

# Participation by Women in Developmental, Social, Cognitive, and General Psychology: A Context for Interpreting Trends in Behavior Analysis

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We examined participation by women in journals devoted to social, developmental, cognitive, and general psychology. Authorship and first authorship by women increased from 1978 to 1997 for most journals. Participation by women on the editorial staff did not keep pace with their increased authorship for social and developmental psychology. Based on these trends, women's participation decreased with increases in the selectivity of the position for social and developmental psychology (a glass ceiling). The development of a glass ceiling suggests that the contributions of men and women are not always treated equally (gender inequity). Because a similar glass ceiling was reported for journals in behavior analysis (McSweeney, Donahoe, & Swindell, 2000; McSweeney & Swindell, 1998), the causes of this inequity appear to be relatively widespread. The failure to find a glass ceiling for general and cognitive psychology suggests that the inequity might be reduced by subtle pressure for diversity in editorial positions and by adopting actions that encourage women to pursue research positions.

*Key words:* gender equity, developmental psychology, social psychology, cognitive psychology, general psychology

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McSweeney and Swindell (1998) and McSweeney, Donahoe, and Swindell (2000) examined participation by women in several journals devoted to the experimental analysis of behavior and to applied behavior analysis, respectively. They reported that participation by women as authors increased substantially for all journals and for all measures of participation over the last 20 years. However, participation by women on the editorial board did not increase as much as authorship did for either the *Journal of the Experimental Analysis of Behavior (JEAB)* or for four journals in applied behavior analysis. As a result, a glass ceiling developed in which participation by women decreased as the selectivity of the po-

sition increased (i.e., from author to editorial board member).<sup>1</sup>

McSweeney et al. (2000) argued that the development of a glass ceiling over time has implications for the question of whether work by men and women is treated equally (gender equity). This question is important to behavior analysis and to psychology as a whole because of the recent increase in participation by women. In 1950, only 14.8% of doctorate degrees in psychology were awarded to women (Howard et al., 1986). By 1997, that figure was 66.6% (Keita, Houston, Wisnieski, &

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<sup>1</sup> The term *glass ceiling* refers only to the finding that participation by women declines with increases in the selectivity of the position. We chose this term because it has been used in the past to describe a similar phenomenon: the failure of women to advance to top management positions in corporations and government (e.g., Morrison & Von Glinow, 1990). By using this term, we do not wish to imply that editorial staff membership represents a "promotion" from the status of author. Qualitatively different factors may govern entry to the two positions. However, membership on the editorial staff does represent a more selective and prestigious position than authorship because fewer people are selected for the editorial staff than appear as authors.

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Cameron, 1999). Because no discipline can remain competitive if it fails to benefit from the contributions of so many of its members, barriers to full participation by women need to be identified and removed.

McSweeney et al. (2000) argued that finding the temporal development of a glass ceiling provided more convincing evidence of gender inequity than past benchmark measures. A benchmark represents how frequently women should participate if the genders are treated equally. Gender inequity is said to be present if actual numbers fall short of benchmarks. For example, Teghtsoonian (1974) argued that the percentage of female first authors could be used as an estimate of the expected percentage of female journal editors if the genders were treated equally.

Evidence based on benchmark measures is not conclusive, however. Many explanations, other than gender inequity, can potentially explain the data when performance falls short. For example, the percentage of women on the editorial board might be smaller than the percentage of female first authors if women declined invitations to join the board more often than men (e.g., Neef, 1993).

McSweeney et al. (2000) argued that finding the development of a glass ceiling over time provides stronger evidence for gender inequity because it rules out many alternative explanations for the results. For example, to explain the development of the glass ceiling in terms of women declining invitations to join the editorial boards, one would have to assume that women are currently declining invitations to join the boards at a higher rate than they did 20 years ago. This seems unlikely.

The present paper asked whether temporal trends similar to those found for behavior analysis also appear for other areas of psychology. If the development of a glass ceiling is found only for behavior analysis, then the explanation for that development and the effective corrective actions will be spe-

cific to the discipline. If the results are not restricted to behavior analysis, then both the explanation and the cure will be more general.

