
TOPICAL ARTICLES

A Skills-Experience Inventory for the Undergraduate Psychology Major

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Psychology majors develop a number of academic skills during their studies that are valuable in future careers and other domains. However, assessment of experiences related to skill development can be quite difficult and resource intense. We present results of 2 studies using a skills-experience inventory to assess academic skill exposure. In the first study, graduating senior psychology majors reported greater exposure than freshmen in 7 skill-experience areas. The second study showed significant differences in exposure to 5 skill areas among graduating seniors in 4 academic areas. A skills-experience inventory may be an efficient tool for documenting the skills and experiences students encounter when majoring in psychology.

A liberal arts education represents the blending of abstract values and factual knowledge that has been the ideal of Western schooling for over two millennia (Winter, McClelland, & Stewart, 1981). It stands in marked contrast to the emphasis on practical, marketable skills found in technical or vocational training (cf. Hogan, 1991). The liberal arts graduate learns a wide range of analytical skills (Winter et al., 1981) as well as a range of cognitive competencies that go by names such as “reasoning skills, critical thinking, intellectual flexibility, [and] reflective judgment” (Pascarella & Terenzini, 1991, p. 114). Graduates should gather information effectively, communicate well orally and in writing, and exhibit good interpersonal skills (Halpern, 1988).

Numerous studies over the past several decades have sought to document the particular types of skills acquired by liberal arts students, and the evidence is encouraging. As summarized by Pascarella and Terenzini (1991):

Our synthesis suggests that students make statistically significant gains during the college years on a number of dimensions of general cognitive capabilities and skills. Compared to freshmen, seniors have better oral and written communication skills, are better abstract reasoners or critical thinkers, are more skilled at using reason and evidence to address ill-structured problems for which there are no verifiably correct answers, have greater intellectual flexibility in that they are better able to understand more than one side of a complex issue, and can develop more sophisticated abstract frameworks to deal with complexity. (p. 155)

Although these findings tended to support the value of a liberal arts education, it is not clear that students always recognize the development of particular skills or their potential

application. Whether students choose a liberal arts education may well depend on their ability to see the connection between the skills they acquire in college and the career paths they wish to follow (e.g., Hogan, 1991). In a recent *U.S. News & World Report* article, Koerner (1999) pointed to the decrease in the number of men taking the traditional college curriculum and speculated that college may, in the future, appear as a poor economic choice. Many male high school graduates apparently see technical or business training as providing more immediate payoffs—an option they prefer to “four years of *Beowulf* and student loans” (p. 48).

It is important to identify the specific skills acquired by undergraduates in various undergraduate disciplines and document student progress toward achieving these competencies. Within the psychology major, the set of achievable skills includes thinking skills, language skills, information gathering and synthesis skills, and research methods and statistical skills (e.g., McGovern, Furumoto, Halpern, Kimble, & McKeachie, 1991). These skills are varied and distinctive; consequently, they have been elusive to specific delineation and measurement (Hayes, 1996). It may not be surprising that many students are not aware of the many skills acquired during their undergraduate years and, thus, do not effectively market themselves based on these competencies (see Murray, 1997).

Partly in response to this situation, Hogan (1991) and others (e.g., Clay, 1996; Murray, 1997) argued that skill identification and information regarding the development of specific skills should be an integral part of psychology courses. When a psychology major seeks a job following graduation, a skills-based résumé is likely to be more valuable than one that simply lists courses taken and offices and positions held while in school (Edwards & Smith, 1988; Murray, 1997). Levy, Burton, Mickler, and Vigorito (1999) developed a curriculum matrix of desired perspectives, skills, and attitudes for individual psychology courses. They designed this instrument to facilitate program review and outcomes assessment, allowing for a content examination of individual courses in the context of broad curricular objectives.

We created a skills-experience inventory with the goals of giving feedback to individual students as to the development of specific skills through the completion of the psychology major and of documenting the overall nature of skill acquisition by psychology majors in our department. Accreditation

Table 1. Ten General Areas of Academic Skills

Skill Area	Description
1. Written/oral communication	The ability to convey information effectively in both written and oral communication
2. Information gathering	The ability to obtain relevant information from publications, databases, and other appropriate sources
3. Groups/organizations/community	The ability to work effectively in teams and with groups of other people
4. Interpersonal/counseling/interviewing/mentoring	The ability to effectively conduct one-on-one interactions, including counseling, interviewing, and administering standardized tests
5. Behavior management supervision/teaching	The ability to teach, supervise, and manage behavior through personal skills and by monitoring and manipulating relevant aspects of the immediate environment
6. Individual differences/special populations/cultural diversity	The ability to work with individuals from special populations and diverse cultures in a sensitive and effective manner
7. Critical thinking/problem solving	The ability to critically evaluate situations and projects in a rational manner and reach conclusions based on the information available
8. Research methodology/statistics	The ability to design, conduct, and analyze the results of research experiments and studies
9. Ethics/values	The ability to take into consideration the costs, benefits, and impact of projects on the individuals involved and society in general
10. Technology/computer	The ability to use computers for information gathering, analysis, and dissemination

agencies, politicians, students, and their parents are placing increased emphasis on outcomes assessment (Halpern, 1988). Departmental and institutional assessment programs are often expected to originate in psychology departments, due to the expertise in relevant areas such as learning, adult development, psychometrics, and program evaluation (Halpern, 1988).

