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What Sex Is Your Parachute? Interest Inventory/Counseling Models and the Perpetuation of the Sex/Wage Segregation of the Labor Market

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Abstract
This article explores the "gender model" of job research instruments that are based on the Holland Occupational Classification scheme. The six Holland "environments" constitute a ubiquitous base for tests and measures in career counseling and research. Analysis of the 1973 Quality of Employment Survey provides evidence that the Holland Classification scheme replicates the segmentation of women into certain occupations that generate low pay, even after controlling for worker education, job tenure, and age. Comparable data for male wage earners show a significant segregation away from low-income, predominantly female occupations. Thus the Holland occupational scheme and the instruments based upon it are likely to contribute to the replication of sex-segregated labor markets. The findings suggest that current models of "work" and job counseling tests and techniques may reinforce, rather than eliminate, the economic disadvantages for women.

The expansion of women's work roles outside of the home during the past few decades has stimulated considerable interest in the relationships among the work world, career development, and occupational choices

for women. Much of this research and discussion focuses on differences between women and men in career attitudes and outcomes, often deriving "baselines" for these comparisons from traditional societal roles for women and men.

> Thus, there is considerable literature on such topics as sex-role socialization, home-career conflict, sex differences in vocational interests and influences on vocational choice [Hansen and Rapoza, 19781.]

One specific concern in the sociology of work is the relationship of sex roles to the structure of the labor market. Feldberg and Glenn (1979) argue that previous research has been limited by the assumptions of a "job model" for men in the labor force and a "gender model" for women in the labor force. The "gender model" typically focuses on personal characteristics and family circumstances to explain women's paid and unpaid labor force participation and rewards. In this article, we explore the extent to which the assumptions of the "gender model" concerning work roles and gender roles underlie current research instruments developed for the purposes of job selection, entry, and promotion.

One of the major models used to research the relationship of personality factors to the structure of the labor market is the Holland Occupational Model (1973). **A** number of interest inventories, including the Strong-Campbell Vocational Interest Inventory (SCVII), the American College Testing Program Interest Inventory, and the *Self-Directed Search*, correspond with Holland's model of personality types and work environments (Zunker, 1981). In addition, many popularized versions of "self-search" job handbooks are based on Holland's model, including Richard Bolles's (198 1) best-seller *What Color Is Your Parachute?*

Holland proposes that personality and occupational types interact with objective, meritocratic job requirements (job training, education, and so on) to create six different, but often overlapping, work worlds that form the basic for objective "scientific" prediction. The six broad occupational "themes" are premised on the notion that paid workers demonstrate similarities and dissimilarities to coworkers and to one or more of the six ideal-type occupational "personalities." This typology assumes that these workers have and will continue to seek out "compatible" job environments. Clients who take the test, either with machine-scored examinations (such as the SCVII) or as self-administered "explorations" (with Bolles's materials), are given visual and numerical accounts of the work "spheres" that best fit their own personalities.

In effect, Holland (1965) creates a map of the paid labor market that is attached to personality differences among people, between women and men, and among the occupations they "choose" that others like them have chosen in the past. The scales were generally developed from expressed *preferences* for occupations, which reflect "personality" (p. 2).

It is not remarkable that Holland segmented the world on the basis of individual attributes and choices. However, segmentation of the labor market exists, not on the basis of personality, but on the basis of class, race, and sex (Bonacich, 1973). The segmentation of minority, female, and working-class people into particular job categories generates and reinforces a wide range of outcomes, including income inequality and differences in promotional opportunities, as well as personality differences (attitudes, satisfaction, and so on) among workers (Treiman and Hartmann, 1981; Kanter, 1976, 1977). Historically, these segmented labor markets have confined career opportunities for women to those traditional "female" spheres of work in which women are disproportionately represented and under-rewarded, such as nursing, noncollege teaching, and service work (U.S. Commission on Civil Rights, 1978). The clear and increasing relationship between occupational segments (or work environments) and unequal economic outcomes for women is well documented by labor market theorists; it is not our intent to retest those segmented patterns.

