Memorandum

Human Resources Division

TO:	Vacellia Clark, Chief Examiner
	Civil Service Commission
FROM:	Human Resources Staff
RE:	Establish a Passing Score for the Planner II register
DATE:	January 29, 2014

A. Summary

City of Urbana Human Resources staff recommends a passing score of 42 percent using the application as the Civil Service Exam. This would result in an eligibility register of 71 candidates.

B. Background

The position was open for applications from Dec. 13, 2013 – Jan. 17, 2014; in response, the City received 102 applications for the position.

Numerically, the breakdown of applicants is as follows:

Male	66	65%
Female	32	31%
No response or "n/a"	4	4%

Non-Minority	60	59%
Minority	31	30%
No response or "n/a"	11	11%

C. Application Screening

The scoring plan utilized to evaluate applications is detailed in Appendix A of this memo. A total of 26 points were possible. Qualifying factors included a minimum of a master's degree in Urban Planning, Geography, Urban Studies, or Public Administration (applicants could substitute a bachelor's degree and one year of experience for a master's degree) and knowledge of Microsoft Office and Adobe software products. Points were also given for related experience, knowledge of geographic information systems, and experience with public presentations and working with community groups.

Using this scoring plan, the following statistics are observed:

Average	48%	Max	96%
Median	50%	Min.	0%

D. Passing Score and Recommendation

 The hiring manager for this position requests that the passing score be established at 42 percent. At this score, the resulting register will consist of 71 candidates. HR staff concurs with the hiring manager to establish the register based on a 42% passing score to allow for a robust and well-qualified candidate pool for consideration. According to the Adverse/Disparate impact report (Appendix B), adverse impact

to minority groups is observed using the "4/5ths Rule"; however, further analyses using more sophisticated measurement tools including the standard deviation and confidence interval indicates that the number of minority candidates selected at this pass rate is likely the result of random selection and bias is not supported by the data.

Proposed Planner II Register by Gender

Proposed Planner II Register by Race/Ethnicity
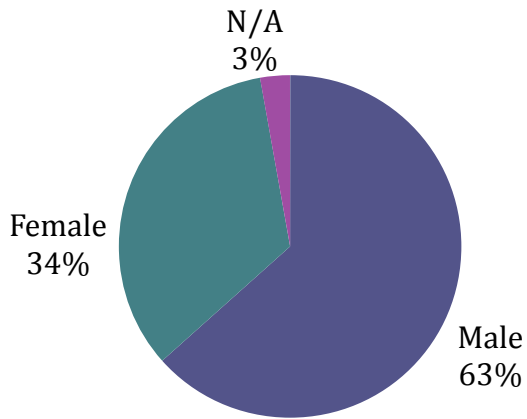
	Applied	On Register
Men	66	45
Women	32	24
n/a	4	2
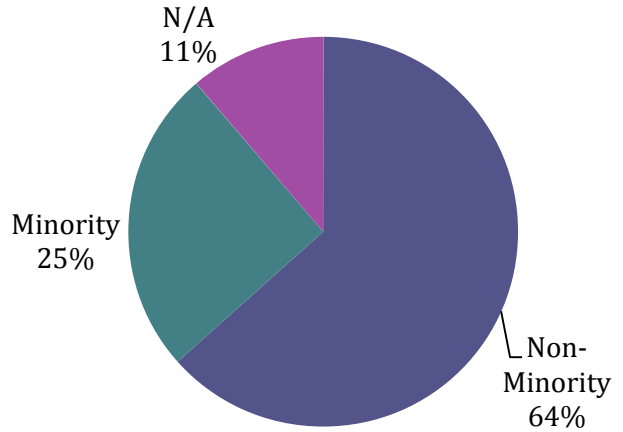
	Applied	On Register
Non-Minority	60	45
Minority	31	18
n/a	11	8