Most would agree that outcome assessment should include multiple measures (e.g., Halpern, 1988). Sheehan (1994) utilized multiple-choice tests; senior and alumni surveys; a capstone course with a research project; and archival data, such as awards, presentations, publications, and acceptances into graduate school. We provide evidence from two administrations of a skills inventory that this instrument can contribute in an important way to a multimethod approach to assessing the benefits of majoring in psychology within the liberal arts tradition.

Study 1: A Skills-Experience Comparison of Senior and Freshmen Psychology Majors

Method

Participants. Students from an ethnically diverse, urban Midwestern university ($N = 102$) participated in this study. Graduating seniors majoring in psychology completed the survey while waiting for standard exit interviews required for graduation. An informed consent form indicated that the results would be used for research purposes and not to evaluate any individual student. Freshmen majoring in psychology participated in partial fulfillment of requirements for fall introductory psychology classes. The mean age of seniors ($n = 51$) was 22.7 years ($SD = 4.3$), and the mean age of freshmen ($n = 51$) was 18.7 years ($SD = 2.5$). Sixty-nine percent of freshmen were women, and 73% of seniors were women.

Materials. We sorted skills identified from the literature and from consultation with psychology faculty into 10 general skill areas, as defined in Table 1. We then developed 9 items for each skill area (90 items in all), 3 items in each of 3 more

specific competencies representative of the general area. Items in each subarea varied in terms of our expected frequency of their occurrence. For example, the items in the third subarea of written–oral communication, “conveying scientific information coherently,” were the following:

- I often have explained a scientific concept to someone.
- I have presented (orally or in writing) the results of a scientific study.
- I have created a poster detailing the results of a scientific study.

Procedure. For each skill area, participants indicated exposure to a skill-experience by checking that item and indicated any skill experiences not addressed by the nine items using an open-ended item. Individuals received scores for each skill area based on the number of items they checked, ranging from 0 to 9. Administration of the inventory rarely took more than 15 min.

Results

Table 2 reports the mean skill-experience levels in each of the 10 areas for the freshmen and seniors. The multivariate ANOVA showed a significant overall effect for experience in the psychology program, $\Lambda(10, 91) = .53, p < .001$. Seniors reported significantly more experiences in 7 of the 10 skill areas: communication, $F(1, 100) = 5.66, p = .019$; information gathering, $F(1, 100) = 20.35, p < .001$; interpersonal, $F(1, 100) = 11.63, p < .001$; critical thinking, $F(1, 100) = 13.22, p < .001$; research methods, $F(1, 100) = 62.21, p < .001$; ethics/values, $F(1, 100) = 18.02, p < .001$; and technology–computer, $F(1, 100) = 4.28, p = .041$. There were no significant differences for groups–organizations, behavior management, or individual differences (see Table 2). The results for research methods, $\eta^2 = .38$; information gathering, $\eta^2 = .17$; and ethics/values, $\eta^2 = .15$, indicates the greatest effects. Critical thinking ($\eta^2 = .12$), communication ($\eta^2 = .05$), and technology/computer ($\eta^2 = .04$) results also provided evidence for skill exposure in these areas.

Table 2. Mean Scores for Study 1

Skill Area	Freshmen		Seniors	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
1. Communication*	3.98	1.66	4.74	1.67
2. Information gathering**	4.57	1.95	6.54	2.07
3. Groups/organizations	4.70	2.14	4.65	2.00
4. Interpersonal**	2.78	1.17	3.78	1.81
5. Behavior management	3.52	2.36	3.37	2.05
6. Individual differences	4.50	1.51	4.67	1.90
7. Critical thinking**	3.37	1.31	4.59	2.06
8. Research Methods**	2.26	1.77	5.74	2.62
9. Ethics/values**	3.50	1.81	5.22	2.44
10. Technology/computer*	5.41	1.45	6.02	1.57

Note. The possible range of mean scores is 0 to 9, with 0 indicating that the student checked no skill experiences for an area, and 9 indicating that the student checked all possible skill experiences for an area.

* $p < .05$. ** $p < .001$.

