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Participation by Women in Behavior Analysis

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The participation of women in behavior analysis as authors of articles published in the *Journal of the Experimental Analysis of Behavior* (*JEAB*) and the *Journal of Applied Behavior Analysis* (*JABA*), as members of the Association for Behavior Analysis (ABA), and as contributors to the 1982 ABA convention was examined. Since the inception of *JEAB* and *JABA*, men have appeared as authors far more frequently than women, although women have published relatively more frequently in the latter journal than in the former. Across years, there has been an upward trend in the proportion of *JEAB* authors who are female; this is not the case for all *JABA* authors, although it does hold for senior authors. In 1980–1981 and 1981–1982, females represented approximately half of ABA's student and affiliate members but less than a third of its full members. Approximately a third of the contributors to posters and symposia and a seventh of those delivering invited addresses at the 1982 ABA convention were women.

Several articles published in the last decade have considered gender as it relates to the activities of professional psychologists. It has been shown that the relative number of degrees in psychology awarded to women declines from the B.A./B.S. to the Ph.D. From 1976 to 1977, for example, women earned approximately 55% of the bachelors and 47% of the masters degrees awarded in the field, but less than 35% of the doctorates (Vetter, 1980).

Given that fewer women than men receive doctorates in psychology, it is not surprising that relative to men: 1) women are less frequently elected editors of American Psychological Association (APA) journals (Over, 1981; Teghtsoonian, 1974); 2) women represent a smaller proportion of APA membership (Teghtsoonian, 1974); 3) women publish fewer papers (Cole, 1979; Helmreich et al., 1980; Over, 1982); 4) women are cited less often (Cole, 1979; Endler, Rushton, & Roediger, 1978; Helmreich et al., 1980); and 5) women less frequently receive formal recognition for research achievement (e.g., election to the National Academy of Sciences, Distinguished Scientific Contribution awards from the APA) (Over, 1982). Data also indicate that individual female holders of doctorates: 1) appear to be less productive researchers than men of similar experience and vocational placement (Cole, 1979; Guyer & Fidell, 1973; Helmreich et al., 1980; Over, 1982); 2) are more frequently unemployed than their male counterparts (Solmon, 1978); and 3) are less likely than men to hold appointments in prestigious universities (Astin, 1972).

Most analyses of women in psychology have considered the discipline in its entirety. It is not certain whether the relations obtained from general surveys hold for behavior analysis. Membership data (Over, 1982) indicate that men outnumber women by an especially large number in Division 25 of APA, which suggests that their involvement in the basic science area of behavior analysis is relatively small. However, "the fields in which women have greatest proportionate representation are developmental psychology, school psychology, child and

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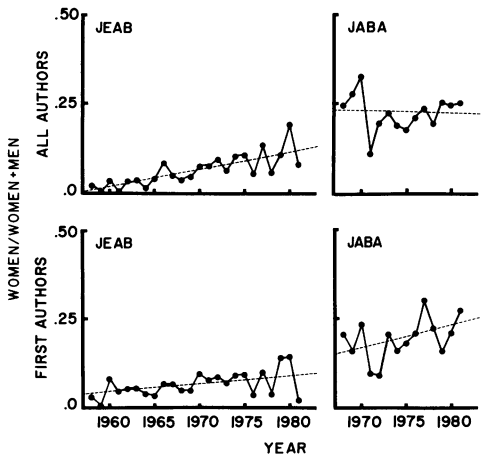

Fig. 1. The proportion of research articles authored by women and published in *JEAB* or *JABA*. Data are summarized by year and reported separately for total (junior and senior) and first (senior) authors. Regression lines were fitted by the method of least squares. The equations describing these lines, reading from the upper left to the lower right frame, are: $Y = .38 + .49X$, $Y = 22.6 - .05X$, $Y = 3.7 + .23X$, and $Y = 15 + .58X$.

youth studies, adult development and aging, mental retardation, and the psychology of women" (Over, 1982, p. 30). Interest in any of these areas would certainly be compatible with active participation in applied behavior analysis. In light of the foregoing, one might expect women to be more active in applied behavior analysis than in the experimental analysis of behavior.

