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The Growth of Methodological and Ethical Reasoning Among Psychology Students

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Abstract

A total of 331 students sampled from lower- and upper-division psychology courses completed the Test of Integrated Process Skills (TIPS) questionnaire and an Ethics questionnaire. TIPS performance was directly related to students' advancement in the Psychology major whereas ethical reasoning was related to students' general academic advancement irrespective of major.

The Growth of Methodological and Ethical Reasoning Among Psychology Students

Successfully completing an undergraduate degree reflects both a *broad* education, exemplified by completing General Education courses, and an *intensive* education, exemplified by completing courses in a major and minor. Not surprisingly, students' new ideas, beliefs, or abilities may arise from one, the other or both sources. This study explores whether undergraduate psychology students learn *methodological* and *ethical* reasoning skills from their intensive educational training in psychology, broad educational training outside the department, or from both sources.

Methodological reasoning refers to planning, conducting, and interpreting research. Specific skills include generating hypotheses, managing variables by operationally defining, controlling and manipulating them, designing studies, and evaluating results. Methodological reasoning may be acquired by students through their intensive educational training as psychology majors as each class in the curriculum addresses methodological skills (WSU Psychology Assessment, 2004). However, such skills may also arise through broader educational training as many other courses outside of psychology also teach methodological reasoning skills.

Ethical reasoning refers to the ability to recognize and react to cases of unfairness, subjugation, and injustice. Specific ethical reasoning skills include appreciating multiple perspectives (i.e., victimizer and victim), empathizing with victims, and reacting appropriately. Like methodological reasoning, ethical reasoning skills may be acquired by students majoring in psychology or through broader educational training.

To test whether methodological and ethical reasoning skills are acquired by psychology students inside or outside the discipline, students in lower- and upper-division psychology courses completed questionnaires addressing these skills.

Method

Participants

The sample included 331 students (46% male, 54% female) in lower- and upper division psychology courses, who received extra credit for participating. Overall, most were Freshmen (49%) with the other statuses equally divided. Of those expressing a major (68%), 30% were Psychology majors and of those expressing a minor (57%), 22% were Psychology minors. Of those not who had yet to select a major or a minor, a small percentage expressed a strong likelihood of choosing to major (15%) or minor (9%) in psychology.

A subgroup of *Psychology Students* was composed of students who were Psychology majors and minors and those self-identified as likely to become so. There were 114 Psychology Students (36.5% male, 63.5% female) with 27 Freshmen, 14 Sophomores, 24 Juniors, and 39 Seniors. The larger number of Freshmen and Seniors than Sophomores and Juniors is in keeping with the distribution of students in the rest of the university. The students differed in expected ways as a function of student status (e.g., Age, Number of Psychology Courses Completed) and did were the same in expected ways as a function of status (Gender, GPA).

Procedure

Participants completed a 30 minute questionnaire in their classrooms. The questionnaire contained three parts in a fixed order: Demographics, Ethics assessment, and Methodological Reasoning assessment.

The demographics questions included Age, Sex, GPA, Student Status, ACT or SAT scores (so few were completed that these variables were dropped), Major (or failing that, the certainty that the student would major in Psychology), Minor (or certainty of being a Psychology minor), and total number of psychology courses taken.

Methodological reasoning was tested by the 36-item Test of Integrated Process Skills (TIPS) (Dillasaw et al., 1982). There are 6 subscales on the test. Internal consistency of the test (Cronbach's alpha) was previously determined to be 0.89.

Ethical reasoning was tested by a 10-item Ethical Reasoning test which was developed for this study. The students made judgments of the ethics of various academic situations and their judgments of degree of "offensiveness". Some of the scenarios depicted unethical behavior of student or faculty while others depicted perfectly accepted behavior.

Results

The data were analyzed in a three-step process which reflects increasingly conservative tests of whether changes in students' Methodological and Ethical reasoning are related directly to their training in psychology.

Step 1

The first step assessed whether there were changes over student status in task performance. The total frequency of correct responses on the TIPS and Ethical tests were subjected to a One-Way ANOVA by Student Status (Freshmen, Sophomore, Junior, and Senior). Performance on the TIPS task proved to be significant, $F(3, 277)=10.77$, $p<.001$ but not performance on the Ethics task, $F(3, 312)=2.02$, ns. However, Freshmen ($M=7.0$ out of 10) had significantly lower Ethics scores than did Seniors ($M=7.54$), $t(309)=56.36$, $p<.001$.

