Lesson Plan 1: Green Space Exposure and Self-Perceived Anxiety

Objectives:
-SWBAT define what green space is and list several specific examples of green space in Brooklyn
-SWBAT define what anxiety is and give examples of symptoms of anxiety
-SWBAT develop ways that people could reduce anxiety levels based on what they have learned about green space and anxiety

Lesson Duration: 1 hour

Aim: What is green space? Can exposure to green spaces lower anxiety levels?

Do Now: Students will work in pairs and will be asked to write down what they think green space is and to list 3 examples of green spaces in Brooklyn. Students will be also asked to write down what they think anxiety is and give an example of an event when people usually experience anxiety. Students will share their thoughts.

MATERIALS:

-Lesson plan
-laptop and projector
-Powerpoint presentation (Green space and Anxiety: Is there a Correlation?)
-research articles on green space and anxiety

Procedure:
1. Give definition of green space and show various types of green space, including specific examples in Brooklyn.

2. Give definition of anxiety and various symptoms of anxiety, citing specific instances in which people tend to experience high anxiety (i.e. taking tests, dental visits).

3. Introduce the major research project: Green space exposure and self-perceived anxiety. Have a guided practice session where students think about whether there is a relationship between exposure to green space and anxiety levels. Since this is an introduction to the study, we will keep the hypothesis non-directional for now (since Hypothesis testing is lesson 4b): There is a relationship between green space exposure and self-perceived anxiety.

Homework:
Read the following articles on greenspace and anxiety and write a 2-page literature review:

Bullock, C. H. (2008). Valuing urban green space: hypothetical alternatives and the status quo.
        Journal of Environmental Planning and Management 51(1), 15-35.
Henker, B, Whalen, C., Jamner, L. & Delfino, R. (2002). Anxiety, affect, and activity in
        teenagers: monitoring daily life with electronic diaries. Journal of the American Academy
        of Child and Adolescent Psychiatry. 41(6), 660-670.

Lesson Plan 1: Green Space Exposure and Self-Perceived Anxiety

Objectives:
-SWBAT define what green space is and list several specific examples of green space in Brooklyn
-SWBAT define what anxiety is and give examples of symptoms of anxiety
-SWBAT develop ways that people could reduce anxiety levels based on what they have learned about green space and anxiety

Lesson Duration: 1 hour

Aim: What is green space? Can exposure to green spaces lower anxiety levels?

Do Now: Students will work in pairs and will be asked to write down what they think green space is and to list 3 examples of green spaces in Brooklyn. Students will be also asked to write down what they think anxiety is and give an example of an event when people usually experience anxiety. Students will share their thoughts.

MATERIALS:

-Lesson plan
-laptop and projector
-Powerpoint presentation (Green space and Anxiety: Is there a Correlation?)
-research articles on green space and anxiety

Procedure:
1. Give definition of green space and show various types of green space, including specific examples in Brooklyn.

2. Give definition of anxiety and various symptoms of anxiety, citing specific instances in which people tend to experience high anxiety (i.e. taking tests, dental visits).

3. Introduce the major research project: Green space exposure and self-perceived anxiety. Have a guided practice session where students think about whether there is a relationship between exposure to green space and anxiety levels. Since this is an introduction to the study, we will keep the hypothesis non-directional for now (since Hypothesis testing is lesson 4b): There is a relationship between green space exposure and self-perceived anxiety.

Homework:
Read the following articles on greenspace and anxiety and write a 2-page literature review:

Bullock, C. H. (2008). Valuing urban green space: hypothetical alternatives and the status quo. Journal of Environmental Planning and Management 51(1), 15-35.
Henker, B, Whalen, C., Jamner, L. & Delfino, R. (2002). Anxiety, affect, and activity in teenagers: monitoring daily life with electronic diaries. Journal of the American Academy of Child and Adolescent Psychiatry. 41(6), 660-670.

Green space and Anxiety: Is there a correlation?

What is Green space?

What is green space?

Green space: *n.* a plot of undeveloped land separating or surrounding areas of intensive residential or industrial use that is maintained for recreational enjoyment

Country Parks

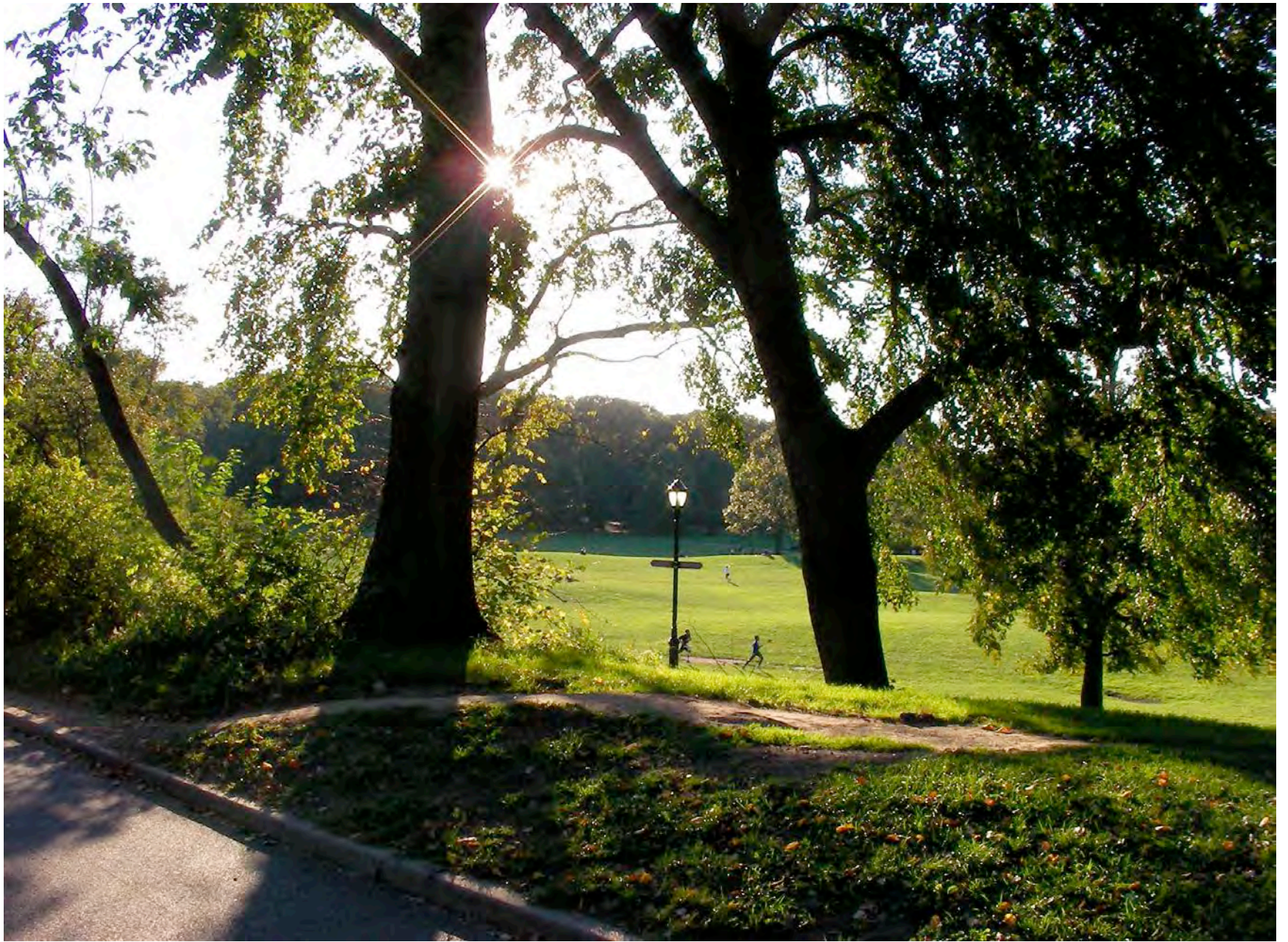Calderglen Country Park, Scotland

Nature Reserves

Niagara Glen Nature Reserve, Ontario, Canada

City Parks

Central Park, New York City

Prospect Park, Brooklyn

Green Urban Landscapes

Cheonggyecheon Stream, Seoul, Korea

Rooftop Garden

New York
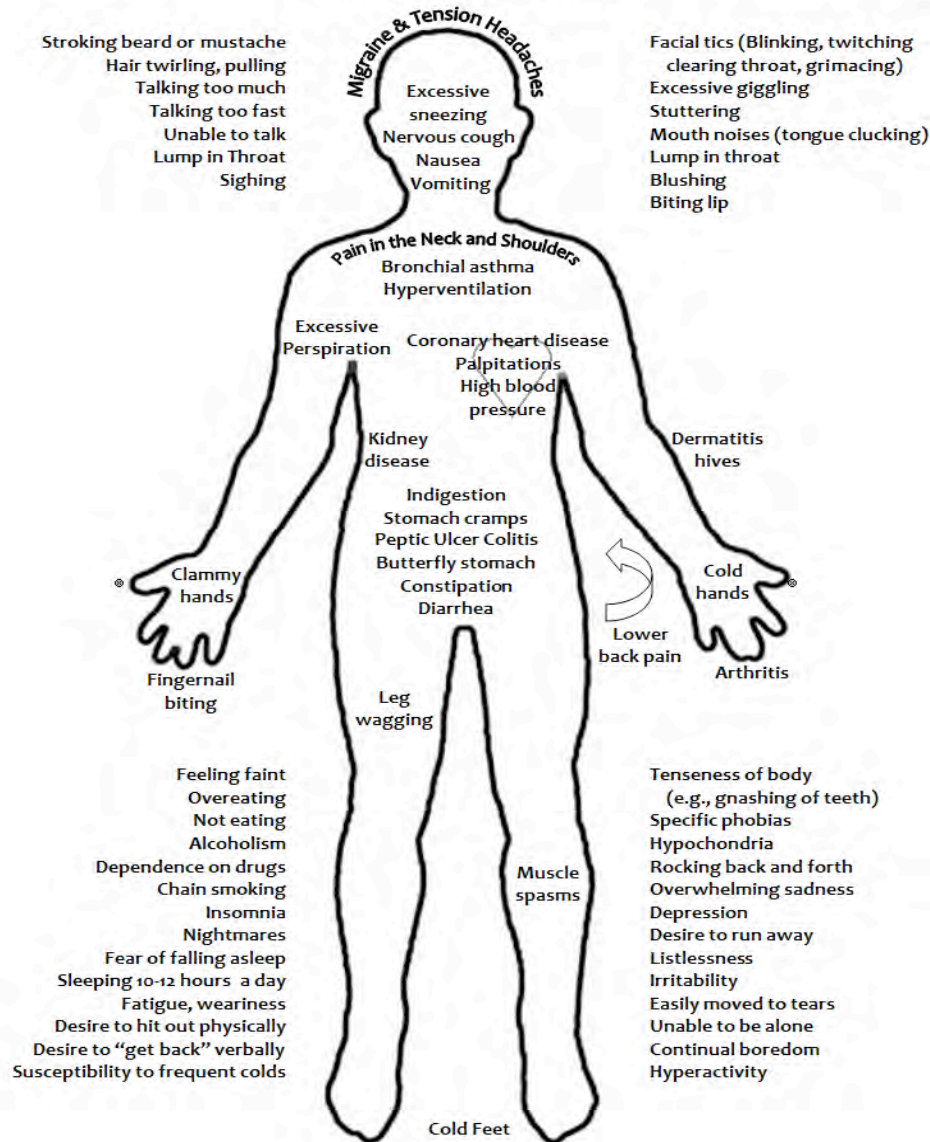
What is Anxiety?

What is Anxiety?

Definition:

• Normal *sustained* reaction to stress

• Helps one cope with tense situations

• If becomes excessive, irrational dread of everyday situations, it can turn into a debilitating disorder

Examples of Anxiety Disorders:

• Generalized Anxiety Disorder

• Obsessive-Compulsive Disorder (OCD)

• Panic Disorder

• Post-traumatic Stress Disorder (PTSD)

• Social Anxiety Disorder

COMMON ANXIETY SYMPTOMS

Migraine & Tension Headaches

Stroking beard or mustache
Hair twirling, pulling
Talking too much
Talking too fast
Unable to talk
Lump in Throat
Sighing

Excessive sneezing
Nervous cough
Nausea
Vomiting

Facial tics (Blinking, twitching
clearing throat, grimacing)
Excessive giggling
Stuttering
Mouth noises (tongue clucking)
Lump in throat
Blushing
Biting lip

Pain in the Neck and Shoulders

Bronchial asthma
Hyperventilation

Excessive Perspiration

Coronary heart disease
Palpitations
High blood pressure

Kidney disease

Dermatitis hives

Indigestion
Stomach cramps
Peptic Ulcer Colitis
Butterfly stomach
Constipation
Diarrhea

Clammy hands

Cold hands

Lower back pain

Fingernail biting

Leg wagging

Arthritis

Feeling faint
Overeating
Not eating
Alcoholism
Dependence on drugs
Chain smoking
Insomnia
Nightmares
Fear of falling asleep
Sleeping 10-12 hours a day
Fatigue, weariness
Desire to hit out physically
Desire to "get back" verbally
Susceptibility to frequent colds

Muscle spasms

Tenseness of body
(e.g., gnashing of teeth)
Specific phobias
Hypochondria
Rocking back and forth
Overwhelming sadness
Depression
Desire to run away
Listlessness
Irritability
Easily moved to tears
Unable to be alone
Continual boredom
Hyperactivity

Cold Feet

What makes you anxious?

