Educational Psychology
Introduction/Research Methods

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My Background???

B = E x B'

B = E x B'
Behavior Environ. Biological
Variables Variables

NATURE-NURTURE debate
In any science we focus on events that occur and often ask several questions about those events:

- what happened?
- how did it happen?
- why did it happen?

A time sequence:

```
\[ \begin{array}{c}
1 & 2 & 3 \\
\hline
1 & 2 & 3 \\
\end{array} \]
```

Instr.  ??  Not Working

Why Research??

Why should I be concerned with research?

Isn’t teaching just common sense??

Shouldn’t I just do what “feels right” to me and what works for me?”
Sometimes, what seems to be common sense, may not be right.

Sometimes, what seems to be intuitive or obvious may not be correct.

For Example:
- The more money spent on education, the better the product with regard to student achievement???
- Is scolding students is an effective method of managing misbehavior.
- Should students change answers on multiple choice tests?? (…or…is your first hunch is your best hunch on tests??)

Benjamin, Cavell, & Shallenberger (1984)
- Asked 58 college faculty whether changing answers on tests is a good idea
- Like most students, the dominant belief among faculty was that changing answers hurts the score.
Beliefs among 58 surveyed faculty members:

- Hurts the score (55.2%)
- Improves the score (15.5%)
- Doesn’t change score (10.3%)
- Don’t know (19.0%)

Beliefs about the effects of changing answers on Multiple Choice tests

Benjamin, et al. (1984) (continued)

- These researchers then reviewed 20 actual studies on this issue (students taking tests and changing answers) and found......
Benjamin, Cavell, & Shallenberger (1984)

Actual effects of changing answers:
- Change wrong to right  (57.8%)
- Change right to wrong  (20.2%)
- Change wrong to wrong (22.0%)

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Actual effects of changing answers on multiple Choice tests

<table>
<thead>
<tr>
<th>Type of Change</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Right to wrong</td>
<td>20.2%</td>
</tr>
<tr>
<td>Wrong to right</td>
<td>57.8%</td>
</tr>
<tr>
<td>Wrong to wrong</td>
<td>22%</td>
</tr>
</tbody>
</table>

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Benjamin, et al. (1984) (continued)

- So.....
- The results of these reviewed studies showed that changing answers generally increased rather than reduced students’ test scores.
- Note the difference between beliefs about changing answers and the actual research-based results of this practice.
Hold on to your seats!!!....
Observe the psychic at work!!!

Research Methods
1. Descriptive/Correlational Research
2. Experimental Research

Descriptive/Correlational Research
- Goal: Observe and describe behavior
- Discover links or associations between variables
- Weakness: Does NOT explain causes of behavior
2 different measures:
1. Info from parents on their kids viewing habits
2. Peers' ratings of aggression of these kids.

Result #1

<table>
<thead>
<tr>
<th>Violence in Fav. Programs</th>
<th>Ratings of Agg.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Result #2

<table>
<thead>
<tr>
<th>Total TV Time</th>
<th>Ratings of Agg.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Correlation is an index or estimate of how two factors or two variables are related.

Correlation Coefficient \( r \)

\[ -1.00 \quad \leftrightarrow \quad +1.00 \]

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**Two Features of \( r \):**

1. **Size of coefficient (\( r \))**
   - How close to zero or +/- 1.00
   - Shows strength of relationship

   - Closer the coefficient is to -1.00 or +1.00, the stronger the relationship (i.e., the greater the correlation).

   - Closer it is to Zero, the weaker the relationship or correlation.

   \[ r = -0.65 \text{ is same size as } r = +0.65 \]
2. **Sign of coefficient (pos/neg)**
- shows direction of relationship
- Pos Corr - Both variables change in same direction
  - As one increases the other increases
  - As one decreases the other decreases
  - Examples:
    - (Height and Weight)
    - (Amt of Study time and GPA)

- Neg Corr - Both variables change in opposite directions
  - As one increases the other decreases (and vice versa) (# of cigarettes smoked and # of years of life expectancy)

- **all** correlations involve relationship between two variables or measures

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**What is the correlation between:**

**HEIGHT AND IQ??**
What is the strongest relationship or correlation below?? Weakest??

+.95    -.95
+.02    +.97
-.05    -.17
-.98    +.03

What is a Perfect Correlation??

Positive and Negative correlation

Interpreting correlation coefficients
Back to TV example:

Result #1 (What kind of corr??)

Positive Correlation:
- As amount of violence in favorite programs increase for the group, ratings of aggression increase.
- As one variable increases, the other increases.

![Positive Correlation Graph]

Result #2 (What kind of corr??)

Negative Correlation:
- As total TV time increases for the group, ratings of aggression decrease (inverse relationship).
- As one variable increases, the other decreases.
CAUTION!!!!!

- Correlation does **not** mean Causation
- All correlation means is that the two variables are related.
- Correlation doesn’t tell us anything about what caused what.

Given a correlation between two variables there are 3 possibilities:
- A caused B
- B caused A
- C accounts for both A and B
If all we know are the results of a correlational study, without any other info, we CAN'T KNOW FOR SURE, which of those 3 possibilities is correct:

- Maybe kids who are already aggressive prefer to watch violent programs

2. EXPERIMENTAL STUDIES

- allow us to draw conclusions about cause and effect.
- we manipulate variables in particular ways and then measure the effects of these manipulations on behavior.

Study of Note-taking methods

- 90 High School Juniors (Males)
- mediocre typists
- asked to report to lab 7:00 pm
- We need to form 3 groups
- How should we assign to groups?
Randomly assign 30 subjects to each of 3 groups.

By randomly assigning, we assume that individual differences are evenly distributed, such that our groups do not differ in any systematic way before we get started.

1 Notes by Hand 2 Notes by Laptop 3 No Notes (Control Group)  
n=30  n=30  n=30

All 90 subjects treated identically:
- briefing period
- all watch same film
- all take same test
- all are in identical rooms

The only Difference for the groups:
- note taking method (Independent variable)
**Independent Variable:**
The variable that is manipulated or changed to see its effects on some outcome variable or measure.

*Examples:

**Dependent Variable:**
Is usually some behavior that is measured or observed...It’s an outcome variable or measure that is affected by the Independent Variable.

*Examples:

**Internal Validity:**
The extent to which the results of an experiment or study can be attributed to the Independent Variable ONLY.

**External Validity:**
The extent to which the results of an experiment or study can be generalized to different groups of subjects, different settings, etc.

**Strengths and Weaknesses of Experimental Research**

**Strengths:**
- Conclusions about cause-and-effect can be drawn

**Weaknesses:**
- Artificial nature of experiments
- Ethical and practical issues
End of Research
Methods