The first set of data collected in the present project show the proportion of empirical articles authored by women that appeared in the *Journal of the Experimental Analysis of Behavior* (*JEAB*) and the *Journal of Applied Behavior Analysis* (*JABA*) each year from their inception through 1981. These are the oldest journals dealing with the experimental analysis of behavior and applied behavior analysis, respectively, and are frequently cited (White & White, 1977). While one can surely contribute to the field of behavior analysis in ways other than publishing in either journal (or publishing at all), a *JEAB* or *JABA* publication represents a considerable achievement for most behaviorists and constitutes an addition to behavioral psychology's data base. Thus publications in these journals may be considered as a meaningful as well as readily quantifiable index of research productivity.

WOMEN AS AUTHORS OF JEAB AND JABA ARTICLES

Data on female authorship were collected by a rater who recorded the name and gender of all authors, and of the first author, for each article listed in the "contents" section of the volume she was evaluating. Three raters were involved in this aspect of the study. The first scored *JEAB* articles for 1958–1965 and *JABA* articles for 1968–1972, the second scored *JEAB* articles for 1966–1973 and *JABA* articles for 1973–1977 and the third scored the remaining articles. A fourth rater recorded the names and gender of authors of articles published in *JEAB* in 1964, 1973, and 1981 and in *JABA* in 1969, 1974, and 1979. Her recordings were used to calculate interrater agreement, which was perfect. A calculation of interrater agreement was deemed necessary because the gender of some authors was not readily apparent. Across all years and both journals, it was not possible to determine the gender of 3% of the authors. Those authors were excluded from the analysis.

Figure 1 depicts by years the proportion of research articles authored by women and published in *JEAB* or *JABA*. The upper frame of the figure presents data for all authors; the data for each year represent the total number of female authors divided by the total number of male and female authors. The lower frame presents data for first (senior) authors only. Five aspects of the data presented in Figure 1 bear mention. First, women appear as authors of *JEAB* and *JABA* articles far less often than do men. Second, overall and for each year in which a comparison can be made the proportion of women authors was greater for *JABA* than for *JEAB*. Third, for both journals the proportion of women who appeared as senior (first) authors was slightly less than the proportion of women authors when junior and senior contributors were com-

TABLE 1

Proportion of ABA membership consisting of women, 1980-1981 and 1981-1982

	Membership category							
	Full		Sustaining		Affiliate		Student	
	Proportion	Ratio	Proportion	Ratio	Proportion	Ratio	Proportion	Ratio
1980–1981	.29	204/713	.08	1/12	.45	123/271	.49	305/619
1981–1982	.28	222/806	.17	2/13	.54	148/272	.50	312/626

bined. Fourth, regression lines fitted to the data by the method of least squares (Kolstoe, 1969) indicate that the proportion of female authors (both senior authors alone and junior and senior authors combined) of *JEAB* articles has increased over time. Fifth, regression lines indicate that the proportion of female senior (first) authors of *JABA* articles has increased over time; but when all authors are considered, the proportion of women authors has not increased over the years.

That women publish less frequently in *JEAB* and *JABA* than do men is apparent. Publication data alone, however, may provide an inaccurate reflection of the extent of women's activities in behavior analysis. Regardless of gender, it seems that few behavior analysts publish research articles. Nonetheless, they may contribute to the field in other ways, for example as teachers or theoreticians. These contributions may be reflected in the program of the ABA convention. Thus the second set of data to be reported examines the proportional participation of women to men in the 1982 convention of the Association for Behavior Analysis (ABA). Since its founding in 1975, ABA's membership has nearly doubled, and attendance at the annual ABA convention has exceeded 1000 in each of the past six years. Dues are inexpensive, at least compared to the cost of APA membership. The organization is not exclusionary. Anyone with an avowed interest in behavior analysis may join ABA, either as a full, affiliate, or student member. Participating in the convention also presents few barriers, as practically all posters and symposia submitted for possible presentation are accepted.

