UNITED STATES DISTRICT COURT
FOR THE NORTHERN DISTRICT OF ILLINOIS
EASTERN DIVISION

EQUAL EMPLOYMENT OPPORTUNITY COMMISSION,	)	
	)	
Plaintiff,	)	
	)	Civil Action No.
v.	)	79-C-4373
	)	
SEARS, ROEBUCK AND CO.,	)	Judge Nordberg
	)	
Defendant.	)	

WRITTEN REBUTTAL TESTIMONY
OF DR. DAVID A. WISE REGARDING COMMISSION SALES

My name is David Wise. I previously testified on May 20 and 29, 1985. See also Written Direct Testimony of Dr. David A. Wise Regarding Commission Sales (Sears Exhibit 5). Sears Exhibit 5-1 is a copy of my resume.

1. Relatively few applicants were selected for commission sales jobs at Sears. The assumption that Sears tried to hire the best of the applicants provides a framework within which hiring decisions and sales performance data at Sears may be interpreted. The conclusions based on this proposition are consistent with the major empirical regularities revealed by the data.

2. EEOC expert Dr. Bernard R. Siskin has questioned the validity of this assumption. See Written Rebuttal Testimony of Bernard R. Siskin -- Commission Sales. The three issues to which Dr. Siskin devotes the most attention are the extent to which the best applicants are selected, the related question of error in evaluating the qualifications and interest of applicants, and the

assumption of normality underlying Sears Exhibit 5-6.[1]

3. The conclusion that sales performance data at Sears show no evidence of discrimination against women, but instead suggest affirmative action, is not materially affected by evaluation error. The exhibits presented by Dr. Siskin provide a misleading characterization of evaluation error and do not help in assessing the likely magnitude of evaluation error. Dr. Siskin also has misinterpreted the use of the Applicant Interview Guide data shown in Sears Exhibit 5-6.

4. Sales performance of men and women. Sales performance data show that, on average, women did less well than men. In addition, the poorest performing women did less well than the poorest performing men year after year. See Sears Exhibit 6-3-2. If Sears were only concerned with maximizing sales, it would have substituted men with higher sales potential for women.

5. The model developed in my direct testimony was intended to illustrate the relationships between hiring the best available applicants, the observed hiring decisions, and the sales performance of hires. The simulations reported in Sears Exhibit 5-7 illustrate the expected relationship between the sales performance of men and women hires selected from among available applicants at individual stores, where who is hired depends on the qualifications of the other applicants. The simulation incorporates error in the evaluation of the potential sales performance of applicants. The model and simulation show the relation-

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1. Dr. Madden raises the same issues. See Written Testimony of Dr. Janice Madden ¶ 19.

ship between a selection procedure that selects the best of the available applicants and the empirical finding that women hires with the poorest sales performance do less well than the poorest performing men. Two features of the hiring procedure could yield this result. The first is explicit affirmative action in favor of women. The second is random error in evaluation when women are, on average, less qualified and interested than men.

6. If men were on average more qualified than women, random error would benefit women more than men because it would increase somewhat the proportion of women hires. In addition, random error would lead to women hires on average performing less well than men and the worst women performing less well than the worst men. If maximization of sales were Sears' only goal, the result could be corrected, for example, by adjusting the evaluation of men versus women to avoid the relative over-valuation of women relative to their true sales performance. That the poorest performing women hires did worse than the poorest performing men hires year after year indicates that profit maximization was not Sears' only goal.

7. Figure A illustrates the effect of random error in evaluating applicants. If there were no error, estimated qualifications would be equal to actual qualifications as indicated by the 45 degree line. Assume that to be hired, qualifications must exceed L. Each person hired would perform as expected; all persons near, but above, L would perform above L.

8. To incorporate the effect of randomness in the illus-

tration, assume that for persons with low actual qualifications, predicted qualifications are sometimes above and sometimes below their actual qualifications, as indicated by the wavy line. Assume the same for persons with high actual qualifications. If persons are hired when predicted qualifications are greater than L, the actual sales performance of the low group would be lower than predicted. This phenomenon is called regression toward the mean. The effect will not be as pronounced for the high actual qualification group. In the illustration, they will on average perform as predicted. The lower the actual average qualifications of a group, the more likely it is that persons hired from the group are hired by "luck" or "mistake." Random error benefits disproportionately the group with lower actual qualifications and has the same effect as explicit preference for members of the group.

9. This point is shown in the lower half of Sears Exhibit 5-7, where men are assumed to be .75 standard deviations more qualified and interested than women. In the case where neither group is preferred, the average sales performance of the lowest 10 percent of women is 1.50, whereas it is 1.59 for men. If women are preferred, the performance of the lowest 10 percent of women is decreased to 1.39, and the average for men is increased to 1.67. When men are preferred, the average performance of the lowest 10 percent of women is increased and the average of men hires is decreased. Both the use of affirmative action comparable to the point preference for women, and random error that results in relatively more women than men hired by "luck," serve

to yield women hires who could be replaced by better qualified men if the employer were concerned only with maximizing sales.

10. To demonstrate the effect of greater random error, simulations like the one in the bottom half of Sears Exhibit 5-7 are shown in Table A for different error variances. The numbers in Table A are more accurate than those in Sears Exhibit 5-7 because they represent the average of five simulations, rather than the result of one. Table A demonstrates that the larger the random error, the lower the average sales performance of hires, with the effect on women relatively greater than the effect on men. For example, if neither group is preferred, the average sales performance of men falls by 9 percent when the error standard deviation is increased from 0 to .5; the decrease is 16 percent for women. The effect of random error on hires with the lowest sales performance is considerably greater, again with the greatest effect on women, the group with the lowest level of actual qualifications and interest. The average of the lowest performing men falls by 34 percent when the error standard deviation is increased from 0 to .5; the average of the lowest performing women falls by 42 percent.

