

Factors Affecting the Desire to Study in Graduate Level in Psychology that Emphasize Research
Areas among Undergraduate Students

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Author Note

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Abstract

The purpose of this study was to examine the factors affect undergraduate research career goal. The sample consisted of 26 undergraduate students in psychology. This study tried to predict research career goal and scholarly activity by sets of independent variables: research training environment, research self-efficacy, research interest, and year in program. Results from path analysis indicated that research training environment had a positive indirect effect to research career goal via two successive mediations: research self-efficacy and research interest. None of predictors except year in school had significant effect on scholarly activity. Surprisingly, scholarly activity had a nonsignificant negative direct effect on research career goal. Limitations, future directions, and implications for research training are discussed.

Keywords: research career goal, research training, research interest, undergraduate students

Factors Affecting the Desire to Study in Graduate Level in Psychology that Emphasize Research Areas among Undergraduate Students

Although many undergraduate students select psychology as their major, not all of the students decide to continue studying in psychology. Furthermore, students may be interested in research (e.g., cognitive, developmental, or social psychology) or professional areas (e.g., clinical, school, or industrial/organizational psychology). One of the strengths in psychology is strong scientific background that makes the field different from folk beliefs. Therefore, the desire to pursue studying in research area in psychology will maintain this strength in the future. Thus, this study aims to explore the factors influencing the undergraduate students' decision whether they will apply for graduate study in research areas of psychology. I hope that this study will reveal some facts that can be applied for enhancing scientific practice in psychology.

Although I have not found the study related to this decision in the undergraduate students in psychology, Kahn and Scott's (1997) study was the similar one but conducted in graduate students in counseling psychology. They revealed many factors related to research career goal that can be applied in this study. First, research career goal of counseling students was directly predicted by research interest. This relationship is theoretically supported by theory of career choice (Holland, 1985, as cited in Kahn & Scott, 1997). Therefore, I hypothesize that research interest is the main predictor in decision to continue study in research-oriented psychology.

Second, Kahn and Scott found that research productivity does not have significant effects on research career goal. However, I think the effect of research productivity on research career goal exists in the undergraduate students because the research productivity is a requirement for graduate school application. Thus, I hypothesize that research productivity positively predicts research career goal.

Third, according to research training environment theory (Gelso, 1997), research training environment foster research productivity by increasing students' research interest and research self-efficacy. Kahn and Scott (1997) and Kahn (2001) found these relationships among graduate counseling students. Thus, I expect to find this relationship among undergraduate students also.

In addition, some studies found that research interest was determined by research self-efficacy (Kahn & Scott, 1997; Kahn, 2001; Deemer, Martens, & Podchaski, 2007). In the Kahn (2001) model, the effect of research self-efficacy on research interest was fully mediated by research outcome expectations, as proposed in the social cognitive career theory (Hackett & Lent, 1992, as cited in Kahn & Scott, 1997). That is, the more students' perceived research ability, the better the expected outcomes, and then the more the interest in research. Therefore, I hypothesize that research self-efficacy affects research interest in undergraduate students as well.

Finally, the scholarly activity and research self-efficacy is determined by year in program (Kahn & Scott, 1997). This effect is also applicable in undergraduate students such that students in the higher years have studied research design and have research projects more than students in the lower years. Thus, I expect this relationship among undergraduate students as well.

Method

Participants

The sample consisted of 26 undergraduate students in psychology major of a large public university in Midwest. Twenty four participants were female. Reported years in school were 6 sophomore, 15 junior, 5 senior, and 1 student in the fifth year.

Measures

Interest in Research Questionnaire. This measure (Bishop & Bieschke, 1998) is a 16-item measure which respondents indicate their degree of interest in specific research activities on

a 5-point Likert scale ranging from 1 (very disinterested) to 5 (very interested). The reported coefficient alphas ranges from .89 - .93 (Deemer, Martens, & Podchaski, 2007). The alpha in this study was .92.