We suggest that the Holland model, in conjunction with occupational interest inventories such as the Strong-Campbell Vocational Interest Inventory, provides one mechanism that replicates and legitimates sex segmentation in the labor market that is associated with current patterns of women's paid labor force participation. Finding a job is a crucial individual aspect of reproducing or eliminating discriminatory wage labor patterns. Job searches are often formally or informally reinforced by schools and other institutions through the use of tests and measures (Carnoy, 1972). To the extent that these tests and inventories are normed upon segmented labor market structures, and use those norms as indicators of the "right match" for an individual job seeker, and encourage current job seekers to rely upon the past choices of "similar" personality types, they will help to reproduce a sex-segregated and labor market. This may be the most evident in the channeling of women into particular "spheres" through traditional counseling and job search methods, while other work environments are disproportionately identified by counselors and tests as "male" occupations. As women and men use interest inventories to make choices, these "choices" are actually based on a model reflecting sex-seg-

regated labor markets, rather than a model that fits their personality to the "right" job. The "right job based on these personality traits is significantly related to the gender of the test taker.

For this analysis, we selected the current version of the Strong-Campbell Vocational Interest Inventory. This test ranks as one of the most widely used interest inventories in career counseling and research (Zunker, 1981: 120).1 In the past, criticism of the Holland model and the early versions of the Strong Vocational Interest Inventory (SVII) focused on issues of internal reliability and validity as well as sex bias. These potential internal sex biases and attempts to "sexually neutralize" those instruments have been well reviewed in the past.[2] We focus on the epistemology of the model and the instrument, that is, the basis, nature, and creation of "knowledge" about occupational environments and clusters of personality characteristics that are reflected in the structure of the tests themselves. Thus we are challenging the gender stratification of these tests, which remains "largely invisible and unproblematic in the sociology of work" (Feldberg and Glenn, 1979: 77). (See Mercer, 1976, for a cogent discussion of testing epistemology and test "fairness".)

Operating from an implicit "gender model" of occupational interests and "choices," Holland and other researchers validate these interest inventories. As women enter occupations that are most often identified by Holland's interest inventories as "feminine" in "personality traits," the instruments achieve a significant "hit rate" (Prediger and Cole, 1975). This hit rate is relatively easy to inflate if women traditionally restrict their choices to a small number of occupational sectors. What the "hit rate" does not reveal, however, is the extent of income inequality inherent to the sex-segregated nature of the Holland model (and to the real labor market). We will also investigate the "costs" to women in the paid labor force that are predicted by these occupational models.

An added validity problem for occupational inventories is the narrow definition of the work world. The sets of "personality" traits that make up the six Holland environments were normed on "bright" students or on college-student samples exclusively. Thus the Holland model and the SVII include only a select set of occupational possibilities. This research tactic excludes the vast majority of working-class students and/or students who do not proportionately participate in higher education. This bias in the model restricts the generalizability of test findings and suggests to both researchers and job seekers that (1) only elite workers will be helped by this instrument; (2) the range of jobs described to women and men does not encompass the vast majority of low-paid, low-prestige

occupational classifications; and (3) the personality characteristics of "average" students and workers are relatively unimportant to occupational "environments" and potential rewards.

What follows is an analysis of the Holland model of the world of work as reflected in the Strong-Campbell Vocational Interest Inventory. We argue that these six "environments" parallel the current segmentation of the labor market and reveal a research foundation, widely used, with the potential to reinforce economic inequalities for women. In addition, we will address the bias in the prestige and economic factors associated with development and use of the scale, which omits a significant proportion of real-life "jobs" from the model. Holland's focus on individual similarities and dissimilarities to group interests and skills obscures the inherent gender stratification of labor market models. Further, these models reproduce gender stratification to the extent that individuals make occupational choices from interest inventories based on the model.

Career Environments

Holland, (1973: 28) readily admits that his "environmental models" do not reflect the institutional demands of work structures. Instead, he formulates the typology on the basis of "activities, competencies, perceptions and values" at the individual and occupational group level. By using raw scores as interest indicators, "no norm or reference group is used. Instead, the reference is the logical basis of the items. This results in scales that reflect the socialization process" (Cole and Hanson, 1975: 10). Holland's model is criticized for its "socialization dominance" approach (Hanson and Cole, 1975) but has not been tested for the possible economic results of a basic "gender model" of the work world.