WOMEN'S PARTICIPATION IN ABA

In view of the nature of the organization, the ABA membership should represent a cross section of behavioral psychologists. In addition, presentations at ABA's annual convention may be taken as an indication of active involvement in behavior analysis. Given this, determining the proportion of ABA members who are female and the relative contribution of women to the ABA convention may be of some interest. Unfortunately, records are unavailable for adequately determining the gender of members for each year since ABA has been in existence. Nor is there sufficient information to determine the gender of all those who have made presentations at the eight ABA conventions held to date. However, 1980–1981 and 1981–1982 membership listings are available, along with records adequate for determining the gender of those who participated in the 1982 convention.

Data reported in Table 1, which shows the proportion of female members of ABA, were taken from ABA records. Those shown in Table 2, which depicts the proportion of invited addresses, symposia, and posters women contributed to the convention, were gleaned by one rater

TABLE 2

Proportion of invited addresses, symposia, and posters presented by women at the 1982 ABA convention. Data are presented separately for senior and total contributors

All female participants					
Invited addresses		Symposia		Posters	
Proportion	Ratio	Proportion	Ratio	Proportion	Ratio
.14	13/91	.32	159/490	.35	379/1,086
Female as senior participant					
Invited addresses		Symposia		Posters	
Proportion	Ratio	Proportion	Ratio	Proportion	Ratio
.14	13/91	.30	87/287	.38	153/408

who recorded the name and gender of each person who contributed to a symposium or invited address as listed in the 1982 program book and a second rater who did the same for each person who contributed a poster. These raters recorded data separately for junior and senior contributors. In order to calculate interrater agreement, a third rater independently recorded the name and gender of every third contributor listed in the booklet. Her data agreed perfectly with those of the two primary raters, and it was possible to determine the gender of each person who contributed to the 1982 convention.

When overall membership (all membership categories combined) is considered, women constituted 39% (633 of 1616) of ABA's members in 1980–1981, and 40% (684 of 1716) in 1981–1982. In both membership years, approximately half of the student and affiliate members were women, but less than three in ten full members were female. Sustaining members of ABA historically are few; one of twelve and two of thirteen such members were women in 1980–1981 and 1981–1982, respectively.

At the 1982 ABA convention, 14% of the invited addresses (all by single authors), 30% of the symposia, and 38% of the posters presented listed women as senior contributors. When junior and senior contributors are combined, 32% of the contributors to symposia were female, as were 35% of the contributers to posters. It was not possible to discern from titles the specialty area (e.g., experimental analysis of behavior, applied behavior analysis) of convention presentations, thus we cannot meaningfully speculate on women's primary area(s) of concentration.

One noteworthy aspect of the ABA data is that while about as many student and affiliate members were female as male in 1980–1981 and 1981–1982, a sizeable majority of full members were men. A second is that the proportion of contributions made by women at the 1982 ABA convention was much lower for invited addresses than for either posters or symposia.

GENERAL DISCUSSION

The present findings suggest that certain influential activities in behavior analysis are more frequently performed by men than by women. Previous studies have convincingly demonstrated for psychology taken as a whole that women publish proportionally fewer articles than men (Cole, 1979; Helmreich et al., 1980; Over, 1982) and are less frequently engaged in other high prestige scientific activities (Over, 1982). That this holds true for behavior analysis is hardly surprising.

Insofar as the present data are consistent with other, more general, reports, their value might rightly be questioned. Certainly they shed no light on the factors that have led men to engage in certain activities in behavior analysis with greater frequency than women, nor suggest strategies for increasing women's participation in these areas. The reported data do, however, provide empirical quantification of what is widely acknowledged

as a problem—women are underrepresented in behavior analysis, as they are in science in general. Perhaps more importantly, the publication data indicate that this has changed very little since the inception of *JEAB* and *JABA*. This is especially distressing in view of data indicating that across 14 other psychology journals, women were the senior authors of 21% of all papers in 1977, a sizeable increase from the value of 13% recorded in 1972 (Over, 1981). Comparing these data with the present data leads to an inescapable conclusion: behavior analysis has been less successful than certain other areas of psychology in increasing women's involvement as researchers and authors.