Dental visits: Dental Anxiety

Taking tests: Test Anxiety

"Tests make you nervous and break out in *what*?"

Interacting with others/giving presentations: Social Anxiety

Research Project: What is the effect of green space on self-perceived anxiety?

Is there a relationship between green space and anxiety?

- What are some ways you think green space is related to anxiety?

  - Positive effects?
  - Negative effects?

Homework Assignment: due 12/13

Read the following articles on green space and anxiety and write a 2-pg literature review:

Bullock, C. (2008). The role and use of urban open space: hypothetical alternatives and the status quo. *Journal of Environmental Planning and Management.* 51(1), 15-35.

Henker, B., Whalen, C., Jamner, L. & Delfino, R. (2002). Anxiety, affect and activity in teenagers: monitoring daily life with electronic diaries. *Journal of the American Academy of Child and Adolescent Psychiatry.* 41(6), 660-670.

Green space and Anxiety: Is there a correlation?

What is Green space?

What is green space?

Green space: *n.* a plot of undeveloped land separating or surrounding areas of intensive residential or industrial use that is maintained for recreational enjoyment

Country Parks

Calderglen Country Park, Scotland

Nature Reserves

Niagara Glen Nature Reserve, Ontario, Canada

City Parks

Central Park, New York City

Prospect Park, Brooklyn

Green Urban Landscapes

Cheonggyecheon Stream, Seoul, Korea

Rooftop Garden

New York

What is Anxiety?

What is Anxiety?

Definition:

• Normal *sustained* reaction to stress

• Helps one cope with tense situations

• If becomes excessive, irrational dread of everyday situations, it can turn into a debilitating disorder

Examples of Anxiety Disorders:

• Generalized Anxiety Disorder

• Obsessive-Compulsive Disorder (OCD)

• Panic Disorder

• Post-traumatic Stress Disorder (PTSD)

• Social Anxiety Disorder

COMMON ANXIETY SYMPTOMS

Migraine & Tension Headaches

Stroking beard or mustache
Hair twirling, pulling
Talking too much
Talking too fast
Unable to talk
Lump in Throat
Sighing

Excessive sneezing
Nervous cough
Nausea
Vomiting

Facial tics (Blinking, twitching
clearing throat, grimacing)
Excessive giggling
Stuttering
Mouth noises (tongue clucking)
Lump in throat
Blushing
Biting lip

Pain in the Neck and Shoulders

Bronchial asthma
Hyperventilation

Excessive Perspiration

Coronary heart disease
Palpitations
High blood pressure

Kidney disease

Dermatitis hives

Indigestion
Stomach cramps
Peptic Ulcer Colitis
Butterfly stomach
Constipation
Diarrhea

Clammy hands

Cold hands

Lower back pain

Fingernail biting

Leg wagging

Arthritis

Feeling faint
Overeating
Not eating
Alcoholism
Dependence on drugs
Chain smoking
Insomnia
Nightmares
Fear of falling asleep
Sleeping 10-12 hours a day
Fatigue, weariness
Desire to hit out physically
Desire to "get back" verbally
Susceptibility to frequent colds

Muscle spasms

Tenseness of body
(e.g., gnashing of teeth)
Specific phobias
Hypochondria
Rocking back and forth
Overwhelming sadness
Depression
Desire to run away
Listlessness
Irritability
Easily moved to tears
Unable to be alone
Continual boredom
Hyperactivity

Cold Feet

What makes you anxious?

Dental visits: Dental Anxiety

Taking tests: Test Anxiety

"Tests make you nervous and break out in *what*?"

Interacting with others/giving presentations: Social Anxiety

Research Project: What is the effect of green space on self-perceived anxiety?

Is there a relationship between green space and anxiety?

- What are some ways you think green space is related to anxiety?

    – Positive effects?
    – Negative effects?

Homework Assignment: due 12/13

Read the following articles on green space and anxiety and write a 2-pg literature review:

Bullock, C. (2008). The role and use of urban open space: hypothetical alternatives and the status quo. *Journal of Environmental Planning and Management.* 51(1), 15-35.

Henker, B., Whalen, C., Jamner, L. & Delfino, R. (2002). Anxiety, affect and activity in teenagers: monitoring daily life with electronic diaries. *Journal of the American Academy of Child and Adolescent Psychiatry.* 41(6), 660-670.

Lesson Plan 2: Green Space Exposure and Self-Perceived Anxiety

Objectives:
-SWBAT define what a survey is what it measures
-SWBAT consider which type of survey will be appropriate for the current research study
-SWBAT identify ways to minimize measurement error, by considering validity and reliability
-SWBAT explain different kinds of question items typically used in surveys: open-ended and various types of multiple choice questions
-SWBAT determine ways of developing research questions, keeping the prospective participants in mind

Lesson Duration: 1 hour

Aim: What is the method of testing would be appropriate for our current research project?

Do Now: Students will work in groups and will be asked to think about 2 ways we could test green-space exposure and self-perceived anxiety. Students will share their thoughts.

Materials:

-Lesson plan
-laptop and projector
-Powerpoint presentation (What is a Survey?)

Procedure:

1. Give definition of what a survey is and explain what a survey measures.

2. Explain ways that researchers try to minimize measurement error. Give definitions of *validity* and *reliability*.

3. Give different types of surveys used in social research (i.e. face-to-face interview, telephone interview, written questionnaire. Ask students to decide which type of survey they think will be appropriate for this study (written questionnaire).

4. Give examples of types of survey questions: open-ended and 3 types of multiple choice questions. Explain that open-ended questions are difficult to answer and will generate many different kinds of responses, and that they are typically used for qualitative data and exploratory research.

5. Discuss some tips that will be helpful in developing survey questions:
    -Making sure survey questions match research objectives
    -Think about the research participants you plan to test
    -Use natural and familiar language. Consider age and educational level when phrasing questions

Do Now:
(10 minutes)

In your group, think of 2 ways we could test green space exposure and self-perceived anxiety and be prepared to discuss your answers with the class.

Do Now: (10 minutes)

Which testing measure would be appropriate for this study?

We'll be using the survey method to conduct this study…

What is a Survey?

What is a Survey?

- <u>Survey</u>: *n.* a method for collecting information from individuals in a sample in order to learn about the larger population

What does a Survey Measure?

- Demographic information: age, gender, grade, ethnicity, religion

- Attitudes and opinions about ideas, emotions or products

Types of Surveys used in Social Research

- Face-to-face interview

- Telephone interview

- Written questionnaire

- Web survey

Face-to-face Interview

Telephone Interview

Written Questionnaire

SCRUEM, OVA, AGIN & AGIN PROPERTIES
The "Trusted" Name In Time Share

Attendee's Questionnaire

1. How many of your family members are vegetarian? _____ Vegan? _____

2. Any other food issues we should take into account? (allergies, no red meat, etc.)

_____

3. How many of your family members like each of the following beverages:

Coke _____   Diet Coke _____   Red Bull _____   Mountain Dew _____

Juice _____   Gatorade _____   Iced Tea _____   Sprite _____

Other (specify) _____

4. How many of your family members like each of the following snack categories:

Salty _____   Sweet _____   Cheesy _____   Bland _____

5. How many of your family members like each of the following foods:

Apples _____   Oranges _____   Trail Mix _____   Energy Bars _____

6. Here in the desert, we respect the native wildlife. Please let us know which member of your family will be associated with each of the following desert dwellers. No doubling up--if you have fewer than six family members, leave one or two blank.

a. The Cactus is adept at finding and storing liquids. _____

b. The Coyote is a trickster, never to be trusted. _____

c. The Jackrabbit is swift and nimble-footed _____

d. The Rattlesnake projects its venom straight and far. _____

e. The Road Runner escapes capture with quick wits. _____

f. The Scorpion whips its tail with speed and accuracy. _____

Please send your completed Attendee's Questionnaire to this address:
SOAA, 1820 Remembrance Hill St., Las Vegas, NV 89144-5420. Alternately, you can email the completed Attendee's Questionnaire to SOAA-Properties@excite.com or fax it to us at 413-826-0148. We need them by April 12th, so don't delay! Don't forget about the driver information, which can be included with the AQ if you mail it or fax it.

Web Survey

Which type of survey do you think we should use?

Types of Surveys used in Social Research

- Face-to-face interview

- Telephone interview

- Written questionnaire

- Web survey

Types of Surveys used in Social Research

- Face-to-face interview

- Telephone interview

- Written questionnaire
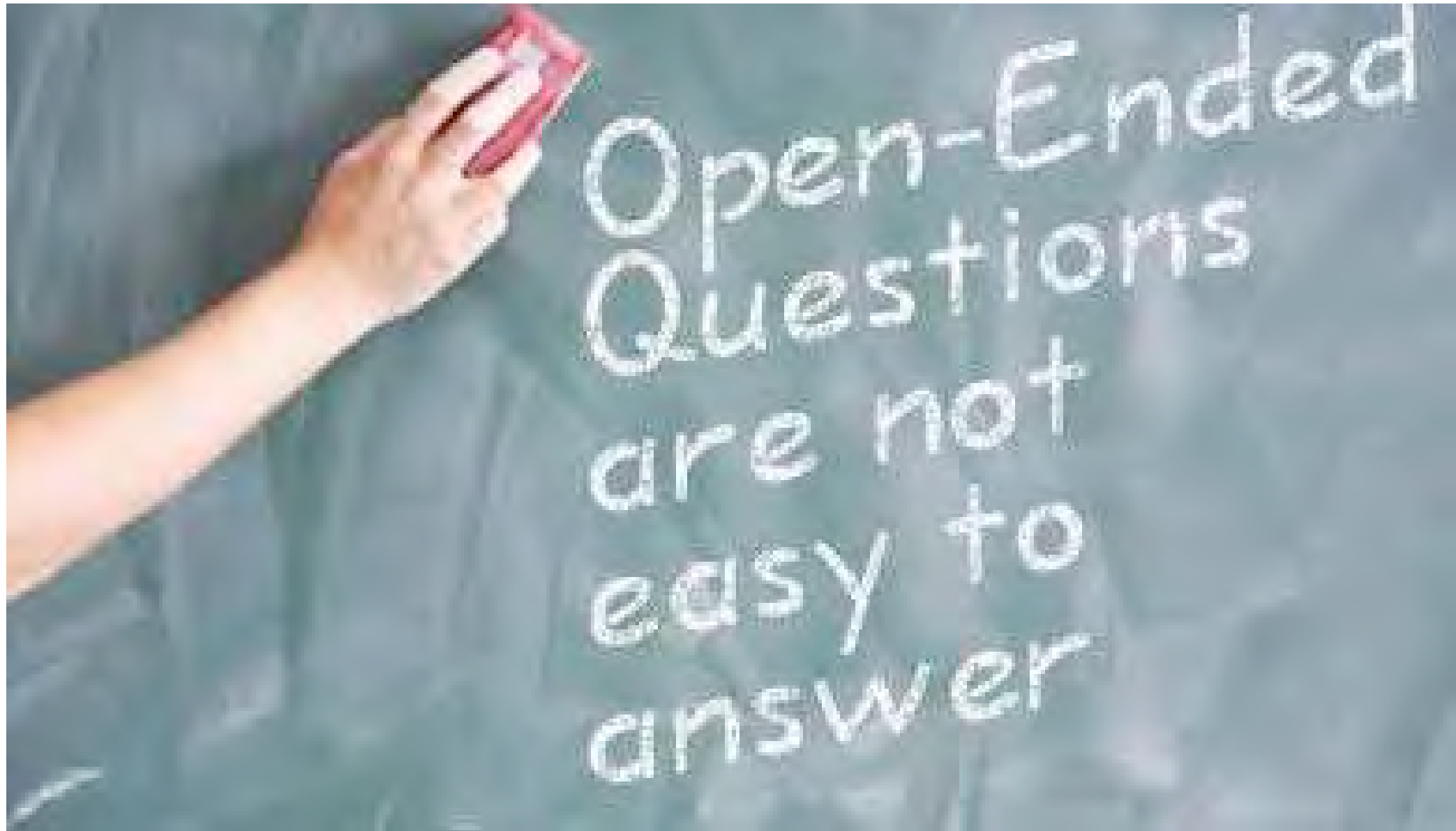
- Web survey

Types of Survey Questions

Open-ended Questions

Advantage: Allow people to answer questions the way they want

Ex: What is your favorite food?

Consider: What makes you happy?