Holland's six work worlds include the following: Realistic, Investigative, Artistic, Social, Enterprising, and Conventional. The environments and their associated personality traits are presented in Table 1. For this article, we will use the blending of work environments, occupational titles, and personality traits in the Strong-Campbell Vocational Interest Inventory (1981), as indicated in Table 2. Holland's Realistic Environment is "characterized by the dominance of opportunities and demands that entail an explicit ordered or systematic manipulation of objects, tools, machines and animals" (1973: 29). Individuals associated with this environment are less adept at working with people; "they learn instead sim-

Table 1. Personality Traits for Six Work "Environments" (Holland, 1973)

Realistic	Investigative	Artistic	Social	Enterprising	Conventional
Conforming	Analytical	Complicated	Ascendant	Acquisitive	Conforming
Genuine	Cautious	Disorderly	Cooperative	Adventurous	Conscientious
Frank	Critical	Emotional	Feminine	Ambitious	Defensive
Normal	Curious	Feminine	Friendly	Argumentative	Efficient
Persistent	Independent	Idealistic	Generous	Dependent	Inflexible
Practical	Intellectual	Imaginative	Helpful	Energetic	Obedient
Stable	Introspective	Impractical	Idealistic	Exhibitionistic	Orderly
Thrifty	Introverted	Impulsive	Insightful	Flirtatious	Persistent
Uninsightful	Methodical	Independent	Kind	Impulsive	Practical
Masculine	Passive	Introspective	Persuasive	Pleasure-seeking	Prudish
Materialistic	Precise	Intuitive	Responsive	Self-confident	Self-controlled
Self-effacing	Rational	Nonconforming	Sociable	Sociable	Unimaginative
Shy	Reserved	Original	Tactful		
Uninvolved	Unassuming		Understanding		
	Unpopular				

Table 2. Occupational Classifications for Six Work "Environments" (SVII, 1981)

Realistic	Investigative	Artistic	Social	Enterprising	Conventional
Air Force Officer	Veterinarian (F)	Architect	Speech Pathologist	Flight attendant	Executive Housekeeper
Army Officer	Chemist	Lawyer	Social Worker	Beautician	Business Teacher
Navy Officer	Physicist	Public Relations	Minister	Store Manager	Banker
Police Officer	Medical Technician	Advertising Exec.	Reg. Nurse (F)	Insurance Agent	Credit Manager
Aqriculture Teacher	Dental Hygenist	Interior Decorator	Licensed Practical Nurse (M)	Realtor	IRS Agent
Farmer	Dentist	Musician	Special Education Teacher	Public Official	Public Administrator (M)
Forester	Optometrist	Commercial artist	Elementary School Teacher	Public Admin. (F)	Accountant
Skilled Crafts worker	Physical therapist	Fine artist	Physical Education Teacher	Investment Fund Manager	Secretary
X-ray Technician	Physician	Art Teacher	Recreation Leader	Marketing Exec.	Dental Assistant
Engineer	Regist. Nurse (M)	Photographer	YM/YWCA Director	Personnel Dir.	
Veterinarian (M)	Math Teacher	Librarian	School Administrator	Chamber of Comm. President	
Licensed Practical	System Analyst	Foreign Language Teacher	Guidance Counselor	Restaurant Manager	
Nurse (F)					
Occupational	Computer Prog.	English Teacher	Social Science Teacher	Buyer	
	Therapist				
	Chiropractor			Purchasing Agent	
	Pharmacist			Agribusiness Manager	
	Biologist			Home Econ. Teacher	
	Geographer			Nursing Home Admin	
	Mathematician			Dietitian	
	College Prof.				
	Sociologist				
	Psychologist				

ple, direct *masculine* coping methods" (emphasis added) that reinforce a range of personality traits, including conformity, genuineness, normality, stability, thrift, lack of insight, practicality, shyness, and masculinity. The following occupations are included in the SCVII: officers in the military, engineers, male veterinarians, skilled crafts people, and occupational therapists.

The Investigative Environment involves the "observation and symbolic, systematic, creative investigation of physical, biological or cultural phenomena." The traits reinforced include introspection, analysis, passivity, methodicalness, rationality, independence, an assuming manner, lack of popularity, a critical approach, and pessimism. Occupations in this environment are female veterinarian, male registered nurse, geologist, physicist, mathematician, dentist, dental technician, psychologist, and sociologist.

The Artistic Environment generates "ambiguous, free, unsystematized activities and competencies," Traits reinforced in this environment include imagination, intuition, disorder, emotion, *femininity*, idealism, impulsiveness, independence, introspection, and impracticality. Within this area, compatible occupations include architect, lawyer, public relations director, art teacher, photographer, English and foreign language teachers, librarian, and reporter.

