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This study tested a causal model of vocational behavior developed by Astin (1984) that incorporated both psychological (work motivation and work expectations) and cultural-environmental (gender-role socialization and the structure of opportunity) factors. A questionnaire packet was administered to 113 faculty women and 103 faculty men. Similarities and differences in predictors of publishing activity for faculty women and men are discussed. Although some interesting relationships among the variables were found, the present study did not support the model. To promote future research, some conceptual and methodological problems of the study are pointed out. Contains 50 references. Five figures and three table present data and statistical analysis. (Author/TS)

Diane S. Schaupp, Mary Kopola, Merle Keitel, Giselle Esquivel

A SOCIOPSYCHOLOGICAL MODEL OF CAREER CHOICE AND VOCATIONAL BEHAVIOR

Tuesday, August 15, 1995 from 12:00 - 12:50

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"Presented at the 103rd Annual Convention of the American Psychological Association in New York August 11-15, 1995."

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Women's increased participation in the labor force has been accompanied by greater awareness on the part of counseling psychologists that our ability to predict, explain, and modify women's vocational behavior is at best inadequate (Osipow, 1973; Vetter, 1978). Women continue to be seriously underrepresented in many professions, and in managerial and administrative positions because socialization very often has resulted in producing response sets among women which constrict their options (Astin, 1984). Clearly, there is a need for a theoretical framework to explain the career development of women, particularly a theoretical conceptualization capable of intergrating exisiting knowledge, generating testable research hypotheses, and guiding intervention efforts. To fill this need, Astin (1984) developed a model of career choice and vocational behavior to explain differential interests and capabilities of both women and men.

Model of Career Choice and Vocational Behavior

Astin (1984) proposed a need-based sociopsychological model, which defines both psychological factors (work motivation and work expectations) and cultural-environmental factors (gender-role socialization and the structure of opportunity).

Work Motivation. Astin (1984) posited that work motivation in

the form of three primary needs (for survival, pleasure, and contribution) is the same for both women and men. According Astin (1984), work, which is defined as activity directed to produce or accomplish something, has the capacity to satisfy needs that are perceived to be important to one's career. For instance, survival needs at work are perceived as important because their satisfaction results in money to pay for food and shelter; pleasure needs are perceived as important because of the fulfillment gained from the work activity itself; and contribution needs are perceived as important because of the knowledge that one's work can benefit others.

Work Expectations. Astin (1984) proposed that the needs that motivate human beings to engage in work are the same for women and men, but women and men differ in their work expectations; that is, in their perceptions of what types of work are available or accessible to them and what types of work can best satisfy their needs. This variable is a mediating variable. Work expectations are a function both of gender-role socialization and the perceived structure of opportunity. To understand how expectations develop in the life of an individual, the socialization process must be examined.

Gender-Role Socialization. In our society, play activities have traditionally been defined and distributed according to gender. In a study of gender differences that examined the kinds of play in which children engage, Lever (1978) observed that boys play outdoors far more than girls do, which allows them greater freedom of movement and permits them to go farther away from home, thus giving them early

experiences of independence. Playing indoors, on the other hand, restricts body movement and vocal expression. Moreover, playing indoors is more private, less subject to the scrutiny of the world, whereas playing outdoors is more open to surveillance and widespread recognition. Boys also engage in competitive games more often than girls; thus, their competitiveness and drive to achieve are reinforced. Lever (1978) concluded that the play of children produces gender-specific social skills and capacities that carry over into the performance of adult roles.

Astin (1984) translates the notion of winning and of gaining points inherent in the competitive games that boys play into the acquisition of resources (power, prestige, and income) through gainful employment. Thus, the survival needs of men tend to be satisfied by earned income. Boys learn to satisfy their pleasure needs by building things and solving puzzles. Similarly, their contribution needs are satisfied through the direct production of tangible objects. In contrast, indoor games played by girls involve nurturing and caring for others rather than competing with them. From this early experience comes the notion that women satisfy their survival needs by marrying and taking care of a man, who must earn the living. Similarly, girls learn to satisfy both their pleasure needs and their contribution needs by direct service to others.

In summary, play is differentiated by gender, and these differences produce different skills, different perceptions of what the world of work has to offer, and different impressions of what activities can best satisfy survival, pleasure, and contribution

needs. In other words, very early in their lives, children form gender-linked expectations about need gratification through work.

The Structure of Opportunity. Astin (1984) suggested that if socialization were the only determinant of expectations, there would be little social change. The same values would be handed down from generation to generation within a given society. However, social change does occur through historical events and by scientific and technological advances. The socialization process and the structure of opportunity influence each other to some extent (i.e., the socialization process limits the changes in the structure of opportunity, while the structure of opportunity influences the values that are transmitted through the socialization process).

According to Astin (1984), the rising divorce rate, the proliferation of nontraditional life styles, and changes in the nation's economy have all had an impact on work behavior aimed at satisfying the need for survival. Women can no longer regard marriage as a guarantee of economic security through the life span. They may remain single, they may divorce, or they may find that a single income cannot cover the family's subsistence needs. Thus, virtually all women today need to plan for the contingency of taking paid employment outside the home. In addition, affirmative action legislation gives some women access to higher paying jobs that were once reserved for men. This means that women are more likely to be satisfying their needs directly rather than indirectly through the income of their spouses.

Clearly, changes in the structure of opportunity may lead women to modify their work expectations that were initially shaped by

socialization experiences and early perceptions of the opportunity structure.

Statement of the Problem

As recently as 1991, inequities in salary and employment between faculty women and men were reported. The Digest of Educational Statistics (DES, 1991) reported that of the 464,072 full-time instructional faculty of higher education, 128,063 were women and 336,009 were men. Of these totals, 50.2% of the faculty women held tenure compared to 70.5% of the faculty men. Within colleges and universities, as rank increased, the percentage of women decreased. In 1989-90, women were 40% of assistant professors, 26% of associate professors, but only 13% of full professors (Academe, 1990).

While there has been a focus on affirmative action, the percentage of women on college faculties has increased only slightly, from 22.5% in 1974-75 to 27.4% in 1989-90 (Academe, 1990; National Center for Educational Statistics, 1983). Women faculty are more likely to teach in community and undergraduate institutions than in doctoral-level research institutions.

