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ABSTRACT

Considerable evidence suggests that human survival and the opportunity for a decent life for all depend on attaining a way of life more in harmony with the natural environment and available resources. As a step toward understanding specializing in environmental problems, this study compared environmental psychology researchers with interpersonal attraction researchers and with psychologists in general on measures of current career and educational background. Both groups of researchers are more oriented than other psychologists to scientific aspects of psychology and less oriented to people-related aspects. Fewer differences were obtained between the two research groups, although the environmental psychologists seem somewhat more biologically and quantitatively oriented, perhaps a reflection of an ecological perspective. The clearest trend appears to be that a more heterogeneous area like environmental psychology will attract a more diverse group of researchers. Tables and references are included in the study.
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**ENVIRONMENTAL PSYCHOLOGY: A CASE STUDY OF
SCIENTIFIC SPECIALIZATION**

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The
Johns Hopkins
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ENVIRONMENTAL PSYCHOLOGY: A CASE STUDY OF SCIENTIFIC SPECIALIZATION

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Introductory Statement

The Center for Social Organization of Schools has two primary objectives: to develop a scientific knowledge of how schools affect their students, and to use this knowledge to develop better school practices and organization.

The Center works through three programs to achieve its objectives. The Schools and Maturity program is studying the effects of school, family, and peer group experiences on the development of attitudes consistent with psychosocial maturity. The objectives are to formulate, assess, and research important educational goals other than traditional academic achievement. The School Organization program is currently concerned with authority-control structures, task structures, reward systems, and peer group processes in school. The Careers program (formerly Careers and Curricula) bases its work upon a theory of career development. It has developed a self-administered vocational guidance device and a self-directed career program to promote vocational development and to foster satisfying curricular decisions for high school, college, and adult populations.

This report, published by the Careers program, examines occupational specialization by comparing psychologists who have achieved recognition in environmental psychology with other psychologists.

Abstract

Considerable evidence suggests that human survival and the opportunity for a decent life for all depend on attaining a way of life more in harmony with the natural environment and available resources. As a step toward understanding specializing in environmental problems, this study compared environmental psychology researchers with interpersonal attraction researchers and with psychologists in general on measures of current career and educational background. Both groups of researchers are more oriented than other psychologists to scientific aspects of psychology and less oriented to people-related aspects. Fewer differences were obtained between the two research groups, although the environmental psychologists seem somewhat more biologically and quantitatively oriented, perhaps a reflection of an ecological perspective. The clearest trend appears to be that a more heterogeneous area like environmental psychology will attract a more diverse group of researchers.

Environmental Psychology: A Case Study of
Scientific Specialization

Studies of vocational choice appear to have emphasized global occupational categories, with less emphasis placed on choice of specializations or subcategories within occupations (Crites, 1969). However, individual occupational satisfaction and effectiveness may depend largely on choice of a speciality, and the distribution of persons among specialties may affect the general welfare substantially. It may be especially important to understand and further specialization in environmental problems because considerable evidence indicates that human survival and the opportunity for a decent life for all depend on attaining a way of life more in harmony with the natural environment and available resources (NAS-NRC Committee on Resources and Man, 1969; Ehrlich and Ehrlich, 1972; Kirk, 1973; Meadows, Meadows, Randers and Behrens, 1972; Ward and Dubos, 1972).

Accordingly, the present study examines the characteristics of psychologists who have been actively involved in environmental psychology as a step toward understanding participation in this scientific sub-specialty. Psychology offers advantages for a study of interest in environmental issues because the relationship of humans to their environment may be considered the central problem of the discipline, and because coming to terms with environmental constraints may require large changes in implicit assumptions common among psychologists (Bartz, 1970; Looft, 1971; Tornatzky, Fairweather and O'Kelley, 1970).

Method

The basic procedure was to compare psychologists who had achieved recognition for research in environmental psychology with other psychologists. The environmental psychology group consisted of persons cited as an author or coauthor in an Annual Review chapter on research on environmental psychology (Craik, 1973) and listed as members of the American Psychological Association (APA, 1973). Two comparison groups of non-environmental psychologists were used. The first attempted to control for characteristics associated with doing research, or doing research of a citable quality, rather than with choice of environmental psychology for the content of research. Consequently, this comparison group consisted of persons cited in the chapter on interpersonal attraction (Byrne and Griffitt, 1973) in the same Annual Review edition and listed as APA members.¹ This procedure for selecting subjects yielded 73 environmental psychologists and 109 psychologists who had studied interpersonal attraction, including three psychologists who appear in both groups. These three psychologists were also included in both groups in all statistical analyses because it appeared that any bias introduced by this procedure would be conservative (i.e., rejection of the null hypothesis would be less likely). In both groups, of course, psychologists vary in the degree to which they are committed to the problem area and therefore in the degree to which that area can be considered a true specialty.