The Social Environment is characterized by Holland as "the manipulation of others to inform, train, develop, cure or enlighten." Traits outlined for this work environment include susceptibility (to social, humanitarian, and religious influence), helpfulness, idealism, insight, kindness, friendliness, generosity, responsibility, tact, understanding, and *femininity*. Given this definition of a nurturant work sphere, it is not surprising to find the following occupations associated: social worker, minister, female registered nurse, teacher, counselor, and recreation leader.

In contrast, Enterprising personality traits involve the manipulation "of others, but with the intent to attain personal or organizational self-interest or goals" (i.e., for profit). This work environment theoretically creates susceptibility to social, emotional, and "materialistic" influences. These experiences reinforce acquisitiveness, adventurousness, ambition, argumentativeness, dependence, energy, exhibitionism, flirtatiousness, impulsiveness, pleasure seeking, self-confidence, and sociability. The occupations included are flight attendant, beautician, department store manager, realtor, life insurance agent, female public administrator, elected official, marketing executive, personnel director, buyer, male agri-

business manager, female home economics teacher, nursing home administrator, restaurant manager, and dietician.

The scheme of personality characteristics closely approximates the dimensions of "masculinity" and "femininity" implicit in the job-gender model of work. Clearly, the authors of these measures committed themselves to using the current structure of both the labor market and the sex/gender system it reflects. The above listings include several job titles that are sex specific (e.g., *male* public administrator, *female* veterinarian, *male* nurse). According to the authors, the personality dimensions of males and females in those occupations were significantly distinct at the time they were measured.

Sandra Bem, (1974) found many of these same traits reliably distinguished for sex-role appropriateness by subjects in her experimental design. The Bem Sex Role Inventory includes a variety of "sex-appropriate" traits or behaviors that reflect the status quo of gender roles. Not all terms are parallel, but a superficial review suggests that at least two of the Holland work environments are highly associated with Bem's masculinity indices: Investigative (analytical, independent, intellectual, and rational) and Enterprising (adventurous, ambitious, argumentative, self-confident). The Social dimension includes the following adjectives rated as "feminine": cooperative, feminine, insightful, kind, responsive, tactful, and understanding. Thus it is not surprising that men and women who take the SVII or use other measures based on the Holland model have substantially different scores across the occupational categories.

We question the following assumptions and goals of the Holland model, and of those instruments based on the model, particularly (1) that segmentation of workers reflects personality differences, as opposed to preexisting economic structures and (2) that career guidance "themes" will *equalize* occupational outcomes for women and men. We will demonstrate empirically that the Holland model and interest inventories based upon it reinforce the current sex-segregated labor market and economic inequalities for women.

Research Methods

Data are from the 1972-1973 Quality of Employment Survey conducted by Quinn and Shepard (1974). Data were obtained through personal interviews with 1,496 full- and part-time employed women and men living in the United States and the District of Columbia (see Quinn

et al., 1974, for a full discussion of sampling techniques and sampling error). Information about the quality of employment, labor problems, job environment, and job standards was obtained from respondents.

Variables

Worker's age, education, and sex were recorded by individual respondents. The variable TENURE reflects the respondents' report of the number of months worked for their current employer. PERCENT FEMALE is the percentage of women in a particular occupation, identified by 1970 industry reports (U.S Bureau of the Census, 1972). The dependent variable, INCOME, is the reported annual income of respondents before taxes.

Occupations were coded in accordance with the Duncan Socioeconomic Index (SEI; Duncan, 1971) as well as the Institute for Social Research (ISR) Occupational Classification Index. To construct the variable HOLLAND, we identified each occupational classification clustered in the six work environments. These occupational titles were selected by the narrowest possible identification available from either the Duncan SEI or the ISR classification scale. In only one instance, Occupational Therapist, was the overlap of the ISR and Duncan SEI codes with other occupational titles so complicated that it was not possible to identify a distinct group of workers as set out in the SVII occupation titles. Respondents were assigned a HOLLAND score of 1 if their occupation was within the Realistic environment, 2 if Investigative, 3 if Artistic, 4 if Social, 5 if Enterprising and 6 if Conventional. Those respondents who did not have occupations within the six environments were excluded from the multiple classification analysis that follows.

