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ABSTRACT

While considerable research has been reported on cognitive outcomes of Personalized Student Instruction (PSI) courses, little information about affective outcomes of the PSI is available. In this study three methods of instruction including an introductory psychology PSI with no formal classes, an educational psychology with some formal classes, and a traditional-taught introductory psychology with all formal classes were used to investigate affective outcomes. Students responded to 12 items designed to sample various levels from the Taxonomy of Educational Objectives: Affective Domain. In the last item students ranked all the courses they were taking that semester from most favorite to least favorite. The results indicate no significant differences in affective outcomes. Combining scores across all items show a very small advantage for the PSI students. It is clear that PSI students, who are not exposed to a program in a formal classroom situation, show no affective disadvantage when compared to traditionally taught students. (Author/DE)

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Cognitive and Affective Outcomes of PSI Mastery Programs as Compared to Traditional Instruction

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ABSTRACT

Two types of PSI programs in Psychology are described. These 2 courses were compared to traditional instruction on 13 items which measured affective outcomes of the course. On three items, significant differences among the 3 groups were found, though these differences were quite small and inconsistent. When 12 items were summed, a very small but significant advantage was found for the 2 PSI groups. It seems clear that PSI students, who are not exposed to a professor in a formal classroom situation, show no affective disadvantage when compared to traditionally taught students. PSI students may even have a slight advantage in terms of affective outcomes.

COGNITIVE AND AFFECTIVE OUTCOMES OF PSI/MASTERY PROGRAMS AS COMPARED TO TRADITIONAL INSTRUCTION

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Introduction

In the Fall semester of 1971, a PSI program was introduced for Introductory Psychology at Trenton State College. The system is similar to that described by Keller (1968). Students enrolled in PSI worked through the course at their own pace. Each student was required to pass a chapter test at 80% or better before he was allowed to go on to the next chapter. Student assistants (proctors) were employed to provide immediate feedback about test results, and to explain any points missed. All students were required to pass 12 chapter tests and a final examination before the semester ended.

Research comparing cognitive outcomes of PSI to traditionally taught classes has been conducted for several semesters, and has been reported elsewhere (Breland and Smith, 1974). The findings are consistent with those of other investigators. (See Kulik, Kulik and Carmichael, 1974, for a summary of studies of cognitive outcomes of PSI.) We have compared PSI and traditionally taught students on common final examinations in Introductory Psychology I. These tests included both factual items and items requiring integrative responses, and PSI students have consistently scored higher on both types of items. A test of retention of basic concepts from Introductory Psychology I administered to students enrolled in Introductory

Psychology II indicated significantly higher retention by students who had studied under the PSI method. A test of retention of more obscure concepts administered one semester after Introductory Psychology I had been taken showed no significant difference between PSI students and students taught with traditional methods.

Affective Outcomes of PSI

While considerable research has been reported on cognitive outcomes of PSI courses, little detailed information about affective outcomes of the PSI method has been reported. Most studies dealing with affective outcomes only ask the students whether they enjoyed the PSI course in general, or whether they would choose to take another course in a PSI format. These studies all indicate that PSI courses are popular (Sheppard and MacDermot, 1970; Myers, 1970, McMichael and Corey, 1972; Lloyd and Knutzen, 1959; Born and Herbert, 1971; Witters and Kent, 1972; Morris and Kimbrell, 1972). Some data has been reported comparing the withdrawal rate of students from PSI and traditionally taught classes (Born, Gledhill and Davis, 1972; Sheppard and Mac Dermot, 1970) but the results of these studies are difficult to interpret.

Little research is available on the effect of the PSI format on attitudes of students toward the subject matter of the course. The lack of formal instruction by a professor seems to have no negative effect on cognitive outcomes, but will this lack make students less enthusiastic or interested in the subject matter? The issue is complex. Our students report that they like the PSI format and clearly they learn more. Doing well and liking the method might carry over to more positive attitudes towards the subject matter. On the other hand, the lack of "interesting" films, lectures and demonstrations by an enthusiastic professor might set

the PSI system at a disadvantage in terms of student affective outcomes. Few studies have been done on this problem. Kulik, Kulik and Carmichael (1974) reviewed a paper by Gallup (1971) in which it was reported that the number of psychology majors had increased since PSI was introduced at his institution, a fact which they suggest may indicate positive affect resulting from PSI. Sheppard and MacDermot (1970) asked their students, "How does the probable long-range value for you of this course compare with all other courses you have had in college?" but student responses to this question were numerically combined with a general evaluation of the PSI format and so were obscured. PSI students reacted more favorably on this composite score than did traditionally taught students. These investigators also noted that PSI students rated the course higher in terms of stimulating more interest and pursuing further study in the area.

