**Practice Items: Interpreting Complex Designs**

**Scenario:** Dr. Levy examines whether humorous TV commercials are more effective in getting people to like a product than factual (non-humorous) TV commercials. He also wants to know whether these types of commercials influence adults and teenagers in the same way. In this experiment 40 adults and 40 teenagers are randomly assigned to watch either a humorous or factual TV commercial about the same product (this yields 20 participants in each of the 4 conditions). The dependent variable is the participants' rating of how much they like the product, using a 100 point scale (0 = It Totally Awful; 100 = It’s Totally Fantastic). Assume that any difference of 5 or more rating points is statistically significant.

1. Based on the data below, what are the results?

<table>
<thead>
<tr>
<th>Type of Commercial</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
</tr>
<tr>
<td>Humorous</td>
</tr>
<tr>
<td>Adults</td>
</tr>
<tr>
<td>Teenagers</td>
</tr>
</tbody>
</table>

   a. main effect Type of Commercial  
   b. main effect Age  
   c. both main effects  
   d. interaction  
   e. interaction & main effect Type of Commercial  
   f. interaction & main effect Age  
   g. interaction & both main effects  
   h. no main effects, no interaction

2. Based on the data below, what are the results?

<table>
<thead>
<tr>
<th>Type of Commercial</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
</tr>
<tr>
<td>Humorous</td>
</tr>
<tr>
<td>Adults</td>
</tr>
<tr>
<td>Teenagers</td>
</tr>
</tbody>
</table>

   a. main effect Type of Commercial  
   b. main effect Age  
   c. both main effects  
   d. interaction  
   e. interaction & main effect Type of Commercial  
   f. interaction & main effect Age  
   g. interaction & both main effects  
   h. no main effects, no interaction
3. Based on the data below, what are the results?

### Type of Commercial

<table>
<thead>
<tr>
<th>Age</th>
<th>Humorous</th>
<th>Factual</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adults</td>
<td>30</td>
<td>40</td>
</tr>
<tr>
<td>Teenagers</td>
<td>10</td>
<td>20</td>
</tr>
</tbody>
</table>

- a. main effect Type of Commercial
- b. main effect Age
- c. both main effects
- d. interaction
- e. interaction & main effect Type of Commercial
- f. interaction & main effect Age
- g. interaction & both main effects
- h. no main effects, no interaction

4. Based on the data below, what are the results?

### Type of Commercial

<table>
<thead>
<tr>
<th>Age</th>
<th>Humorous</th>
<th>Factual</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adults</td>
<td>20</td>
<td>40</td>
</tr>
<tr>
<td>Teenagers</td>
<td>80</td>
<td>60</td>
</tr>
</tbody>
</table>

- a. main effect Type of Commercial
- b. main effect Age
- c. both main effects
- d. interaction
- e. interaction & main effect Type of Commercial
- f. interaction & main effect Age
- g. interaction & both main effects
- h. no main effects, no interaction

5. Based on the data below, what are the results?

### Type of Commercial

<table>
<thead>
<tr>
<th>Age</th>
<th>Humorous</th>
<th>Factual</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adults</td>
<td>65</td>
<td>65</td>
</tr>
<tr>
<td>Teenagers</td>
<td>35</td>
<td>35</td>
</tr>
</tbody>
</table>

- a. main effect Type of Commercial
- b. main effect Age
- c. both main effects
- d. interaction
- e. interaction & main effect Type of Commercial
- f. interaction & main effect Age
- g. interaction & both main effects
- h. no main effects, no interaction
6. Based on the data below, what are the results?

<table>
<thead>
<tr>
<th>Age</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Humorous</td>
<td>Factual</td>
</tr>
<tr>
<td>Adults</td>
<td>75</td>
<td>45</td>
</tr>
<tr>
<td>Teenagers</td>
<td>65</td>
<td>55</td>
</tr>
</tbody>
</table>

a. main effect Type of Commercial  
b. main effect Age  
c. both main effects  
d. interaction  
e. interaction & main effect Type of Commercial  
f. interaction & main effect Age  
g. interaction & both main effects  
h. no main effects, no interaction