E. Attachments

Appendix A: Application Exam Scoring Plan

Appendix B: Disparate Impact Report for a 42% Passing Score

Appendix C: Planner II job description

Appendix A: Application Exam Scoring Plan

1. Which best describes the highest level of education that you have completed? To receive credit, your degree must be in Urban Planning, Geography, Urban Studies, Public Administration or a related field.
No degree **(0)**
Associate's degree **(0)**
Pending Bachelor's degree--I anticipate graduating in May 2014. **(1)**
Bachelor's degree **(2)**
Pending Master's degree--I anticipate graduating in May 2014. **(3)**
Master's degree or higher **(4)**

2. Which best describes your major course of study?
   a. Urban Planning, Geography , Urban Studies, or Public Administration
   b. Other related area
   c. My degree is unrelated

3. If you selected "Other", please explain:

Questions of experience refer to full-time, professional work. If you have worked part time, you must adjust the experience you are reporting accordingly. For example, if you worked part-time at 20 hours per week for 2 (two) years, this is equivalent to one (1) year of full-time experience (40 hrs./week). The work experience you report should also be reflected in the Work Experience section of this application.

4. Which best describes your level of professional experience?
   a. No experience **(0)**
   b. Less than one year **(1)**
   c. 1-3 years **(2)**
   d. 4-6 years **(3)**
   e. 7-10 years **(4)**
   f. 11 years or more **(5)**

5. Do you have professional experience with any of the following? Select all that apply: (**1 point for each)**
   a. Transportation/multi-modal planning
   b. Historic preservation
   c. Urban design
   d. Plan review
   e. Zoning
   f. Subdivision review
   g. None of the above

6. For each of the boxes you checked in Question #5 above, describe your related experience :

7. Please select the following software programs with which you have at least basic working knowledge: (**1 point for each).**
> Microsoft Word or comparable software
> Microsoft Excel or comparable software
> Microsoft PowerPoint or comparable software
> Geographic Information System
> Adobe Illustrator
> Adobe InDesign
> Adobe Photoshop
> None of the above

8. Do you have AICP certification?
   a. Yes **(2)**
   b. No **(0)**

9. Do you have work experience presenting to commissions, boards, and/or City Council?
   a. Yes **(1)**
   b. No **(0)**

10. Briefly describe your work experience presenting to commissions, boards, and/or City Council, referencing jobs listed in your application/resume. If you do not have this experience, type 'None' in the space provided.

11. Do you have work experience working with communities, businesses, and government agencies?
   a. Yes **(1)**
   b. No **(0)**

12. Briefly describe your work experience working with communities, businesses, and government agencies, referencing jobs listed in your application/resume. If you do not have this experience, type 'None' in the space provided.

Disparate Impact Analysis
(an On-Line Internet based application)

[■ SHRM Education]

Instructions: Please fill out the information into the form below. Once you have entered your data below, you may select the types of analysis to be conducted by checking the appropriate boxes. Then press the compute button at the bottom of the form to view the results.

Select the type of employment decision: [Selection ▼]

Enter a title for your report: [Planner II]

Number of Male		Number of Non-Minority		Number of Younger		Number of Non-Disabled	
66	Applicants	60	Applicants		Applicants		Applicants
45	Selected	45	Selected		Selected		Selected
Number of Female		**Number of Minority**		**Number of Older**		**Number of Disabled**	
32	Applicants	31	Applicants		Applicants		Applicants
24	Selected	18	Selected		Selected		Selected

☑ -Adverse Impact
☑ -Chi-Square
☑ -Standard Deviation
☑ -Confidence Intervals
☑ Probability Distribution

Select the Statistical Tests you wish to execute by checking or unchecking the boxes on the left. Then press the 'Compute' button below.

[Compute]

Display: ☑ Description of Statistic ☑ Interpretation of Results

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Planner II

Adverse-Impact Report

Adverse Impact and the "four-fifths rule." - A selection rate for any race, sex, or ethnic group which is less than four-fifths (4/5ths) (or eighty percent) of the rate for the group with the highest rate will generally be regarded by the Federal enforcement agencies as evidence of adverse impact. *Uniform Guidelines on Employee Selection Procedures*

Rate of Females Applicants Selected	Rate of Males Applicants Selected	Adverse Impact Ratio for Females	Adverse Impact Ratio for Males
(24/ 32) = 0.75	(45/ 66) = 0.6818	(0.75/ 0.6818)= 1.1	(0.6818/ 0.75)= 0.91
Adverse impact as defined by the 4/5ths rule was not found in the above data.			