11. The important point is not that either of these mechanisms will lead to women hires with the lowest sales performance doing less well than men hires with the lowest sales performance, but rather that the data indicate that a similar outcome persists from year to year. It will only persist if more qualified men are passed over in favor of less qualified women.

12. Based on the assumption that Sears attempted to hire

the best available applicants, my previous testimony demonstrated that ignoring even relatively small differences in the interests and qualifications of men and women could lead to grossly inaccurate predictions of the proportion of women among hires. This conclusion is not affected by reasonable assumptions about measurement error in evaluation, as shown by the relationship between the error standard deviation and the proportion of women hires in Table A. With zero evaluation error, the proportion of women hires is .196 if neither men nor women are preferred. With a random error standard deviation of .5, the proportion of women hires is .230. Thus, random error of this magnitude has relatively little effect on the proportion of women hires.

13. Judging the magnitude of evaluation error. Based on the sales performance data for hires and promotions, it is not reasonable to assume that evaluation error played a dominant role in actual hiring and promotion decisions. To the extent that there was substantial evaluation error in ranking outside applicants, one would expect that the error would be considerably less when ranking current employees considered for promotion because the actual performance of one employee could be directly compared with the performance of another. Yet, the relationship between the sales performance of men and women promoted into commission sales is very similar to the pattern observed among men and women hires. See Sears Exhibit 6-3-2. This is not what one would expect if hiring were dominated by error in the evaluation of applicants.

14. With very large random error, the average performance

of men and women hires would approach the actual means of the men and women applicants. In this situation, it would never pay to hire women unless hiring and turnover costs were zero because the predicted (mean) sales if a man were hired would always be greater than the predicted sales if women were hired. If hiring and turnover costs were zero, then everyone would be "hired," and only those with the best revealed sales performance would be retained. Of those retained, the proportion of women would be the same as the proportion predicted on the basis of no evaluation error.

15. Table B shows correlations between the actual and predicted sales performance of hires, based on the simulated hiring of 1000 persons. With an error standard deviation of .5, for example, the correlation between the actual and predicted sales performance of hires is .59 and the proportion of variation in sales performance explained by predicted performance is .35.

16. Dr. Siskin's Exhibit D-2 relates the proportion of women hires to the correlation between the predicted and actual performance of all applicants. One would expect this correlation to be quite high. For example, if a random sample of all high school graduates were to attend Harvard University, the correlations between SAT scores and performance at Harvard would be extremely high. The correlation between SAT scores and the performance of the applicants actually admitted would be much lower. It is easy to distinguish the players in the NBA draft, to cite another example, from all high school or college basketball players. It is more difficult to predict how well those who

are in fact drafted will perform in the NBA.

17. This point can also be seen in Figure B. The large curve represents the distribution of the actual performance of all applicants and the small curve the error distribution. The error variance is small relative to the variance of the sales performance of all applicants but is much larger relative to the performance of the best applicants, those above point L. It is typically only possible to measure the relationship between the predicted and actual performance of persons who are in fact selected from a larger group of applicants. It is this correlation that we are accustomed to considering and the one that would typically be used to measure the relationship between predicted and actual performance, not the correlation that Dr. Siskin considers.

18. Correlations analogous to those that Dr. Siskin considers are shown in the last two columns of Table B. With an error standard deviation of .4, the correlation among the applicants is .93, but among the hires it is only .68. The proportion of variation explained among the applicants is .86; among the hires it is only .46.

19. As shown in the last two rows of Table B, Dr. Siskin's low correlations of .5 and .3 imply extremely low correlations between the predicted and actual sales performance of hires. This point is illustrated graphically in Figure C. An error standard deviation of 3.18 (corresponding to Dr. Siskin's correlation of .3) implies a correlation between the predicted and actual performance of hires of only .13. Only 2 percent of

the variation in actual performance is explained by predicted performance. It implies an error standard deviation over three times as large as the standard deviation of the actual qualifications of all applicants. This is analogous to assuming that it is not possible for predictions to distinguish the performance of Olympic runners from the performance of weekend joggers, were both groups to enter a race. It is like assuming that the error variance in predicting an individual's academic ability from his or her SAT score is many times larger than the variance of academic ability among all persons who have ever taken the test. In the context of Sears, it is analogous to assuming that the performance of an average applicant would often be predicted to be better than the performance of anyone ever hired by Sears.

20. My model of the hiring process also leads to the conclusion that the ratio of the probability that a man would be hired to the probability that a woman would be hired increases as measured qualifications decrease if, due to unmeasured characteristics, men are somewhat more qualified and interested than women at any level of measured qualifications. This is a regularity in the data emphasized by Dr. Siskin. One would not expect this outcome if one applicant were indistinguishable from another.

21. The data show that the probability that an applicant with high measured qualifications would be hired was much greater than the probability that an applicant with low measured qualifications would be hired. For example, women applicants with commission product sales experience were about ten times as

likely to be hired as those without it. This is not what one would expect if Sears were unable to distinguish among applicants with widely varying actual qualifications. As my model emphasizes, Sears would attempt to identify the best applicants irrespective of the categorization of applicants used by Dr. Siskin for analytic purposes. These categorizations are constructs, possibly useful for analysis purposes, but not to be confused with Sears' goal of hiring the best possible applicants.[1]

22. Applicant Interview Guide Data. To illustrate the proportion of women hires that one might predict based on a ranking of applicants, I used data from Applicant Interview Guides (AIGs). Dr. Siskin has misunderstood my use of these data, and his discussion of the non-normality of the survey responses is misdirected.