How does this differential representation of women and men by status in institutions of higher education affect students? First, the organization of institutions of higher education mirrors gender stereotypes. The message that males are dominant and females subordinate, which students receive from other sources, is further reinforced. Second, since professors serve as role models for many of their students, the underrepresentation of faculty women in

certain fields, and in higher education in general, serves to perpetuate gender discrepancies in career aspirations. In fact, faculty women may be particularly important role models for women in their choice of careers and in their productivity (Basow & Howe, 1987; Gilbert & Evans, 1985; Goldstein, 1979; Simeone, 1987). Therefore, the predominance of white male faculty, especially in the higher ranks, may do little to change the gender status quo. A third effect of the differential representation of faculty women and men is the creation of a different climate for women and men students.

With reference to women, "campus climate" has been defined as "those aspects of the institutional atmosphere and environment which foster or impede women's personal, academic and professional development" (American Council on Education, 1987, p. 7). These include institutional practices and policies, the classroom experience of students, and the professional environment in which women faculty and staff must operate. The differential representation of faculty women in institutions of higher education may inadvertently result in differential treatment such as providing women with fewer institutional resources and less release time, appointing women primarily to less powerful institutional committees which have little institution-wide or fiscal responsibility, exclusion of women from informal exchanges, passing over ideas or suggestions advanced by women in meetings, and making disparaging comments about women in general and particularly about women in the professions (Anonymous, 1991; Sandler, 1986). While the individual behaviors and attitudes that create a "chilly" professional

environment for women in institutions of higher education may seem unimportant, taken collectively they can be severely demoralizing. Often, differential views of women may be expressed so subtly that no one is fully aware of what has occurred. These behaviors not only limit women's advancement but also leave women professionally and socially isolated. Thus, women have limited opportunities to make professional contributions, and they experience a lower sense of self-confidence.

Often a woman's lower status in academia has been attributed to her lower research productivity (Astin, 1978; Cohen & Gutek, 1991; Helmreich, Spence, Beane, Lucker, & Matthews, 1980; Ladd & Lipset, 1976). Scholarly productivity is an important index of performance in academia. The rewards, rank, and salary are based largely on productivity. Scholarship demonstrated in published works not only increases one's status, but also represents one's contributions to knowledge, the advancement of science, and the betterment of society.

A reveiw of the literature reveals research that examines the relationship of publishing activity and numerous internal (psychological) and external (cultural-environmental) factors. A shortcoming of previous research revealed that while some studies had theory to guide them, none were guided by career development theory to explain vocational behavior.

The focus of this study was to examine the direct and indirect effects of gender and variables (i.e., work motivation, work expectations, gender-role socialization, and the structure of opportunity) identified by Astin (1984) on vocational behavior, in

this case, publication rate. That is, would (a) work motivation, measured as need satisfaction; (b) gender-role socialization, measured as gender-role identification (i.e., masculine and feminine characteristics); (c) work expectations, measured as work-related expectancies; and (d) the structure of opportunity, measured by perceived institutional bias and two organizational climate factors (i.e., warmth and pressures-standards), have stronger effects when linked directly or indirectly to the dependent variable publication rate? Figure 1 presents a model of these relationships.

METHOD

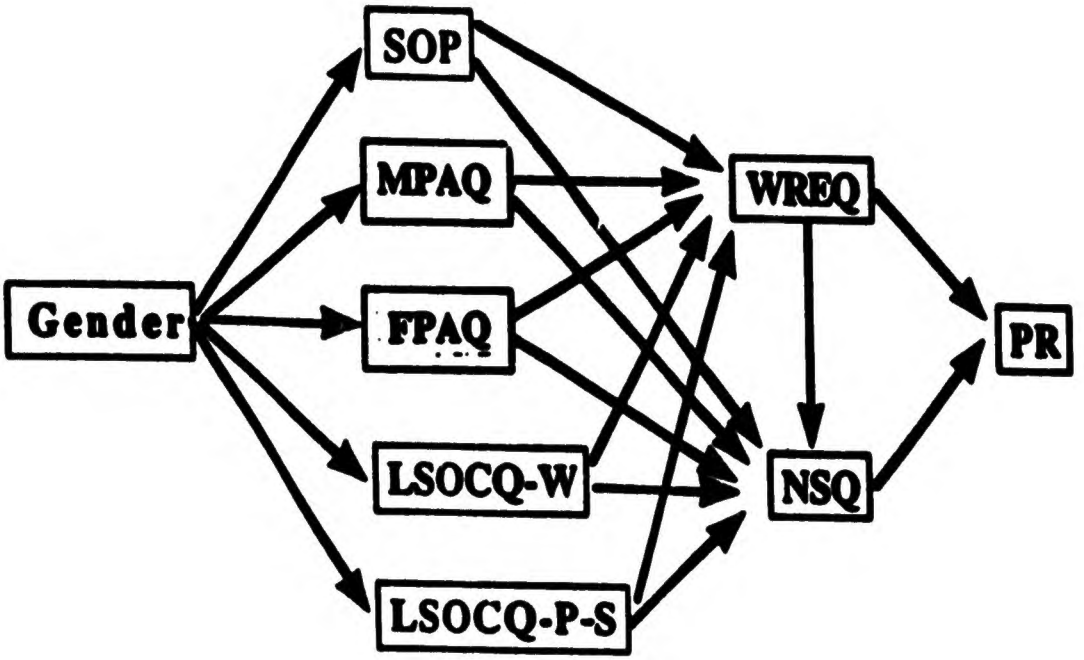
Participants

Subjects in this study were 215 faculty members who were employed by universities throughout the United States that awarded post-master's degrees. The sample size exceeded the minimum of 15 subjects per predictor variable, which has been suggested as a "rule of thumb" when balancing sample size and number of predictors in path analysis (Borg & Gall, 1983).

The sample of 215 faculty members consisted of 113 faculty women and 102 faculty men. Table 1 reports demographic characteristics of the sample. The majority of the sample (70.8%) held Ph.D.'s. Most faculty (81.6%) were tenured but 18.4% were nontenured faculty. The sample consisted of 4 instructors, 41 assistant professors, 70 associate professors, 96 full professors,

Figure 1

Conceptual Model Indicating Relations Among Gender, the Structure of Opportunity, a Masculine and Feminine Gender - Role Identification, Organizational Warmth and Pressures-Standards, Work Expectations, Work Motivation, and Publication Rate within a Path Analytic Framework.