Rate of Minorities Applicants Selected	Rate of Non-Minorities Applicants Selected	Adverse Impact Ratio for Minorities	Adverse Impact Ratio for Non-Minorities
(18/ 31) = 0.5806	(45/ 60) = 0.75	(0.5806/ 0.75)= 0.77	(0.75/ 0.5806)= 1.29

The Adverse Impact Ratio for Minorities is less than 0.80.
Minorities Applicants are Selected at a rate less than 80% (4/5ths) of the rate that Non-Minorities
Applicants are Selected.

Chi-Square Report

Observed Expected	Selected	Not Selected	Row Totals
Males	45 46.4694	21 19.5306	66
Females	24 22.5306	8 9.4694	32
Column Total	69	29	98

Chi-Square = 0.4809
The value of the statistic is less than 3.841. This indicates that there is a 95 percent chance that these results have been obtained absent any form of bias. Therefore, you may conclude that these results fall within normal random variations and are not the result of bias.

Observed Expected	Selected	Not Selected	Row Totals
Non-Minorities	45 41.5385	15 18.4615	60
Minorities	18 21.4615	13 9.5385	31
Column Total	63	28	91

Chi-Square = 2.752
The value of the statistic is less than 3.841. This indicates that there is a 95 percent chance that these results have been obtained absent any form of bias. Therefore, you may conclude that these results fall within normal random variations and are not the result of bias.

Standard-Deviation Report

The difference between the proportion of the protected class Selected and the proportion of all Applicants Selected has a normal distribution with a mean and standard deviation. The statistic is shown below:

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      (r / n) - p

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  sqrt(p * (1-p) / n) * sqrt(1-q)
```

Analysis of proportion of Females Selected
where:

	Selected	Not Selected	Row Totals

- **r = number of Females Selected.**
- **n = number of Selected (Females and Males).**
- **p = proportion of Applicants that are Females.**
- **q = proportion of Applicants Selected.**

Males	45	21	66
Females	24	8	32
Column Total	69	29	98

r = 24
n = 69
p = 32 / 98 = 0.327
q = (24 + 45) / (32 + 66) = 0.704

Standard Deviation Statistic = 0.693

These results show that the proportion of Females Selected is 0.693 standard deviations above the proportion of Applicants Selected. A result of less than 2 standard deviations is generally considered non-significant.

Analysis of proportion of Minorities Selected where:

- **r = number of Minorities Selected.**
- **n = number of Selected (Minorities and Non-Minorities).**
- **p = proportion of Applicants that are Minorities.**
- **q = proportion of Applicants Selected.**

	Selected	Not Selected	Row Totals
Non-Minorities	45	15	60
Minorities	18	13	31
Column Total	63	28	91

r = 18
n = 63
p = 31 / 91 = 0.341
q = (18 + 45) / (31 + 60) = 0.692

Standard Deviation Statistic = -1.659

These results show that the proportion of Minorities Selected is -1.659 standard deviations below the proportion of Applicants Selected. A result of less than 2 standard deviations is generally considered non-significant.

Confidence Interval Report

The proportion of the protected class Selected has an expected value that would fall within a specified confidence interval. The statistic is shown below:
Observed value = (r / n)
Expected value = p

Standard Deviation = sqrt(p * (1-p) / n) * sqrt(1-q)

Confidence Interval:
Lower Bound = p - 1.96 * Std Dev
Upper Bound = p + 1.96 * Std Dev

Analysis of proportion of Females Applicants Selected **where:**

- **r = number of Females Selected.**
- **n = number of Applicants Selected.**
- **p = proportion of Females among those Selected.**
- **q = proportion of Applicants Selected.**

r = 24
n = 69
p = (32/(32+66))=0.327
q = ((24 + 45)/(32 + 66))=0.704
(r/n)=24/69=0.3478

The lower bound of the confidence interval is: 0.327 -(1.96* 0.031)= 0.2663
The upper bound of the confidence interval is: 0.327 +(1.96* 0.031)= 0.3867

Confidence Interval = 0.2663 to 0.3867

These results show that the proportion of Females Females (r/n=0.3478) is contained in the confidence interval. Therefore a finding of disparate impact is not supported by this data.

Analysis of proportion of Minorities Applicants Selected **where:**

- **r = number of Minorities Selected.**
- **n = number of Applicants Selected.**
- **p = proportion of Minorities among those Selected.**