Item analysis indicates that our expectations for the frequencies of skill-experience occurrences were generally accurate. Overall, 69% of respondents checked the first item in each subarea, 39% checked the second item, and 19% checked the third item. We performed a content analysis of the open-ended responses to identify relevant skills or skill areas not addressed by the inventory; we did not include these items in the calculation of scores. The majority of responses to the open-ended responses mentioned skill experiences addressed in later sections of the instrument. Other responses included personal traits, such as responsibility, that the inventory did not measure. A few responses included skills not included in the inventory, such as teaching an entire course. We may incorporate these skills into future versions.

Discussion

Results from the administration of this skills inventory indicate that undergraduates experience a variety of competency-building tasks as part of their studies in psychology. A psychology program may be particularly adept at developing competency in research methods, information gathering, and ethics/values. Low ratings for behavior management and individual differences may indicate that although coursework exposes students to this material, students are unlikely to hold positions in which they set behavioral contingencies or work with special populations. Only a few students reported these types of skill experiences. The majority of freshmen respondents had held volunteer positions, indicating that these types of experiences may now be quite common in high school.

Study 2: A Skills-Experience Comparison Among Academic Areas

One of the most common questions asked of college students is, "What's your major?" One obvious contextual difference in the academic experience is the major field studied. Lehman and Nisbett (1990), for example, found that social science majors exhibited strong gains in statistical and meth-

odological reasoning, whereas natural science majors exhibited strong gains in solving conditional logic problems.

The psychology major may be distinctive not for the specific knowledge and skills developed, but rather for the range of knowledge and skills developed (Hayes, 1996). Psychology combines communication, interpersonal skills, critical thinking, information gathering, research, and data analysis. Students discuss ethical issues and obtain practical experiences through internships and lab courses. This study compared graduating psychology majors and students in other academic disciplines using the skill-experience inventory. We hypothesized that psychology majors would have experienced a broader range of skill-related activities in comparison to other majors during their academic careers.

Method

Participants. Students ($N = 124$) from the same university as in Study 1 participated in this experiment. We obtained from the undergraduate dean's office a listing of all students graduating in May, 1999. We then contacted 40 individuals, based on a random selection from the list of graduating seniors, in each of four academic areas: psychology, natural sciences (biology and chemistry), humanities (history and English), and other social sciences (sociology, criminal justice, and anthropology). Sixty-six percent of psychology majors, 61% of other social science majors, 69% of natural science majors, and 71% of humanities majors were women. The mean ages were 22.11 ($SD = 2.60$) for psychology majors, 22.23 ($SD = 2.96$) for other social science majors, 22.18 ($SD = 2.96$) for natural science majors, and 22.67 ($SD = 1.41$) for humanities majors.

Materials. Because we designed the skill-experience inventory used in the first study for psychology majors, we made minor modifications to create an instrument appropriate for all major fields, although we retained the same 10 general skill areas. For example, we changed "I have given someone a psychological test or supervised a research experiment" to "I have tested someone for a research project." In addition, we modified 6 items cited by less than 10% of the psychology seniors or freshmen in Study 1 to increase the appropriateness of experiences.

Procedure. Students received an e-mail describing the study and asking for their participation. We attached the skills-experience inventory to the e-mail. Students could either reply with their responses saved into the document or complete a hard copy in the freshmen dean's office. As an incentive for students to complete and return the survey, we offered two raffle prizes of \$25 for students in each of the four areas. We followed up the e-mails with phone calls for those who did not return the inventory. Finally, we mailed a copy of the inventory to remaining students 1 week after graduation, along with a letter on department stationery asking for their help. We included a stamped envelope addressed to one of the authors to facilitate return of the inventory.

One month after we sent the mailing, we had received 35 responses from the natural sciences, 32 from psychology, 32 from other social sciences, and 25 from the humanities. We excluded from the analysis 3 respondents who failed to indi-

Table 3. Mean Scores for Study 2

Skill Area	Psychology		Natural Science ^a		Social Science ^b		Humanities ^c	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
1. Communication	5.22 _a	1.80	4.54 _{a,b}	1.69	3.81 _b	1.39	4.16 _b	1.76
2. Information gathering	6.75 _a	2.05	5.14 _b	1.57	5.38 _b	2.21	5.08 _b	1.56
3. Groups/organizations	5.09	1.98	4.71	2.26	4.31	1.99	4.76	1.73
4. Interpersonal	4.75 _a	2.25	3.14 _b	1.73	3.38 _b	1.43	3.28 _b	1.93
5. Behavior management	4.19	2.41	3.29	1.92	3.34	2.24	4.12	2.60
6. Individual differences	5.16	1.90	4.91	2.18	4.69	1.55	5.36	1.46
7. Critical thinking	5.25	2.00	4.57	1.46	4.41	2.00	4.28	1.81
8. Research methods	6.69 _a	1.80	4.51 _b	2.24	4.63 _b	2.15	3.28 _b	2.15
9. Ethics/values	6.03 _a	2.09	4.94 _b	2.24	4.34 _{b,c}	1.79	3.40 _c	2.06
10. Technology/computer	6.28	2.08	6.17	1.48	5.63	1.92	5.40	1.69

Note. Means with different subscripts differ at $p < .05$.

