rate how important it is for a new Industrial/Organizational Psychologist to possess the following skills to succeed in your organization by circling the appropriate number between 1 (very unimportant) and 6 (very important) for each skill.

Skills	Ratings					
	Very Unimportant					**Very Important**
1. Administrative Management (planning, budgeting)	1	2	3	4	5	6
2. Business Development	1	2	3	4	5	6
3. Conflict Management	1	2	3	4	5	6
4. Making Presentations	1	2	3	4	5	6
5. Personal Professional Development	1	2	3	4	5	6
6. Personnel Management (recruiting, coaching)	1	2	3	4	5	6
7. Project Management	1	2	3	4	5	6
8. Report Writing	1	2	3	4	5	6

Appendix G

IRB Approval

EMPORIA STATE UNIVERSITY™

1200 Commercial
Emporia, Kansas
66801-5087

620-341-5351
620-341-5909 fax
www.emporia.edu

GRADUATE STUDIES AND RESEARCH
RESEARCH AND GRANTS CENTER
Campus Box 4003

November 19, 2010

Amanda Steiner
PARM
2613 Knollbrook Ct.
Lawrence, KS 66046

Dear Ms. Steiner:

Your application for approval to use human subjects, entitled "Training Needs Assessment for Graduate Training in I/O Psychology: What KSAOs Employers Desire When Hiring an I/O Psychologist," has been reviewed. I am pleased to inform you that your application was approved and you may begin your research as outlined in your application materials.

The identification number for this research protocol is 11030 and it has been approved for the period 10/30/10 to 10/30/11.

If it is necessary to conduct research with subjects past this expiration date, it will be necessary to submit a request for a time extension. If the time period is longer than one year, you must submit an annual update. If there are any modifications to the original approved protocol, such as changes in survey instruments, changes in procedures, or changes to possible risks to subjects, you must submit a request for approval for modifications. The above requests should be submitted on the form Request for Time Extension, Annual Update, or Modification to Research Protocol. This form is available at www.emporia.edu/research/docs/irbmod.doc.

Requests for extensions should be submitted at least 30 days before the expiration date. Annual updates should be submitted within 30 days after each 12-month period. Modifications should be submitted as soon as it becomes evident that changes have occurred or will need to be made.

On behalf of the Institutional Review Board, I wish you success with your research project. If I can help you in any way, do not hesitate to contact me.

Sincerely,

Robyn Long
Chair, Institutional Review Board

pf

cc: George Yancey

PERMISSION TO COPY

I, Amanda Steiner, hereby submit this thesis to Emporia State University as partial fulfillment of the requirements for an advanced degree. I agree that the Library of the University may make it available for use in accordance with its regulations governing materials of this type. I further agree that quoting, phototyping, or other reproduction of this document is allowed for private study, scholarship (including teaching) and research purposes of a nonprofit nature. No copying which involves potential gain will be allowed without written permission of the author. I also agree to permit the Graduate School at Emporia State University to digitize and place this thesis in the ESU institution repository.

_____

Signature of Author

_____

Date

Training Needs Assessment for Graduate Training in I/O Psychology: What KSAOs Employers Desire When Hiring an I/O Psychologist

_____

Title of Thesis

_____

Signature of Graduate School Staff

_____

Date Received