23. Responses to the AIGs provide a ranking of individuals by their self-assessed valuation of their own experience, skills, and interest. This ranking has two components -- a "true" experience, skill, or interest component and an error component resulting from evaluation. Such error could result from random error in individual self-evaluations, random fluctuation among

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1. Dr. Siskin contends that the "tail argument after the multivariate adjustment is irrelevant" because there are often relatively few applicants for each hire per cell. Written Rebuttal Testimony of Bernard R. Siskin -- Commission Sales Issues at 35. Suffice it to say that Sears is not a captive of Dr. Siskin's cells. It is certainly more reasonable to assume that Sears tries to hire the best people possible, without regard to the cells in Dr. Siskin's multivariate cross-classification analysis.

individuals in the implicit comparisons they make with other individuals in ranking themselves, or random fluctuation in the implicit comparisons that individuals make in evaluating their abilities in one area versus another. Therefore, the structure of the responses -- true qualifications plus error -- is the same as in the simulations shown in Sears Exhibit 5-7 and in Table A here. The fact that random variation is inherent in the rankings is an advantage of these data as an indication of how Sears might rank applicants.

24. The complication presented by the AIGs is that respondents were required to "squeeze" their self assessments into one of five categories. The adjustment to the data shown in Sears Exhibit 5-6 accounts for the fact that there is likely to be substantial variation among the experiences, skills, and interests of individuals who assign themselves the same categorical number. Among those who give themselves a value of 5 in experience, for example, some will have much more expereince than others.

25. The important assumption in the use of the data is that individual self-evaluations would be illustrative of the sort of ranking that Sears would make. This is not to say that Sears' ranking would have corresponded exactly to the self-evaluation ranking; it simply supposes that the distribution of the rankings of men and women based on their own self-evaluations would correspond roughly to the distribution of rankings that Sears would make. The question then is: what proportions of the best applicants, according to this ranking, would be women?

26. Thus, the criticism that all hires are from the 99th percentile is not germane. There is no assumption underlying Sears Exhibit 5-6 that the persons at the top of the ranking would all be among the top one percent of applicants according to actual qualifications. It is only that by the ranking, including its random error components, the proportion of women would vary dramatically by product line.

27. Also, it is not relevant that many hires do not have product line experience by Dr. Siskin's assessment. Individuals, in making assessments of their own experience and skills are not constrained to his categorizations.

28. Dr. Siskin points out that the results could be sensitive to the normality assumption. It is true that the exact results obtained would differ depending on the distributional assumptions. But, there is no reason why the results based on normality would be unrepresentative. The actual distributions of experience, interest, and skills may look more like log-normal than normal distributions, that is, they may have more extended right hand tails. The nature of the results would be the same, however. If the distributions were more uniform, the proportions of women hires analogous to the proportions shown in Sears Exhibit 5-6 would be lower. In short, although the precise numbers could be sensitive to distributional assumptions, the point of the argument would not be.

29. Dr. Siskin also presents data in Exhibit 1-E to demonstrate that the survey responses are not normally distributed. This analysis, too, is misdirected. My analysis does not assume

that the AIG responses themselves would be normally distributed. The assumption implicit in my use of the data is that the underlying distributions of experience, skills, and interest are normally distributed. If this were the case, or if the underlying distribution had any normal-like shape, the distribution of the categorical survey responses would not be normal. This point is demonstrated in Figure D. Assume, for example, that a large proportion of respondents would rate their experience less than 1.5. In this case, their actual survey responses would be constrained to be at 1 and the distribution of responses would look like that in the bottom part of Figure D. Although the underlying distribution is normal, the distribution of the survey responses would be far from normal. An example with a large proportion of responses at 1 and 5 is shown in Figure E. Again, the underlying distribution is normal-like but the categorized responses are not. In this case, the categorical responses could lead to the naive conclusion that the underlying distribution is bimodal when in fact it is not.

David A. Wise

Subscribed and sworn to before me
this _____ of _____, 1985

Notary Public

My commission expires:

TABLE A
SIMULATED PERFORMANCE OF MEN AND WOMEN BY
ERROR STANDARD DEVIATION, AND BY HIRING PREFERENCE

Error Standard Deviation	Preference of 0.25 Standard Deviations for:	Proportion of Women Hires	Average Performance of Hires: Lowest 10% Men	Lowest 10% Women	Total Men	Total Women	Highest 10% Men	Highest 10% Women
0.0	Neither	.196	1.61	1.62	2.34	2.13	3.12	2.95
	Women	.331	1.75	1.41	2.42	2.00	3.17	2.80
	Men	.109	1.58	1.77	2.29	2.26	3.08	3.11
0.1	Neither	.189	1.59	1.55	2.33	2.11	3.12	2.98
	Women	.325	1.68	1.39	2.41	2.00	3.18	2.80
	Men	.099	1.54	1.59	2.29	2.22	3.10	3.16
0.2	Neither	.193	1.50	1.34	2.30	2.08	3.14	2.98
	Women	.318	1.56	1.30	2.36	1.99	3.19	2.82
	Men	.111	1.47	1.51	2.26	2.22	3.11	3.13
0.3	Neither	.203	1.40	1.20	2.27	1.97	3.20	2.90
	Women	.323	1.48	1.09	2.34	1.88	3.16	2.33
	Men	.111	1.35	1.25	2.23	2.08	3.16	3.09
0.4	Neither	.217	1.19	1.05	2.19	1.89	3.15	2.84
	Women	.329	1.26	0.98	2.24	1.84	3.20	2.74
	Men	.124	1.14	1.16	2.15	2.01	3.11	3.04
0.5	Neither	.230	1.06	0.94	2.12	1.79	3.10	2.83
	Women	.338	1.09	0.86	2.16	1.75	3.15	2.96
	Men	.129	0.97	0.96	2.06	1.89	3.07	3.00