^aNatural science students majored in biology or chemistry. ^bOther social sciences students majored in sociology, criminal justice, or anthropology.

^cHumanities students majored in history or English.

cate their major. We calculated area scores in the same manner as in the first study.

Results

The Bartlett Box test indicates that the assumption of homogeneity of variance was met for all the univariate ANOVAs—an important concern due to the unequal sample sizes. Table 3 shows the mean scores for each academic area in the 10 skill categories. The analysis indicates a significant overall effect, Wilks's $\Lambda(30, 326.48) = .56, p < .001$, and statistically significant differences in 5 of the 10 skill areas: communication, $F(3, 120) = 4.54, p = .005, \eta^2 = .05$; information gathering, $F(3, 120) = 5.81, p < .001, \eta^2 = .08$; interpersonal, $F(3, 120) = 5.45, p = .002, \eta^2 = .11$; research methods, $F(3, 120) = 10.18, p < .001, \eta^2 = .19$; and ethics-values, $F(3, 120) = 7.19, p < .001, \eta^2 = .11$.

Groups/organizations, behavior management, individual differences, critical thinking, and technology- and computer-skill areas did not exhibit significant differences. Tukey B tests revealed that psychology majors indicated greater exposure to communication and ethics/values skills than did other social science majors and humanities majors. Natural science majors reported more experiences than humanities majors in ethics/values skills. Psychology majors reported more experiences than the three other groups for interpersonal, information-gathering, and research-methods skills.

Discussion

Study 2 provides evidence that psychology majors differ from other academic disciplines in their experience of competency-building skill activities. Psychology majors had significantly greater exposure in five skill areas. Somewhat surprisingly, natural science majors paralleled psychology majors more than did those from the other social sciences.

Conclusions

These studies provide evidence for an efficient means of measuring exposure to skill-building activities in undergradu-

ate programs. Study 1 indicates significant differences in exposure to skill areas between those beginning and completing their undergraduate psychology program. This result parallels Pascarella and Terenzini's (1991) summary of gains in cognitive capabilities and skills during college and establishes the skills inventory as a valuable tool in a multimethod approach to outcome assessment. Study 2 also provides evidence of major-specific differences in exposure to cognitive skills as a function of undergraduate training in the liberal arts. Psychology majors reported an impressive array of skill experiences compared to their peers majoring in other fields. This finding supports Hayes's (1996) assertion that psychology majors gain a broad range of skills. Because we originally developed the inventory for use with psychology majors, faculty from the appropriate fields should provide input on item content if the skill experiences of nonpsychology majors are to be analyzed.

Results from the inventory can provide useful feedback to students by identifying experiences in skill areas related to their career goals. The general results may provide faculty with valuable information as part of a multimethod approach in assessing skill exposure in their programs. Departments may track the academic experiences of their students and structure course activities to enhance skill development.

Neither study displayed significant differences for skills relating to groups and organizations, behavior management, or individual differences. These results suggest that students do not obtain these skill experiences through coursework, but they might through extracurricular activities. Study 2 did not display significant differences among academic areas for critical thinking or technology/computer skills. Students from each discipline apparently had significant and comparable exposure to activities in these skill areas. Exposure to information technology is now an integral part of the undergraduate experience. Students frequently use programs for word processing, e-mail, and accessing the Web. In fact, it is quite unusual for a student not to use computers during college.

We assessed students on the basis of their participation in skill-developing tasks, rather than on an assessment of their abilities in these areas. Further research should assess the effects of these experiences on student learning. Although the precise skill levels of the students may not be known, the inventory does indicate the extent and diversity of opportunities for skill development encountered by undergraduates.

We believe it is reasonable to assume that those who check different experiences and items containing less-common experiences, such as participation in a research conference, have greater levels of competence. This assumption is also one that employers appear to make when they examine a prospective employee's résumé. To that extent, the results of these studies suggest that psychology majors bring many important skills to the marketplace. This inventory may provide a useful reminder to students about the benefits of a college education and suggest marketable skills that are attractive to employers.

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Notes

1. This research was supported by an internal grant from Loyola University Chicago.
2. We presented portions of Study 1 at the August 1999 convention of the American Psychological Association and portions of Study 2 at the May 2000 meeting of the Midwestern Psychological Association.
3. Copies of the inventories are available at <http://www-personal.umich.edu/~kruger/skills.html>.
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