Test Selection: Single Sample

Randomness Assumption:
Random Selection

Random Selection
(to apply to all designs)
Were sampling units randomly selected?

Yes
No

Data met random selection criterion
Data did not meet random selection criterion

Randomness Assumption

Random Selection
(to apply to all designs)
Were sampling units randomly selected?

Yes
No

Random Assignment
(not applicable to single sample designs)
Were sampling units randomly assigned to levels of the independent variable?

Yes
No

Data met random assignment criterion
Data did not meet random assignment criterion

If data do not meet the random selection criterion, the data violate the randomness assumption.
Independence Assumption: Sample Formation

Sample Formation
Were samples formed using probability sampling?

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
</table>

Data met sample formation criterion | Data did not meet sample formation criterion

Independence Assumption: No Interaction

No Interaction Among Subjects
Did sampling units have an opportunity for regular interaction with each other?

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
</table>

Data met no interaction among subjects criterion | Data did not meet no interaction among subjects criterion

Independence Assumption:

Sample Formation
Were samples formed using probability sampling?

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
</table>

Data met sample formation criterion | Data did not meet sample formation criterion

No Interaction Among Subjects
Did sampling units have an opportunity for regular interaction with each other?

<table>
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<tr>
<th>Yes</th>
<th>No</th>
</tr>
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Data met no interaction among subjects criterion | Data did not meet no interaction among subjects criterion

If data do not meet either the sample formation criterion or the no interaction among subjects criterion, or do not meet both the sample formation and the no interaction among subjects criteria, then data violate the independence assumption.
Is Any Statistical Hypothesis Test Appropriate?

"Death Penalty" Assumptions
Did data meet both the Randomness and the Independence Assumptions?

Yes (both assumptions met)  
No (at least one assumption violated)

Some statistical hypothesis test is appropriate  
No statistical hypothesis test is appropriate

Design Assumption

Tests  
These three tests are appropriate for a single sample design:
- goodness-of-fit
- chi-square test
- single sample
- Kolmogorov-Smirnov test
- single sample
- Student t test

Scaling Assumption

Dependent Measure  
What was the level of measurement for the dependent measure?

Nominal  
Ordinal  
Interval/Ratio

Rule out single sample  
Kolmogorov-Smirnov test and single sample  
Student t test
Rule out goodness-of-fit  
chi-square test and single sample  
Student t test
Rule out goodness-of-fit  
chi-square test and evaluate the distribution assumption

Appropriate test is the goodness-of-fit  
chi-square test
Appropriate test is the single sample  
Kolmogorov-Smirnov test
**Distribution Assumption**

<table>
<thead>
<tr>
<th>Population Normal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Are dependent measures scores normally distributed in the population?</td>
</tr>
<tr>
<td>Yes</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Appropriate test is the</th>
<th>Appropriate test is the</th>
</tr>
</thead>
<tbody>
<tr>
<td>single sample Student t test</td>
<td>single sample Kolmogorov-Smirnov test</td>
</tr>
</tbody>
</table>