Open-ended Questions

Multiple Choice Questions: 4 Kinds

- Categorical
- Likert-scale
- Ordinal
- Numerical

Categorical

Use when the possible choices are categories, and the participant must belong to one category

Ex: What is your education level?
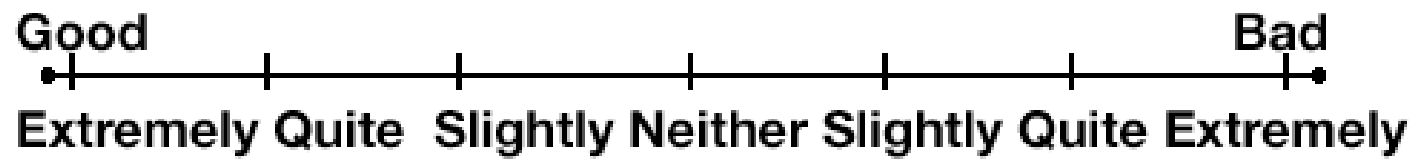
     O Freshman

     O Sophomore

     O Junior

     O Senior

Likert Scale

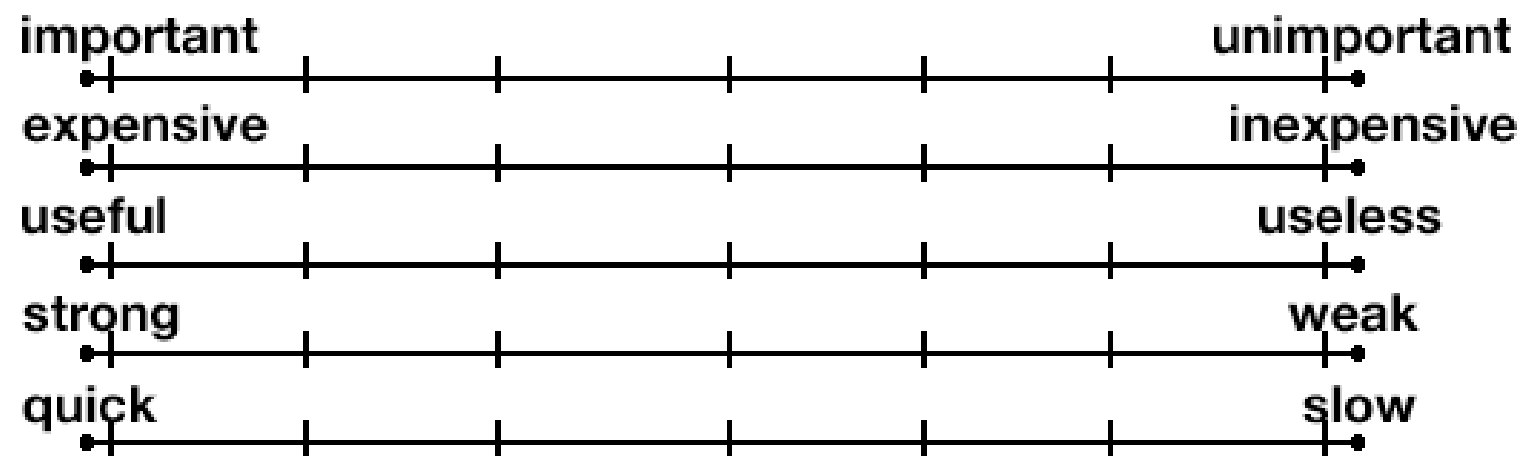Use a Likert-scale question when you want to determine the degree of a participant's attitudes about something

Ex: How important is education to you?

Likert Scale Ratings

Semantic scale

Good ──────────────────────────── Bad

Extremely Quite   Slightly Neither Slightly Quite Extremely

Semantic Differential Scale

important ──────────────────────── unimportant

expensive ──────────────────────── inexpensive

useful ──────────────────────────── useless

strong ──────────────────────────── weak

quick ──────────────────────────── slow

Strongly Disagree (1)	Disagree (2)	Disagree Somewhat (3)	Neutral (4)	Agree Somewhat (5)	Agree (6)	Strongly Agree (7)
O	O	O	O	O	O	O

Ordinal: Rank-Ordering

Please rank the importance of qualities in a team leader (1-5, 5 being *very important*)

_ A team leader that is sincere

_ A team leader that gets resources for the team

_ A team leader that is a good motivator

How to Reduce Measurement Error

- [Validity](#) - Does the survey measure what it claims to measure?

- [Reliability](#) - Does the survey produce consistent results over repeated trials?

Tips for Developing Survey Questions

- Make sure your survey questions match your research objectives

- Think about the research participants you plan to test

- Use natural and familiar language

  - Consider age and educational level when phrasing questions

Lesson Plan 3: Green Space Exposure and Self-Perceived Anxiety

Objectives:
-SWBAT reflect on different types of survey questions (ordinal, nominal, likert)
-SWBAT develop questions that would assess green space exposure

Lesson Duration: 1 hour

Aim: How do we assess green space exposure?

Do Now: Students will work independently and will be asked to write in their journals three questions designed to assess green space exposure.

Materials:
-Lesson plan
-chalkboard
-chalk

Procedure:

1. In their groups, students will share their green space questions. This part of the lesson is designed to promote lots of student interaction and collaborative thinking.

2. Ask students to explain what a survey measures and review the various types of survey questions.

3. Put the words "Green Space" on the board and circle it. Then ask students what synonyms/words come to mind when they hear the word "green space." The word associations yielded from this exercise will help to formulate their questions. Only write down words that are synonymous with "green space" (i.e. trees, parks, gardens). Refer to the first lesson for the definition to assist them.

4. Students will continue to formulate their questions for the rest of the class session. We will then look through the questions and make decisions about whether there are questions that need to be discarded because they are irrelevant, redundant or perhaps overlap with the anxiety measure. The definition of validity in research (the extent to which a test measures what it claims to measure) will be reinforced.

Homework: Students will finalize 20 questions that asks about green space exposure frequency.

Lesson Plan 4: Green Space Exposure and Self-Perceived Anxiety

Objectives:
-SWBAT explain what green space is and why it might have the potential to lower anxiety levels
-SWBAT develop the second part of their survey: anxiety measurement using the different types of survey questions (ordinal, nominal, likert)

Lesson Duration: 1 hour

Aim: How do we assess self-perceived anxiety?

Do Now: Students will work independently and will be asked to write in their journals three questions designed to assess self-perceived anxiety.

MATERIALS:

-Lesson plan
-chalkboard
-chalk

Procedure:

1. In their groups, students will share questions measuring self-perceived anxiety. This part of the lesson is designed to promote lots of student interaction and collaborative thinking.

2. Ask students to explain what a survey measures and review the various types of survey questions.

3. Put the word "Anxiety" on the board and circle it. Ask students to provide words that are synonymous with anxiety (irritation, nervous tension, agitation, etc). The word associations yielded from this exercise will help them develop different ways of asking about anxiety for their survey. Refer to the first lesson for the definition to assist them.

4. Students will continue to formulate their questions for the rest of the class session. We will then look through the questions and make decisions about whether there are questions that need to be discarded because they are either irrelevant, redundant or perhaps overlap with the green space exposure measure. The definition of validity in research (the extent to which a test measures what it claims to measure) will be reinforced.

Homework: Students will finalize 20 questions that ask about green space exposure frequency.

Lesson Plan 5: Green Space Exposure and Self-Perceived Anxiety

Objectives:
-SWBAT explain how an experiment is different from a study
-SWBAT understand that in correlational research, one cannot conclude that one variable causes the other
-SWBAT distinguish between the different kinds of relationships in correlational research: linear vs. non-linear, perfect vs. imperfect and positive vs. negative
-SWBAT graph their own predictions of what they think the relationship is between green space and anxiety and give a supporting argument for their prediction.

Lesson Duration: 1 hour

Aim: How do psychologists investigate and explain causes and patterns in the environment?

Do Now: Students will work independently and will be asked to write in their journals how they think a study is different from an experiment.

Materials:

-Lesson plan
-Chalkboard
-Chalk
-Laptop and Projector
-Powerpoint lecture: *How do Psychologists Investigate and Explain Causes and Patterns in Humans?*

Procedure:

1. In their groups, students will share their answers on how they think an experiment is different from a study.

2. Give the scientific definitions of an *experiment* and *study*.

3. Lead into an example in which 2 variables seem to have a relationship (Does eating Cheerios lower cholesterol?). Ask students to think of other causes that could explain this relationship. Explain that because there are multiple causes (including a possible third variable) that could explain the illusory association, correlation does not imply causation.

4. Give a list of words that researchers typically use to describe correlational research (i.e. pattern, trend, relationship, association). Reinforce that researchers do not use the words "cause," "effect" or any other terms that imply a directional relationship for a study.

5. Explain different kinds of relationships (linear vs. non-linear; perfect vs. imperfect; positive vs. negative) in correlational research and draw scatterplot graphs on the board. Mention that the only types of relationships that the majority of psychologists are interested in are positive and negative linear, imperfect relationships.

Homework: Have students graph their own predictions using a scatterplot about what they think the relationship is between green space exposure and self-perceived anxiety and give a reason that supports this prediction.
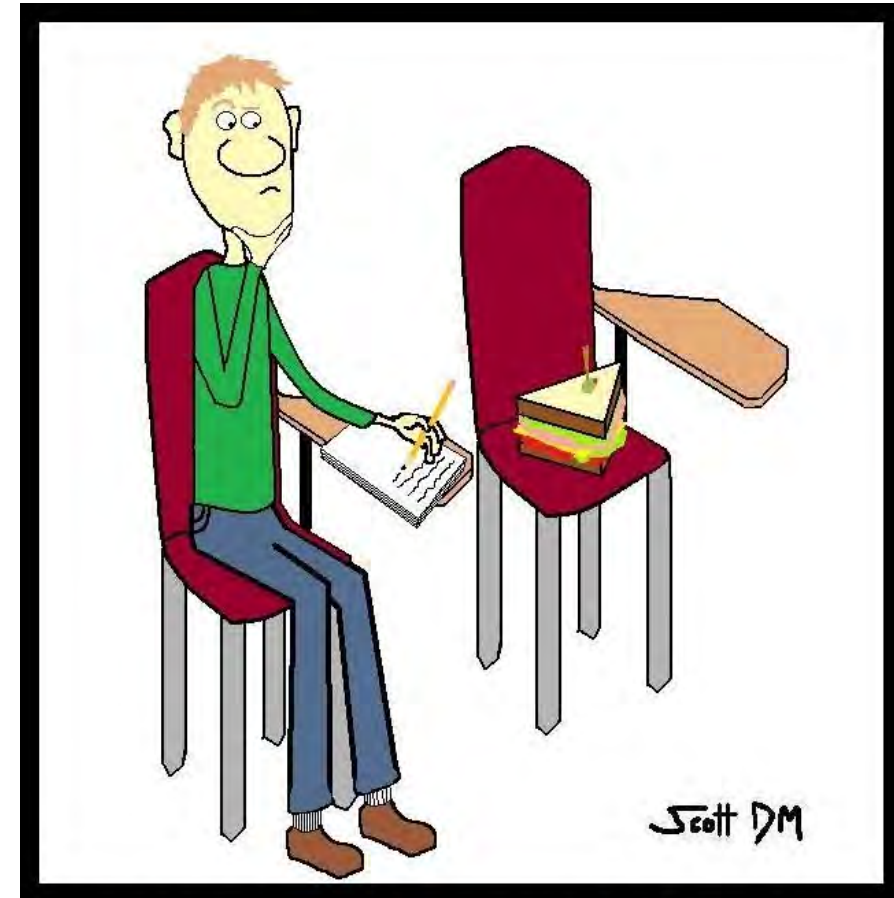
Do Now:

How is an experiment different from a study?

How do Psychologists
investigate and explain
causes and patterns in humans?

What is an Experiment?

- A deliberate manipulation or change in a real world setting created by an experimenter

- The manipulation/change is called the independent variable

- Dependent variable: what is being measured

An abandoned ham sandwich? Or Psychology Department experiment? There was no way Fred could tell for sure.

What is a Study?