Key

SOP = Structure of Opportunity (Institutional Bias)
MPAQ = Personal Attributes Questionnaire Masculinity Score
FPAQ = Personal Attributes Questionnaire Femininity Score
LSOCQ-W = Litwin and Stringer Organizational Climate Factor Warmth
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and 4 others. The sample was primarily Caucasian (95.2%). In addition, 71.4% of the participants were married. Faculty reported that they received their highest degree from 1924 to 1993. In addition, the faculty members' mean number of children was .993.

The majority of the participants spent more time in activities related to teaching than research. Of the total sample, 84.4% spent over 10 hours per week on activities related to teaching, whereas, only 27.3% of the sample spent over 10 hours on research-related activities.

Procedures

A list of 4,000 academics who fit the sampling criteria was purchased from Market Data Retrieval. Market Data Retrieval obtains their lists of academics by calling institutions of higher education and requesting course catalogues from each school. The academics listed in the catalogues are then contacted requesting permission to place them on the mailing list. A 1:3 sampling ratio was selected to yield a sample of 600 from the original 4,000 academics. The number 17 was chosen from a random table of numbers (from 17 to 44), and then the faculty member corresponding to that number and every third faculty member thereafter was selected from the faculty roster (Glass & Hopkins, 1984). To ensure a balance of genders, the next eligible member of the opposite gender was chosen when the random draw yielded a successive member of the same gender. Of the total 600, 300 were faculty women and 300 were faculty men.

Each of the selected individuals was sent an introductory

Table 1

Demographic Characteristics of the Sample (N = 215)

Variable	Category	Frequency	%
Gender	Female	113	52.6
	Male	102	47.4
Age	Under 30	1	0.5
	31-40	30	13.8
	41-50	64	30.4
	51-57	72	33.2
	58 and over	48	22.1
Ethnicity	African American	4	2.4
	Asian	2	1.2
	Caucasian	207	95.2
	Hispanic	1	0.6
	Other	1	0.6
Relationship Status	Single	29	14.3
	Widowed	3	1.4
	Divorced	19	8.8
	Married	155	71.4
	Significant Relationship	9	4.1
Highest Degree	Ph.D.	153	70.8
	Ed.D.	17	7.9
	Psy.D.	0	0.0
	M.A./M.S./M.Ed.	30	14.5
	Other	15	6.8

Table 1 (continued)

Variable	Category	Frequency	%
Rank	Instructor	4	1.8
	Assistant Professor	41	18.9
	Associate Professor	70	32.8
	Full Professor	96	44.7
	Other	4	1.8
Tenure	No	38	18.4
	Yes	177	81.6
Salary	Under $15,000	0	0.0
	$15,001-20,000	0	0.0
	20,001-25,000	4	1.8
	25,001-30,000	5	2.3
	30,001-35,000	17	7.8
	35,001-40,000	35	16.1
	40,001-45,000	42	19.4
	45,001-50,000	37	17.1
	50,001-55,000	25	11.5
	55,001-65,000	33	15.2
	65,001-75,000	17	8.8
Discipline of Highest Degree	Biological Sciences	16	7.9
	Physical Sciences	18	8.9
	Education	36	16.6
	Social Sciences	35	16.1
	Behavioral Sciences	16	7.9
	Other	42	42.6

Table 1 (continued)

Variable	Category	Frequency	%
Hours Worked Weekly:			
On Teaching	no time spent	6	2.7
	under 5 hours	2	0.9
	5-9 hours	24	12.0
	10-20 hours	72	33.2
	over 20 hours	111	51.2
On Research	no time spent	15	6.8
	under 5 hours	78	35.9
	5-9 hours	65	30.0
	10-20 hours	40	19.4
	over 20 hours	17	7.9
On Professional Service in the Organization	no time spent	2	1.8
	under 5 hours	82	37.8
	5-9 hours	87	40.1
	10-20 hours	29	13.4
	over 20 hours	15	6.9
On Professional Service out of the Organization	no time spent	49	23.5
	under 5 hours	98	45.2
	5-9 hours	45	20.7
	10-20 hours	15	6.9
	over 20 hours	8	3.7

Table 1 (continued)

Variable	Category	Frequency	%
Administrative Duties	no time spent	60	28.6
	under 5 hours	68	31.4
	5-9 hours	30	13.8
	10-20 hours	27	12.4
	over 20 hours	30	13.8

letter requesting their participation and a reply postal card addressed to the experimenter. The postal card provided space to check whether the respondent would/would not participate in the survey about academic careers. Space was also provided to check whether the respondent was interested in receiving a report of the findings of the research. Of the 600 postal cards that were initially sent out, 257 were returned (43%) indicating a willingness to participate in the present study.

Upon receipt of the postal card, those volunteering to participate were mailed a cover letter with the questionnaire packet and a postage-paid return envelope addressed to the experimenter. A second mailing was sent out 3 weeks after the first mailing with a follow-up letter to those who had not yet returned their questionnaires (50 packets), in order to increase the response rate (Erdos, 1983; Weathers, Furlong, & Solorzano, 1993). To further ensure randomness by obtaining a high return rate (Erdos, 1983), the survey was designed so that the reader would feel that she/he was participating in an important and interesting study. To accomplish this, particular attention was paid to the cover letter, and the length and layout of the survey.

Two hundred and twenty surveys were finally returned (37%). Of the 220, 215 of the returned surveys were usable (35%). Two of the surveys were not usable because of missing data, and three were returned too late to be included in the data analysis. The response rate was below the minimum recommended (54%) when surveying a professional population in order to ensure the representativeness of

the group surveyed (Wiersma, 1986). Therefore, since the response rate was below the minimum recommended, the sample does not represent a random sampling of the population studied.

A master list with the names and addresses of the respondents with the corresponding numerical codes was kept until all mailings were completed to keep track of the return rate. In order to preserve the confidentiality of the respondents, the master list was destroyed once the questionnaires had been returned. The postal cards that contained the subjects' names requesting the study results were also destroyed once the names were transferred to a list that did not connect the name to the number code.