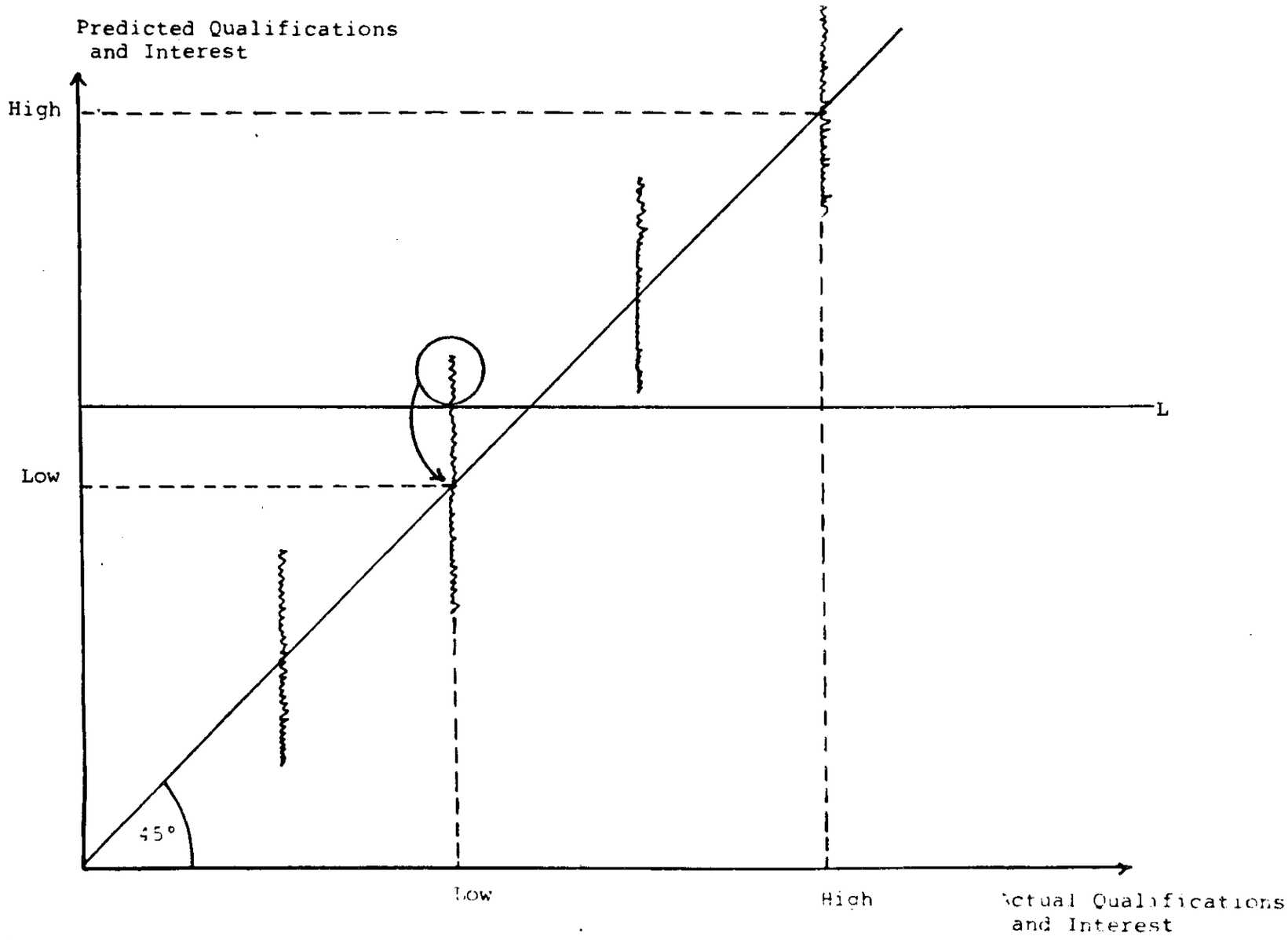
The simulations assume that 100 applicants at an individual store are drawn from a national pool with a proportion .661 women. The normally distributed qualifications and interest of men are 0.75 standard deviations higher than those for women. Preference of 0.25 standard deviations is given to neither, to women, or to men. Given the preference, the best of the 100 applicants is selected. The process is repeated 1,000 times; that is, for 1,000 stores. The entries in the table are the average sales performance of the hires. Five simulations were run for each error standard deviation. The entries represent the average over the five simulations.

TABLE B

THE RELATIONSHIP BETWEEN THE ERROR STANDARD DEVIATION AND THE CORRELATION BETWEEN THE ACTUAL AND PREDICTED SALES PERFORMANCE OF HIRES AND APPLICANTS.

	Hires		Applicants	
Error Standard Deviation	Correlation	Proportion of Variation Explained	Correlation	Proportion of Variation Explained
0	1.00	1.00	1.00	1.00
.1	.96	.92	.99	.98
.2	.91	.83	.98	.96
.3	.82	.67	.96	.92
.4	.68	.46	.93	.86
.5	.59	.35	.89	.79
1.732	.26	.07	.50	.25
3.180	.13	.02	.30	.09

Based on simulations with 1000 hires.