A total of 637 respondents had all information complete, including an occupation that fell within the six Holland work environments. This included 399 male respondents and 238 female respondents. After occupational titles of all 1,496 respondents were fitted into the Holland scheme, only 44% of the total occupations reported by this national sample could be included. Thus, the occupations held by a majority of respondents (56%) are not included in the Holland classifications. As stated earlier, this indicates a certain class bias incorporated into the Holland model, along with gender bias. In the next section, we will compare those unclassified occupations to those that "fit" within the Holland model.

Data Analysis

An analysis of variance for the mean differences in the average percentage female within each respondent's occupation was examined across the six Holland environments, separated by sex. Table 3 indicates a significant relationship between the Holland environments and the percentage of women employed on the average in those occupations ($F = 15.40$, $p \leq .001$). The Conventional and Social environments have the highest average percentage of women employed within occupations (51% and 46%, respectively).

Sex Segmentation: Holland Work Environments

The breakdown by sex within each Holland environment reveals sharp distinctions between the occupations in which women and men are employed. Within the Realistic environment, the occupations in which men respondents are employed have an average of only 13% female employees, whereas women respondents in this same environment work in occupations with an average of 63% female employees. Significant contrasts are also apparent in the Social and Conventional environments. Men in the Social environment are employed in occupations that are 31% female, whereas women are employed in occupations that had, on the average, 78% female employees. The Conventional category shows even greater sex segmentation; women are employed in occupations in which over 91% of their coworkers are female. Male respondents, however, were employed in jobs that had a mere 12% female employees. Overall, the breakdown gives a clear indication that women respondents were employed in areas that were predominantly "female" jobs when categorized by Holland classifications, especially in the Social and Conventional environments.

Sex Segmentation: Uncategorized Occupations

Those respondents who were not categorized in the Holland environments did not fare much better. Women respondents worked in jobs that were, on the average, 62% female in composition. Of the six work environments, four are as segmented as, or even more segmented than, the nonclassified jobs for paid women workers. In addition, the occupational

Table 3. Analysis of Variance: Percentage of Women in Respondent's Occupation by Holland Occupational Categories by Sex

Variable	N	% Women in Respondent's Occupation Mean
Realistic	72	28.03
Male	50	12.64
Female	22	63.00
Investigative	98	17.51
Male	84	14.13
Female	14	37.79
Artistic	54	26.17
Male	40	18.93
Female	14	46.86
Social	51	46.06
Male	35	31.43
Female	16	78.06
Enterprising	163	35.88
Male	99	20.49
Female	64	59.69
Conventional	119	51.21
Male	60	11.72
Female	59	91.37

Grand mean = 30.86; $F = 15.40$; $p < .001$

prestige ratings for these nonclassified jobs were significantly lower than those in the Holland model. The Duncan SEI scores for the noncategorized occupations averaged 6.64 on a scale of 1 to 10, with 10 the highest SEI score. The six Holland categories ranged from an average SEI score of 6.8 (Enterprising) to **9.3** (Investigative). This finding reinforces the argument that the Holland model is based on a restricted definition of occupations.

The average incomes for noncategorized occupations were also significantly lower than each of the average incomes reported in the Holland classifications. The average income for both male and female employees whose job were *not* categorized in the Holland model was $8,481. This is in contrast to the average Conventional income of $8,671 up to the highest average for investigative income of $15,272 (see Table 4).

Table 4. Analysis of Variance: Income by Holland by Sex

Variable	N	Mean	Significance (Within Holland)
Realistic	69	9,565	
Male	48	11,702	$p < .001$
Female	21	4,681	$F = 28.78$
Investigative	93	15,272	
Male	79	16,046	$p < .05$
Female	14	10,907	$F = 4.76$
Artistic	54	9,598	
Male	38	11,068	$p < .001$
Female	16	6,106	$F = 11.67$
Social	101	9,629	
Male	51	10,176	$p < .10$
Female	50	9,070	$F = 2.76$
Enterprising	198	9,868	
Male	118	12,821	$p < .001$
Female	80	5,513	$F = 91.15$
Conventional	122	8,671	
Male	65	11,011	$p < .001$
Female	57	6,004	$F = 76.23$

Grand mean = 9,504; $F = 17.03$; $p < .001$

Income Inequality

Table 4 shows results for an analysis of variance for income across the Holland classifications, by sex, that are significantly different. The Investigative category has the highest average income, with significant differences between average male employee income of $16,046 and average female employee income of $10,907 ($F = 4.76$, $p \leq .05$). Within the Realistic environment, men's earnings ($11,702) and women's earnings ($4,681) were again significantly different ($F = 2.76$, $p \leq .001$). The difference between men's and women's incomes in the Artistic category was also significant beyond the .001 level, with women earning $6,106 and men earning $11,608 ($F = 11.67$).

