COMPARE 2.0:

Identifying Statistically Significant Differences in Pay
When Comparing Groups

• Not just any difference is a “real” difference
  – It could be a “chance event”
  – It could indicate a reliable or “real difference”

• When a difference is “real” it is said to be “Statistically Significant”
  – Less than 1 chance in 20 that you would expect to see it purely by chance
  – Less than a 5% probability that the difference is NOT real
Is There A Statistically Significant Difference in Compensation?

It seems obvious in the data presented that females earn less than males.

• Lowest paid female is paid less than the lowest paid male.
• Highest paid male is paid more than the highest paid female.
• Average pay for males is higher than the average pay for females

• HOWEVER, this does not prove discrimination!
The Real World

<table>
<thead>
<tr>
<th>Job Title</th>
<th>Data</th>
<th>Female</th>
<th>Male</th>
<th>Impacted/Difference</th>
<th>Difference (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>C++ Programmer</td>
<td>Count of Gender Status</td>
<td>86</td>
<td>78</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Average FTE Annual Pay</td>
<td>$123,382</td>
<td>$126,481</td>
<td>Female $3,100</td>
<td>2.45</td>
</tr>
</tbody>
</table>

Does the difference in pay indicate discrimination?
Is the Difference Statistically Significant?

Use an independent samples t-test to find out

Gender → Salary

<table>
<thead>
<tr>
<th>Group</th>
<th>Average Daily Salary ($)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>103.99</td>
</tr>
<tr>
<td>Female</td>
<td>95.68</td>
</tr>
</tbody>
</table>

- Difference between averages is: $8.31
- The question is: “Is this statistically significant?”

- Statistical $p=0.005$
  - Statistical Model: $t$-test or dummy-coded regression
How Does a t-Test Work?

\[ \bar{X} - \bar{Y} = ? \]

\[ \bar{X} - \bar{Y} = \text{Error} + \text{Real Difference} \]
A Venn Diagram Illustrating The Point

If an employee’s gender directly impacts pay, discrimination *may* exist.
While gender may share a statistically significant relationship with compensation, the real question is whether it is “really” gender or some other legitimate variables that happen to differ by gender.
The Result of Controlling for Tenure and Job Performance

Salary by Gender after accounting for differences in Tenure Performance and Education

**Gender + Tenure + Performance + Education → Salary**

<table>
<thead>
<tr>
<th>Group</th>
<th>“Adjusted” Average Daily Salary ($)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>104.50</td>
</tr>
<tr>
<td>Female</td>
<td>102.15</td>
</tr>
</tbody>
</table>

Mean Difference: -$2.35
Statistical $p=0.072

NO LIABILITY
For More Information

COMPARE Compensation Analysis Software
www.biddle.com/compensation-analysis-software.php

EEO Training & Resources
Biddle Consulting Group Institute for Workforce Development (BCGi)
www.BCGinstitute.org

Consulting
Biddle Consulting Group, Inc. offers compensation analysis consulting, in addition to providing a broad range of additional EEO compliance and analytical services.

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