¹ The author chose interpersonal attraction because he felt that it and environmental psychology both fell under the broad rubric of social psychology but differed enough to permit any characteristics associated with choice of problem area to emerge.

The second comparison group aimed at measuring the characteristics of psychologists in general. This group was obtained by taking the psychologist listed in the APA Directory (1973) immediately following each psychologist in the combined environmental psychology and interpersonal attraction groups. Because of the overlap described above, this comparison group included 179 psychologists. Although this group is not a random sample of psychologists, it should be representative of them. The only obvious bias is that it is more likely that a spouse, child, or parent of a researcher will be included, but it appears that any effect of this bias would be conservative, except with respect to sex (e.g., the backgrounds of spouses usually will have common elements). It is possible that this procedure also is somewhat biased with respect to ethnic group membership, but any effects of such a bias again appear conservative.

Data about the characteristics of these three groups of psychologists were obtained from the APA Directory (1973) and included age, sex, highest degree, current employer, psychological sub-specialty in which earned highest degree, psychological sub-specialty corresponding to first area of interest listed in the Directory, APA membership status, and participation in APA divisions. The Directory also identified the college or university where these psychologists obtained their undergraduate education, where they obtained their highest degree, and where they were currently employed if they hold an academic position. These data were combined with scores obtained from Astin (1965) to describe the undergraduate, graduate, and current college "environments" of each of the three groups.

Results

There appear to be some relevant differences between the two lists of authors cited in the Annual Review chapter. For example, the 73

psychologists constitute only 20.1% of all authors cited for environmental psychology (so 79.9% of the authors were non-psychologists) while the 102 psychologists constitute 57.6% of all authors cited for interpersonal attraction. The difference between these proportions is highly significant ($z = 4.34, p < .001$), and indicates that environmental psychology is the more heterogeneous, interdisciplinary field (the cited nonpsychologists also are quite diverse). Similarly, the author of the environmental psychology chapter is also author or co-author of 3.6% of the cited articles, while the authors of the interpersonal attraction chapters are also authors or co-authors of 22.7% of the cited articles. This difference too is highly significant ($z = 7.09, p < .001$). Because it seems improbable that these authors differ markedly in vanity, the most plausible interpretation again appears to be that environmental psychology is the more diverse field.

The comparisons of the three groups of psychologists on sex, highest degree, and age are summarized in Table 1, and are all significant.²

Insert Table 1 about here

Compared to psychologists in general, researchers on both environmental psychology and interpersonal attraction are younger, more likely to be male, and more likely to hold a Ph.D. Additional analyses revealed that although the control group differed from the researchers, the two groups of researchers did not differ significantly. Also, further analysis indicated that the larger proportion of women in the control group cannot be attributed to the selection procedure's bias toward including researchers' spouses.

²

Chi Squares, of course, are based on frequencies, not percents, and test the null hypothesis derived from the marginal totals.

Table 2 summarizes the analysis of current employment for the three groups. The breakdown into employer types generally follows the scheme used

Insert Table 2 about here

by Clark (1957) in his earlier study of American psychologists, but differs in treating private clinical practice separately. The results indicate that psychologists in the control group are less likely to be employed by a college or university and more likely to be employed by all other types of employers. Psychologists in the interpersonal attraction group are somewhat more likely than environmental psychologists to be employed by a college or university, a further indication of the greater homogeneity of this group.

Results for area of highest degree and current first interest are shown in Table 3. Compared to researchers, the control group appears more involved in the people-oriented aspects (i.e., educational and clinical)

Insert Table 3 about here

of psychology. The interpersonal attraction group is concentrated in the area of social psychology, and thus again is more homogeneous than the other two groups. The modal category for the environmental psychology group is social psychology, but this group also is characterized by more emphasis on experimental psychology and sub-areas with a large biological component, perhaps reflecting greater scientific and ecological orientation.

The results shown in Table 4 for participation in APA throws additional light on this question. As might be expected, both groups of researchers are more likely than the control group to be Fellows and less likely to be

Insert Table 4 about here

Associates in APA. The divisional participation of the control group, as reflected in total number of divisional memberships, also is somewhat less. The overall divisional participation is greater for environmental psychologists than for interpersonal attraction psychologists, a further

indication of the greater heterogeneity of the environmental psychology group.