Step 2

The data from Step 1 suggest that TIPS and Ethical test scores change over student status. However, because most of the Juniors and Seniors but few of the Freshmen and Sophomores were Psychology majors or minors (with only a few of the former interested in becoming so), the comparison may have been flawed. The next step was to correlate task TIPS and Ethics test scores directly to students' number of psychology courses, independently of Age, Sex, and GPA. This analysis allowed for the assessment of whether increases in scores are directly related to the number of psychology courses taken, irrespective of other factors. As shown in Table 1, only TIPS score was significantly related to psychology courses taken, suggesting that only Methodological Reasoning was affected by training in Psychology.

Step 3

The sample in Step 2 includes some Freshmen and Sophomore students who are very interested in becoming Psychology majors or minors and many others who are disinterested. The third analysis examined only those students in the sample who are Psychology majors or minors or who are interested in becoming so. Only a third of the sample (N=114) could be categorized as a *Psychology Student* (see *Participants* for a description of the sub-sample). Their TIPS performance was analyzed by student status using an ANCOVA, controlling for Age, Sex, and GPA. Three aspects of their performance were analyzed: Overall Total Score, the percentage of students who score in the top third overall (Figure 2), and the subscales of the TIPS, only three of which were significant (Figure 3).

Place Figures 1 and 2 about here

The data show that competence in methodological reasoning increases dramatically during junior year, perhaps by consolidating three specific methodological reasoning skills, which were strongly correlated: Identifying independent, dependent and extraneous variables, articulating appropriate hypotheses, and designing effective tests of particular hypotheses.

Discussion

Undergraduate education is a complex marriage between learning intensively from a discipline in which one is a major and minor and broadly from General Education courses. This complicates identifying the source of changes in students' ideas, abilities, and skills. The present study examined the source of change in two such skills: Ethical and Methodological reasoning.

Ethical reasoning did show a moderate change, at least between Freshmen and Seniors in the entire sample. While the change was small, it reflects students' recognition of the ethical complexity of college life. Further research exploring students' ethical insights into academic life seems necessary as even seniors averaged only 7.5 correct out of 10 ethical dilemmas. However, academic ethics was not specifically or uniquely learned in the discipline of psychology. There was no relation between Ethics score and the number of psychology courses taken. While psychology class may provide training in the nature of academic ethics (cheating, deception, etc.), it is certainly not an exclusive source of such knowledge to students who are taking psychology classes.

In comparison, increases in Methodological Reasoning performance directly correlated with the number of Psychology courses taken. Moreover, Methodological competence is acquired specifically in junior year, when students generally being to take a critical mass of courses in their discipline. The significant jump in *above average* performance on the TIPS tests

during junior year is likely the result of students integrating together the multiple methodological skills being learned at the time across a variety of psychology courses.

The results suggest that psychology students are learning methodological reasoning skills in their discipline. Further research can begin to identify the sources of individual differences in methodological reasoning and their implications for learning to "think like a psychologist."

Figure 1: The Percentage of Psychology Students Scoring in the Top Third on the TIPS Test by Student Status.