Research Self-Efficacy Scale. This scale (Phillips & Russell, 1994) consists of 12 items aimed to assessing one's perceived competence in conducting research tasks. Participants will rate on 10-point Likert scale ranging from 0 (no confidence) to 9 (total confidence). This scale is modified to be appropriate for undergraduate samples. That is, most undergraduates do not have specific mentor relationship with faculty members and do not have thesis or dissertation as a requirement. These items are changed to undergraduate context, such as presenting a research study or using introductory statistics. The coefficient alpha ranges from .89 to .90 (Kahn, 2001). The alpha in this study was .92.

Research Training Environment Scale. The original scale (Kahn & Miller, 2000) contained 18 items aimed to assess perception of research training environment, by rating on 5-point Likert scale ranging from 1 (disagree) to 5 (agree). This scale have coefficient alpha of .85 to .88 (Kahn, 2001). However, six items are deleted because they cannot be applied for undergraduate contexts, such as thesis and dissertation. The alpha in this study was .63, which was much lower than the previous studies. The possible explanation is that undergraduate students have lower opportunities to be familiar with faculty members. Thus, they may have less accurate information in research training environment rating.

Scholarly Activity. This scale, modified from Kahn and Scott's (1997) scale, contains 13 items that cover past accomplishment and current research involvement in undergraduate setting. The items are rated by checking on how many times a participant involve in the research activity,

ranging from 0 (Never), 1, 2, 3, 4, 5, and More than 5. The coefficient alpha in this study was .73.

Research Career Goal. Similar to Kahn and Scott (1997), the variable is measured by ranking from 1 (most preferable) to 5 (least preferable) on five possible options. These options are possible plans after finishing undergraduate study: continue graduate study in research areas of psychology, continue graduate study in professional areas in psychology, continue graduate study in other areas, work related to psychology, work unrelated to psychology. The weighted sum is used. It is calculated by, first, reversing the order of the rank. That is, 5 is assigned for the most preferable choice and 1 is assigned for the least preferable choice. Next, the reversed rank is multiplied by its weight. The five options have the weights of 2, 1, 0, 0, and 0, respectively. Then, the products of each option are added together.

Procedures

The participants were recruited from psychology classes in the university. Also, the posters were posted on the hallway in psychology department. Undergraduate students who were interested in participation took the survey on the website. The incentive of \$30 was given for one participant to motivate participation. The confidentiality was compromised by asking an email address of participant to give the incentive. Thus, we developed a consent form on the first page of the survey, which informed participants that the responses were confidential and the information was reported as group statistics. The response rate cannot be directly estimated because I do not know the number of undergraduate students who have known about this study. The approximate maximum response rate was 47% estimated by finding a ratio of the total sample size to the number of people who viewed the website.

Result

The means, standard deviations, and correlations of the study variables are reported in Table 1. Because the hypothesized model involved several mediation effects, I tested the model by path analysis by LISREL 8.8. Because the 21 elements of variance covariance matrix were estimated by only 26 participants, the result of path analysis should be interpreted carefully. It is possible that the obtained covariance matrix is largely different from the covariance matrix in population. Path analysis assumes that the sample covariance matrix is population covariance matrix, so large sample size is required.

The hypothesized model, as shown in Figure 1, was examined. According to Hu and Bentler (1999), misspecified models usually showed a comparative fit index (CFI) < .95, a standardized root-mean-square residual (SRMR) > .06, and a root-mean-square error of approximation (RMSEA) > .05. The model provides good fit to the data, $\chi^2(5, N = 26) = 2.75, p = .74$, RMSEA = .00, CFI = 1.00, SRMR = .051, and explained 19% of variance in research self-efficacy, 32% of variance in research interest, 61% of variance in scholarly activity, and 25% in research career goal. However, the lowest sample size in their simulation study is 150, which is much higher than the obtained sample size in this study. The good fit conclusion can be made, however, because SRMR tended to overly reject correct model in small sample size (Hu & Benter, 1999) and the obtained SRMR in this study was still in the good fit range.