Methods

Three methods of instruction were used to investigate affective outcomes. The Introductory Psychology PSI format, which uses no films, lectures, or formal contact with the instructor, has already been described. A modified PSI format is used in Educational Psychology. In this course, half of the assigned class periods are set aside for mastery testing using procedures similar to those in Introductory Psychology PSI. For the other half of the class periods, an optional program was made available. In this time, films were shown, lectures and demonstrations were presented, and peripheral material was discussed. While no critical material was presented, attendance at these enrichment sessions could help students get a better grade. No students enrolled in Educational Psychology PSI were psychology majors, and for many students the course was their first contact

with the discipline of psychology. The course content was comparable in many ways to Introductory Psychology, though Educational Psychology PSI had a more applied orientation.

Introductory Psychology PSI and Educational Psychology PSI were compared to traditionally taught Introductory Psychology courses. Participation by instructors of traditional Introductory Psychology was voluntary, and those instructors with a history of relatively low anonymous student evaluations were not asked to participate in this study.

Instruments

A short questionnaire concerning affective outcomes was given to all PSI students and to those traditionally taught students whose professors agreed to participate. The first 12 items attempted to sample various levels from the Taxonomy of Educational Objectives: Affective Domain (Kratwohl, Bloom and Masia, 1964). Students responded to the 12 items on a 5-point scale from strongly agree to strongly disagree. Half of the items were stated negatively. The last item asked the students to rank all the courses they were taking that semester from most favorite to least favorite, and the relative rank of the psychology course was noted. Not all students take the same number of courses, so the relative rank of the psychology course was not comparable across all students. Since most of the students take 5 courses, the relative rank of the psychology course was transformed to an estimated position in a 5-course load. The questionnaire is presented in Appendix 1.

Results

The three methods of instruction (Introductory Psychology PSI with no formal classes, Educational Psychology PSI with some formal classes, and traditionally taught Introductory Psychology with all formal classes) were compared on each item, on the sum of all 12 items, and on the relative rank of the course in a 5-course load. Table 1 shows the means, standard deviations, and sample sizes for each comparison. In 10 of the 13 individual items, no significant differences among groups was found. In only three items were significant differences ($p. < .01$) found, and these differences were quite small.

For item 2 (Even if I had the time, I probably would not take any more psychology courses) regular students gave lower (hence more favorable) ratings than did Educational Psychology PSI students, though not significantly lower than ratings for Introductory Psychology PSI. This finding is difficult to explain. Our PSI students consistently report that the PSI classes require more work than regular classes, and this might explain some of the difference.

Significant differences were also found on Item 6 (The study of psychology has been helpful for my own personal development). Both PSI groups scored significantly higher (more favorably) on this item, though again the differences were small. This difference might be explained by the fact that students consistently report that the PSI format has improved their study habits. The frequent personal attention offered by the proctors in PSI might also have influenced the responses to this item.

Item 10 (No one should be required to learn about psychology) showed Educational Psychology PSI students giving lower (more favorable) responses.

Educational Psychology students are nearly all education majors, and they may have found the study of psychology relevant for their career preparation. Likewise, Educational Psychology includes few basic research findings, and has a much more applied emphasis. Perhaps the stress on the relevance of the material produced this difference.

To test the general effect of PSI on affective outcomes of instruction, the two PSI groups (Introductory Psychology and Educational Psychology) were combined. For all students, a total score was calculated on the first 12 items. The scoring of negatively stated items was reversed before the individual items were summed. The mean on the total score for the combined PSI groups was 45.76 (σ = 6.11), while the mean for the students taught by traditional methods 44.76 (σ = 5.99). The advantage of the PSI groups was quite small, but significant at the .05 level.

No psychology majors were enrolled in Educational Psychology PSI, and 40 of the students taking Introductory Psychology stated that they were psychology majors. The psychology majors might have biased the results. All comparisons were therefore recalculated, omitting psychology majors. These omissions had a negligible effect on the results; the same significant differences were observed.