- **q = proportion of Applicants Selected.**

r = 18
n = 63
p = (31/(31+60))=0.341
q = ((18 + 45)/(31 + 60))=0.692
(r/n)=18/63=0.2857

The lower bound of the confidence interval is: 0.341 -(1.96* 0.033)= 0.2757
The upper bound of the confidence interval is: 0.341 +(1.96* 0.033)= 0.4056

Confidence Interval = 0.2757 to 0.4056

These results show that the proportion of Minorities Minorities (r/n=0.2857) is contained in the confidence interval. Therefore a finding of disparate impact is not supported by this data.

Probability Distribution Report

| Number Females Selected	Number Males Selected	Rate of Females Applicants Selected	Rate of Males Applicants Selected	Adverse Impact Ratio of Females	Adverse Impact against Females ?	Probability	Cumulative Probability
3	66	(3/32)	(66/66)	0.0938	YES	0	0
4	65	(4/32)	(65/66)	0.1269	YES	0	0
5	64	(5/32)	(64/66)	0.1611	YES	0	0
6	63	(6/32)	(63/66)	0.1964	YES	0	0
7	62	(7/32)	(62/66)	0.2329	YES	0	0
8	61	(8/32)	(61/66)	0.2705	YES	0	0
9	60	(9/32)	(60/66)	0.3094	YES	0	0
10	59	(10/32)	(59/66)	0.3496	YES	0	0
11	58	(11/32)	(58/66)	0.3912	YES	0	0
12	57	(12/32)	(57/66)	0.4342	YES	0.000001	0.000001
13	56	(13/32)	(56/66)	0.4788	YES	0.000012	0.000013
14	55	(14/32)	(55/66)	0.525	YES	0.000081	0.000095
15	54	(15/32)	(54/66)	0.5729	YES	0.000447	0.000541
16	53	(16/32)	(53/66)	0.6226	YES	0.001973	0.002514
17	52	(17/32)	(52/66)	0.6743	YES	0.007029	0.009543
18	51	(18/32)	(51/66)	0.7279	YES	0.020306	0.02985
19	50	(19/32)	(50/66)	0.7838	YES	0.047693	0.077543
20	49	(20/32)	(49/66)	0.8418	NO	0.091178	0.16872
21	48	(21/32)	(48/66)	0.9023	NO	0.141832	0.310552
22	47	(22/32)	(47/66)	0.9654	NO	0.179156	0.489708
23	46	(23/32)	(46/66)	1.0313	NO	0.183051	0.672759
Selected-> 24	45	(24/32)	(45/66)	1.1	NO	0.150363	0.823122
25	44	(25/32)	(44/66)	1.1719	NO	0.098419	0.921541
26	43	(26/32)	(43/66)	1.2471	NO	0.050691	0.972232
27	42	(27/32)	(42/66)	1.3259	NO	0.020183	0.992415
28	41	(28/32)	(41/66)	1.4085	NO	0.006055	0.99847
29	40	(29/32)	(40/66)	1.4953	NO	0.001317	0.999787
30	39	(30/32)	(39/66)	1.5865	NO	0.000195	0.999982
31	38	(31/32)	(38/66)	1.6826	NO	0.000018	0.999999
32	37	(32/32)	(37/66)	1.7838	NO	0.000001	1

Given that 69 were Selected from a pool of 66 Males and 32 Females it was possible to have Selected from 3 to 32 Females.

Adverse Impact would be found if you Selected 19 or fewer Females.

The probability of Adverse Impact occurring even if the employment decisions were random (i.e. unbiased) is 0.0775 (the sum of the probabilities of having Selected 19 or fewer Females).

Since the probability of Adverse Impact occurring even if the selection was random (i.e. unbiased) is less than 10%, an observed Adverse Impact may be significant since there is a low probability that Adverse Impact would have occurred by chance.