Figure 1 also provides whether the standardized regression weights were significantly different from 0. The sampling distributions of each regression weight are assumed to be normal distribution. Only 4 out of 9 regression weights are significant at .05. The significant paths were in the same direction as the study hypotheses. The nonsignificant paths could be resulted from low power or the correct null hypotheses, so they were not interpretable. I decided to retain the

nonsignificant paths in the model because, in my opinion, the theories were supported from previous studies and should not be modified based on the result from small sample size.

However, the effect of scholarly activity toward research career goal was not theory-based. Although the path was not significant, the path was negative which contradicted to the hypothesized model. Actually, Kahn and Scott (1997) hypothesized that the research career goal affected scholarly activity in counseling graduate students. Therefore, I tested several post hoc analyses.

First, it is possible that the relationship of both variables was spurious effects from common causes in this study (i.e., research self-efficacy and research interest). So I deleted the direct path from scholarly activity to research career goal and test for difference in chi-square. The difference in chi-square was not significant, $\Delta\chi^2(1, N = 26) = 1.75, p = .19$. However, the modified model has less desirable fit statistics, $\chi^2(6, N = 26) = 2.75, p = .74$, RMSEA = .00, CFI = 1.00, SRMR = .10. Thus, I retained the hypothesized result.

Second, the effect may be reversed such that research career goal predicted scholarly activity. The model was not supported by the data, $\chi^2(6, N = 26) = 12.05, p = .06$, RMSEA = .12, CFI = .92, SRMR = .09.

Third, instead of casual effect, the residuals of both variables were correlated such that there were some other variables outside the model that affected both variables simultaneously. The model was not supported by the data, $\chi^2(6, N = 26) = 11.89, p = .06$, RMSEA = .12, CFI = .93, SRMR = .09.

Fourth, the casual effect of both variables was reciprocal relationship. The fit indices was slightly different from the hypothesized model, $\chi^2(5, N = 26) = 5.65, p = .34$, RMSEA = .04, CFI = .99, SRMR = .04. Notice that this model had larger chi-square value than the hypothesized

model, which was considered as more parsimonious. Thus, this model provided slightly poorer fit than the hypothesized model. Thus, I retained the hypothesized model. In sum, the result from post hoc analyses suggested that the direct effect from scholarly activity to research career goal provides best fit.

Discussion

The purpose of this study was to examine the factors influencing research career goal of undergraduate students in psychology major. As expected by theory of research career choice, research interest predicted research career goal in positive direction. As expected by the social cognitive career theory, research self-efficacy positively affected research interest. As expected also, scholarly activity depended on year in program.

Training environment theory, however, is partially supported by the data. Research training environment increased research self-efficacy and indirectly increased research interest, which was mediated by research self-efficacy. However, controlling for year, research self-efficacy and research interest did not have significant effect on scholarly activity. However, the directions of both paths were positive in small magnitude. The larger sample size is required to pinpoint whether these effects exist in population or are attributed to random sampling error. The same discussion also explains the low direct effect from year in program to research self-efficacy. It can be resulted from either real effect in population or sampling error.

The effect from scholarly activity to research career goal was different from the hypothesis. The hypothesis proposed that the effect was positive. However, the result found that the effect was not significant and in negative direction. I have tried the post hoc analyses and found that the hypothesized model was still the best in fit statistics. I think it is too early to assume that the negative effect exists and try to find the theoretical explanation of this negative

effect. I believe that a replication study with larger sample size is needed to examine whether the negative effect is real effect in population or random error.

