

# Educational Psychology

## *Introduction/Research Methods*

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## My Background???

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$$B = E \times B'$$

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

**NATURE-NURTURE** debate

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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?

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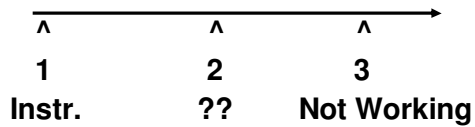
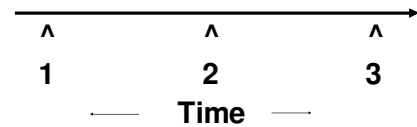
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A time sequence:



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## 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?"

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- Sometimes, what seems to be common sense, may not be right.
- Sometimes, what seems to be intuitive or obvious may not be correct.

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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??)

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**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.

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**Benjamin, Cavell, & Shallenberger (1984)**

**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%)

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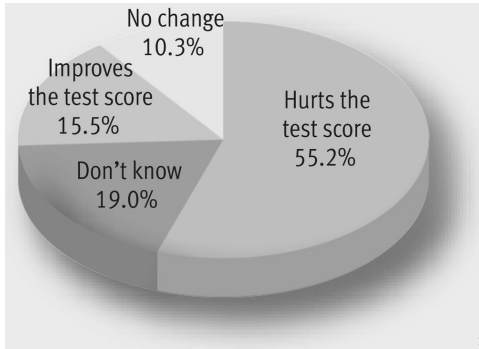
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**Beliefs about the effects of changing answers on Multiple Choice tests**



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**Benjamin, et al. (1984) (continued)**

- These researchers then reviewed 20 actual studies on this issue (students taking tests and changing answers) and found.....

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**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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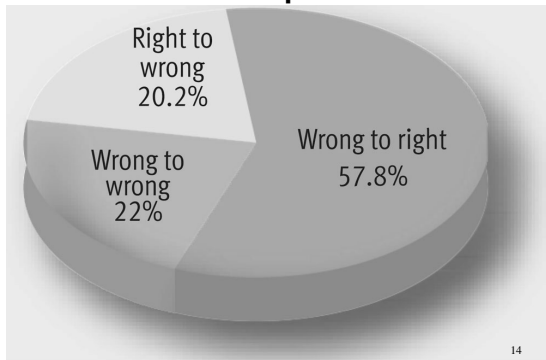
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**Actual effects of changing answers on multiple Choice tests**



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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.**

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**Hold on to your seats!!!.....**

**Observe the psychic at work!!!**



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### **Research Methods**

- 1. Descriptive/Correlational Research**
- 2. Experimental Research**

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### **Descriptive/Correlational Research**

- Goal: Observe and describe behavior**
- Discover links or associations between variables**
- Weakness: Does NOT explain causes of behavior**

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**2 different measures:**

**1. Info from parents on their kids viewing habits**

**2. Peers' ratings of aggression of these kids.**

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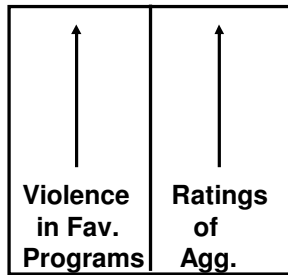
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**Result #1**



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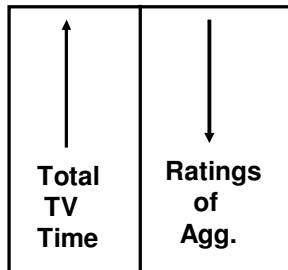
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**Result #2**



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**Correlation is an index or estimate of how two factors or two variables are related.**

**Correlation Coefficient  $r$**

**-1.00   ←————→   + 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).

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

**$r = -.65$  is same size as  $r = +.65$**

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**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)

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- 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??**

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**What is the strongest relationship or correlation below?? Weakest??**

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

**What is a Perfect Correlation??**

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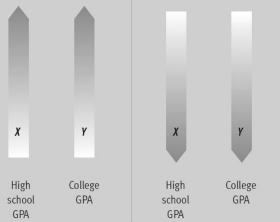
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### Positive and Negative correlation

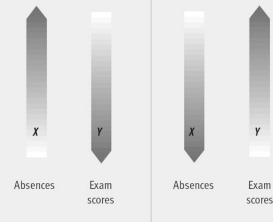
**Positive correlation**

High scores on X are associated with high scores on Y, and low scores on X are associated with low scores on Y.



**Negative correlation**

High scores on X are associated with low scores on Y, and low scores on X are associated with high scores on Y.



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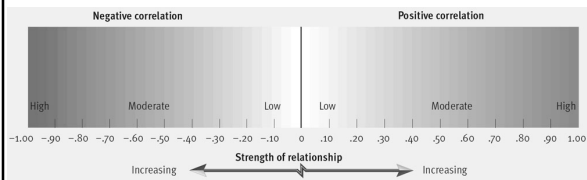
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### Interpreting correlation coefficients



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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.

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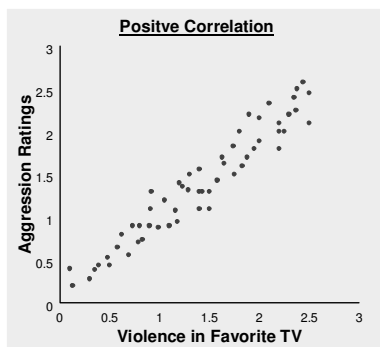
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Result #2 (What kind of corr??)

Negative Correlation:

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

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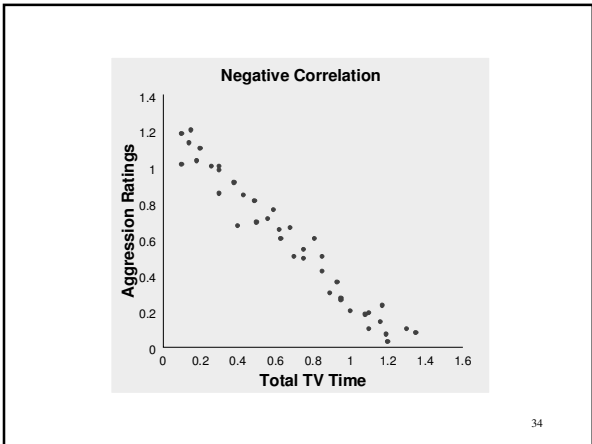
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**CAUTION!!!!**

- 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.



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**Given a correlation between two variables there are 3 possibilities:**

- A caused B
- B caused A
- C accounts for both A and B

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- 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

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## 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.

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### 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?

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- **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.

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<b>1</b>	<b>2</b>	<b>3</b>
<b>Notes by Hand</b>	<b>Notes by Laptop</b>	<b>No Notes (Control Group)</b>
<b><u>n</u>=30</b>	<b><u>n</u>=30</b>	<b><u>n</u>=30</b>

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**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)

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**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:

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**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.

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**Strengths and Weaknesses of Experimental Research**

Strengths:

- Conclusions about cause-and-effect can be drawn

Weaknesses:

- Artificial nature of experiments
- Ethical and practical issues

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## End of Research Methods



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