The relationship between sex and income was weaker for the Social environment, but still the pattern of women earning less than men held ($9,070 and $10,176, respectively). In the Enterprising occupations, men earned on the average more than twice what women earned, with aver-

age incomes of $12,821 and $5,513, respectively ($F = 91.15$, $p \leq .0\ 01$). This same differential held in the Conventional environment, with men earning $11,011 on the average, and women earning $6,004 ($F = 76.23$, $p \leq .001$).

Overall, five of the six occupational environments designed by Holland include women earning significantly less than men in the same environment. Moreover, women in these environments work in substantially sex-segmented sectors of the job market. The only environment that approaches income parity for women and men is the Social sphere. In this work environment, males work with a higher percentage of female coworkers, and they also experience the lowest average male salaries. This sphere, described in Holland's model with "feminine" adjectives such as "helpful," "kind," and "understanding," represents the "feminized" sector of the labor market identified in other research as a crucial determinant of women's unequal labor force participation (Blau, 1977).

Multiple Classification Analysis

For a thorough understanding of the relationships among the Holland research classifications, income inequalities, and sex segmentation, we examined the direct statistical effects of the classification scheme. Multiple classification analysis was used to examine the interrelationship between the dependent variable (INCOME) and the predictor variables (AGE, SCHOOL, and TENURE) within the context of the additive model by estimating the adjusted deviations from the grand mean (Andrews et al., 1973). We predict the average incomes of women and men respondents in the sample, and the improvement of that prediction through knowledge of the Holland classification, while controlling for factors such as job tenure, age, and educational background. The analysis is conducted separately for women and men. The multiple classification analysis provides a measure of association (beta) that relates each independent variable to the dependent variable, while controlling for all other independent variables.

Women's Wages

The multivariate analysis predicting women's wages is presented in Table 5. A clear relationship exists between the amount of income and the Holland classifications, with the Investigative environment yielding the highest average incomes for women. However, for women respondents, employment in the Realistic occupations generates the lowest average in-

Table 5. Multiple Classification Analysis: Women and Income (Holland Occupational Groupings and Job Tenure, Controlling for Education and Age)

Main Effects	N	Unadjusted Means	Adjusted for Independents	Adjusted for Independents and Covariates
Holland				
Realistic	21	4,681	4,987	5,602
Investigative	13	9,977	9,620	8,895
Artistic	14	6,507	6,568	6,884
Social	50	9,070	8,889	7,215
Enterprising	74	5,066	5,073	5,891
Conventional	56	5,986	6,082	6,363
		eta = .55	beta = .51	beta = .25*
Tenure				
1 year or less	56	4,950	5,460	5,283
1 to 3 years	45	6,031	6,012	6,009
3 to 5 years	25	6,904	6,519	6,410
5 to 10 years	46	6,615	6,495	6,572
More than 10	56	8,164	7,940	8,105
		eta = .36	beta = .28	beta = .32*
Covariate Regression Coefficients :		School	= 12.30*	
		Age	= .06	

Grand mean = 6,503; R^2 = .46; *p < .001

comes, followed in order by the Enterprising and Conventional classifications. After controlling for TENURE, SCHOOL, and AGE, the average incomes for women increase slightly in the Realistic, Artistic, Enterprising, and Conventional categories. In contrast, average incomes decrease significantly for the Investigative and Social occupational environments after incorporating controls. This relationship is strong, but is slightly attenuated after controls for background variables are introduced (beta = .25, $p \leq .001$).

The multivariate model yields a grand mean income for women of $6,503. Knowledge of the Holland classifications, as well as job TENURE and SCHOOL, made a significant contribution to our prediction of income. Using the two independent variables and controlling for education and age, this model explained 46% of the variance in income for women (R^2 = .46).

Men's Wages

In each of the Holland classifications, men earned consistently more income than women, even after controls for SCHOOL and AGE were introduced. This difference is evident in the grand means for the two populations (see Table 6), with men earning, on the average, almost twice as much as women ($12,192 and $6,503, respectively).