A fundamental tenet of behavior analysis is that there must be a clear specification of the behavior to be changed before it is possible to develop a program that may be successful in bringing about this change. The present data reflect the products of behavior (e.g., publications, posters), not behavior *per se*. While many would agree that increasing women's production of such products is a worthy goal, pursuing this goal requires understanding of those behaviors which lead to the desired products. Unfortunately, we behavior analysts have thus far failed to accomplish a scientific analysis of scientific behavior. Although the overall contribution of men may be relatively greater than that of women in some areas of behavior analysis, in actuality a rather small number of individuals appear to dominate the field.

An especially significant accomplishment would be to determine how the behavior of these few productive individuals differs from that of rank and file scientists and to determine the variables responsible for these differences. Doing so will undoubtedly be a difficult task. Much scientific behavior is subtly contingency-shaped, thus the controlling variables are not easily tacted. Nonetheless, if one's goal is to produce good scientists, the necessary first step is to determine those behaviors which make a scientist "good."

At this point, it is unclear whether established female behavior analysts behave in substantially different ways than do established males in the field. This is true despite the publication of a multitude of studies which have attempted to determine the factors which contribute to the greater scientific involvement and achievement of men relative to women. Two general tacks have been taken in these studies (cf. Teghtsoonian, 1974). In one, an attempt is made to discern intrapsychic characteristics of females that may contribute to lessened scientific activity and performance. "Fear of success" (e.g., Horner, 1970, 1974) is a prime example of such an alleged characteristic and their shortcomings as explanations.

Despite early pronouncements to the contrary, there is no agreement as to whether females "fear success" more often than males, nor whether the verbal responses indicative of "fear of success" are correlated with success (or lack of same) in any endeavor (Mednick & Weissman, 1975; Tresemer, 1977). In any case, "fear of success," like other alleged intrapsychic characteristics, can have no rightful status as a causal variable. Attempting to account for differences in scientific achievement on the basis of such characteristics is misleading and turns attention away from behaviors which actually determine success.

A second tack frequently taken in studies of gender differences in science involves searching for discriminatory practices likely to diminish the success of women relative to men. As Teghtsoonian notes, this approach assumes that "there are two sets of reinforcement contingencies for professional behaviors, one for men and one for women, and that the one for men is designed to reinforce job performance at a higher rate than the one for women" (1974, p. 262). While "designed" implies an intent that may be lacking, men and women may well be differentially consequated for similar behaviors. Such differential consequation is widespread in society (see Astin & Hirsch, 1977; Schaffer, 1981; Williams, 1983), and is frequently discriminatory in that males receive more reinforcement than females even though they emit similar

behaviors. For example, women psychologists are likely to receive less pay and hold lower positions than men, even when their performance is equated on several dimensions (Astin, 1972).

It is far beyond our purpose to attempt a review of the massive literature dealing with discriminatory treatment of women. It must be recognized, however, that women's relative lack of involvement in science undoubtedly reflects general cultural practices, as well as the specific reinforcement contingencies arranged by the scientific community. It is axiomatic in behavior analysis that in order to change behavior one must be able to alter the consequences of that behavior. No behavior analyst can alter the reinforcement contingencies arranged by society at large and, to that extent, no behavior analyst can ensure that the success of women in science is not diminished by discriminatory practices. Fortunately, this does not mean that no reasonable steps can be taken to increase women's involvement and success in behavior analysis. The following section briefly considers three strategies that might prove useful in increasing women's involvement and success in the field.