Predicted Qualifications
and Interest
High
Low
L
45°
Low
High
Actual Qualifications
and Interest

113

FIGU

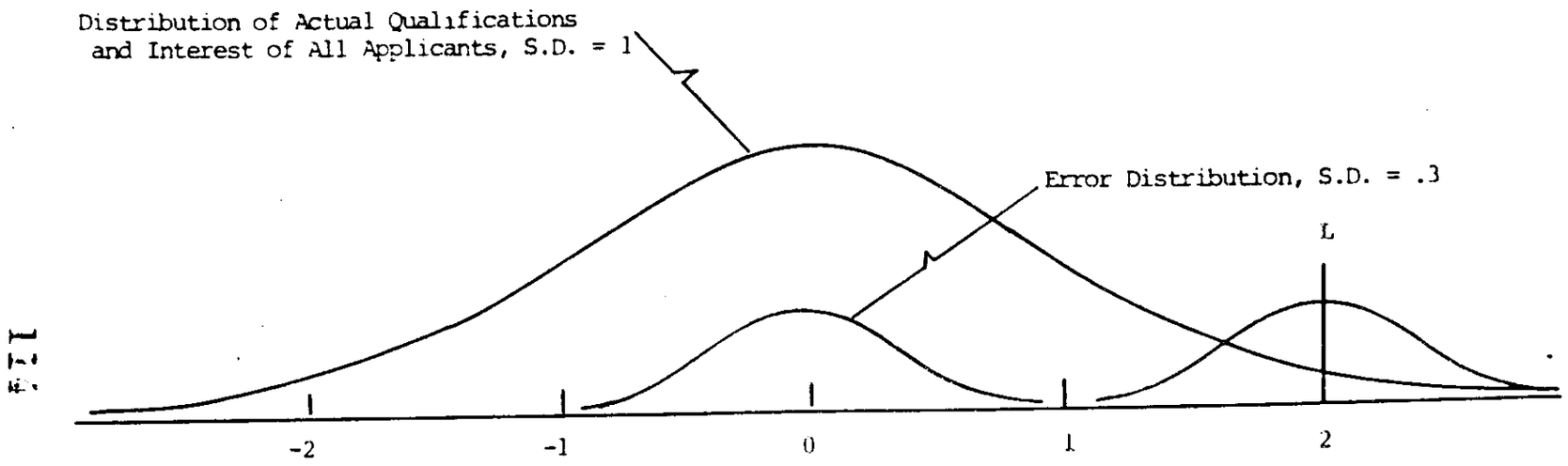

Distribution of Actual Qualifications
and Interest of All Applicants, S.D. = 1
Error Distribution, S.D. = .3
L
-2
-1
0
1
2

FIGURE B

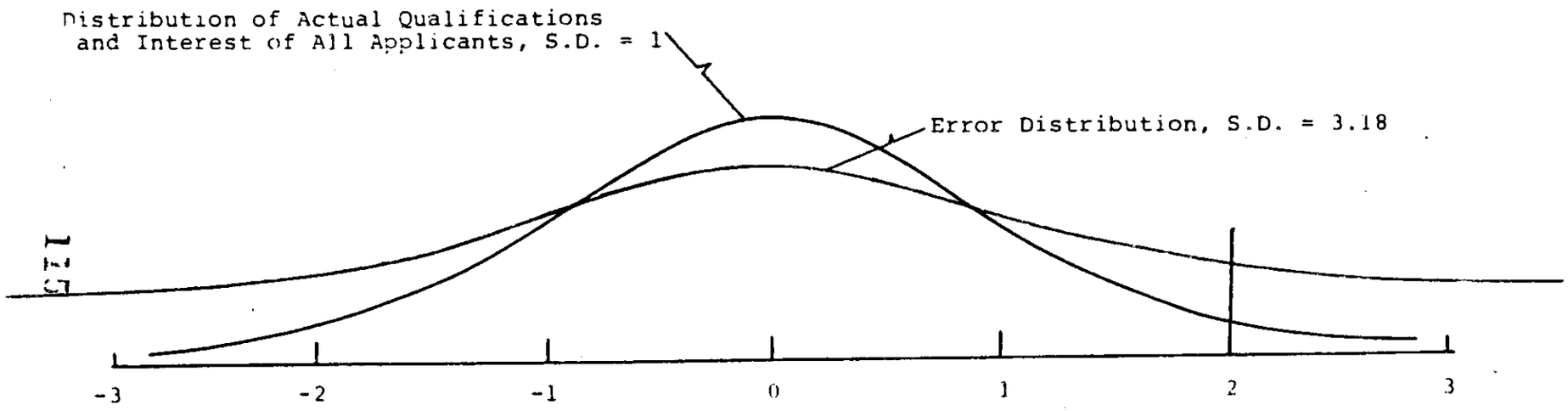
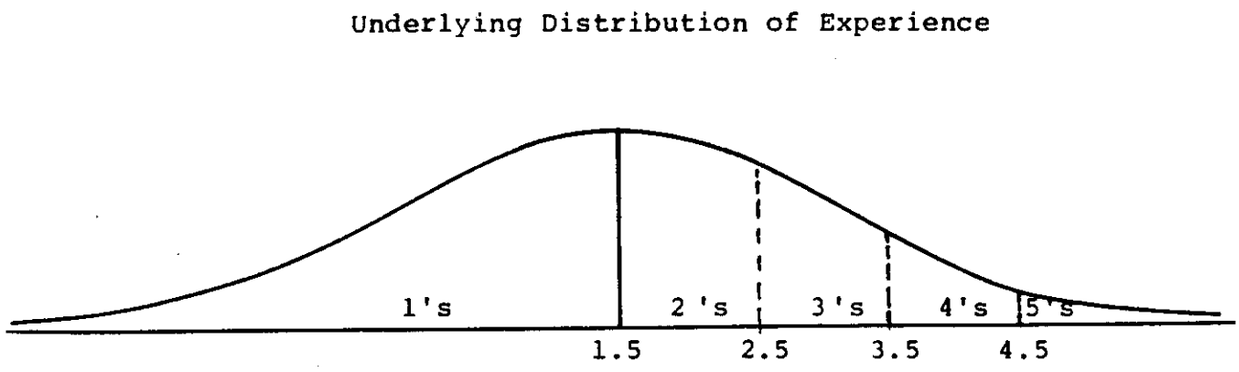