Probability Distribution of the variable: Number of Females Selected.

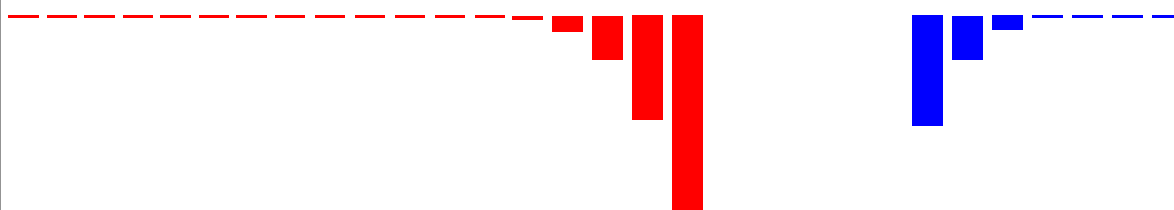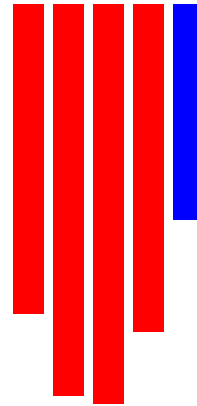

Number of female Applicants Selected
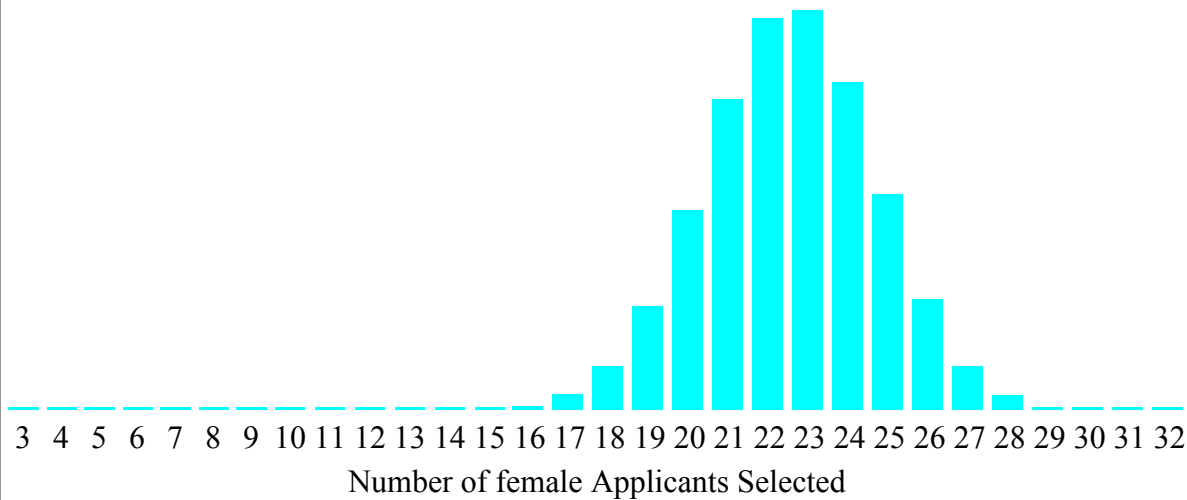
The probability distribution of having Selected from 3 to 32 Females is displayed above. The graph above is shown starting with 3 since the probabilities below this point are near zero. As can be seen, the most likely event (highest probability) to have occurred by chance (or decisions not affected by any form of bias) is to have Selected 23 female Applicants. This represents the mean of the probability distribution. Approximately half of the probability distribution is above this point and approximately half is below this point. The total area contained in the probability distribution is equal to 1. Thus, probabilities for each number of female Applicants Selected are a fraction of the total probability distribution. The larger areas of the distribution represent higher probabilities of occurance. Adding the individual probabilities up to a certain point enable you to compute the probability of having Selected that many or fewer female Applicants. Adding the individual probabilities from a certain point and higher enable you to compute the probability of having Selected that many or more female Applicants.

The characteristics of the probability distribution--its mean and standard deviation--are a function of the number of female and male Applicants and the number of Applicants to be Selected. Though it is possible to have Selected from 3 to 32 female Applicants, the individual probabilities of having Selected each number of female Applicants can be computed and accumulated. As noted before, these individual probabilities are a function of the number of female and male Applicants and the number of Applicants to be Selected.

Using the distribution above, a 90 percent confidence interval on the variable 'Number of Females Selected' would have a lower bound of 19 and an upper bound of 26.

The significance of having Selected 24 or fewer Females is graphically displayed below.

3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32

Number of female Applicants Selected

As noted earlier, Adverse Impact, according to the 4/5ths rule, would be found if you Selected 19 *or fewer* female Applicants.

You have Selected 24 female Applicants. The probability of having Selected 24 *or fewer* Females is equal to the cumulative probability for having Selected 24 Females Applicants. The cumulative probability of having Selected 24 female Applicants is 0.8231 and is graphically displayed, in red, above.