All manuscript reviews should be blind. Blind reviews are those in which manuscripts are evaluated by referees unaware of their author's identity. The purpose of blind reviews is to ensure that articles are rated according to their merits and that a referee's biases for or against another scientist do not influence the decision to publish an article. Several studies indicate that the reported gender of the author(s) of a written work can influence how that work is evaluated. Goldberg reported that "there is a tendency among women to downgrade the work of professionals of their own sex" (1968, p. 30). Subsequent experiments have not unanimously supported this conclusion. Ferber and Huber (1975), Levenson et al. (1975), and Moore (1978) have, for example, found that under certain conditions there is a positive bias toward articles written by an author of the evaluator's gender. It is unfortunate that biases of this sort are no less significant than the kind of bias reported by Goldberg.

Neither *JEAB* nor *JABA* utilize blind reviews. While neither data nor personal experience suggest that referees for either journal are biased against articles written by females, the majority of members of the board of editors of each journal are men, despite a significant increase over time in the proportion of female editors. Given this, any reviewer bias in favor of same-gender authors would work to the detriment of women more often than men. Though this may not be a real fear, it appears that no harm could come from the employment of blind reviews. Given this, and the lack of a compelling argument in favor of nonblind reviews, their continued use appears unwarranted.

Groups for supporting women in behavior analysis should be developed and supported. Groups designed to support women in behavior analysis and elsewhere, such as the Behaviorists for a Nonsexist Society special interest group associated with ABA, might facilitate women's involvement in the field in several ways. First, such groups encourage verbal behavior which may eventually lead to a decrease in gender-based discrimination in behavior analysis. Talking about problems almost always precedes their solution, thus it appears profitable to encourage all behavior analysts to discuss the role and treatment of women in their field.

Second, such groups—which can, should, and do include males and females—provide aspiring female (and male) behavior analysts with direct access to established scientists who may verbally describe as well as model appropriate professional behaviors.

Third, support groups can provide social reinforcement for academic and professional behavior. Members can also offer suggestions concerning problems commonly encountered by women students and professionals (e.g., sexual harassment) and provide public support for a member attempting to deal with such a problem.

Fourth, support groups can in some cases provide members with access to

scientific and vocational information they might otherwise be denied. Some data suggest that relative to men women are "isolated from the national 'old boy' network and thus out of touch with the 'invisible college' through which much exchange of scientific information takes place" (Helmreich et al., 1980, p. 907). To the extent that this is true, systematic efforts to increase the diffusion of information to women behavior analysts may help to alleviate the problems associated with the "old boy" network and increase women's success in the field.

The principles of behavior analysis should be employed in designing and evaluating programs for increasing women's participation in the field. Women's participation and achievement in behavior analysis will be most apt to increase significantly if systematic efforts are made to ascertain the kinds of environments that foster and maintain their interest in the field and to expose women to such environments. It must be recognized that at present, women and men are likely to enter college and the workplace with different histories and repertoires. Consequently, their professional skills and activities may not be similarly enhanced by identical treatment. Unfortunately, behavior analysts have done little to develop strategies to optimize the scientific repertoires of individuals entering the field, irrespective of their gender. Current graduate programs in behavior analysis, for example, make few or no provisions for individualized treatment of students and are almost never data-based. Such programs are unlikely to provide optimal training for either women or men. This, however, in no way implies that behavioral strategies cannot be employed in the training of scientists or in increasing women's participation in behavior analysis. Certainly the adoption of such strategies is more likely to produce the latter result than the currently favored option of analyzing in mentalistic terms why women have rarely succeeded in science and offering no practical suggestion for altering what women actually do.

The preceding suggestions are neither novel nor panacean. If taken, they will be no more than small and tentative steps down what must prove to be a long and sometimes tortuous road. That women are relatively underrepresented in behavior analysis, as they are in science in general, is beyond debate. That this is widely perceived as a problem is obvious from the great volume of literature addressing the role of women in science that has appeared in the past decade. The problem, unfortunately, is a complex one, and, as Hersen (1981) so aptly puts it, "complex problems demand complex solutions." There is no sure and simple way to increase women's involvement in behavior analysis, but this is no excuse for ignoring the problem. Beyond requiring complex solutions, complex problems have the vexatious quality of failing to disappear despite all efforts to ignore them.

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