## METHOD

To facilitate comparison across studies, our procedure was similar to that used by McSweeney and Swindell (1998) and by McSweeney et al. (2000) with the following exceptions. First, rather than examining behavior analysis, we examined participation by women in the areas of social, developmental, cognitive, and general psychology. These areas were selected to broadly represent experimental psychology and to include areas that are usually thought to treat women well. Social and developmental are among the areas of psychology in which women participate most frequently (Russo, Olmedo, Stapp, & Fulcher, 1981). As in the earlier studies, four journals were selected to represent most areas. Five were selected for developmental so that we could include clinical, as well as experimental, journals. Although our data on rejection rates are for the earlier time periods, they indicate that most of the journals that we examined are highly selective (rejection rates ranging from 50% to 90%; Buffardi & Nichols, 1981; Rotton, Levitt, & Foos, 1993).

Second, unlike our earlier papers, we do not report the percentage of all articles that had a female author. This measure provided little new information beyond that provided by two of our other measures: the percentage of female authors and first authors.

Third, in the previous papers we counted an article whenever a title and author were listed in the table of contents of the journal. We followed that convention here except that we did not count "Comments" in *American Psychologist* or entries in either "PSPBlication Notes" or "News of the Society" in *Personality and Social Psychology Bulletin* as articles. "Comments" did not always fit our definition of an

article because they were not given a title in the earlier years. "PSPublication Notes" and "News of the Society" usually presented news items rather than psychological science.

Finally, we included the editor and associate editors along with the members of the editorial board in a new measure, "editorial staff." This category included anyone who was responsible for the scientific oversight of the journal. It did not include individuals who were primarily concerned with the business of running the journal. We added the editor and associate editors to our previous measure of the editorial board because Odum (2000) argued that information about participation of women at the highest levels of the editorial process was needed before concluding that women are excluded from the highest levels of the profession. We reported a general category of editorial staff, rather than reporting the editor and associate editors in a different category than the editorial board, because the small numbers of editors and associate editors made statistics based solely on them so variable that they were unreliable. For example, Odum reported a standard deviation for the percentage of women serving as associate editors of *JEAB* that was approximately equal in size to the mean. (See McSweeney & Swindell, 2001, for further discussion of this issue.) As will be reported, the present statistics (entire editorial staff) differed little from previous statistics (editorial board only).

## RESULTS

Table 1 presents the percentage of authors, first authors, and editorial staff members who were women for each journal for each of the four 5-year intervals from 1978 to 1997. For comparison to McSweeney and Swindell (1998) and McSweeney et al. (2000), the percentage of female editorial board members is also presented in parentheses. Because results are similar for the editorial staff and board, all fur-

ther analyses will refer only to the entire editorial staff. The table is arranged to highlight changes in the participation of women as a function of the selectivity of the position. As in the past, we assume that it is more difficult to be an editorial staff member than to be a first author and more difficult to be a first author than an author (McSweeney et al., 2000; McSweeney & Swindell, 1998).

### *Developmental and Social Psychology*

Participation by women as authors usually increased substantially over the 20-year period for journals in both developmental and social psychology. In contrast, participation by women on the editorial staff changed differently for different journals. For example, for developmental, editorial participation increased over time for the *Merrill-Palmer Quarterly* and the *Journal of Abnormal Child Psychology (JACP)*, but it decreased for the *Journal of Clinical Child Psychology (JCCP)*. A glass ceiling appeared in recent years for all journals in both fields. That is, in 1993 to 1997, participation by women as editorial staff members fell short of their participation as authors, usually by large amounts for all journals in these areas. This difference was usually smaller or did not exist for the years 1978 through 1982.

To verify the statistical significance of these changes, multivariate analyses of variance (MANOVAs) with weighted regressions were applied to the percentages reported in Table 1. MANOVAs were used on the assumption that the percentages of female authors, first authors, and editorial staff members were not independent. The means for each 5-year interval were weighted by the total number of articles published because of large differences in the sizes of the journals. The percentage of female authors,  $F(3, 16) = 5.05$ , developmental,  $F(3, 12) = 33.04$ , social, and the percentage of female first authors,  $F(3, 16) = 6.87$ , developmental,  $F(3, 12) = 4.86$ , social, increased sig-

TABLE 1

Mean percentage of all authors (A), first authors (F), and members of the editorial staff (E) who are women. The mean percentage of editorial board members who are women (EB) appears in parentheses. Results are reported for each of the journals over the four 5-year intervals from 1978 to 1997