- A study/correlational research looks at relationships between factors or variables

- No manipulation of variables

- Correlation: is the relationship, direction and magnitude between these variables
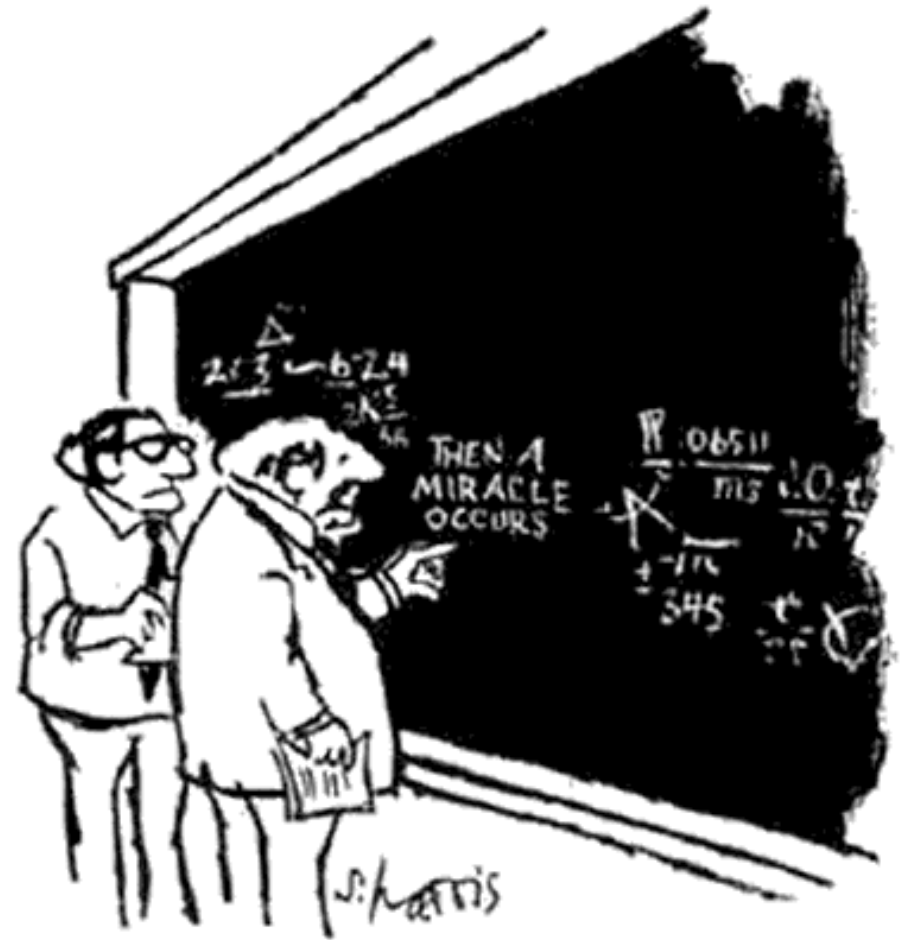
"I THINK YOU SHOULD BE MORE EXPLICIT HERE IN STEP TWO."
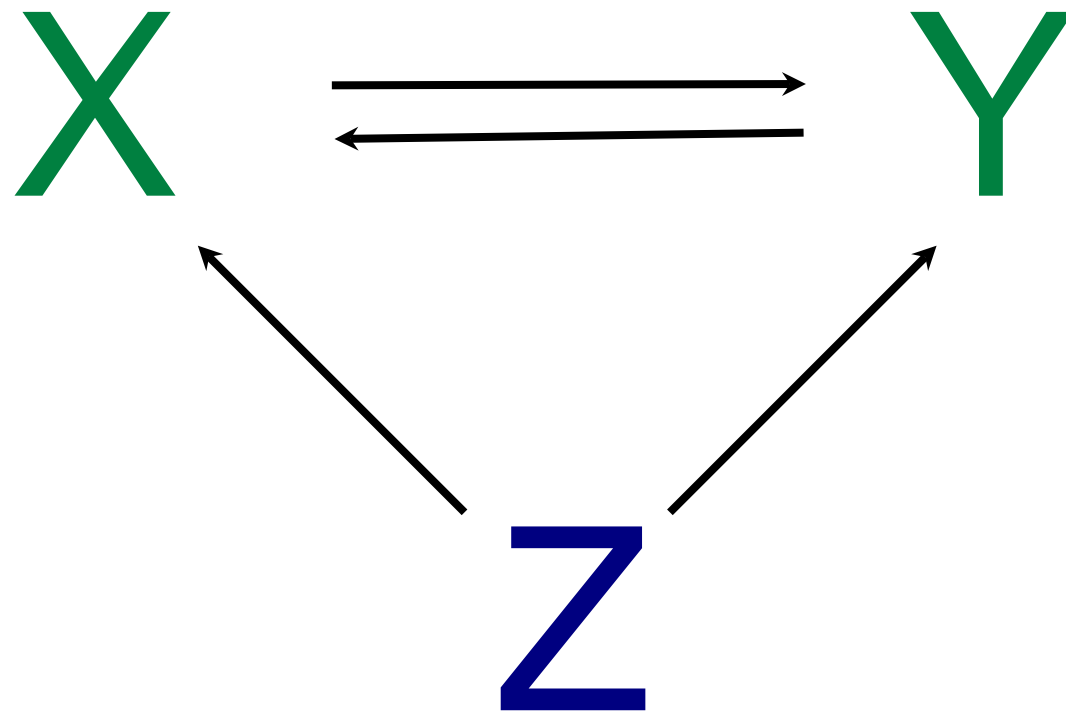
Does eating Cheerios lower cholesterol?

If X = eating Cheerios and

Y= lower cholesterol
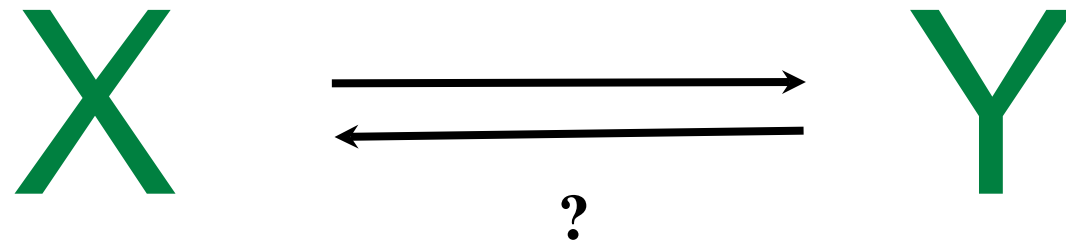
What about another factor?
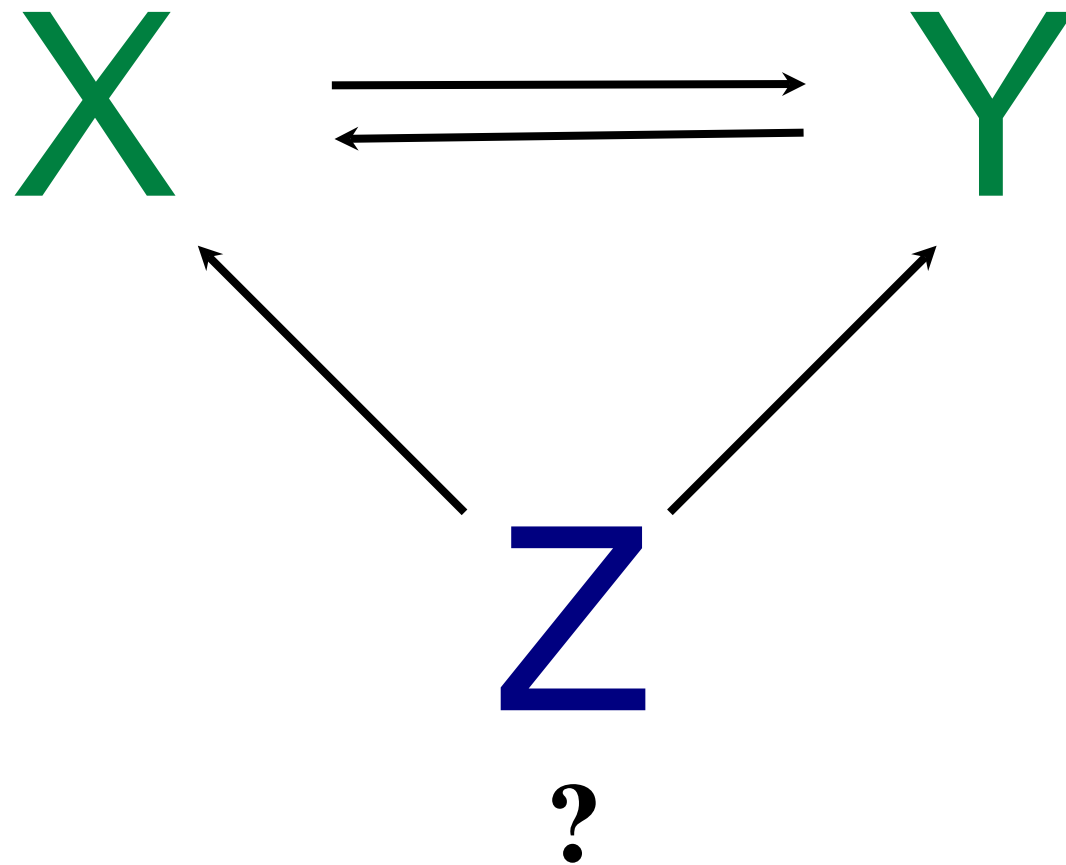
Correlation does not imply causation!

Sometimes correlation is an "accident"

Words/phrases that we use to describe studies

- correlation

- tend/tendency

- trend/trending

- pattern

- there is a relationship

- there is an association

Not "cause" or "effect"

So, why correlational research?

- Easier to conduct and analyze

- No correlation implies no causal link

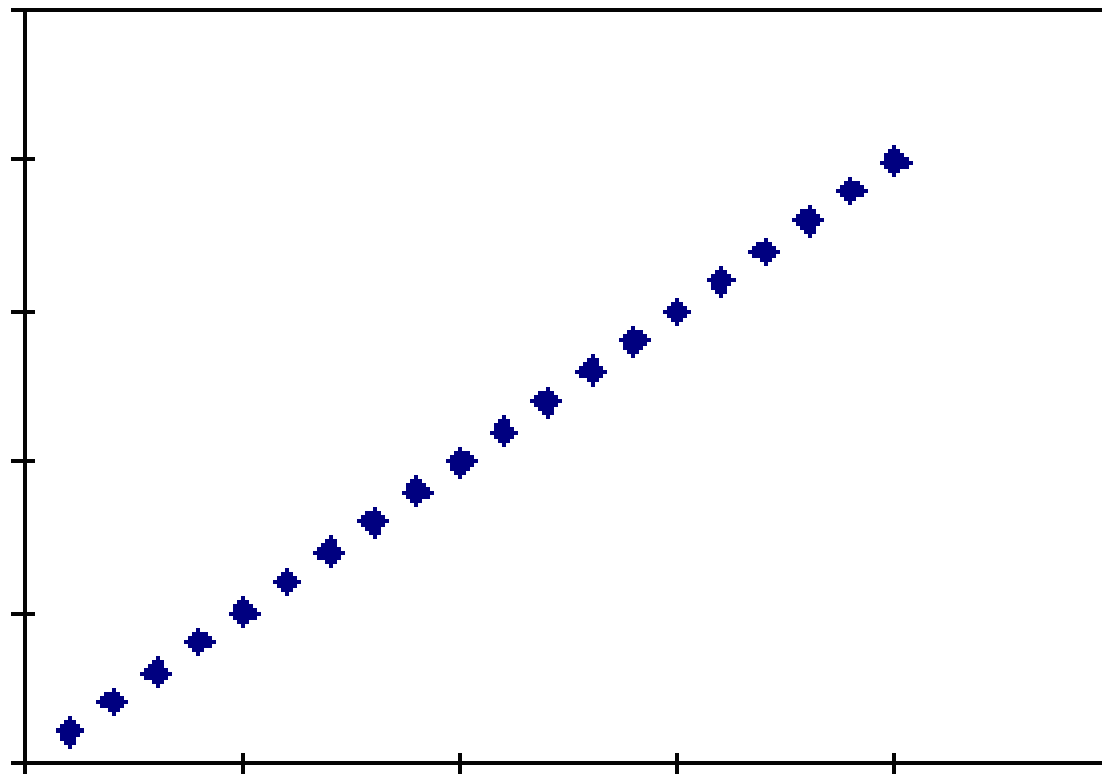- Can use for qualitative variables (i.e. gender)