This table also summarizes divisional participation in each of seven areas. The grouping of divisions was guided by Adkins (1973) factor analytic study of the structure of APA, but also attempted to account for two divisions developed since this study. Psychologists holding no divisional memberships were eliminated and within each area psychologists were divided into those with one or more memberships and those with no memberships. Because each area was treated independently, the statistical tests were independent.

These results reflect the orientation toward people of the control group in its greater participation in the areas of clinical and educational-counseling. The interpersonal attraction group again is characterized by a concentration in the social area, and by more overall homogeneity. The modal category for the environmental psychology group again is social. It is somewhat surprising that environmental psychologists participate more than the interpersonal attraction group in the people-related area of educational counseling and in the engineering-military area. In an earlier study (Adkins, 1954), a number of the divisions in these areas appeared to share a quantitative orientation. It may be that the interest of the environmental psychologists involves this aspect of these areas and therefore is consistent with a greater scientific emphasis.

The last analyses compared the "environments" of the undergraduate, graduate, and current colleges or universities of these three groups of psychologists. These analyses used the colleges measures developed by Astin (1965) which include selectivity, size, and the percent of students

whose major field would place them in each of Holland's (1959, 1973) six types: Realistic, Investigative, Artistic, Social, Enterprising, and Conventional. Realistic fields are typified by civil engineering and agriculture, Investigative fields by the biological and physical sciences, Artistic fields by music and literature, Social fields by education and social work, Enterprising fields by business administration and law, and Conventional fields by accounting. The basic procedure was to treat the environmental measures for each psychologist as his scores and then to compute the average score for each group. Thus, if several psychologists in a given group attended the same college, the environmental measures for that college were included several times in computing the means for that group. This procedure is mathematically equivalent to weighting the scores for a given college by the number of psychologists who attended that college. No attempt was made to estimate characteristics of colleges for which Astin reports no data.

Table 5 summarizes simple analyses of variance comparing these groups on college selectivity and size, including post hoc comparisons of means conducted by the Scheffé (1959); Hays, (1963) procedure.

Insert Table 5 about here

(Variations in N's produced by missing data militated against use of complex analysis of variance.) For technical reasons discussed in detail by Scheffé, the significance level for rejecting the null hypothesis in these post hoc comparisons was set at .10 rather than the customary .05. For all American colleges, the mean on these variables is 50 and the standard deviation is 10. Therefore, all three groups attended and are working in colleges that are larger and more selective than average. The two groups of researchers attended and are working in more selective institutions than the control group, but do not differ from each other in

this respect. No striking differences among the groups were obtained for size.

Similar analyses of variance on the type scores indicated a number of significant differences between researchers and the control group but none between the two groups of researchers. The ipsative character of these measures made these analyses questionable, however, so the major analysis for the type measures followed the procedure suggested by Holland (1973). (In this analysis, the two research groups were combined.) Also, Astin lists all type scores in terms of normalized standard scores with mean = 50 and standard deviation = 10. In order to fit Holland's scheme, the type scores were transformed back to the means and standard deviations that Astin (1965) reports for his original measures of the percent of students falling into the various types.

Specifically, the college environments were described by a three-letter code listing, in order, the types with the three highest percentages of students, and in terms of the "consistency" and "differentiation" of these environmental profiles. There are three possible levels of consistency with a score of 3 indicating the most consistent level. Differentiation is measured by the difference in percents in the most and least frequent types (Holland, 1973). The more consistent an environment, the more compatible are its major elements; and the more differentiated an environment, the greater is its homogeneity. It is clear, of course, that such an analysis is descriptive rather than inferential, and must be interpreted judgmentally.

Table 6 summarizes results of the type analysis of average profiles. In general, the three-letter codes confirmed the greater scientific interest of the two groups of psychological researchers and the greater

Insert Table 6 about here

interest in people of the control group. That is, the first type tended to be Investigative for the researchers and Social for the control group. There is also some indication that the control group returned to a more congenial environment after obtaining their highest degree at a scientifically oriented institution. No differences were obtained for profile consistency, and no important differences for profile differentiation. (Results for differentiation did indicate that all three groups of psychologists attended and are working in institutions that are less homogeneous than the average U. S. college or university.)