Journal	1978-1982				1983-1987				1988-1992				1993-1997			
	A	F	E	(EB)	A	F	E	(EB)	A	F	E	(EB)	A	F	E	(EB)
Developmental																
<i>MPQ</i>	48	44	16	(16)	49	46	24	(19)	50	46	29	(24)	65	65	36	(31)
<i>DP</i>	44	42	39	(37)	49	46	35	(35)	52	50	33	(34)	56	55	42	(42)
<i>CD</i>	46	46	38	(36)	49	47	44	(43)	56	55	48	(48)	55	59	45	(46)
<i>JACP</i>	36	39	19	(20)	41	37	27	(32)	43	43	28	(29)	48	48	35	(36)
<i>JCCP</i>	39	38	44	(41)	45	41	39	(39)	43	43	38	(37)	50	49	35	(34)
Social																
<i>PSPB</i>	25	20	22	(20)	32	28	22	(21)	32	24	24	(21)	39	33	31	(31)
<i>JESP</i>	18	13	12	(11)	27	21	7	(8)	33	24	20	(19)	36	28	28	(27)
<i>JASP</i>	27	28	10	(11)	31	32	18	(19)	38	38	22	(23)	42	40	22	(23)
<i>JPSP</i>	25	20	17	(18)	30	25	22	(23)	34	24	25	(26)	38	30	21	(21)
Cognitive																
<i>CP</i>	33	32	12	(12)	35	36	20	(22)	40	36	26	(28)	30	27	30	(32)
<i>C</i>	24	18	17	(18)	34	31	23	(25)	33	27	24	(25)	34	34	26	(27)
<i>M&amp;C</i>	26	21	17	(17)	32	26	14	(14)	34	30	27	(31)	32	30	29	(29)
<i>JEP:LMC</i>	24	18	26	(25)	26	20	24	(24)	30	27	23	(23)	27	28	32	(32)
General																
<i>PR</i>	12	10	16	(18)	14	11	23	(26)	19	15	13	(15)	17	14	21	(21)
<i>PB</i>	17	14	0		23	23	38		24	23	27		29	27	24	(31)
<i>AP</i>	20	16	17		26	23	14		31	25	22		31	23	33	
<i>JEP:G</i>	23	18	26	(28)	31	28	22	(23)	28	18	24	(25)	28	24	32	(35)

The journals examined were *Merrill-Palmer Quarterly* (*MPQ*); *Developmental Psychology* (*DP*); *Child Development* (*CD*); *Journal of Abnormal Child Psychology* (*JACP*); *Journal of Clinical Child Psychology* (*JCCP*); *Personality and Social Psychology Bulletin* (*PSPB*); *Journal of Experimental Social Psychology* (*JESP*); *Journal of Applied Social Psychology* (*JASP*); *Journal of Personality and Social Psychology* (*JPSP*); *Cognitive Psychology* (*CP*); *Cognition* (*C*); *Memory and Cognition* (*M&C*); *Journal of Experimental Psychology: Learning, Memory, and Cognition* (*JEP:LMC*); *Psychological Review* (*PR*); *Psychological Bulletin* (*PB*); *American Psychologist* (*AP*), and *Journal of Experimental Psychology: General* (*JEP:G*).

nificantly over the 20-year period. The percentage of female editorial staff members did not change significantly for either field,  $F(3, 16) = 0.64$ , developmental,  $F(3, 12) = 2.55$ , social. Here, and throughout this paper, results were considered to be significant when  $p < .05$ .

### Cognitive and General Psychology

Participation by women as authors in cognitive and general psychology usually increased over the 20-year period. However, the gains were not as large or systematic as those for the other areas. The increases in first author-

ship were statistically significant for cognitive,  $F(3, 12) = 3.57$ , but not for general,  $F(3, 12) = 3.13$ , psychology. The increases in authorship were not significant for either cognitive,  $F(3, 12) = 2.55$ , or general  $F(3, 12) = 3.03$ , psychology. Again, the reported statistics resulted from applying MANOVAs to the results in Table 1 weighted by the total number of articles published in a journal.

Women made few gains on the editorial staff during the first 15 years for general psychology but usually participated more during the last 5 years. In contrast, women made substantial

gains on the editorial staff in cognitive psychology. The increases in women on the editorial staff were significant for cognitive,  $F(3, 12) = 5.88$ , but not for general,  $F(3, 12) = 2.31$ , psychology.