Measures

The questionnaire packet included a cover letter explaining the purpose of the study, the voluntary nature of participation in the study, the time involved to participate, and other ethical considerations, such as the confidential nature of responses. The questionnaire packet consisted of six questionnaires: (a) Personal and Career Characteristics; (b) the Litwin and Stringer Organizational Climate Questionnaire (LSOCQ; Litwin & Stringer, 1968; (c) Publication Rate; (d) the Need Satisfaction Questionnaire (NSQ; Mitchell & Moudgill, 1976; Appendix H); (e) the Work-Related Expectancies Questionnaire (WREQ; Sims, Szilagyi, & McKemey, 1976; Appendix I); and (f) the shortened version of the Personal Attributes Questionnaire (PAQ; Spence, Helmreich, & Stapp, 1974).

Data Analysis

Path analysis was used to test the research hypotheses. Path analysis is concerned with estimating the magnitude of the linkages between variables and using those estimates to provide information about the causal relationships among variables when those variables are arranged in a system of direct and indirect linkages (Pedhazur, 1982). In the path analytic approach, the correlation coefficients among the predictor and criterion variable can be broken down into three components: direct, indirect, and spurious effects. This decomposition of the correlations can provide information about the pattern of relationships among the variables (Pedhazur, 1982).

Safeguards for Human Subjects

The procedures used for this study complied with the ethical principles established by the American Psychological Association (1990). The voluntary nature of participation in the present study, other information about the study including the time it took to participate, and measures taken to preserve confidentiality were included in the initial letter sent to subjects. If subjects agreed to participate, they sent back the postal card that was enclosed with the initial letter. Only aggregate data were presented. Materials were assigned number codes for organization and identification purposes. The subject's name did not appear on any of the questionnaires. Lists that connected names to the code numbers were

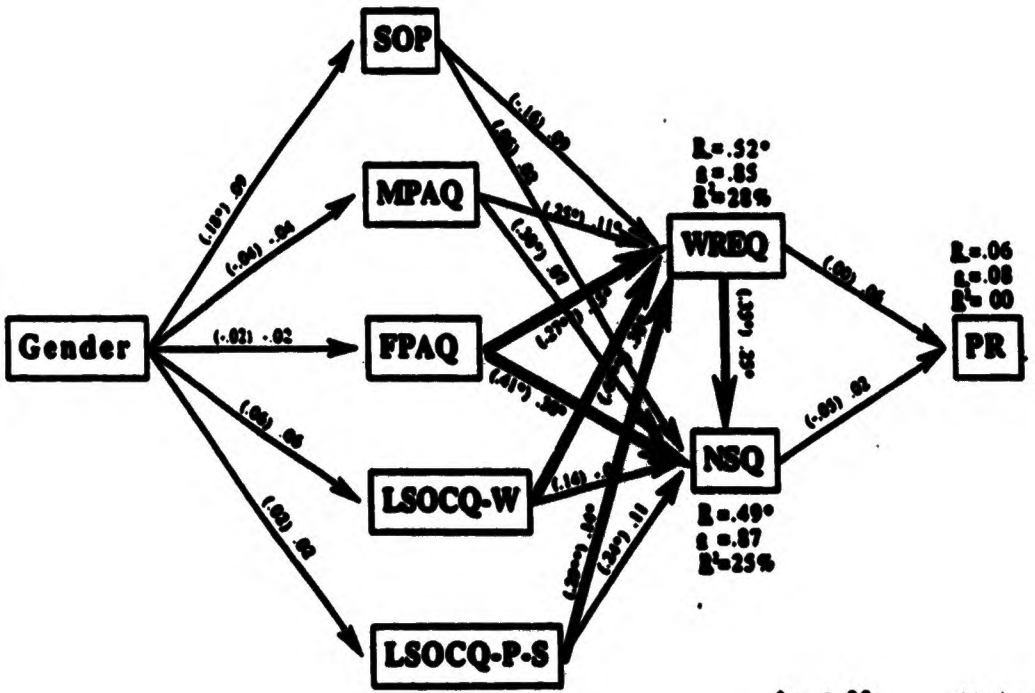
destroyed once the surveys had been returned. The subjects were provided with an opportunity to obtain the results of the study. Also, the researcher was available by phone to answer subjects' questions.

RESULTS

The path analysis outcomes for the original model appear in Figure 2. Each linkage in the model depicts a hypothesized causal relationship between an independent and dependent variable. As evidenced by examination of Figure 2, none of the variables studied predicted publication rate. Also, the opportunity structure (institutional bias) and gender did not play significant roles in the path models, although gender did predict institutional bias. That is, faculty women perceived institutional bias to a greater degree than faculty men. However, the institutional bias measure failed to predict any of the subsequent variables in the model. The gender-role identification variable femininity was positively related to work expectations (WREQ) ($\underline{R} = .15$, $\underline{p} \leq .05$) and work motivation (NSQ) ($\underline{R} = .30$ $\underline{p} \leq .05$), indicating that possession of more feminine characteristics was associated with higher work expectations and work motivation. Organizational (LSOCQ) warmth was positively related to work expectations (WREQ) ($\underline{R} = .38$, $\underline{p} \leq .05$). In addition, organizational (LSOCQ) pressures-standards was significantly related to work expectations (WREQ) ($\underline{R} = .14$, $\underline{p} \leq .05$). Although, femininity scores (FPAQ) were correlated with organizational (LSOCQ)

Figure 2

Results of the Conceptual Model Indicating Relations Among Gender, the Structure of Opportunity, a Masculine and Feminine Gender-Role Identification, Organizational Warmth and Pressures-Standards, Work Expectations, Work Motivation, and Publication Rate within a Path Analytic Framework.



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PR = Publication Rate (Vocational Behavior)

Note. R = multiple correlation; R^2 = coefficient of determination

pressures-standards scores, once the effects of the masculinity scores (MPAQ) were removed, the pressures- standards variable did not significantly predict any of the subsequent variables in the model. In addition, work expectations (WREQ) were significantly related to work motivation (NSQ) ($\underline{R}$ = .25, $\underline{p} \leq .05$).