Distribution of Actual Qualifications
and Interest of All Applicants, S.D. = 1
Error Distribution, S.D. = 3.18
.125
-3
-2
-1
0
1
2
3

FIGURE C


Underlying Distribution of Experience
1's
2's
3's
4's
5's
1.5
2.5
3.5
4.5

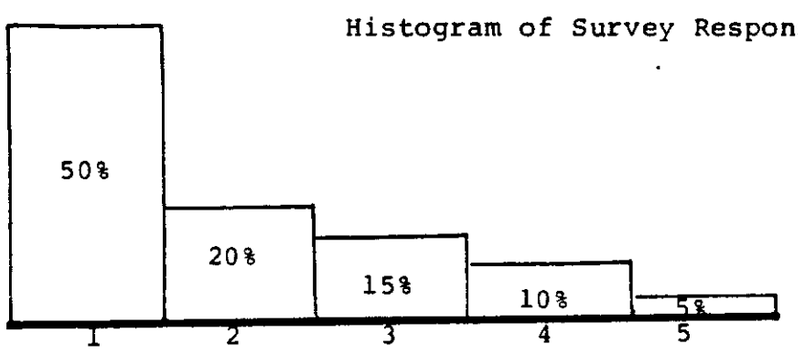
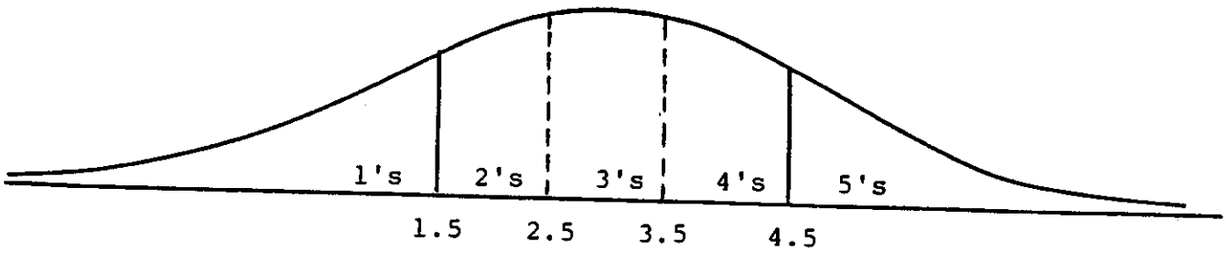

Histogram of Survey Responses
50%
20%
15%
10%
5%
1
2
3
4
5

FIGURE D

Underlying Distribution of Survey Responses



Histogram of Survey Responses

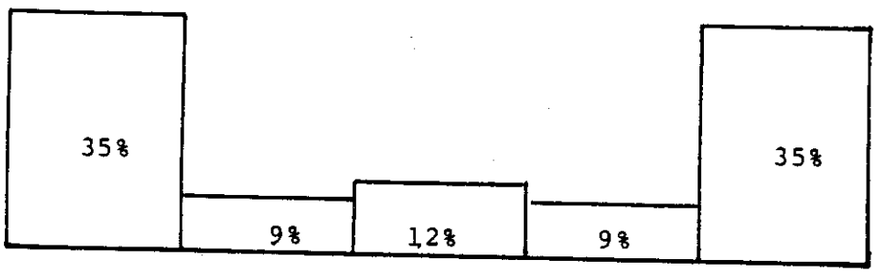


FIGURE E

Sears Exhibit
5-1

January 1985

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GRADUATE STUDIES

Economics, Ph.D., University of California, Berkeley, 1973.

Areas of Concentration: Econometrics, Human Resources, Statistics, (M.A. in Statistics, University of California, Berkeley, 1971).

Dissertation: Academic Achievement and Job Performance: Earnings and Promotions.

UNDERGRADUATE STUDIES

University of Washington, B.A., 1961.

TEACHING EXPERIENCE

John F. Stambaugh Professor of Political Economy, John F. Kennedy School of Government, Harvard University, June 1979 to present.

Associate Professor, Public Policy Program, John F. Kennedy School of Government, Harvard University, July 1976 to June 1979.

Assistant Professor, Public Policy Program, John F. Kennedy School of Government, Harvard University, July 1973 to June 1976.

NON-ACADEMIC EXPERIENCE

Department of Labor, Washington, D.C., January 1963 to September 1969.

Seattle Public Schools, High School Teacher (French), July 1961 to July 1962.

OTHER

National Bureau of Economic Research, Research Associate, 1978 to present.

Co-Director, Program in Public and Private Pensions, Director for Labor Aspects of Pension Plans

Director, Project on Public Sector Payrolls

Co-Director, Project on Youth Employment, 1978-1980.

American Editor, Review of Economic Studies.

Board of Editors, The Quarterly Journal of Economics, 1981-1984.