Based on these trends, a glass ceiling did not occur in recent years for either group of journals. That is, the participation of women as authors was not consistently and substantially greater than their participation as editorial staff members during 1993 through 1997 for cognitive and general psychology.

## DISCUSSION

Participation rates by women as authors and first authors of articles in psychology journals often increased from 1978 to 1997. When increases in authorship occurred, they were not usually accompanied by increased participation by women on the editorial staff. Women's participation on the editorial staff increased systematically over the years that we examined only for cognitive psychology. Based on these trends, a glass ceiling developed in the areas of social and developmental psychology as it had for *JEAB* (McSweeney & Swindell, 1998) and for applied behavior analysis (McSweeney et al., 2000). That is, although women participated more, their increased participation was disproportionately confined to authorship, rather than to the editorial staff. The glass-ceiling discrepancy was substantial in size. During the last 5-year interval, the difference between the percentage of female authors and the percentage of female editorial staff members was 16.2%, 13.3%, and 17.0% on the average for the journals in developmental, social, and applied behavior analysis, respectively. The size of this difference also increased over the last 20 years. During 1978 through 1982, the same statistics were 11.4%, 8.5%, and 0.9%.

It is impossible to identify and rule out all potential competing explana-

tions for the development of a glass ceiling. Therefore, the present data do not prove that gender inequity occurs. However, the present data provide stronger evidence of gender inequity than past benchmark measures. As argued by McSweeney et al. (2000), if the only reported data were those for the last 5 years (a benchmark measure), many hypotheses other than gender inequity could explain the results. In contrast, the temporal development of a glass ceiling for some fields rules out many alternative explanations. We will list some of these problematic explanations here. The reader is referred to McSweeney et al. (2000) for an explanation of the problems with these arguments.

The following hypotheses seem unlikely to explain the data: that women appear less often on the editorial staff than as authors because they lack the skill, intelligence, or motivation required to become editorial staff members; that women decline invitations to join the staff more often than men; that women fail to work hard enough to become editorial staff members because they assign higher priority to other activities (e.g., spending time with their families); that women are less likely to be invited to join the editorial staff because female first authors publish few articles relative to those published by male first authors; that the recent influx of female authors could not be accommodated on the staff without unfairly dismissing deserving men; that editorial staffs are selected largely from those with academic tenure-track jobs and women are entering academia proportionally less frequently than they used to; that women may win initial academic appointments, but may not hold them long enough to become associate or full professors, the levels from which the editorial staff is primarily drawn; and that the increasing participation by women as authors has not had time to reach the editorial level. Again, each of these hypotheses can explain why women might be represented less frequently than men at the

upper levels of the profession, but they are not compatible with the way in which a glass ceiling developed over time. Therefore, if factors other than gender inequity produced the present results, those factors are not simple or obvious.

When we argue that gender inequity provides a plausible explanation for the poor representation of women at the highest level of the profession, we argue only that work by men and women may not be treated equally. We do not know the causes of this unequal treatment, although the present results may point in certain directions. To date, the glass ceiling has been reported for *JEAB* (McSweeney & Swindell, 1998), for four journals in applied behavior analysis (McSweeney et al., 2000), for five journals in developmental psychology, and for four journals in social psychology. Our conclusions may also extend to clinical psychology. Glass ceilings appeared for the two developmental journals that were chosen for their clinical content (*JCCP* and *JACP*) as well as for the journals in applied behavior analysis (McSweeney et al., 2000). As a result, the factors that produce the glass ceiling are likely to be widespread (e.g., societal attitudes) rather than restricted to behavior analysis (e.g., discriminatory action by a few people).

The glass ceiling also appeared in areas of psychology that are usually thought to treat women well (e.g., applied behavior analysis, developmental, social). This suggests that the causal factors are more likely to be unconscious and subtle (e.g., relying on the "old boys network" to select members of the editorial staff) rather than conscious and immediately apparent (e.g., an organized effort to keep women out of important positions). If the factors were consciously recognized, then these areas would not be thought to treat women well.