Discussion

Defining environmental interest in terms of having conducted research on environmental psychology is an important limitation of the present study. One has to begin somewhere, and this procedure appears reasonable as a start. It is probable, however, that a number of non-research psychologists also are quite concerned with environmental problems, but are expressing their concern in different ways, such as direct social action. Moreover, in some cases their concern may represent more of a true specialization than that of the environmental researchers. If such psychologists had been included, the effect almost certainly would have been to reduce the differences between environmental and other psychologists, so any future studies of environmental psychology as a specialty should attempt to identify this group of psychologists.

With respect to understanding scientific specialization, fairly clear differentiation was obtained between psychological researchers and other psychologists. As would be expected, researchers are more oriented to scientific aspects of psychology and less oriented to people related

aspects. This difference in orientation appeared as early as undergraduate college, and is evident in subsequent careers. These results are generally consistent with the earlier findings of Clark (1957). However, this study was less successful in differentiating psychologists working on environmental psychology from those working on interpersonal attraction, because these two groups share many common characteristics associated with being a researcher. There is some indication that environmental psychologists may be more biologically oriented and more interested in the more "hard-headed" kind of psychological research. The clearest trend, however, appears to be that a more heterogeneous area like environmental psychology will attract a more diverse group of researchers. The results also suggest that psychologists are more likely to contribute to solving environmental problems through interdisciplinary work than through narrow specialization.

Studies have often concluded that environmental concern in the general population is a preoccupation of elite, liberal, and upper middle class groups (Constantini and Hanf, 1972; Gale, 1972; Harry, Gale and Hende, 1969; Tognacci, Weigel, Wideen, and Vernon, 1972). The present study confirms this conclusion to a degree. Compared to people in general or to college graduates the environmental psychologists can be said to be an elite group because they have more education or attended more selective colleges. The fact that they attended more selective colleges is also an indication that they are more likely to have originated in the upper socio-economic strata and to be higher on academic potential. Moreover, their current occupations too appear to represent relatively high social status. The same kind of evidence indicates that they can also be considered an elite group compared to psychologists in general. It

appears, however, that these characteristics are associated primarily with their choice of psychology as a profession and research as a specialty rather than with their interest in the environment. That is, psychologists, regardless of their degree of interest in the environment, represent an elite group with respect to the general population and researchers, regardless of their degree of interest in the environment, represent an elite group with respect to psychologists in general.

Johnson (1973) cites critics who contend that environmental concern frequently represents a desire of the privileged to freeze the status quo in order to preserve their advantages. There is very little in these data to justify such an interpretation of the environmental interest of these psychologists. However, their elite status probably constitutes a substantial barrier to communication (either way) between these psychologists and other segments of society. Any such barrier must be a very serious concern to those, including the author, who believe that we are in the midst of a real environmental crisis (Ehrlich and Ehrlich, 1972) that gravely threatens the life and welfare of mankind.

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Table 1

Comparison of Groups on Sex,
Highest Degree, and Age

	A Environ- mental Psychology	B Inter- personal Attraction	C Control	
Female	12.3%	8.3%	23.5%	Chi Square = 12.52**
Male	87.7%	91.7%	76.5%	
Ph. D.	98.6%	100.0%	83.8%	Chi Square = 109.45**
Non-Ph. D.	1.4%	0.0%	16.2%	
Age Mean	42.48	40.94	45.89	F = 6.90**
S. D.	10.56	10.16	12.37	
** P < .01.				

Table 2

Comparison of Groups on Current Employment

Employer	A Environ- mental Psychology	B Inter- personal Attraction	C Control	Overall Chi Square	A vs B Chi Square
College or University	84.9%	95.4%	45.8%	92.49**	5.99*
Other Educational Institution/System	0.0%	0.0%	10.1%		
Federal Government	2.7%	0.0%	6.7%		
Private Industry; Self Employed	1.4%	0.0%	4.5%		
Private Industry, Employee	1.4%	0.9%	3.4%		
Clinical Private Practice	2.7%	0.0%	9.5%		
Non-profit organization, Hospital, State/Local Government	6.8%	3.7%	18.4%		
Other	0.0%	0.0%	1.7%		

* $P < 05$ ** $P < 01$

Note - A vs B Chi Square involves only
Academic vs other positions.