Figure 2 indicates that none of the variance in publication rate (PR) was accounted for by the model variables. In other words, the variables in Astin's (1984) model as measured in this study, did not explain the vocational behavior, publishing activity. However, 28% of the variance of work expectations (WREQ) ($\underline{R}$ = .52, $\underline{p} \leq .05$) was explained by a feminine gender-role identification (FPAQ), and organizational (LSOCQ) warmth and pressures-standards. In addition, examination of Figure 2 reveals that 25% of the variance in work motivation (NSQ) (R = .49, $\underline{p} \leq .05$) was explained by work expectations (WREQ) and a feminine gender-role identification (FPAQ).

These findings led to a modification of Astin's (1984) original model which excluded gender, institutional bias, organizational pressures-standards, and publication rate. Only the linkages that were significant in the initial path analysis were included. The analysis of outcomes for the reduced model for the total sample appear in Figure 3. A model fitting procedure (chi square) was used to determine whether the variance in the data would have been any greater if the linkages that were left out of the model had been included. The results of a chi-square analysis ($\underline{X}^2$ (4, $\underline{N}$ = 215) = 1.77, $\underline{p} \leq .18$), indicated that the model fit the data. Therefore, the exclusion of the four linkages was justified.

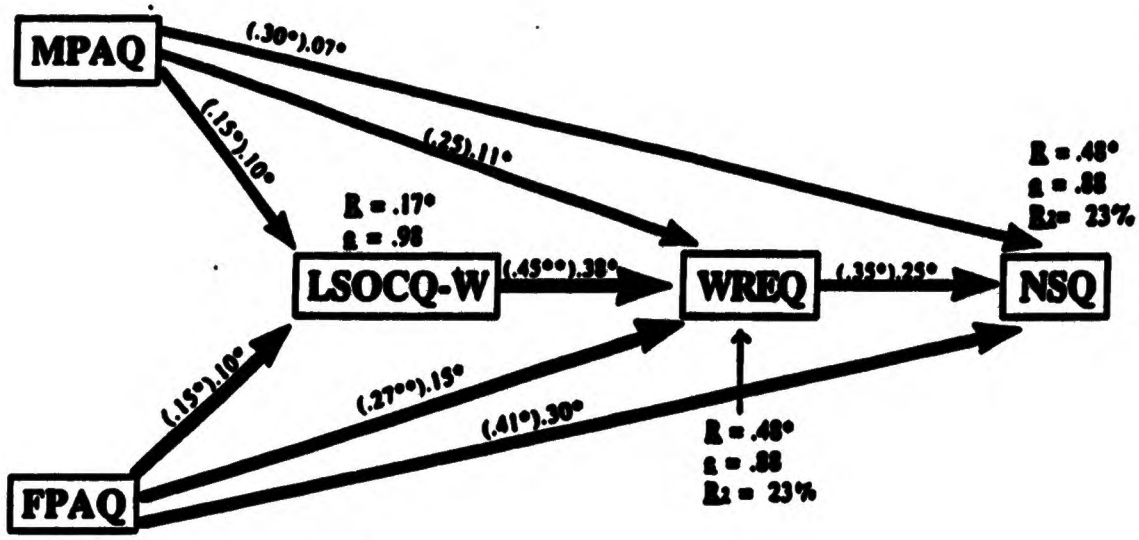
Figure 3 indicates that 23% of the variance in work motivation (NSQ) (R = .48, p < .05) was explained by femininity scores (FPAQ) (R = .30, $p \leq .05$), masculinity scores (MPAQ) (R = .07, $p \leq .05$), and work expectations scores (WREQ) (R = .25, $p \leq .05$). No other variables in the model contributed to the variance in work motivation. Masculinity scores (MPAQ) had a weak indirect effect on work motivation scores (R =.10, $p \leq .05$) mediated by organizational warmth and work expectations scores (WREQ).

Figure 3 also depicts that 23% of the variance in work expectations (WREQ) (R = .48, $p \leq .05$) was explained by organizational warmth (R = .38, $p \leq .05$), and femininity (FPAQ) (R =.15, $p \leq .05$) and masculinity (MPAQ) scores (R = .11, $\leq .05$). Although organizational pressures-standards had originally been correlated with work expectations (WREQ) (r = .20, $p \leq .05$), this correlation proved to be spurious once the effects of LSOCQ warmth, and femininity (FPAQ) and masculinity (MPAQ) were statistically controlled. Finally, a small amount of the variance in organizational LSOCQ warmth (R = .17, $p \leq .05$) was contributed by a weak relationship of the masculinity (MPAQ) (R = .10, $p \leq .05$) and femininity (FPAQ) scores (R = .10, p < .05).

The decomposition table for the analysis for the reduced model appears in Table 1. The column labeled Measures, consisting of subcolumns X and Y, contains the labels for the independent and dependent variables, respectively, for each linkage. The column labeled r depicts the original Pearson correlation coefficients between the two measures. The causal effect consists of the direct

Figure 3

Results for the Total Sample of a Reduced Model Indicating Relations Among a Masculine and Feminine Gender-Role Identification, Organizational Warmth, Work Expectations, and Work Motivation within a Path Analytic Framework



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NSQ = Work Motivation (Work Satisfaction Questionnaire)

Note: R = multiple correlation; R^2 = coefficient of determination

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

Table 1

Decomposition Table for the Reduced Path Model for the Total Sample (N = 215)

Measures			Causal			Spurious
x	y	r	Direct	Indirect	Total	
1	3	0.15	0.10	0.00	0.10	0.05
2	3	0.15	0.10	0.00	0.10	0.05
1	5	0.25	0.11	0.04	0.15	0.10
2	5	0.27	0.15	0.04	0.19	0.08
3	5	0.45	0.38	0.00	0.38	0.04
1	6	0.30	0.07	0.04	0.11	0.19
2	6	0.41	0.30	0.05	0.35	0.06
5	6	0.35	0.25	0.00	0.25	0.10

Note. 1 = MPAQ, Personal Attributes Questionnaire Masculinity Score;
2 = FPAQ, Personal Attributes Questionnaire Femininity Score;
3 = LSOCQ, Litwin and Stringer Organizational Climate Questionnaire, Warmth;
5 = WREQ, Work Expectations (Work-Related Expectancies Questionnaire);
6 = NSQ, Work Motivation (Need Satisfaction Questionnaire).