Although it was widespread, the glass ceiling was not universal. In fact, the failures to find a glass ceiling for cognitive and general psychology may

suggest ways to reduce or eliminate it. The journals in general psychology may have failed to show a glass ceiling partly because they are published by the American Psychological Association (APA), and APA exerts subtle pressure for diversity. Journal editors are asked to report how many editorial board members are women and members of minority groups (D. Jackson, personal communication, September 30, 1999). In addition, women and minority members interested in participating in the publication process are asked to identify themselves. In support of this argument, a glass ceiling failed to appear in two other APA journals: *Journal of Experimental Psychology: Learning, Memory, and Cognition* (Table 1) and *Journal of Experimental Psychology: Animal Behavior Processes* (McSweeney & Swindell, 1998).

The relationship between pressure for diversity and the failure to find a glass ceiling was not perfect, however. A glass ceiling did develop for two APA journals, *Developmental Psychology* and *Journal of Personality and Social Psychology* (Table 1) in spite of the pressure for diversity. In addition, a glass ceiling was found for *JEAB* and for the *Journal of Applied Behavior Analysis* even though the editors of these journals are asked to report the number of female members of the editorial boards. These contradictory findings suggest either that the pressure for diversity is not always successful or that other factors also operate. However, if subtle pressure for diversity did contribute to reducing the glass ceiling in at least some cases, then this ceiling is not intractable. Instead, it sometimes yielded to relatively minor pressure for diversity.

The explanation for the failure to find a glass ceiling for cognitive psychology is not immediately apparent. Some explanations can be questioned. First, gender inequity might be reduced if women are overly represented in a field or as editors of its journals. Although the data are old, female members of APA are more likely to identify

with social and developmental psychology than with cognitive (e.g., Russo et al., 1981). Women have also appeared at least as frequently as editors of journals in social and developmental psychology as they have as editors of journals in cognitive psychology.

Second, the field of cognitive psychology is relatively new. Greater acceptance of women in recent years may have led to their inclusion among the "old boys," eliminating the glass ceiling. Such a hypothesis could be tested by examining women's participation in other relatively new fields (e.g., behavioral pharmacology). However, the appearance of a glass ceiling for three of the four cognitive journals during the early years that we examined (Table 1) tentatively suggests that this explanation is incorrect. A glass ceiling disappeared rather than failed to develop for cognitive psychology.

A somewhat more likely explanation may be that the glass ceiling is eliminated by the presence of a substantial number of women whose job description includes research. There are many reasons why the glass ceiling might yield to numbers. For example, it may be easier to overlook women if there are only a few of them than if there are many. In support of this idea, in 1978 to 1979, a larger percentage of APA members than of members of the faculty of graduate departments of psychology were women for most areas of psychology (Russo et al., 1981). The situation was reversed for cognitive psychology. Of the cognitive psychologists in APA, 14.9% were women and 20.5% of members of the cognitive faculties of graduate departments of psychology were women. That is, at least at that time, proportionally more women who specialized in cognitive psychology occupied positions for which research was a primary requirement.

This explanation is not entirely convincing. The supporting data are relatively old (1978 to 1979), and membership in APA may not accurately reflect a field. Nevertheless, if this expla-

nation is at least partially correct, then the current efforts by universities, such as the Massachusetts Institute of Technology, to provide women with equitable resources for research could eventually contribute to reducing the glass ceiling by making research positions more attractive to women.

As a final point, the failure to find a glass ceiling for the cognitive and general psychology journals does not mean that these journals necessarily treat work by women equitably. We have focused on the development of a glass ceiling as an index of gender inequity because we believe that it provides the clearest available evidence. However, other data from the cognitive and general psychology journals suggest that gender inequity might be expressed in other ways for these journals. For example, participation by women as authors in the cognitive and general journals did not increase significantly over the 20 years that we examined. Participation of women as first authors also failed to increase for the general, but not for the cognitive, journals. The failure to find an increase in participation by women is puzzling in light of the dramatic increase in participation of women in psychology as a whole over the same period, as well as in light of the increase in participation by women as authors and first authors in the other areas of psychology that we examined. The journals in general psychology also publish research in all areas of psychology. Therefore, women might be expected to participate in these journals at approximately their mean rate of participation in other areas if no inequity occurred. Instead, the general psychology journals are last or close to last in terms of absolute percentage of authorship by women, potentially suggesting inequity.

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