Different Kinds of Relationships

- Linear vs. Non-linear

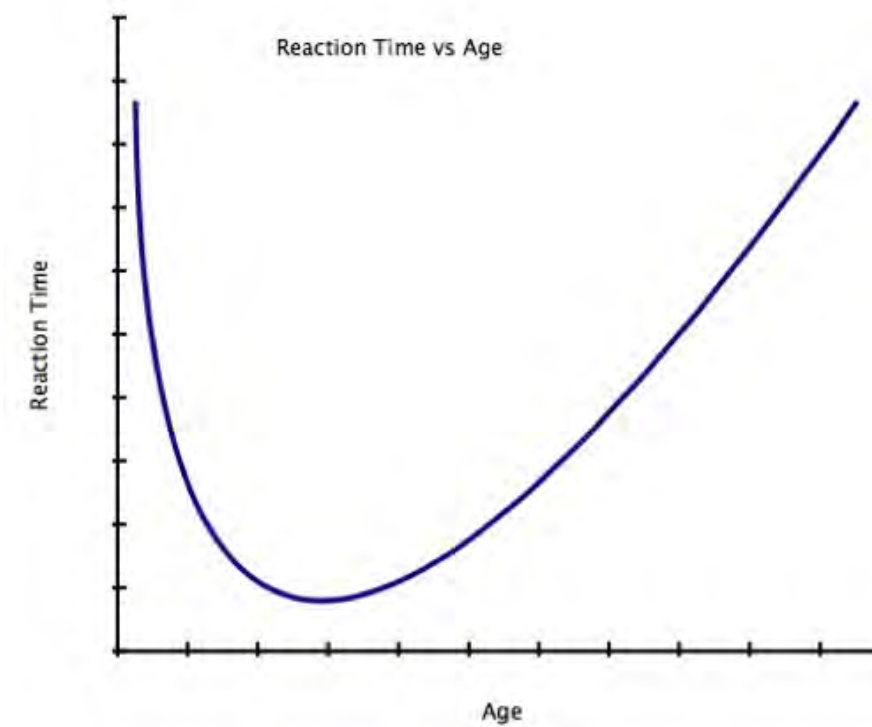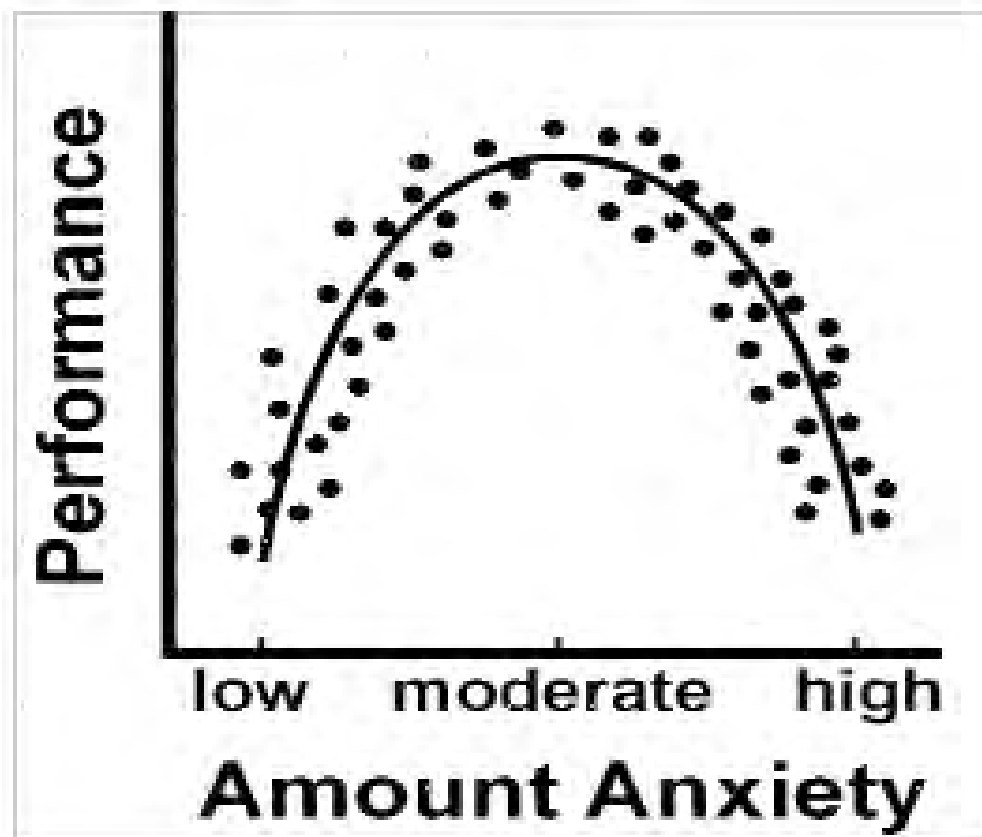- Perfect vs. Imperfect

- Positive vs. Negative

Scatterplot: A graph that represents the relationship between 2 variables
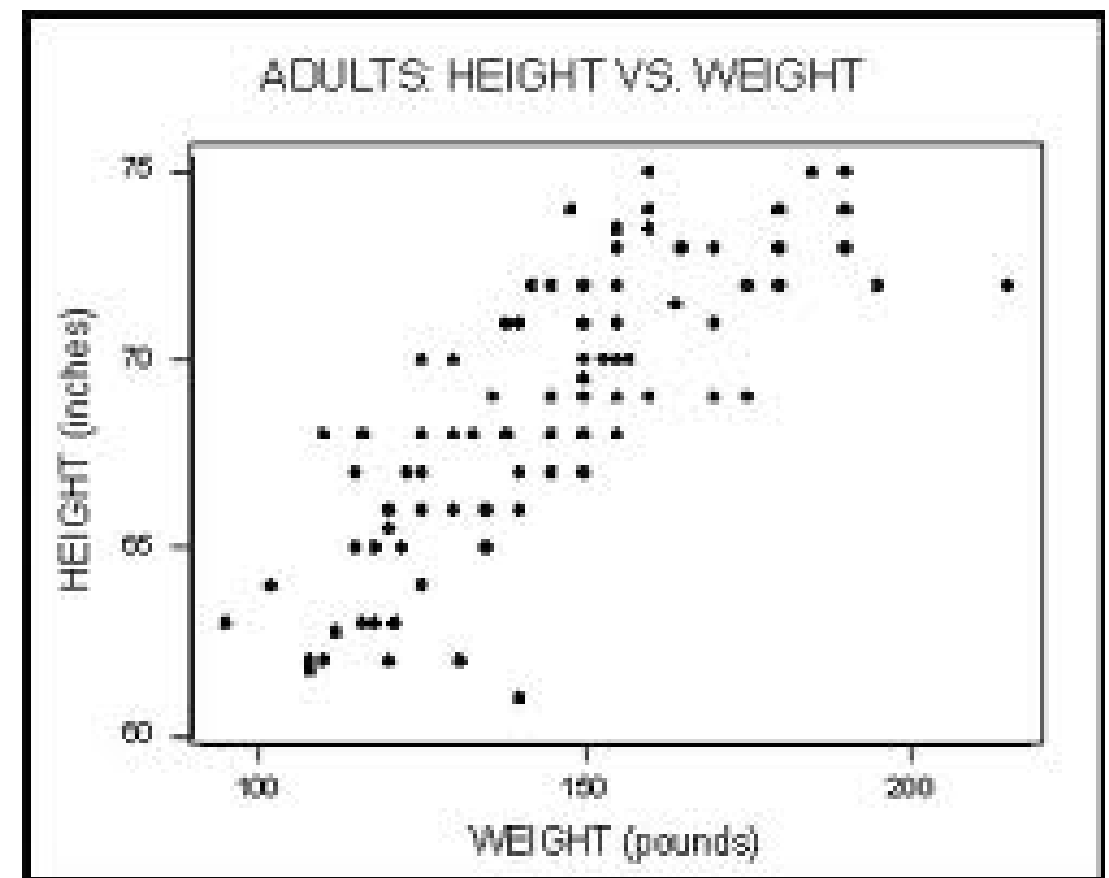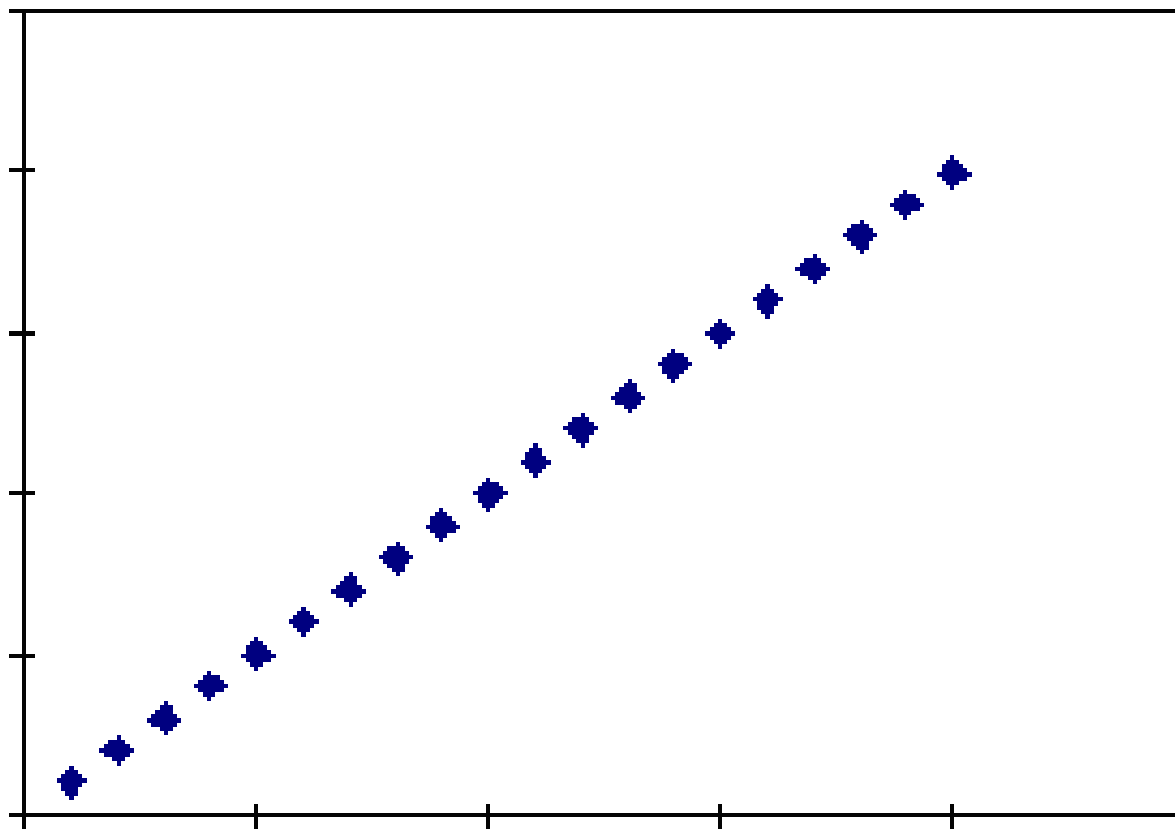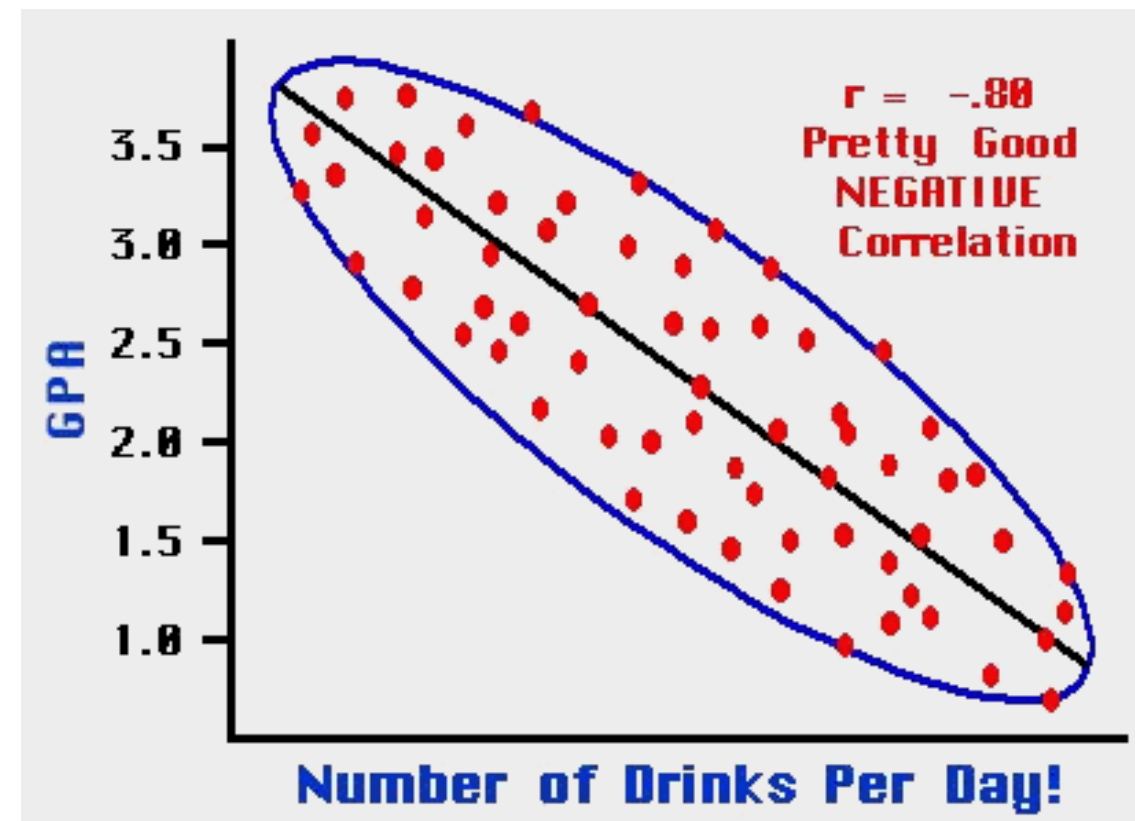
Linear vs. Non-linear