Within the Holland classifications, the Investigative category yields the highest average income for men, with $15,206 average salary even after implementing controls. The Social category shows the lowest average incomes both before ($10,177) and after controls ($9,614). The Realistic category, which yielded the lowest incomes for women, showed an average income of $11,879 for men (the third highest income of the HOLLAND classifications). The Realistic, Enterprising, and Conventional categories showed increases in average income levels after independent variables were controlled for, while the Investigative, Artistic, and Social categories showed income decreases. This relationship of the Holland classifications to predicting income is strong and remains stable after implementing controls (beta = .27, $p \leq .001$).

Before controls were introduced, the relationship between job TENURE and INCOME was linear, with income increasing as tenure increased. After controlling for education and age, the average income level for men dropped after employment tenure of more than ten years. It appears that incomes level off during the 5-10-year TENURE period as well. This relationship is strong and unaltered after controls are introduced (beta = .27, $p \leq .001$). The model explained 26% of the variance in income levels for men. This is substantively less explanation than that provided for women's incomes by the same set of variables.

Discussion

The Holland classifications, and those tests and instruments based upon them, assume the current structure and inequalities of the labor market that reinforce current male occupational advantages. First, the Holland model classifies only certain occupations, excluding jobs with significantly lower average incomes and occupational prestige scores. Thus occupational guidance systems and research models may replicate the segmented and hierarchical structures of the labor market. Moreover, information about occupations, and their relationships to income and oc-

Table 6. Multiple Classification Analysis: Men and Income (Holland Occupational Groupings and Job Tenure, Controlling for Education and Age)

Main Effects	N	Unadjusted Means	Adjusted for Independents	Adjusted for Independents and Covariates
Holland				
Realistic	42	11,879	11,822	12,549
Investigative	71	15,206	15,251	14,579
Artistic	30	10,400	10,314	9,754
Social	51	10,177	10,290	9,614
Enterprising	108	12,541	12,567	12,710
Conventional	61	10,848	10,736	11,605
		eta = .29	beta = .29	beta - .27*
Tenure				
1 year or less	63	8,802	8,848	9,327
1 to 3 years	69	11,458	11,476	11,383
3 to 5 years	55	12,604	12,091	12,165
5 to 10 years	74	12,871	13,219	12,925
More than 10	102	14,068	14,051	12,210
		eta = .30	beta = .30	beta - .27*
Covariate Regression Coefficients:		School	= 14.98*	
		Age	= .37	

Grand mean = 12,192; R^2 = .26; *p < .001

cupational prestige, is more available to those socioeconomic groups that supplied the norms for the Holland model, that is, those groups overrepresented in postsecondary education or who use counseling resources.

Second, more desirable occupations (i.e., with significantly higher income and prestige levels) are male dominated numerically. The very language used to describe these environments reflects "masculine" modifiers for the Investigative environment as opposed to "feminine" modifiers for the Social environment. The Holland model recapitulates male segmentation, even for those women who are working in job classifications defined as traditionally male. Within four of the six Holland classifications, women work in occupations that have significantly higher percentages of female workers than the general labor force (with 60%-91% female wage earners). In only two environments the Artistic and the Investigative, are

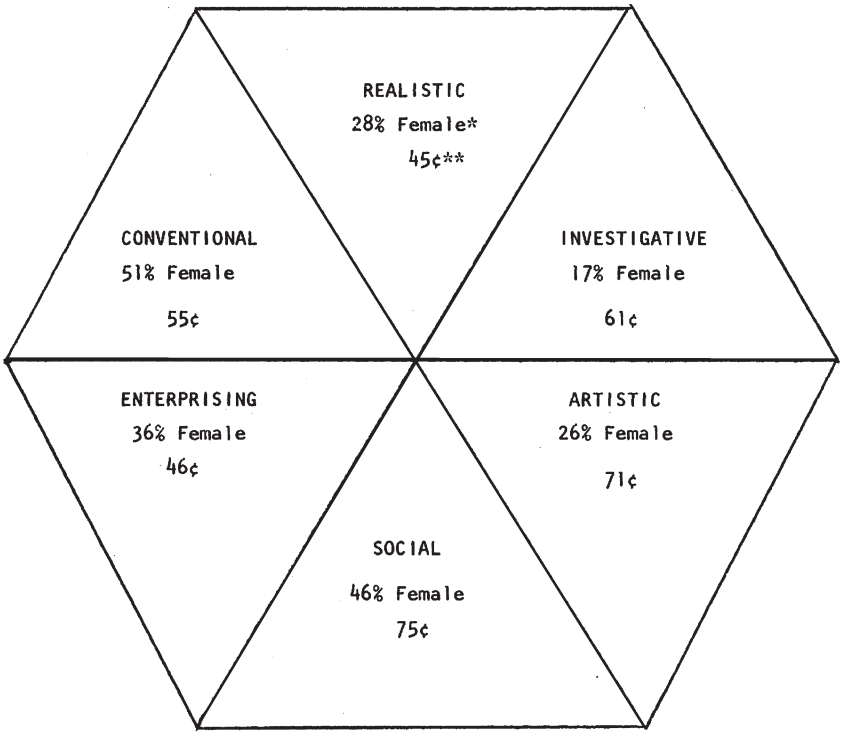
women actually working in occupational classifications that have more equitable proportions of men (38% and 47%, respectively). *Within* these classifications, men continue to work almost exclusively with other men (only 19% and 14% female representation).