Board of Editors, Journal of Labor Economics.

Economics Editor, Public Policy, 1973-1975.

FELLOWSHIPS AND HONORS

Frisch Medal, 1980.

Buchanan Prize, 1974 (Best economics dissertation in a two-year period at Berkeley.)

Special Career Fellowship, Berkeley, 1968-1972.

PUBLICATIONS AND PAPERS

"Technical Problems in Social Experimentation: Cost Versus Ease of Analysis," with Jerry Hausman, forthcoming in Social Experimentation, edited with Jerry Hausman, University of Chicago Press, 1985.

Pensions, Labor and Individual Choice, edited, University of Chicago Press, 1985.

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sity of Chicago Press, 1985.

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"The Effects of the Minimum Wage on Young Men and Women," Working Paper, March 1984.

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"Two-Year Colleges, Vocational Schools, and Labor Market Value," with Steven Venti, Working Paper, March 1984.

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"Youth Employment in the 1970s: The Changing Circumstances of Young Adults," with David Ellwood in American Families and the Economy: The High Costs of Living, Richard Nelson and Felicity Skidmore (eds.), Washington, D.C.: National Academy Press, pp. 59-108, 1983.

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The Youth Employment Problem: Its Nature, Causes, and Consequences, edited with Richard Freeman, Chicago: University of Chicago Press, 1982.

"High School Preparation and Early Labor Force Experience," with Robert Meyer, in The Youth Employment Problem: Its Nature, Causes, and and Consequences, Richard Freeman and David Wise (eds.), Chicago: University of Chicago Press, pp. 277-348, 1982.

"AFDC Participation: Measured Variables or Unobserved Characteristics, Permanent or Transitory," with Jerry Hausman in Proceedings of the Econometric Society European Meeting 1979: Selected Econometric Papers in Memory of Stefan Valavanis, E.G. Charatsis, (ed.), New York: North-Holland Publishing Company, pp. 321-340, 1981.

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"Earnings Effects, Sample Selection, and Treatment Assignment in the Seattle-Denver Income Maintenance Experiment," with Jerry Hausman, Working Paper, October 1980.

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Sears Exhibit
5-2

COMPARISON OF Z-STATISTICS PRESENTED
BY THE EEOC IN ITS FULL-TIME HIRING ANALYSES
TO Z-STATISTICS ACCOUNTING FOR
SAMPLING VARIATION

EEOC Analysis	EEOC Z-Statistic*	Z-Statistic Accounting for Sampling Variation
Unadjusted	90.2	15.98
Logit	57.9	3.54
Multivariate Cross-Classification	27.1	4.00

* EEOC Report on Sears, Roebuck and Co.'s Commission Sales Hiring and Promotion Practices (rev. Sept. 10, 1984), Table 5 at 21 and Table 9 at 30A; Plaintiff's Exhibit Siskin 78 (rev. Jan. 24, 1985).

COMPARISON OF Z-STATISTICS PRESENTED
BY THE EEOC IN ITS UNADJUSTED
FULL-TIME HIRING ANALYSIS TO
Z-STATISTICS ACCOUNTING FOR
SAMPLING VARIATION

TABLE 5

DISPARITIES BETWEEN EXPECTED AND ACTUAL
FEMALE FULL TIME COMMISSION SALES HIRES
BY YEAR, NATIONWIDE AND BY TERRITORY

Nationwide

Year	Total	Percent Female Exp.	Act.	Number Female Exp.	Act.	Diff.	Z	Corrected
1973	4573	50.9	17.6	2328	809	1519	45.1	9.22
1974	2630	67.8	22.5	1783	593	1190	49.7	7.55
1975	1785	66.7	31.1	1191	555	636	31.9	13.30
1976	3113	60.2	31.4	1874	979	895	32.8	8.17
1977	2457	65.5	32.6	1609	802	807	34.3	7.24
1978	1076	68.6	36.6	738	394	344	22.6	8.56
1979	570	64.4	40.5	367	231	136	11.9	6.85
1980	345	66.5	30.7	229	106	123	14.1	5.73
All Years	16549	61.1	27.0	10111	4469	5642	90.2	6.55

* EEOC figures from Report on Sears, Roebuck and Co.'s Commission Sales Hiring and Promotion Practices (rev. Sept. 10, 1984), Table 5 at 21.

COMPARISON OF Z-STATISTICS PRESENTED
BY THE EEOC IN ITS ADJUSTED
FULL-TIME HIRING ANALYSIS TO
Z-STATISTICS ACCOUNTING FOR
SAMPLING VARIATION

TABLE 13

DISPARITIES BETWEEN EXPECTED AND ACTUAL
FEMALE FULL TIME COMMISSION SALES HIRES AS
ADJUSTED BY MULTIVARIATE CROSS-CLASSIFICATION
ANALYSIS, BY YEAR, NATIONWIDE AND BY TERRITORY

Nationwide

Year	Total	Percent Female		Number Female				
		Exp.	Act.	Exp.	Act.	Diff	Z	Corrected
1973	4573	30.9	17.6	1413	809	604	19.3	4.12
1974	2630	41.2	22.5	1084	593	491	19.5	3.86
1975	1785	40.5	31.1	723	555	168	8.1	2.64
1976	3113	36.5	31.4	1136	979	157	5.8	1.47
1977	2457	39.7	32.6	975	802	173	7.1	1.75
1978	1076	41.6	36.6	448	394	54	3.3	1.27
1979	570	39.1	40.5	223	231	-8	-0.7	-0.32
1980	345	40.4	30.7	139	106	33	3.6	1.84
All Years	16549	37.2	27.0	6156	4469	1687	27.1	4.20