Linear

Non-linear

Reaction Time vs Age

Perfect vs. Imperfect

ADULTS: HEIGHT VS. WEIGHT
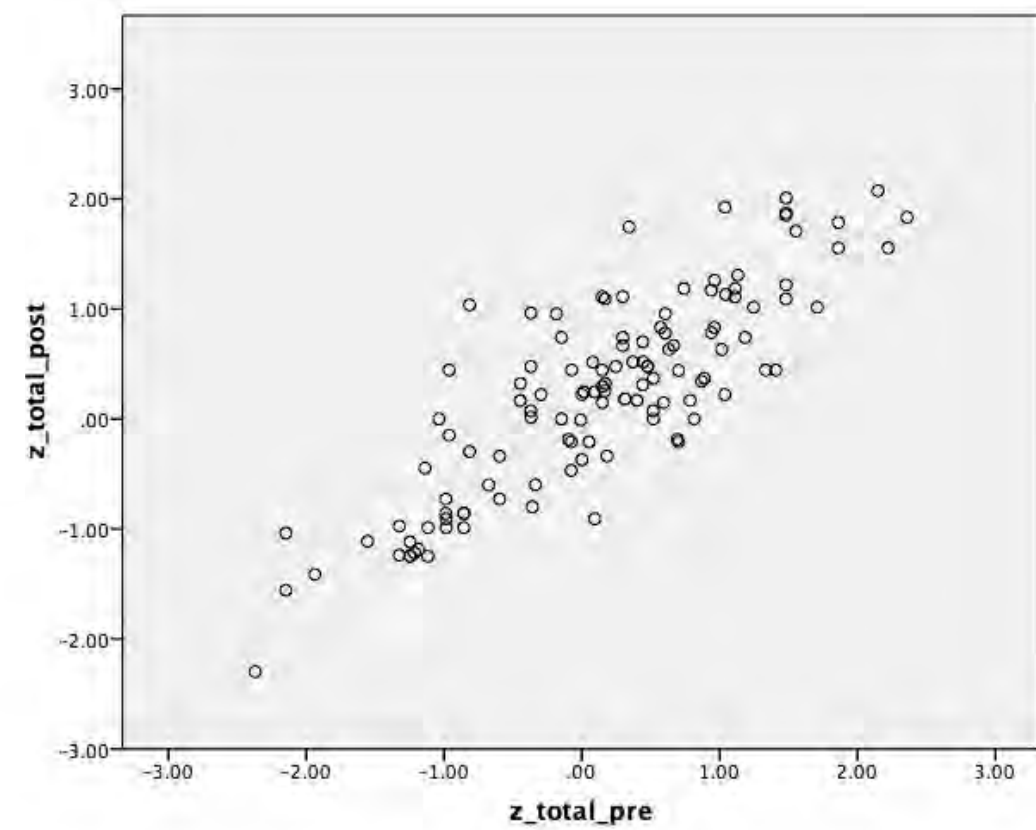
Positive vs. Negative
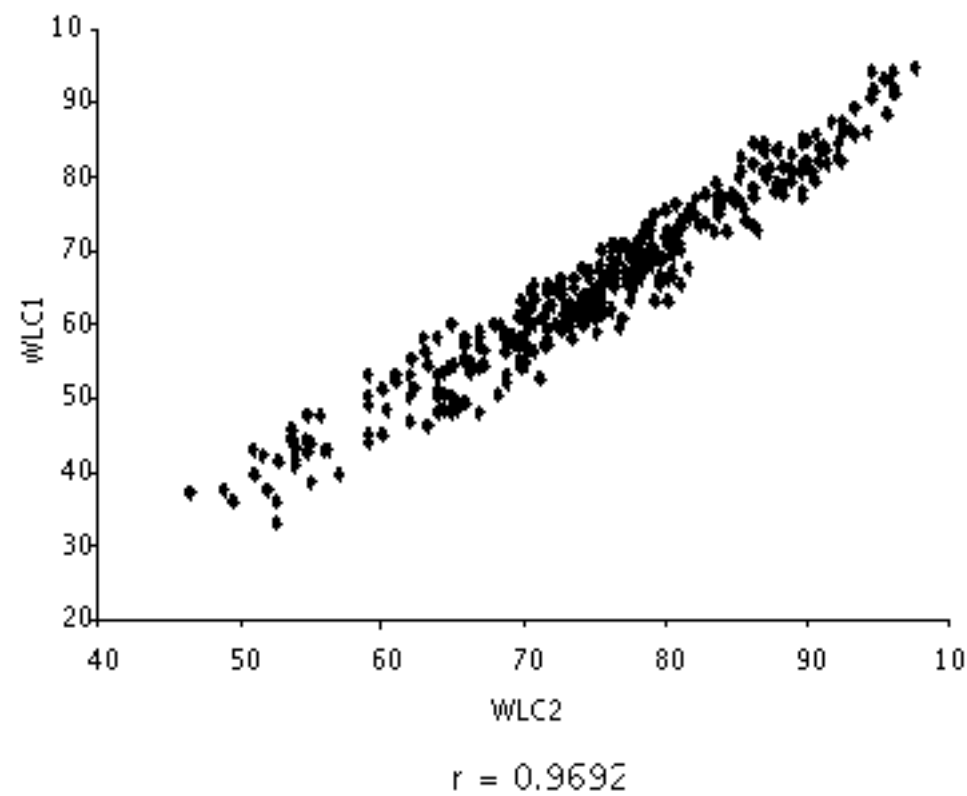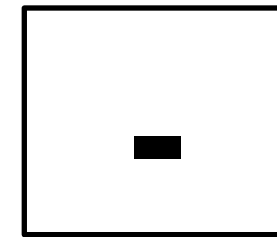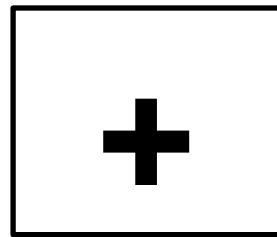
Relationships
Researchers are Interested in

- Linear vs. Non-linear

- Perfect vs. Imperfect

- Positive vs. Negative

Graphing Predictions

- Given what you now know about different kinds of correlational relationships, graph your prediction of what you think the relationship is between green space exposure and self-perceived anxiety.

- Give an argument to support your prediction.

Lesson Plan 6: Green Space Exposure and Self-Perceived Anxiety

Objectives:
-SWBAT list the three statistics to focus on after data has been collected (mean, SD, Pearson r).
-SWBAT define what the Pearson r is (correlation statistic), its range and its size conventions.
-SWBAT understand what an outlier is and that outliers greatly affect r.
-SWBAT understand implications of restricting the range of data or extrapolating outside of their data and that these should never be done.
-SWBAT identify the population and how to theoretically report the results.

Lesson Duration: 1 hour

Aim: What kinds of statistical information do we need in order to understand our data?

Do Now: In groups, students will write down at least 3 kinds of information they are interested in finding out from the data after students have completed the survey.

Materials:

Lesson plan
chalkboard
chalk
projector
Powerpoint lecture: *What kinds of statistical information do we need in order to understand our data?*

Procedure

1. In their groups, students will share their answers on information they are interested in finding out from the data after students have completed the survey.

2. Give 3 statistics that we will primarily focus on after data collection is completed (mean, SD and correlation)

3. Lead into explanation of how a correlation is analyzed using the Pearson r. Explain what the Pearson r is, that it is limited to the range of -1.0 and +1.0 and that it can look at relationship between 2 different variables regardless of scaling and range.

4. Explain what an outlier is (extreme score) and that outliers greatly affect Pearson r. Give an example of how this could happen (i.e one person states he has 15 plants in the home and is frequently exposed to greenspace, while others have lower scores--these high numbers from one person will affect the number in the formula and therefore pull the correlation up, when this is not really accurate. Draw graphs of this showing how outliers can increase correlation and decrease correlation.

5. Explain what restriction of range is and why restricting the range of your sample could be misleading. Draw graph showing this and state that the alternative is to make sure that you sample as many people as possible in the population.

6. Explain what extrapolation is (generalizing outside of data) and that it is misleading and should never be done.

7. Students will identify the sample by stating how many classes and kinds of students (education level) will be tested. They will also indicate how many students are at BASE total. This will lead into the extent to which they should report their correlation data.

Do Now:

In your groups, write down *at least 5* pieces of information you are interested in finding out from the data after students complete the survey

Aim: What kinds of statistical information do we need in order to understand our data?

Some Important Information

- Mean ($\overline{X}$) : average of scores for each variable

- Standard Deviation (s): measures the variability, or "spread" of scores

- Correlation between green space and self-perceived anxiety
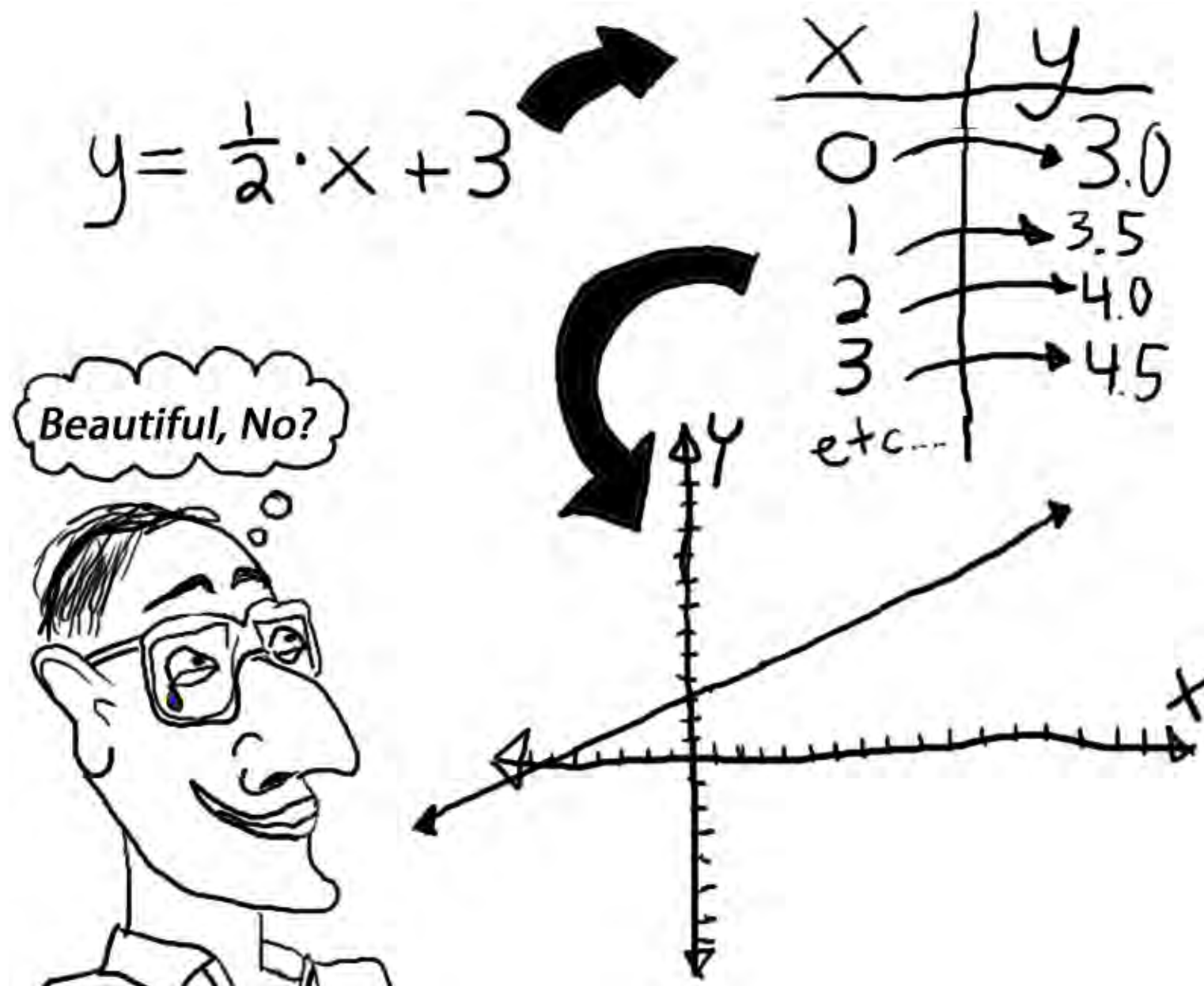
How do we analyze correlational data?

$$r = \frac{n(\Sigma xy) - (\Sigma x)(\Sigma y)}{\sqrt{[\, n\Sigma x^2 - (\Sigma x)^2\,]\,[\, n\Sigma y^2 - (\Sigma y)^2\,]}}$$

What is the Pearson *r*?

Correlation Statistic: Pearson *r*

- Pearson *r*: a <u>number</u> that quantitatively expresses the magnitude and direction of the relationship between 2 variables

- limited to range of -1.0 and +1.0

Can look at relationship between 2 *different* variables

- Regardless of scaling...

- Time vs. Money

- Education vs. Income

- Regardless of the range of each variable...

- Attendance and Grades

- Temperature and Salinity

Consider the following graphs...

Best-fit Line

- Line that best represents the data in the sample

- Equation of a line: $y = bx + a$

- Line will always go through the mean of x and y

What is a "BIG" correlation?

Size conventions for Pearson *r*

- Large: .5 +
- Medium = .3
- Small = .1

- Same conventions for negative correlations

Other Points...

Outliers

- Pearson *r* is greatly affected by *outliers*

- or extreme scores

Give an example of possible outliers for each variable

Restriction of Range

- *graph

- Narrow range may produce no correlation in sample, although there is a high correlation in the population

- Alternative: sample from a wide range of people in the population

Extrapolation: Dangerous!

- For correlations, you *cannot* predict/extrapolate outside of observed data

Identifying the sample and population

- What classes are we testing? What kinds of students?

- How many students are at BASE altogether?

- What if we find a very large (.5) correlation? What can we conclude?