The Social environment is an interesting anomaly for the Holland classification. Men are working in a sphere that includes a sizable percentage of women workers (31.43% female on the average). As a consequence of this "feminized" environment, male workers experience significantly lower average incomes compared to men in other (more segmented) Holland environments. Males in the Investigative and Artistic classifications are still working in jobs that are predominantly male. Thus, the Holland model does not effectively offer a map for changes in the sex segmentation of women wage earners.

One of the most important findings is the tie of the Holland classification to income differentials. Even when controlling for job tenure, education, and age, the Holland classifications reproduce income inequities for women employees. That is, the distribution of women across the Holland categories contributes to a more accurate prediction of these significant differences in income averages. The full model also accounts for a greater proportion of the income differences among women than among men. Thus the meritocratic effects of job tenure age, and education, which are assumed in the Holland scheme, actually have a greater influence on women's salaries in these classifications than upon men's. As noted above, males received significantly lower incomes than their "fellow" workers when working in the Social environment, the least segmented classification. The average incomes of females working in this area are approximately the same as those of their male coworkers, a situation not found in any other classification.

The overall findings of this study are presented in a somewhat altered form in Figure 1. The proportion of women's incomes to men's incomes (with controls) is presented for each of the Holland classifications. The overall percentage of female employees is also noted. This chart reflects the graphic lay out of the Strong Vocational Interest Inventory and the Holland model as presented to individuals who have taken the machine scored inventory. From this data analysis, we more accurately reflect the segmented labor-market structure and its consequences for the income inequalities experienced by women.

Clearly, test designers and researchers who use the Holland model and its derivatives should be aware of the assumptions underlying these schemata. As women and men interpret current research or use job search



*Percentage female in the occupations by 1970 Industry Reports.
**Ratio of female earnings per male earnings of $1.00 after controlling for education and age.

Figure 1. Relationships Among Personality Types and Environments

models as a baseline for occupational choice, they must consider the biasing presuppositions of a segmented "gender model" of the labor market. The documented increases in sex segmentation and income inequality for women over the past decade suggest that we must examine those tests, measures, and research models that may help to reproduce, rather than mitigate, these inequities (U.S. Commission on Civil Rights, 1978).

In conclusion, we have demonstrated that the Holland model of occupational environments recapitulates conceptually the sex-segmented structure of the current labor market. It is a research tool that focuses on personality traits, and omits information about the sex segmented structure it parallels. It is a counseling tool that directly relates gender roles to work roles. Women and men who use these job search strategies will find that their gender-role choices predict their job "preferences." Thus the Holland

scheme cannot contribute to basic structural changes in sex segmentation. The unquestioned use of such tools by researchers and counselors alike may well perpetuate the model on which it was initially built.

Notes

1. Data on the precise number of Strong Vocational Interest Inventories administered each year, and in what settings (education, private practice, business, and so on), are not available from the publisher.
2. These criticisms are based on issues of internal validity and reliability. The Strong Vocational Interest Inventory was severely criticized for potential sex bias. In 1974, Strong and Campbell published their intended modifications for the version actually used in this article. Among those practices they expected to eliminate were (1) the use of pink and blue forms; (2) explicitly sexist interest items; (3) the use of masculinity/femininity scales as occupational predictors; (4) gender references in occupational titles; and (5) the separation of male/female occupational dimensions. In the current form, some sex-specified dimensions remain, because of a lack of "other sex" subjects for establishing norms (i.e., it is substantively sex segregated already) or because norms for the two sexes were significantly divergent to warrant listings under separate occupational environments.

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