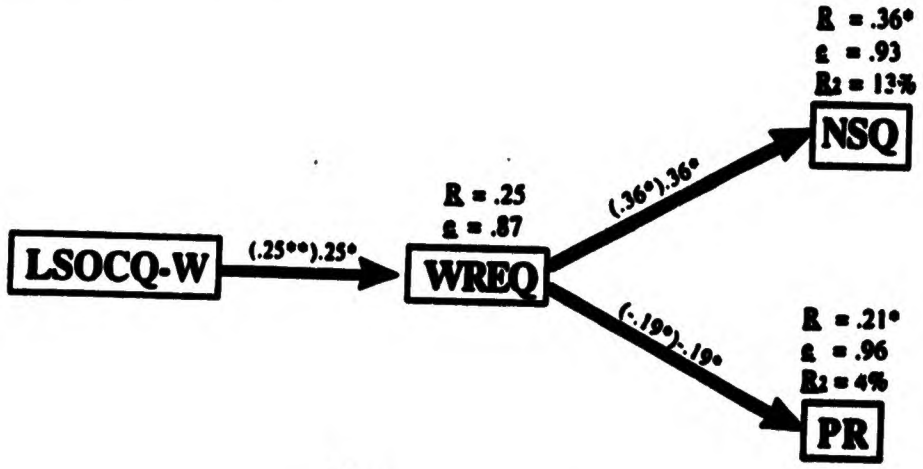
and indirect effects of the independent variable on the criterion, as well as the total effect. The direct effect is the correlation between the independent variable and the dependent variable after the other variables in the equation were statistically controlled. This effect is the path coefficient (standardized beta weight) appearing in Figure 3. The indirect effect represents the influence of the independent variable on the dependent variable, taking into account the indirect paths between the two measures. This effect is calculated by multiplying the path coefficient on the contiguous linkage leading from the predictor to the criterion, and then summing these products for all the indirect paths (Pedhazur, 1982). The total effect is the sum of the direct and indirect effects. Finally, the spurious effect consists of the original Pearson correlation coefficient minus the total causal effect.

Path Analysis Outcomes for the Subsample of Faculty Women

Figure 4 displays the path analysis outcomes for the subsample of faculty women. As evidenced by examination of Figure 4, not all linkages were present in the reduced model. Those linkages excluded were those that proved to be statistically nonsignificant in a preliminary analysis. The results of a chi-square analysis (χ^2 (4, N = 112)= 11.53, $p \leq .57$) indicated that the model fit the data. Therefore, the exclusion of the four linkages was justified. That is, LSOCQ pressures-standards, masculinity scores (MPAQ), femininity scores (FPAQ), and institutional bias scores (SOP) were withheld from

Figure 4

Results for Faculty Women of a Reduced Model Indicating Relations among Organizational Warmth, Work Expectations, Work Motivation, and Publication Rate within a Path Analytic Framework



Key

LSOCQ-W = Litwin and Stringer Organizational Climate Factor Warmth
WREQ = Work Expectations (Work-Related Expectancies Questionnaire)
NSQ = Work Motivation (Need Satisfaction Questionnaire)
PR = Publication Rate (Vocational Behavior)

Note: R = multiple correlation; R2 = coefficient of determination

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

the analysis.

Examination of Figure 4 reveals that 13% of the variance in work motivation (NSQ) (R =.36, $p \leq .05$) was explained by work expectations (WREQ), while 4% of the variance in publication rate (PR) (R = -.21, $p \leq .05$) was explained by work expectations (WREQ). No other variables in the model contributed to the variance in work motivation (NSQ) and publication rate (PR), although LSOCQ warmth had an indirect effect mediated through work expectations (WREQ) on both variables.

Further examination of Figure 4 reveals that only work expectations (WREQ) was significantly related to publication rate (P = -.19, $p \leq .05$), thus, the higher the work expectations among women respondents the less they published. Furthermore, only work expectations (WREQ) were related to work motivation (NSQ) for the subsample of faculty women (P = .36, $p \leq .05$). Finally, only LSOCQ warmth proved to be significantly related to work expectations (P = .25, $p \leq .05$). Thus, the causal chain for this subsample proceeded from LSOCQ warmth to work expectations (WREQ), and from work expectations (WREQ) to work motivation (NSQ) and publication rate (PR) simultaneously. The decomposition table for the reduced model for faculty women appears in Table 2. In summary, for faculty women, organizational warmth exerted a direct effect on work expectations. High work expectations predicted high work motivation, whereas, high work expectations predicted lower productivity in research.

Table 3

Decomposition Table for the Reduced Path Model for Faculty Women (n = 113)

Measures			Causal			Spurious
x	y	r	Direct	Indirect	Total	
3	5	0.25	0.25	0.00	0.25	0.00
5	6	0.36	0.36	0.00	0.36	0.00
5	7	-0.19	-0.19	0.00	-0.19	0.00

Note. 3 = LSOCQ, Litwin and Stringer Organizational Climate Questionnaire, Warmth;
5 = WREQ, Work Expectations (Work-Related Expectancies Questionnaire);
6 = NSQ, Work Motivation (Need Satisfaction Questionnaire);
7 = PR, Publication Rate.

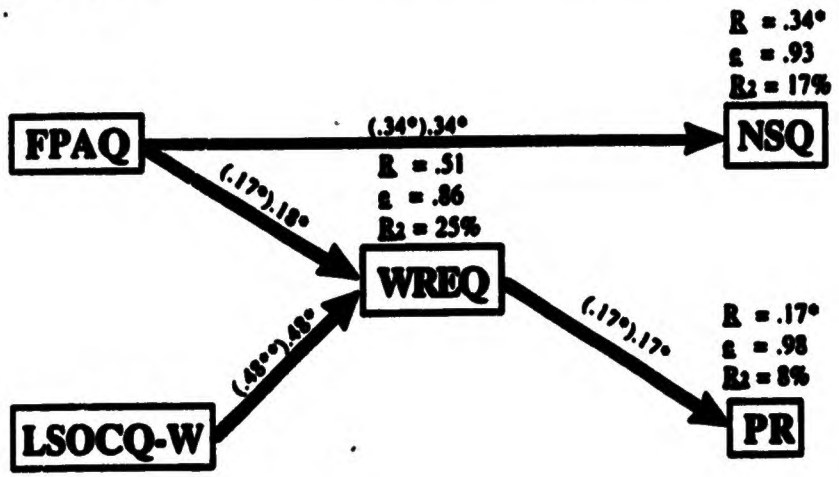
Path Analysis Outcomes for the Subsample of Faculty Men

The path analysis outcomes for the subsample of faculty men appear in Figure 5. Those linkages excluded from the reduced model were LSOCQ pressures-standards, masculinity scores (MPAQ), and institutional bias scores because they were not significant. The results of a chi-square analysis (χ^2 (3), N = 103) = 11.53, $p \leq .57$), indicated that the model fit the data. Therefore, the exclusion of the three linkages was justified.