Conclusions

The superiority of our PSI program in bringing about higher student achievement and retention in Introductory Psychology seems clear. The Introductory Psychology PSI program has no formal instruction associated with it. A PSI program in Educational Psychology, which serves a different student population but which handles similar material, provides a series of optional classes. These two methods of instruction were compared to traditional instruction in Introductory Psychology on 13 items measuring affective outcomes. Generally, no differences in affective outcomes were noted. On those 3 items on which significant differences appeared, differences among the groups were small. Two of the items favored PSI groups, and on one item, the Educational Psychology PSI program was ranked least favorably. Combining scores across all 12 questionnaire items (negatively stated items were reversed) showed a very small advantage for the PSI students.

Although the questionnaire in general shows a very slight advantage for PSI students on affective outcomes, it is difficult to make a strong conclusion about their superiority. It seems clear, however, that PSI students are not any less positively oriented towards the discipline of psychology than are their traditionally taught peers.

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TABLE I

Comparison of 3 Types of Instruction
On Items Measuring Affective Outcomes *

Item		Mean	σ	N
Item 1	Regular	4.10	.85	146
NS	PSI Intro	4.19	.78	273
	PSI Ed.	4.06	1.00	141
Item 2 *	Regular	1.75	.88	147
	PSI Intro	1.89	.92	273
p<.01	PSI Ed.	2.15	1.16	142
Item 3 *	Regular	2.35	1 03	147
NS	PSI Int o	2.30	.94	272
	PSI Ed.	2.29	.98	142
Item 4	Regular	3.32	.97	146
NS	PSI Intro	3.29	.84	272
	PSI Ed.	3.22	.91	140
Item 5	Regular	1.94	.99	146
NS *	PSI Intro	1.76	.78	272
	PSI Ed.	1.87	.97	141
Item 6	Regular	3.73	.89	147
	PSI Intro.	4.01	.78	274
p<.01	PSI Ed	4.06	.87	139
Item 7	Regular	3.95	.78	144
NS	PSI Intro.	3.96	.74	273
	PSI Ed.	3.85	.90	141
Item 8 *	Regular	2.77	.91	146
NS	PSI Intro.	2.62	.89	271
	PSI Ed.	2.55	.92	140
Item 9	Regular	3.40	.98	145
NS	PSI Intro	3.54	.97	269
	PSI Ed	3.32	1.14	140
Item 10	Regular	2.59	1.01	145
*	PSI Intro.	2.36	1.01	269
p<.01	PSI Ed.	2.07	.94	140

Comparison of 3 Types of Instruction
On Items Measuring Affective Outcomes *

Item		Mean	σ	N
Item 11	Regular	1.79	.83	145
NS *	PSI Intro.	1.73	.96	266
	PSI Ed.	1.73	.75	140
Item 12	Regular	3.48	.81	146
NS	PSI Intro.	3.62	.81	268
	PSI Ed.	3.51	.87	137
Rank of	Regular	2.41	1.14	142
Psychology	PSI Intro.	2.41	1.02	245
Course	PSI Ed.	2.37	1.07	132
NS				
Sum. Items 1-12	Regular	44.76	5.99	138
	PSI Intro	46.15	5.97	255
p<.05	PSI Ed.	45.60	6.37	131

* Starred items are stated negatively, hence a lower mean score is the more favorable one.

Appendix I

AFFECTIVE OUTCOMES QUESTIONNAIRE

Psychology course which you are presently enrolled _____

Is this a PSI or a regular course? PSI Regular

Your major _____ Your class: Fr. Soph. Jr. Sr.

Please indicate how you feel about the following questions by rating them this way:

SA = Strongly Agree, A = Agree, ? = Neutral, D = Disagree, SD = Strongly Disagree

1.	I enjoy studying psychology	SA	A	?	D	SD
2.	Even if I had the time, I probably would <u>not</u> take any more psychology courses	SA	A	?	D	SD
3.	I seldom discuss psychology with my friends	SA	A	?	D	SD
4.	I encourage my friends to study psychology	SA	A	?	D	SD
5.	Psychology is a boring subject	SA	A	?	D	SD
6.	The study of psychology has been helpful for my own personal development	SA	A	?	D	SD
7.	If I saw an article in the newspaper about psychology, I would probably read it	SA	A	?	D	SD
8.	I would probably <u>not</u> go to a free lecture about psychology	SA	A	?	D	SD
9.	I would probably volunteer (without money or credit) to be a subject in a psychological study	SA	A	?	D	SD
10.	No one should be required to learn about psychology	SA	A	?	D	SD
11.	Psychology plays a relatively <u>unimportant</u> role in every day life.....	SA	A	?	D	SD
12.	If more people knew about psychology, the world would be a better place to live	SA	A	?	D	SD

13. Please rank all the courses you are studying this semester from your most favorite to your least favorite

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____