* EEOC figures from Plaintiff's Exhibit Siskin 78 (rev. Jan. 24, 1985

Sears Exhibit
5-5

ILLUSTRATION OF DIFFERENCES IN QUALIFICATIONS AND INTERESTS OF MEN AND WOMEN THAT WOULD EXPLAIN EEOC "DISPARITIES"

	Full-Time Hiring: Nationwide	Part-Time Hiring: Territories Other than Midwestern	Part-Time Hiring: Midwestern
EEOC Actual Female Hiring Rate	27.0	35.4	51.6
EEOC "Expected" Female Hiring Rate			
—Unadjusted	61.1	67.2	65.3
—Adjusted[1]	37.2	57.7	56.0
Difference in Mean Levels of Qualifications and Interests of Men and Women that Would Explain Difference Between EEOC "Expected" and EEOC Actual Hiring Rates[2]			
—Unadjusted	0.538	0.498	0.215
—Adjusted	0.175	0.341	0.067
Percent of Women Who Would be More Qualified and Interested than the Average Man			
—Unadjusted	29.5%	30.9%	41.5%
—Adjusted	43.1	36.7	47.3

1. Based on the EEOC multivariate cross-classification analyses.

2. Expressed in standard deviations and assuming that 1 in 100 applicants is selected.

Sears Exhibit
5-6

ILLUSTRATION OF PREDICTED
PROPORTION WOMEN HIRES USING
APPLICANT INTERVIEW
GUIDE DATA

	Full-Time: Nationwide (P = .611)			Part-Time: Territories Other Than Midwest (P = .672)			Part-Time: Midwest (P = .653)		
	Experience	Skill	Interest	Experience	Skill	Interest	Experience	Skill	Interest
Decorating, Interior Design	.73	.77	.86	.81	.83	.92	.80	.82	.91
Sell Major Appliances: Stoves, Refrigerators, Freezers, etc.	.31	.25	.29	.46	.41	.42	.44	.39	.40
Parts Dept.: Stock, Catalog, Locate, Auto, Mechanical	.13	.15	.26	.15	.15	.17	.14	.14	.16
Automotive Repair and Servicing	.01	.01	.04	.01	.01	.02	.01	.01	.02
Sell Home Improvement Jobs: Kitchen, Fence, Roof, etc.	.27	.22	.25	.29	.25	.28	.27	.24	.26
Construction: Carpenter, Sheetrock, Plumbing, etc.	.01	.01	.03	.00	.00	.01	.00	.00	.01
Sell Hardware, Paint, Electrical: Technical Goods	.17	.12	.13	.18	.12	.09	.16	.11	.08
Repair Electronic Goods: Television, Stereos	.18	.12	.08	.12	.06	.04	.11	.05	.03
Repair Mechanical Mdse: Refrig., Laundry, Small Engines	.04	.08	.06	.02	.01	.02	.02	.01	.02

Note: Means and standard deviations were estimated, separately for men and women, for each response category. The predictions were calculated using the standard deviation of the group with the lowest mean. It was assumed that the underlying distributions are normal and that 1 in 100 applicants is selected.

ILLUSTRATION OF PREDICTED
PROPORTION WOMEN HIRES USING
APPLICANT INTERVIEW
GUIDE DATA

	Full-Time: Nationwide (P = .611)			Part-Time: Territories Other Than Midwest (P = .672)			Part-Time: Midwest (P = .653)		
	Experience	Skill	Interest	Experience	Skill	Interest	Experience	Skill	Interest
Parts Dept.; Stock, Catalog, Locate, Auto, Mechanical									
Method 1	.13	.15	.26	.15	.15	.17	.14	.14	.16
Method 2	.01	.05	.22	.01	.03	.12	.01	.02	.11
Sell Home Improvement Jobs: Kitchen, Fence, Roof, etc.									
Method 1	.27	.22	.25	.29	.25	.28	.27	.24	.26
Method 2	.03	.05	.19	.02	.04	.18	.01	.03	.16

Note: Predictions shown for method 1 were calculated as explained in note on page 1. Procedure for method 2 predictions differed in that standard deviations for both the group with the highest mean and group with the lowest mean were used.

Sears Exhibit
5-7

SIMULATED PERFORMANCE OF MEN AND WOMEN
BY DIFFERENCE IN QUALIFICATIONS AND
INTEREST, AND BY HIRING PREFERENCE

Mean Level of Qualifications and Interest for Men Minus the Mean Level for Women	Preference of 0.25 standard deviations for:	Average Performance of Hires					
		Lowest 10%		Total		Highest 10%	
		Men	Women	Men	Women	Men	Women
0.00	Neither	1.92	1.92	2.61	2.61	3.46	3.32
	Women	2.08	1.86	2.73	2.55	3.56	3.27
	Men	1.77	2.03	2.52	2.68	3.35	3.38
0.75	Neither	1.59	1.50	2.31	2.10	3.12	2.89
	Women	1.67	1.39	2.39	1.98	3.18	2.71
	Men	1.54	1.58	2.26	2.20	3.09	3.03

The simulation assumes that 100 applicants at an individual store are drawn from a national pool with a proportion .601 women. The normally distributed qualifications and interest of men and women differ by 0.00 or 0.75 standard deviations. Preference of 0.25 standard deviations is given to neither, to women, or to men. Given the preference, the best of the 100 applicants is selected. The process is repeated 1,000 times; that is, for 1,000 stores. In addition, it is assumed that applicant rankings have an error component with mean zero and standard deviation of 0.10. The entries in the table are the average sales performance of the hires.