Seventeen percent of the variance in work motivation (NSQ) (R = .34, $p \leq .05$) was explained by femininity scores (FPAQ). Eight percent (8%) of the variance in publication rate (PR) (R = .17, $p \leq .05$) was explained by work expectations scores (WREQ). Only work expectations (WREQ) predicted publication rate (PR) (r = .17, $p \leq .05$); that is, as work expectations (WREQ) increased, faculty men reported more publishing activity. Both LSOCQ warmth (r = .48, $p \leq .05$) and femininity scores (FPAQ) (r = .18, $p \leq .05$) predicted work expectations (WREQ) which, in turn, predicted publication rate (PR). Thus, faculty men with high work expectations were likely to publish more, especially as reports of warmth (i.e., an emphasis on socializing and belonging) in their work environment increased, and they reported more behaviors consistent with a feminine gender-role identification (FPAQ). In addition, Figure 5 reveals that only femininity scores (FPAQ) predicted work motivation (NSQ) (r = .34, $p \leq .05$), indicating that work motivation (NSQ) increased as behaviors consistent with a feminine gender-role increased for faculty men in

Figure 5

Results for Faculty Men of a Reduced Model Indicating Relations Among a Feminine Gender-Role Identification, Organizational Warmth, Work Expectations, Work Motivation, and Publication Rate within a Path Analytic Framework



Key

FPAQ = Personal Attributes Questionnaire Femininity Score
LSOCQ-W = Litwin and Stringer Organizational Climate Factor Warmth
WREQ = Work Expectations (Work-Related Expectancies Questionnaire)
NSQ = Work Motivation (Need Satisfaction Questionnaire)
PR = Publication Rate (Vocational Behavior)

Note: R = multiple correlation; R^2 = coefficient of determination

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

the sample.

Two major causal chains resulted in a path analysis for faculty men. One chain linked a feminine gender-role identification (FPAQ) to work motivation (NSQ); and a second chain linked LSOCQ warmth and a feminine gender-role identification (FPAQ) to work expectations (WREQ) which, in turn, linked work expectations (WREQ) to publication rate (PR). The decomposition table for the reduced model for faculty men appears in Table 3.

Summary

In summary, four path models were presented: the original model and three reduced models. In the original model, only a few of the linkages were significant, none of the variables served as mediating variables, and the independent variables did not account for any of the variance in publication rate. These findings led to a modification of Astin's (1984) original model.

In a reduced model, a direct positive relationship was found between a feminine gender-role identification and work motivation. In addition, a direct positive effect was found between a feminine gender-role identification and organizational warmth and work expectations. Finally, work expectations were found to directly affect work motivation. In conclusion, the results of this study revealed some interesting relationships among the variables identified by Astin's (1984) model of career choice and vocational behavior, but none of these variables explained any of the variance

Table 3.

Decomposition Table for the Reduced Path Model for Faculty Men
(n = 102)

Measures			Causal			Spurious
x	y	r	Direct	Indirect	Total	
2	5	0.17	0.18	0.00	0.18	-0.01
3	5	0.48	0.48	0.00	0.48	0.00
2	6	0.34	0.34	0.00	0.34	0.00
5	7	0.17	0.17	0.00	0.17	0.00

Note. 2 = FPAQ, Personal Attributes Questionnaire Femininity;
3 = LSOCQ, Litwin and Stringer Organizational Climate Questionnaire, Warmth;
5 = WREQ, Work Expectations (Work-Related Expectancies Questionnaire);
6 = NSQ, Work Motivation (Need Satisfaction Questionnaire);
7 = PR, Publication Rate.

in vocational behavior (i.e., publishing activity).

The sample was separated into two groups to determine whether the relationship among the model variables differed for faculty women and men. Nonsignificant linkages were excluded from the original analysis; thus, two reduced models resulted. The reduced model for faculty women accounted for 13% of the variance in work motivation and 4% of the variance in publication rate. Likewise, the reduced model for faculty men accounted for 17% of the variance in work motivation and 8% of the variance in publication rate. Work expectations mediated the effects of organizational warmth on publication rate in both models. For faculty men, a feminine gender-role identification had an indirect effect on publication rate mediated through work expectations. In addition, a feminine gender-role identification had a direct effect on work motivation for the subsample of faculty men. The gender-role identification variables dropped out altogether in the reduced model for faculty women. It is noteworthy that work expectations had different effects on the publishing activity of faculty women and men in the sample. For faculty women high work expectations predicted lower productivity in research. Conversely, faculty men with high work expectations were likely to publish more.

DISCUSSION

The results of this study do not lend support to the inclusion of work motivation as a variable that influences publication rate.

This finding is different from the findings of Blackburn et. al. (1991) and Helmrich et. al. (1990). They found that motivational factors (i.e., self-competence, self-efficacy, institutional preferences, consensus and support, and achievement motivation) were predictors of publishing activity. In the present study, although work motivation was an important variable in all of the reduced models; it did not influence vocational behavior (i.e., publishing activity) directly as hypothesized.

One explanation for this finding might be that the study participants were from universities where teaching was valued more than research (e.g., 84% of the participants spent over 10 hours a week on teaching compared to 27% who spent over 10 hours on research). Therefore, the task of teaching may have been more responsible for the satisfaction of work needs than the task of research.