Since the probability is greater than 10%, we are unable to reject the hypothesis that the decisions occurred due to chance. Therefore, we must conclude that it is entirely possible that having Selected 24 or fewer female Applicants is an event that occurred due to chance and not from discriminatory actions by the employer.

Number Minorities Selected	Number Non-Minorities Selected	Rate of Minorities Applicants Selected	Rate of Non-Minorities Applicants Selected	Adverse Impact Ratio of Minorities	Adverse Impact against Minorities ?	Probability	Cumulative Probability
3	60	(3/31)	(60/60)	0.0968	YES	0	0
4	59	(4/31)	(59/60)	0.1312	YES	0	0
5	58	(5/31)	(58/60)	0.1669	YES	0	0
6	57	(6/31)	(57/60)	0.2037	YES	0	0
7	56	(7/31)	(56/60)	0.2419	YES	0	0
8	55	(8/31)	(55/60)	0.2815	YES	0	0
9	54	(9/31)	(54/60)	0.3226	YES	0	0
10	53	(10/31)	(53/60)	0.3652	YES	0	0
11	52	(11/31)	(52/60)	0.4094	YES	0.000001	0.000001
12	51	(12/31)	(51/60)	0.4554	YES	0.000009	0.00001
13	50	(13/31)	(50/60)	0.5032	YES	0.00007	0.00008
14	49	(14/31)	(49/60)	0.553	YES	0.000406	0.000486
15	48	(15/31)	(48/60)	0.6048	YES	0.00188	0.002367
16	47	(16/31)	(47/60)	0.6589	YES	0.006943	0.009309
17	46	(17/31)	(46/60)	0.7153	YES	0.020566	0.029875
Selected-> 18	45	(18/31)	(45/60)	0.7742	YES	0.049053	0.078928

|							
19	44	(19/31)	(44/60)	0.8358	NO	0.094394	0.173322
20	43	(20/31)	(43/60)	0.9002	NO	0.146589	0.319911
21	42	(21/31)	(42/60)	0.9677	NO	0.18343	0.503342
22	41	(22/31)	(41/60)	1.0386	NO	0.184308	0.68765
23	40	(23/31)	(40/60)	1.1129	NO	0.147847	0.835497
24	39	(24/31)	(39/60)	1.1911	NO	0.093871	0.929368
25	38	(25/31)	(38/60)	1.2733	NO	0.046594	0.975962
26	37	(26/31)	(37/60)	1.3601	NO	0.017765	0.993727
27	36	(27/31)	(36/60)	1.4516	NO	0.005072	0.998799
28	35	(28/31)	(35/60)	1.5484	NO	0.001043	0.999842
29	34	(29/31)	(34/60)	1.6509	NO	0.000145	0.999987
30	33	(30/31)	(33/60)	1.7595	NO	0.000012	1
31	32	(31/31)	(32/60)	1.875	NO	0	1

Given that 63 were Selected from a pool of 60 Non-Minorities and 31 Minorities it was possible to have Selected from 3 to 31 Minorities.

Adverse Impact would be found if you Selected 18 or fewer Minorities.

The probability of Adverse Impact occurring even if the employment decisions were random (i.e. unbiased) is 0.0789 (the sum of the probabilities of having Selected 18 or fewer Minorities).

Since the probability of Adverse Impact occurring even if the selection was random (i.e. unbiased) is less than 10%, an observed Adverse Impact may be significant since there is a low probability that Adverse Impact would have occurred by chance.

Probability Distribution of the variable: Number of Minorities Selected.

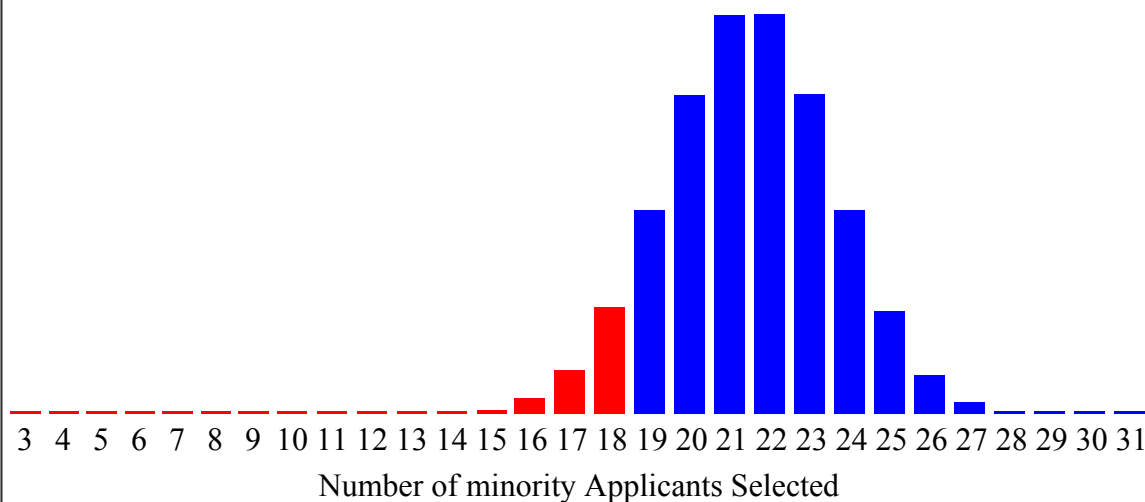Number of minority Applicants Selected
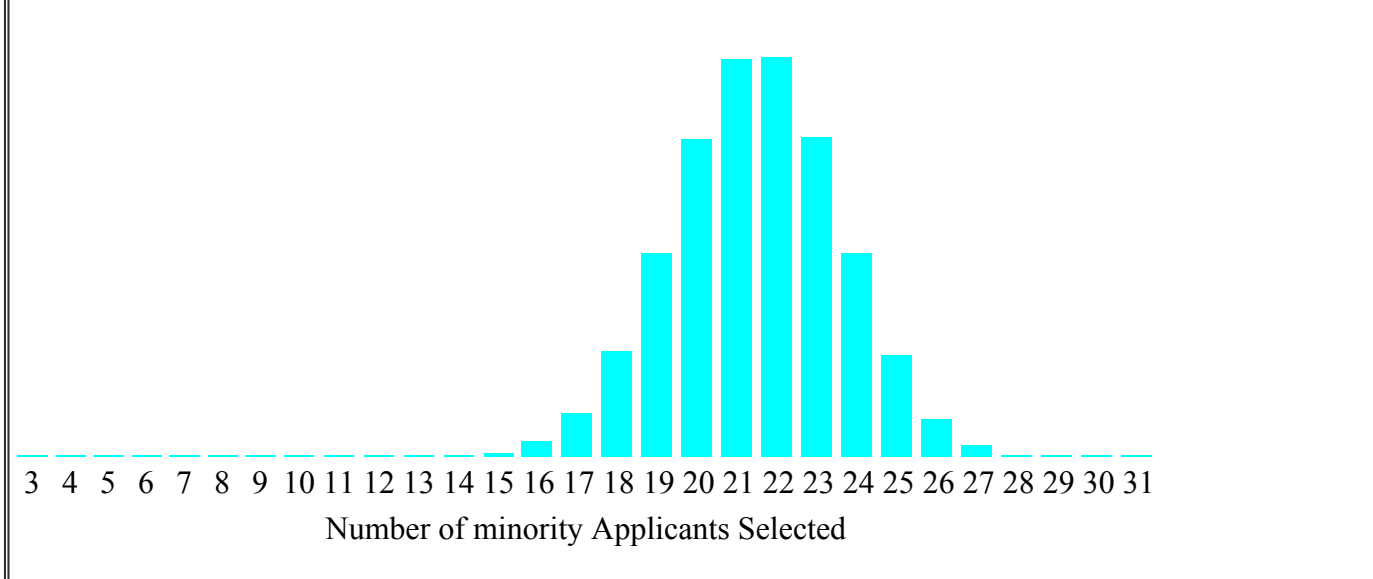