7. Based on the data below, what are the results?

<table>
<thead>
<tr>
<th>Age</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Humorous</td>
<td>Factual</td>
</tr>
<tr>
<td>Adults</td>
<td>85</td>
<td>45</td>
</tr>
<tr>
<td>Teenagers</td>
<td>45</td>
<td>45</td>
</tr>
</tbody>
</table>

a. main effect Type of Commercial  
b. main effect Age  
c. both main effects  
d. interaction  
e. interaction & main effect Type of Commercial  
f. interaction & main effect Age  
g. interaction & both main effects  
h. no main effects, no interaction
**Scenario:** Dr. Sikov examines whether persuasive messages are more effective when they are written (e.g., a newspaper editorial) or delivered visually (e.g., a T.V. editorial). He also wants to know whether message effectiveness depends on a person's level of education. Sixty adults who have graduated from college and sixty adults who never attended college are randomly assigned to either a written message condition or to a visual message condition (this yields 30 participants in each of the 4 conditions). The written and visual messages, which have identical content, argue in favor of a large increase in gasoline taxes. The dependent variable is the participants' rating of how much they agree with the message, using a 10 point scale (1 = Totally Disagree; 10 = Totally Agree). **Assume that any difference of 1 full point or more is statistically significant.**

**LAB EXAMPLE 1**

Agreement with Message as a Function of Method of Delivery and Education Level

Main Effect: Method of Delivery?

Main Effect: Education Level?

Interaction?
LAB EXAMPLE 2

Agreement with Message as a Function of Method of Delivery and Education Level

Main Effect: Method of Delivery?

Main Effect: Education Level?

Interaction?
Main Effect: Method of Delivery?

Main Effect: Education Level?

Interaction?
Main Effect: Method of Delivery?
Main Effect: Education Level?
Interaction?
LAB EXAMPLE 5

Agreement with Message as a Function of Method of Delivery and Education Level

Main Effect: Method of Delivery?
Main Effect: Education Level?
Interaction?
Main Effect: Method of Delivery?

Main Effect: Education Level?

Interaction?
LAB EXAMPLE 7

Agreement with Message as a Function of Method of Delivery and Education Level

Main Effect: Method of Delivery?

Main Effect: Education Level?

Interaction?
Agreement with Message as a Function of Method of Delivery and Education Level

Main Effect: Method of Delivery?

Main Effect: Education Level?

Interaction?
**Scenario:** Let's stay with the same scenario and independent variables as we had for figures. Once again, the dependent variable is the participants’ rating of how much they agree with the message, using a 10 point scale (1 = Totally Disagree; 10 = Totally Agree). **Assume that any difference of 1 full point or more is statistically significant.**

**PRACTICE EXAMPLE 1**

**Agreement with Message as a Function of Method of Delivery and Education Level**

- **Main Effect: Method of Delivery?**
- **Main Effect: Education Level?**
- **Interaction?**
PRACTICE EXAMPLE 2

Agreement with Message as a Function of Method of Delivery and Education Level

Main Effect: Method of Delivery?

Main Effect: Education Level?

Interaction?
Main Effect: Method of Delivery?

Main Effect: Education Level?

Interaction?
Agreement with Message as a Function of Method of Delivery and Education Level

Main Effect: Method of Delivery?
Main Effect: Education Level?
Interaction?
Main Effect: Method of Delivery?

Main Effect: Education Level?

Interaction?
Agreement with Message as a Function of Method of Delivery and Education Level

Main Effect: Method of Delivery?
Main Effect: Education Level?
Interaction?
Main Effect: Method of Delivery?

Main Effect: Education Level?

Interaction?
ANSWERS

Tables
1. "d"
2. "a"
3. "c"
4. "f"
5. "b"
6. "e"
7. "g"

Figures
1. Main effect Education Level
2. Main effect Method of Delivery
3. Both main effects
4. Main effect Method of Delivery & interaction
5. Main effect Education Level & interaction
6. Interaction
7. Both main effects & interaction (f.y.i: this is an ordinal interaction)
8. Both main effects & interaction (f.y.i: this is a disordinal interaction)

Bar Graphs
1. Interaction
2. Main effect Method of Delivery
3. Both main effects
4. Main effect Education Level & interaction
5. Both main effects and interaction
6. Both main effects and interaction
7. Main effect Education Level