- What if we find a very small (.1) or no correlation (0)? What can we conclude?

Lesson Plan 7: Green Space Exposure and Self-Perceived Anxiety

Objectives:
-SWBAT review the rights that participants have during the research process.
-SWBAT understand how to researchers code and organize survey data and variables in SPSS.
-SWBAT define what "dummy coding" is and why some data are collapsed before analyzed.
-SWBAT identify which correlations are significant.
-SWBAT determine whether their hypothesis was consistent with the results and possible explanations if they were not consistent.

Lesson Duration: 1 hour

Aim: Do our data analysis support our hypothesis about whether there is a correlation between green space and self-perceived anxiety?

Do Now: In groups, write down what their hypothesis is about the relationship between green space and anxiety. Also, list one confounding variable that could be affecting the relationship.

Materials:

-Lesson plan
-Chalkboard
-Chalk
-Projector
-Powerpoint lecture: *Do our data analysis support our hypothesis about whether there is a correlation between green space and self-perceived anxiety?*

Procedure:

1. Review rights that participants have during the course of a research study. Specifically, a) participants must be given general information about the study as well as risks; b) participants have a right to withdraw from the study at any time without penalty; c) participants information must be anonymous

2. Lead into showing an snapshot of the data, showing how data are and variables are coded in SPSS, specifically pointing out what the rows and columns mean.

3. Explain what dummy coding is (assigning numbers to represent variables with categories of the same kind. Give examples of variables with several levels (i.e. gender, yes/no responses, likert scale responses). Also give examples of survey items that had to be dummy coded in SPSS.

4. Explain how we "cleaned the data" by collapsing a category for one of the responses, and explain why the decision was made. (Since very few students reported taking either the bus or train, but many students reported taking the bus and train for the daily commute, so created one category for "public transportation" to include those who take the bus, train, or both).

5. Students will be asked which correlation is commonly used to analyze correlations (Pearson r). Show the actual output of the data with the correlation matrix and point to the correlations associated with green space and anxiety variables. Mention that the correlations with asterisks are significant and are the only ones that are important. Ask students to identify the significant correlations.

6. Students will be shown descriptive statistics (mean and standard deviations) of the variables for anxiety, and correlations that were significant. Explain the importance of looking at the standard deviation for correlations, because if it's too high, we probably shouldn't take the correlation seriously.

7. Students will be asked whether their hypothesis was consistent with the results, and will be asked to give look at the bigger picture and give reasons that would possibly explain the correlation.

Homework: Students will be assigned to complete their results section of their research paper, which will be due the following week.

Do Now: Write down what your hypothesis is about the relationship between green space and anxiety. Also, list one possible confounding variable that could affect the relationship.

Possible Confound?

- Noise in classroom could affect the anxiety measure

Aim: Do our data analysis support our hypothesis about whether there is a correlation between green space and self-perceived anxiety?

Ethics: Participant Rights

- Participants must be given general information about the study and any potential harm they may encounter

- Participants have a right to withdraw from the study at any time without penalty

- Anonymity: no identifying information should be linked to a participant

How do we code and organize survey data?

"Snapshot" of Data

Survey Raw Data.sav

	G1	G2	G3	G4	G5	G6	G7	G8	G9	G10
1	7	30	0	3	4	12	1	4	3	1
2	12	5	0	1	3	12	4	3	6	1
3	8	5	2	2	7	12	1	4	5	2
4	15	10	0	2	3	6	2	5	6	1
5	4	0	0	1	0	6	8	4	4	1
6	5	6	1	2	7	10	6	4	4	1
7	6	15	2	3	10	12	20	4	5	1
8	5	5	1	2	3	5	10	4	4	1
9	6	9	1	2	15	14	2	5	6	1
10	1	3	0	2	0	8	4	4	5	1
11	5	3	0	1	0	3	2	4	4	1
12	5	15	0	2	7	6	1	3	4	1
13	3	1	0	1	2	7	3	1	3	1
14	3	0	0	5	0	5	7	3	4	1
15	2	0	0	2	0	5	1	5	4	4
16	2	1	0	2	0	7	5	4	6	1
17	35	3	0	2	5	15	10	2	4	1
18	7	4	0	2	1	5	1	5	5	1
19	9	0	1	2	8	22	4	4	5	1
20	0	1	2	2	12	7	3	4	5	1

Survey Raw Data.sav

	G1	G2	G3	G4	G5	G6	G7	G8	G9	G10
1	7	30	0	3	4	12	1	4	3	1
2	12	5	0	1	3	12	4	3	6	1
3	8	5	2	2	7	12	1	4	5	2
4	15	10	0	2	3	6	2	5	6	1
5	4	0	0	1	0	6	8	4	4	1
6	5	6	1	2	7	10	6	4	4	1
7	6	15	2	3	10	12	20	4	5	1
8	5	5	1	2	3	5	10	4	4	1
9	6	9	1	2	15	14	2	5	6	1
10	1	3	0	2	0	8	4	4	5	1
11	5	3	0	1	0	3	2	4	4	1
12	5	15	0	2	7	6	1	3	4	1
13	3	1	0	1	2	7	3	1	3	1
14	3	0	0	5	0	5	7	3	4	1
15	2	0	0	2	0	5	1	5	4	4
16	2	1	0	2	0	7	5	4	6	1
17	35	3	0	2	5	15	10	2	4	1
18	7	4	0	2	1	5	1	5	5	1
19	9	0	1	2	8	22	4	4	5	1
20	0	1	2	2	12	7	3	4	5	1

Survey Raw Data.sav

Survey Questions	G1	G2	G3	G4	G5	G6	G7	G8	G9	G10
1	7	30	0	3	4	12	1	4	3	1
2	12	5	0	1	3	12	4	3	6	1
3	8	5	2	2	7	12	1	4	5	2
4	15	10	0	2	3	6	2	5	6	1
5	4	0	0	1	0	6	8	4	4	1
6	5	6	1	2	7	10	6	4	4	1
7	6	15	2	3	10	12	20	4	5	1
8	5	5	1	2	3	5	10	4	4	1
9	6	9	1	2	15	14	2	5	6	1
10	1	3	0	2	0	8	4	4	5	1
11	5	3	0	1	0	3	2	4	4	1
12	5	15	0	2	7	6	1	3	4	1
13	3	1	0	1	2	7	3	1	3	1
14	3	0	0	5	0	5	7	3	4	1
15	2	0	0	2	0	5	1	5	4	4
16	2	1	0	2	0	7	5	4	6	1
17	35	3	0	2	5	15	10	2	4	1
18	7	4	0	2	1	5	1	5	5	1
19	9	0	1	2	8	22	4	4	5	1
20	0	1	2	2	12	7	3	4	5	1

Survey Raw Data.sav

	Name	Type	Width	Decimals	Label	Values	Missing	Columns	Align
1	G1	Numeric	8	0	front door	None	None	8	≡ Right
2	G2	Numeric	8	0	bedroom window	None	None	8	≡ Right
3	G3	Numeric	8	0	plants in room	None	None	8	≡ Right
4	G4	Numeric	8	0	windows in room	None	None	8	≡ Right
5	G5	Numeric	8	0	plants in home	None	None	8	≡ Right
6	G6	Numeric	8	0	windows in home	None	None	8	≡ Right
7	G7	Numeric	8	0	# of blocks gre...	None	None	8	≡ Right
8	G8	Numeric	8	0	frequency	{1, never}...	None	8	≡ Right
9	G9	Numeric	8	0	enjoyment	{1, never}...	None	8	≡ Right
10	G10	Numeric	8	0	type of transpo...	{1, public tr...	None	10	≡ Right
11	G11	Numeric	8	0	commute pass...	{1, never}...	None	8	≡ Right
12	G12	Numeric	8	0	minutes in gre...	{0, I don't g...	None	8	≡ Right
13	G13	Numeric	8	0	hours in direct...	None	None	8	≡ Right
14	G14	Numeric	8	0	# of people in...	None	None	8	≡ Right
15	G15	Numeric	8	0	# of people in r...	None	None	8	≡ Right

Variable View in SPSS

Variable View in SPSS

What is "Dummy" Coding?

- In data analysis: assigning numbers to represent variables with categories of the same kind

  - Gender: Male = 1; Female = 2

  - Response: No = 0; Yes = 1

  - Likert Scale Responses: 1=Never; 2=Very Rarely; 3=Rarely; 4=Occasionally; 5=Frequently; 6=Always

Question #G8

- How frequently do you visit your nearest park or green space?

- 1=Never; 2=Very Rarely; 3=Rarely; 4=Occasionally; 5=Frequently; 6=Always

Survey Raw Data.sav

	G1	G2	G3	G4	G5	G6	G7	G8	G9	G10
1	7	30	0	3	4	12	1	4	3	1
2	12	5	0	1	3	12	4	3	6	1
3	8	5	2	2	7	12	1	4	5	2
4	15	10	0	2	3	6	2	5	6	1
5	4	0	0	1	0	6	8	4	4	1
6	5	6	1	2	7	10	6	4	4	1
7	6	15	2	3	10	12	20	4	5	1
8	5	5	1	2	3	5	10	4	4	1
9	6	9	1	2	15	14	2	5	6	1
10	1	3	0	2	0	8	4	4	5	1
11	5	3	0	1	0	3	2	4	4	1
12	5	15	0	2	7	6	1	3	4	1
13	3	1	0	1	2	7	3	1	3	1
14	3	0	0	5	0	5	7	3	4	1
15	2	0	0	2	0	5	1	5	4	4
16	2	1	0	2	0	7	5	4	6	1
17	35	3	0	2	5	15	10	2	4	1
18	7	4	0	2	1	5	1	5	5	1
19	9	0	1	2	8	22	4	4	5	1
20	0	1	2	2	12	7	3	4	5	1

Survey Raw Data.sav

	Name	Type	Width	Decimals	Label	Values	Missing	Columns	Align
1	G1	Numeric	8	0	front door	None	None	8	☰ Right
2	G2	Numeric	8	0	bedroom window	None	None	8	☰ Right
3	G3	Numeric	8	0	plants in room	None	None	8	☰ Right
4	G4	Numeric	8	0	windows in room	None	None	8	☰ Right
5	G5	Numeric	8	0	plants in home	None	None	8	☰ Right
6	G6	Numeric	8	0	windows in home	None	None	8	☰ Right
7	G7	Numeric	8	0	# of blocks gre...	None	None	8	☰ Right
8	G8	Numeric	8	0	frequency	{1, never}...	None	8	☰ Right
9	G9	Numeric	8	0	enjoyment	{1, never}...	None	8	☰ Right
10	G10	Numeric	8	0	type of transpo...	{1, public tr...	None	10	☰ Right
11	G11	Numeric	8	0	commute pass...	{1, never}...	None	8	☰ Right
12	G12	Numeric	8	0	minutes in gre...	{0, I don't g...	None	8	☰ Right
13	G13	Numeric	8	0	hours in direct...	None	None	8	☰ Right
14	G14	Numeric	8	0	# of people in...	None	None	8	☰ Right
15	G15	Numeric	8	0	# of people in r...	None	None	8	☰ Right

Variable View in SPSS

How frequently do you visit the nearest park or green space?

Survey Raw Data.sav

	G1	G2	G3	G4	G5	G6	G7	G8	G9	G10
1	7	30	0	3	4	12	1	4	3	1
2	12	5	0	1	3	12	4	3	6	1
3	8	5	2	2	7	12	1	4	5	2
4	15	10	0	2	3	6	2	5	6	1
5	4	0	0	1	0	6	8	4	4	1
6	5	6	1	2	7	10	6	4	4	1
7	6	15	2	3	10	12	20	4	5	1
8	5	5	1	2	3	5	10	4	4	1
9	6	9	1	2	15	14	2	5	6	1
10	1	3	0	2	0	8	4	4	5	1
11	5	3	0	1	0	3	2	4	4	1
12	5	15	0	2	7	6	1	3	4	1
13	3	1	0	1	2	7	3	1	3	1
14	3	0	0	5	0	5	7	3	4	1
15	2	0	0	2	0	5	1	5	4	4
16	2	1	0	2	0	7	5	4	6	1
17	35	3	0	2	5	15	10	2	4	1
18	7	4	0	2	1	5	1	5	5	1
19	9	0	1	2	8	22	4	4	5	1
20	0	1	2	2	12	7	3	4	5	1

What was Participant 13's response?   Rarely

Question #G10

- What is your typical daily commute like (e.g., bus, subway, personal vehicle, bike, walk, etc.)?