There are several limitations on this study. The biggest weakness of this study is low sample size. The sample size was not enough to provide good parameter estimates in using path analysis. In addition, the participants from this study were based on convenience sampling by volunteer. The response rate was also less than 50%. Therefore, the obtained covariance matrix is probably systematically different from the population covariance matrix. The result from this study should be interpreted carefully. Last but not least, the scales used in this study were developed by modifying from counseling graduate students settings for undergraduate students settings. Without testing for reliability or validity, the scales were used in this study. The scale may be not valid in undergraduate settings, such as the modified research training environment scale, which had low reliability compared to the scale used for graduate settings.

Some practical applications can be made from this study. When students have good research training environment, they will learn about research and develop research self-efficacy. As a consequence, they will be interested in research and plan their goal to be a research psychologist. Policy makers may try to develop research training environment, research self-efficacy, or research interest to foster undergraduate students' research career goal.

Future research needs to replicate this study to make the conclusion from this study clearer. Researchers may add other outcome variables, such as actual application to graduate schools in psychology with research emphasis. Moderation and mediation effect need to be examined, such as the directional relationship from year in school and scholarly activity. Year in school cannot be fostered in application. Researchers need to examine the mediation effect to see why year in school has large effect on scholarly activity. Also, researchers can examine

moderation effects to see when the relationship is strong or weak. Finally, the modified measures from this study are needed to be validated. Finding more support in construct validity will ensure that the statistical relationships among scales represent the relationships among target variables, not other variables else.

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Table 1

Descriptive Statistics and Correlations among Variables in this Study (N = 26)

Variable	1	2	3	4	5	6
1. Year						
2. Research Training Environment	-.13					
3. Research Self-Efficacy	.24	.34				
4. Research Interest	.10	.20	.56**			
5. Scholarly Activity	.78**	-.09	.26	.20		
6. Research Career Goal	-.21	.30	.10	.43*	-.15	
<i>M</i>	3.04	55.04	87.57	48.95	19.17	11.04
<i>SD</i>	0.77	5.81	18.80	13.32	5.70	2.49

Note. * $p < .05$. ** $p < .01$.

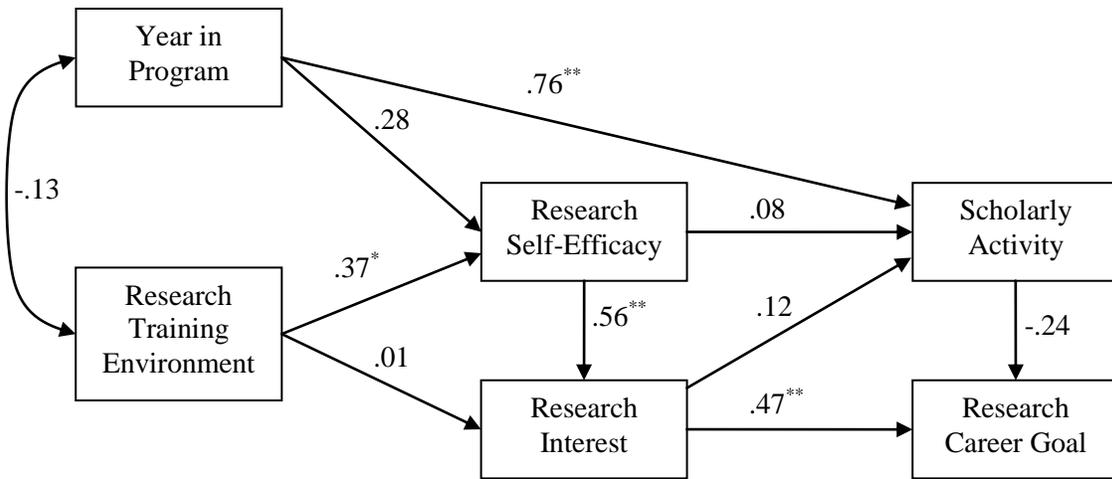


Figure 1. Hypothesized model of research career goal. Values represent standardized path weights ($N = 26$). All values are printed above or on the right of respective paths. $*p < .05$. $**p < .01$.