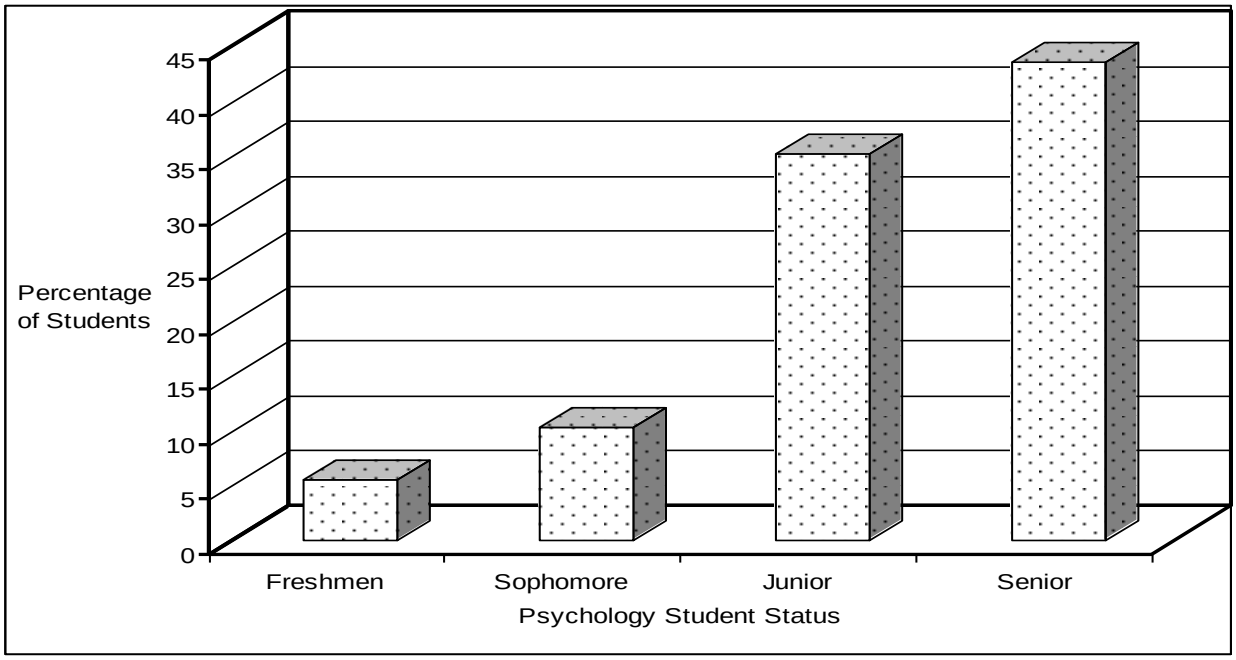
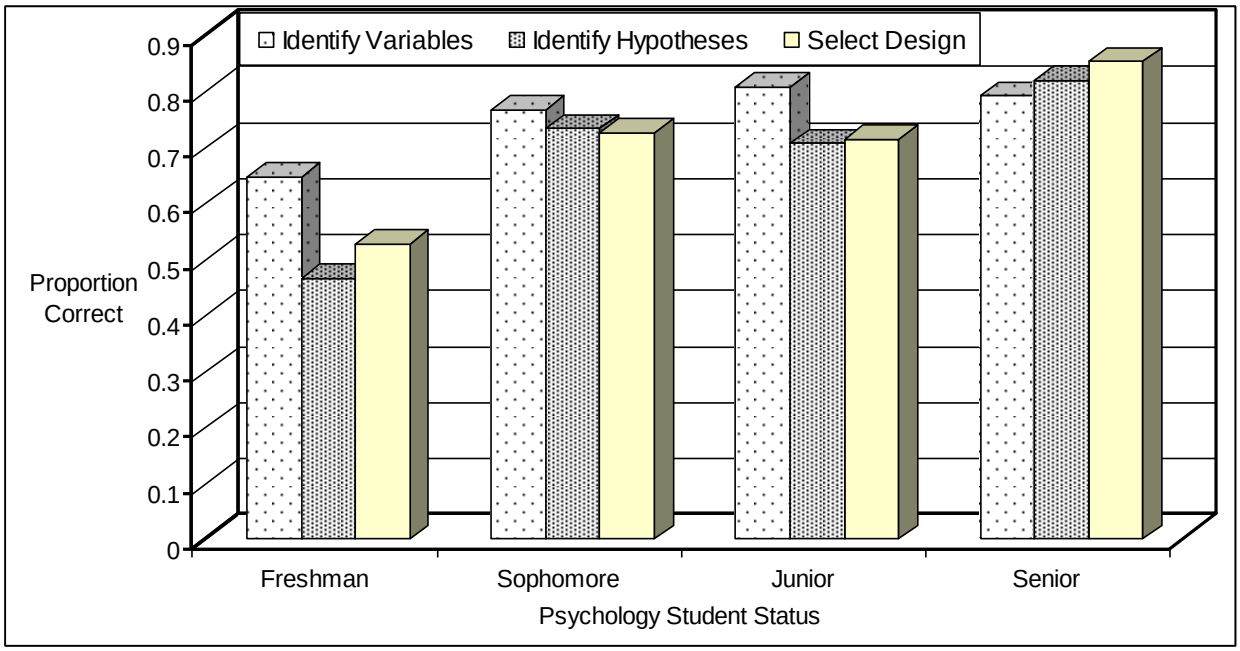


Figure 2: Average Percent Correct of Psychology Students on Selective TIPS subtests, by Student Status.



References

Dillashaw, F. G., and Okey, J. (1982). Test of the integrated science process skills for secondary science students. *Science Education, 64*, 601-608.

Psychology Department Assessment (2004). http://departments.weber.edu/psychology/assessment/ASSESSPAGE.htm