The probability distribution of having Selected from 3 to 31 Minorities is displayed above. The graph above is shown starting with 3 since the probabilities below this point are near zero. As can be seen, the most likely event (highest probability) to have occurred by chance (or decisions not affected by any form of bias) is to have Selected 22 minority Applicants. This represents the mean of the probability distribution. Approximately half of the probability distribution is above this point and approximately half

is below this point. The total area contained in the probability distribution is equal to 1. Thus, probabilities for each number of minority Applicants Selected are a fraction of the total probability distribution. The larger areas of the distribution represent higher probabilities of occurance. Adding the individual probabilities up to a certain point enable you to compute the probability of having Selected that many or fewer minority Applicants. Adding the individual probabilities from a certain point and higher enable you to compute the probability of having Selected that many or more minority Applicants.

The characteristics of the probability distribution--its mean and standard deviation--are a function of the number of minority and non-minority Applicants and the number of Applicants to be Selected. Though it is possible to have Selected from 3 to 31 minority Applicants, the individual probabilities of having Selected each number of minority Applicants can be computed and accumulated. As noted before, these individual probabilities are a function of the number of minority and non-minority Applicants and the number of Applicants to be Selected.

Using the distribution above, a 90 percent confidence interval on the variable 'Number of Minorities Selected' would have a lower bound of 18 and an upper bound of 25.

The significance of having Selected 18 or fewer Minorities is graphically displayed below.

Number of minority Applicants Selected

As noted earlier, Adverse Impact, according to the 4/5ths rule, would be found if you Selected 18 *or fewer* minority Applicants.

You have Selected 18 minority Applicants. The probability of having Selected 18 *or fewer* Minorities is equal to the cumulative probability for having Selected 18 Minorities Applicants. The cumulative probability of having Selected 18 minority Applicants is 0.0789 and is graphically displayed, in red, above.

Since the probability is less than 10%, we must reject the hypothesis that the decisions occurred due to chance. Therefore, we must conclude that the result 18 minority Applicants were Selected supports (based on statistics) a finding of Adverse Impact.

View Source Code

Disparate Impact analysis: a program by hr-software.net to analyze employment decisions for a variety of EE...

Send questions or comments to webmaster@hr-guide.com. Thank you.

Wednesday, January 29, 2014