Table 3
Comparison of Groups on Area of
Highest Degree and Current First Interest

Area of Highest Degree	A Environ- mental Psychology	B Inter- personal Attraction	C Control	Overall Chi Square	A vs B Chi Square
Systems, Experim., Physiol., Comp., Psycho- pharm., Psycholing.	20.5%	6.4%	13.4%	118.52**	19.58**
Developmental, Personality	5.5%	7.3%	5.6%		
Social	27.4%	51.4%	4.5%		
Clinical	21.9%	20.2%	28.5%		
Community, School, Counseling Educational	2.8%	2.7%	23.4%		
Engineer, Indus., Psychomet., Military	1.4%	1.8%	5.6%		
General, Other, Unknown	20.5%	10.2%	19.0%		
Area of Current First Interest					
Systems., Experim., Physiol, Comp., Psycho- pharm., Psycholing	24.7%	11.0%	13.4%	159.03**	28.46**
Developmental, Personality	20.5%	6.5%	9.0%		
Social	28.8%	65.1%	7.8%		
Clinical	8.2%	10.1%	34.6%		
Community, School, Counseling Educational	4.1%	1.8%	25.1%		
Engineer, Indus., Psychomet., Military	9.6%	2.8%	9.5%		
General, Other, Unknown	4.1%	2.8%	0.6%		

** P < 01

Table 4

Comparison of Groups on APA Membership Status
and Divisional Participation

	A Environ- mental Psychology	B Inter- personal Attraction	C Control	Overall Chi Square	A vs B Chi Square	
Membership Status						
Fellow	27.4%	37.6%	12.9%	39.18**	2.08	
Member	69.9%	59.6%	75.4%			
Associate	2.7%	2.8%	11.7%			
Total Number of Divisional Memberships						
3 or more	24.7%	10.7%	19.6%	29.56**	8.68*	
2	26.0%	35.9%	14.5%			
1	37.0%	36.9%	31.3%			
0	12.3%	16.5%	34.6%			
Areas in which those who are Divisional Members hold One or more Memberships						
<u>Area</u>	<u>Divisions Included</u>					
	12, 13, 18, 22, 27, 29, 30, 31, 33		21.9%	22.1%	76.7%	7.03* 0.01
Social- Developmental	7, 8, 9, 20	65.6%	93.0%	30.8%	80.97** 18.41**	
Experimental	3, 6, 25, 28	15.6%	10.5%	10.3%	1.32 -	
General	1, 2, 10, 24, 26, 32	23.4%	15.1%	20.5%	1.76 -	
Engineering- Military	19, 21	9.4%	0.0%	5.1%	7.71* 8.40**	
Consumer- Industrial	14, 23	6.3%	3.5%	6.8%	1.11 -	
Educational Counseling	5, 15, 16, 17	21.9%	4.7%	31.6%	22.13** 10.31**	

* P < 05

** P < 01

Note: No A vs B Chi Square was computed when overall Chi Square was not significant.

Table 5

Comparisons of Selectivity and Size of Undergraduate, Graduate, and Current College or University

Undergraduate College	A		B		C		Significance Level for Mean Comparisons	
	Environ-mental Psychology	Inter-personal Attraction	Control	F	A vs B	A vs C	B vs C	
Selectivity	N	98	165					
	Mean	62.70	59.20	6.68**	< .01	< .05		
Size	S.D.	7.60	7.08					
	Mean	63.26	63.11	1.90	-	-	-	
Colleges where obtained Highest Degree	S.D.	10.13	9.15					
	N	72	171					
Selectivity	Mean	64.51	61.18	6.52**	< .01	< .10		
	S.D.	6.73	6.76					
College where Currently Employed	Mean	65.58	69.30	2.62	-	-	-	
	S.D.	7.03	6.44					
Selectivity	N	91	61					
	Mean	60.32	56.30	4.62**	< .05	< .05		
Size	S.D.	6.89	9.50					
	Mean	66.58	63.79	4.38*	-	-	< .05	
S.D.	6.59	6.63	8.15					

* P < .05

** P < .01

Note: Significance levels for mean comparisons determined by the Scheffé (Hays, 1963) post hoc procedure.

Table 6

Description of Average Profiles for Undergraduate,
Graduate and Current Colleges in Terms of Holland's Scheme

		Combined Environmental Psychology and Inter- personal Attraction	Control	Average of all U.S. Colleges
Undergraduate	Three Letter Code	ISE	SIE	SIA
	Consistency	2	2	2
	Differentiation	14.46	12.35	23.70
Highest Degree	Three Letter Code	ISR	ISR	
	Consistency	2	2	
	Differentiation	14.70	12.30	
Current	Three Letter Code	ISR	SIE	
	Consistency	2	2	
	Differentiation	13.14	14.91	