It is also possible that the needs measured in the present investigation to represent work motivation are not the basic needs that serve as the primary motivators of publishing activity. For instance, Erez and Shneorson (1980) found in a comparison of academic and public sector professionals, significant differences in primary work motivators; that is, the academic group was higher on opportunity for publishing, flexibility in the allocation of time, and occupational status. The public sector group was higher on challenge in operation of the organization, authority to manipulate others, and higher level of income. Thus, different needs served as motivators in different types of professional careers. Astin's

conceptualization of work motivation may need to be expanded to adequately explain publishing activity.

Work expectations did not explain any of the variance in publishing activity in the path analyses for the total sample. This finding did not support previous research (Landino & Owen, 1988; Schoen & Winocur, 1988) which found that work expectations (measured as self-efficacy expectations) were positively related to publishing activity. In previous research, when relationships between work expectations and research productivity were found, frequency and confidence were measured and correlated separately for each academic task (i.e., research, teaching, and service). In the present study, the three academic tasks were not examined separately. One score represented work-related expectations in all three performance areas. Therefore, work expectations might have explained more of the variance in the vocational behavior teaching since teaching may have been valued more than research by the present sample.

Work expectations showed interesting effects when two separate path analyses were conducted for faculty women and men. Unlike the findings of Landino and Owen (1988), who found that research self-efficacy related to higher research productivity, the present study found that faculty women had high work expectations but lower productivity in research, while faculty men with high work expectations were likely to publish more.

Perhaps when women respondents reported work expectations, they were thinking about the three performance areas in academia. With high work-related expectations in all three performance areas,

faculty women might diffuse their energy so that it is impossible to excel in any one area. For faculty men, when they reported work-related expectations, they might have been thinking in terms of the academic task of research. They may think more about research because they are socialized (e.g., through mentoring) to prioritize research. This suggests that gender-differentiated socialization may, indeed, be affecting work-related expectations which, in turn, affects vocational behavior as Astin (1984) posited.

When path analyses were conducted separately for faculty women and men, the feminine gender-role identification variable dropped out altogether for the subsample of faculty women. However, the feminine gender-role identification variable affected work expectations and, consequently, publication rate in the reduced model for faculty men. Feminine behaviors (i.e., devotion of self to others, helpfulness toward others, and understanding and warmth in relationships with others) might make men more successful at networking. Networking has been a skill that has been associated with faculty men's research productivity in previous research (Blackburn et al., 1991). Conversely, Marshall (1985) found that professional women did not use their feminine characteristics to promote themselves in work settings. Thus, it may be that faculty men know how to use these characteristics in a way that is more advantageous to them in their careers than faculty women.

A direct positive relationship existed between gender and institutional bias (i.e., the structure of opportunity.) This finding supported previous research (Aisenberg & Harrington, 1988;

Sandler, 1986; Simeone, 1987) that confirmed the existence of subtle discriminatory attitudes and behaviors which affects the hiring and advancement of women in higher education.

In Astin's (1984) model, the perception of opportunities and barriers in work settings was posited to affect vocational behavior. For the present study, an indirect positive relationship between gender and publication rate (i.e., vocational behavior) mediated by institutional bias was not found. This is understandable since mean scores for publication rate did not differ according to gender. Therefore, for this sample, although discriminatory work attitudes were perceived more often by faculty women, evidence was not found to support Astin's (1984) model or previous research (Aisenberg & Harrington, 1988; Sandler, 1986; Simeone, 1987) that attributed faculty women's lower research productivity to these discriminatory work attitudes.

It is also noteworthy that institutional bias had a strong negative relationship to organizational warmth, (i.e., an emphasis on sociability, belonging, and group membership) for both faculty women and men. This result extends the findings of Aisenberg and Harrington (1988) to include faculty men. In Aisenberg and Harrington's qualitative study, both groups (i.e., 25 tenured faculty women and 37 faculty women who left academic track positions) who were interviewed, reported that negative gender-role stereotypes of women held by members of the academic work environment, contributed to faculty women's social isolation, and consequent lower research productivity. Apparently, work environments that are seen as

discriminatory are perceived as "chilly" by all, regardless of gender.

All the organizational climate factors correlated in a positive direction to work expectations. Since Astin (1984) posited that work expectations (i.e., one's belief about the types of work activities one is capable of performing) is influenced by certain perceptions about the structure of opportunity (i.e., perceived properties of the work environment), this finding lends support to Astin's (1984) model. However, the connection of work expectations to vocational behavior was nonexistent or very weak.

The following limitations might be addressed in future research to increase the explained variance in publication rate. It is recommended that (a) universities where a priority for research has been clearly delineated be surveyed, (b) vocational behavior be operationalized as teaching in a similar sample, (c) a different conceptualization of work motivation be utilized, and (d) other variables known to relate to research productivity be included in a model to predict publication rate.

The results of this study have a number of implications for counseling. For faculty men, the expected relationship was found between work expectations and publishing activity. However, for faculty women, there was a negative relationship. It may be that faculty women have high work expectations in teaching, service, and research so that they find it impossible to excel in any one area. If, in fact, future research supports that faculty women have high work expectations in too many areas, counselors will need to help

faculty women select certain areas where they want to excel. Counselors could also promote the idea of mentoring to help faculty women identify their strengths and limitations, and gain a clearer direction for their academic activity.

For both faculty women and men, organizational warmth was consistently found to be associated with work expectations, but only for faculty men did work expectations increase research productivity. Given this association, steps could be taken to increase organizational warmth such as encouraging campus socializing, improving research climates in departments, and providing time and money to support participation in research networks on and off campus.More research needs to investigate the relationship between organizational warmth and women's professional behavior.

Feminine characteristics or an interpersonal orientation was found to be a relevant variable when examining publishing activity for faculty men. This further illuminates the importance of networking which previous research (Blackburn et al., 1991) associated with faculty men's research productivity. It is noteworthy that the femininity variable dropped out of a path analysis for faculty women even though the femininity mean score for faculty women was significantly higher than for faculty men. Counselors need to encourage faculty women to express themselves interpersonally in a way that will promote their professional development, especially in the area of research. This involves accepting invitations to work on research and writing projects,

encouraging participation in reviews and criticisms of research and writing, receiving information on available research grants, and encouraging regular exchanges at professional meetings (Corcoran & Clark, 1984).

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