- _____(provide type of transportation here)

Survey Raw Data.sav

	G1	G2	G3	G4	G5	G6	G7	G8	G9	G10
1	7	30	0	3	4	12	1	4	3	1
2	12	5	0	1	3	12	4	3	6	1
3	8	5	2	2	7	12	1	4	5	2
4	15	10	0	2	3	6	2	5	6	1
5	4	0	0	1	0	6	8	4	4	1
6	5	6	1	2	7	10	6	4	4	1
7	6	15	2	3	10	12	20	4	5	1
8	5	5	1	2	3	5	10	4	4	1
9	6	9	1	2	15	14	2	5	6	1
10	1	3	0	2	0	8	4	4	5	1
11	5	3	0	1	0	3	2	4	4	1
12	5	15	0	2	7	6	1	3	4	1
13	3	1	0	1	2	7	3	1	3	1
14	3	0	0	5	0	5	7	3	4	1
15	2	0	0	2	0	5	1	5	4	4
16	2	1	0	2	0	7	5	4	6	1
17	35	3	0	2	5	15	10	2	4	1
18	7	4	0	2	1	5	1	5	5	1
19	9	0	1	2	8	22	4	4	5	1
20	0	1	2	2	12	7	3	4	5	1

"Cleaning the Data"

"Cleaning" the Data

- Very few students reported taking either the BUS or TRAIN

- Since many students reported taking the BUS and TRAIN for their daily commute, I *collapsed the data* for this item

- *Collapsing data*: Created one category for "public transportation" to include those who take bus, train, or both

- 1=public transportation; 2=personal vehicle; 3=bike; 4=walk

Survey Raw Data.sav

	Name	Type	Width	Decimals	Label	Values	Missing	Columns	Align
1	G1	Numeric	8	0	front door	None	None	8	☰ Right
2	G2	Numeric	8	0	bedroom window	None	None	8	☰ Right
3	G3	Numeric	8	0	plants in room	None	None	8	☰ Right
4	G4	Numeric	8	0	windows in room	None	None	8	☰ Right
5	G5	Numeric	8	0	plants in home	None	None	8	☰ Right
6	G6	Numeric	8	0	windows in home	None	None	8	☰ Right
7	G7	Numeric	8	0	# of blocks gre...	None	None	8	☰ Right
8	G8	Numeric	8	0	frequency	{1, never}...	None	8	☰ Right
9	G9	Numeric	8	0	enjoyment	{1, never}...	None	8	☰ Right
10	G10	Numeric	8	0	type of transpo...	{1, public tr...	None	10	☰ Right
11	G11	Numeric	8	0	commute pass...	{1, never}...	None	8	☰ Right
12	G12	Numeric	8	0	minutes in gre...	{0, I don't g...	None	8	☰ Right
13	G13	Numeric	8	0	hours in direct...	None	None	8	☰ Right
14	G14	Numeric	8	0	# of people in...	None	None	8	☰ Right
15	G15	Numeric	8	0	# of people in r...	None	None	8	☰ Right

Variable View in SPSS

Survey Raw Data.sav

	G1	G2	G3	G4	G5	G6	G7	G8	G9	G10
1	7	30	0	3	4	12	1	4	3	1
2	12	5	0	1	3	12	4	3	6	1
3	8	5	2	2	7	12	1	4	5	2
4	15	10	0	2	3	6	2	5	6	1
5	4	0	0	1	0	6	8	4	4	1
6	5	6	1	2	7	10	6	4	4	1
7	6	15	2	3	10	12	20	4	5	1
8	5	5	1	2	3	5	10	4	4	1
9	6	9	1	2	15	14	2	5	6	1
10	1	3	0	2	0	8	4	4	5	1
11	5	3	0	1	0	3	2	4	4	1
12	5	15	0	2	7	6	1	3	4	1
13	3	1	0	1	2	7	3	1	3	1
14	3	0	0	5	0	5	7	3	4	1
15	2	0	0	2	0	5	1	5	4	4
16	2	1	0	2	0	7	5	4	6	1
17	35	3	0	2	5	15	10	2	4	1
18	7	4	0	2	1	5	1	5	5	1
19	9	0	1	2	8	22	4	4	5	1
20	0	1	2	2	12	7	3	4	5	1

Let's look at the Correlations! (N=74)

Question: What is the statistic used to analyze correlational studies?

The Pearson *r*

		front door	bedroom window	plants in room	windows in room	plants in home	windows in home	# of blocks greenspace	frequency	enjoyment	type of transportation	commute pass through greenspace	minutes in greenspace	hours in direct sunlight	avg_anxiety
front door	Pearson Correlation	1	.265*	.077	.047	.257*	.276*	.018	.118	.036	.075	.232*	.187	.210	.021
	Sig. (2-tailed)		.023	.520	.691	.028	.018	.881	.318	.764	.528	.048	.114	.090	.862
	N	73	73	73	73	73	73	72	73	73	73	73	73	66	73
bedroom window	Pearson Correlation	.265*	1	.177	.164	.269*	.127	-.128	.138	.042	-.060	.071	.065	.200	-.127
	Sig. (2-tailed)	.023		.134	.166	.022	.285	.284	.243	.724	.613	.550	.582	.107	.285
	N	73	73	73	73	73	73	72	73	73	73	73	73	66	73
plants in room	Pearson Correlation	.077	.177	1	.133	.545**	.059	.143	.190	.208	-.037	-.050	.053	-.061	.041
	Sig. (2-tailed)	.520	.134		.258	.000	.616	.227	.104	.075	.757	.672	.656	.621	.726
	N	73	73	74	74	74	74	73	74	74	74	74	74	67	74
windows in room	Pearson Correlation	.047	.164	.133	1	.009	.062	-.006	.157	.055	-.143	.063	-.042	.017	-.033
	Sig. (2-tailed)	.691	.166	.258		.941	.600	.962	.181	.642	.224	.595	.721	.892	.780
	N	73	73	74	74	74	74	73	74	74	74	74	74	67	74
plants in home	Pearson Correlation	.257*	.269*	.545**	.009	1	.479**	.121	.231*	.248*	.032	.092	.152	.069	.082
	Sig. (2-tailed)	.028	.022	.000	.941		.000	.306	.047	.033	.788	.435	.196	.580	.489
	N	73	73	74	74	74	74	73	74	74	74	74	74	67	74
windows in home	Pearson Correlation	.276*	.127	.059	.062	.479**	1	.055	.152	.193	-.070	.302**	.207	.037	.175
	Sig. (2-tailed)	.018	.285	.616	.600	.000		.645	.196	.099	.551	.009	.077	.764	.135
	N	73	73	74	74	74	74	73	74	74	74	74	74	67	74
# of blocks greenspace	Pearson Correlation	.018	-.128	.143	-.006	.121	.055	1	-.164	-.167	.058	.159	-.211	.010	.054
	Sig. (2-tailed)	.881	.284	.227	.962	.306	.645		.166	.158	.624	.178	.073	.936	.651
	N	72	72	73	73	73	73	73	73	73	73	73	73	66	73
frequency	Pearson Correlation	.118	.138	.190	.157	.231*	.152	-.164	1	.546**	-.219	.139	.378**	.183	-.014
	Sig. (2-tailed)	.318	.243	.104	.181	.047	.196	.166		.000	.061	.237	.001	.139	.905
	N	73	73	74	74	74	74	73	74	74	74	74	74	67	74
enjoyment	Pearson Correlation	.036	.042	.208	.055	.248*	.193	-.167	.546**	1	-.264*	.211	.458**	.076	-.009
	Sig. (2-tailed)	.764	.724	.075	.642	.033	.099	.158	.000		.023	.071	.000	.542	.942
	N	73	73	74	74	74	74	73	74	74	74	74	74	67	74
type of transportation	Pearson Correlation	.075	-.060	-.037	-.143	.032	-.070	.058	-.219	-.264*	1	-.127	-.116	-.155	-.215
	Sig. (2-tailed)	.528	.613	.757	.224	.788	.551	.624	.061	.023		.283	.325	.210	.066
	N	73	73	74	74	74	74	73	74	74	74	74	74	67	74
commute pass through greenspace	Pearson Correlation	.232*	.071	-.050	.063	.092	.302**	.159	.139	.211	-.127	1	.047	.188	.063
	Sig. (2-tailed)	.048	.550	.672	.595	.435	.009	.178	.237	.071	.283		.689	.128	.596
	N	73	73	74	74	74	74	73	74	74	74	74	74	67	74
minutes in greenspace	Pearson Correlation	.187	.065	.053	-.042	.152	.207	-.211	.378**	.458**	-.116	.047	1	.182	.246*
	Sig. (2-tailed)	.114	.582	.656	.721	.196	.077	.073	.001	.000	.325	.689		.141	.035
	N	73	73	74	74	74	74	73	74	74	74	74	74	67	74
hours in direct sunlight	Pearson Correlation	.210	.200	-.061	.017	.069	.037	.010	.183	.076	-.155	.188	.182	1	.315**
	Sig. (2-tailed)	.090	.107	.621	.892	.580	.764	.936	.139	.542	.210	.128	.141		.009
	N	66	66	67	67	67	67	66	67	67	67	67	67	67	67

Green space Exposure

		front door	bedroom window	plants in room	windows in room	plants in home	windows in home	# of blocks greenspace	frequency	enjoyment	type of transportation	commute pass through greenspace	minutes in greenspace	hours in direct sunlight	avg_anxiety
front door	Pearson Correlation	1	.265*	.077	.047	.257*	.276*	.018	.118	.036	.075	.232*	.187	.210	.021
	Sig. (2-tailed)		.023	.520	.691	.028	.018	.881	.318	.764	.528	.048	.114	.090	.862
	N	73	73	73	73	73	73	72	73	73	73	73	73	66	73
bedroom window	Pearson Correlation	.265*	1	.177	.164	.269*	.127	-.128	.138	.042	-.060	.071	.065	.200	-.127
	Sig. (2-tailed)	.023		.134	.166	.022	.285	.284	.243	.724	.613	.550	.582	.107	.285
	N	73	73	73	73	73	73	72	73	73	73	73	73	66	73
plants in room	Pearson Correlation	.077	.177	1	.133	.545**	.059	.143	.190	.208	-.037	-.050	.053	-.061	.041
	Sig. (2-tailed)	.520	.134		.258	.000	.616	.227	.104	.075	.757	.672	.656	.621	.726
	N	73	73	74	74	74	74	73	74	74	74	74	74	67	74
windows in room	Pearson Correlation	.047	.164	.133	1	.009	.062	-.006	.157	.055	-.143	.063	-.042	.017	-.033
	Sig. (2-tailed)	.691	.166	.258		.941	.600	.962	.181	.642	.224	.595	.721	.892	.780
	N	73	73	74	74	74	74	73	74	74	74	74	74	67	74
plants in home	Pearson Correlation	.257*	.269*	.545**	.009	1	.479**	.121	.231*	.248*	.032	.092	.152	.069	.082
	Sig. (2-tailed)	.028	.022	.000	.941		.000	.306	.047	.033	.788	.435	.196	.580	.489
	N	73	73	74	74	74	74	73	74	74	74	74	74	67	74
windows in home	Pearson Correlation	.276*	.127	.059	.062	.479**	1	.055	.152	.193	-.070	.302**	.207	.037	.175
	Sig. (2-tailed)	.018	.285	.616	.600	.000		.645	.196	.099	.551	.009	.077	.764	.135
	N	73	73	74	74	74	74	73	74	74	74	74	74	67	74
# of blocks greenspace	Pearson Correlation	.018	-.128	.143	-.006	.121	.055	1	-.164	-.167	.058	.159	-.211	.010	.054
	Sig. (2-tailed)	.881	.284	.227	.962	.306	.645		.166	.158	.624	.178	.073	.936	.651
	N	72	72	73	73	73	73	73	73	73	73	73	73	66	73
frequency	Pearson Correlation	.118	.138	.190	.157	.231*	.152	-.164	1	.546**	-.219	.139	.378**	.183	-.014
	Sig. (2-tailed)	.318	.243	.104	.181	.047	.196	.166		.000	.061	.237	.001	.139	.905
	N	73	73	74	74	74	74	73	74	74	74	74	74	67	74
enjoyment	Pearson Correlation	.036	.042	.208	.055	.248*	.193	-.167	.546**	1	-.264*	.211	.458**	.076	-.009
	Sig. (2-tailed)	.764	.724	.075	.642	.033	.099	.158	.000		.023	.071	.000	.542	.942
	N	73	73	74	74	74	74	73	74	74	74	74	74	67	74
type of transportation	Pearson Correlation	.075	-.060	-.037	-.143	.032	-.070	.058	-.219	-.264*	1	-.127	-.116	-.155	-.215
	Sig. (2-tailed)	.528	.613	.757	.224	.788	.551	.624	.061	.023		.283	.325	.210	.066
	N	73	73	74	74	74	74	73	74	74	74	74	74	67	74
commute pass through greenspace	Pearson Correlation	.232*	.071	-.050	.063	.092	.302**	.159	.139	.211	-.127	1	.047	.188	.063
	Sig. (2-tailed)	.048	.550	.672	.595	.435	.009	.178	.237	.071	.283		.689	.128	.596
	N	73	73	74	74	74	74	73	74	74	74	74	74	67	74
minutes in greenspace	Pearson Correlation	.187	.065	.053	-.042	.152	.207	-.211	.378**	.458**	-.116	.047	1	.182	.246*
	Sig. (2-tailed)	.114	.582	.656	.721	.196	.077	.073	.001	.000	.325	.689		.141	.035
	N	73	73	74	74	74	74	73	74	74	74	74	74	67	74
hours in direct sunlight	Pearson Correlation	.210	.200	-.061	.017	.069	.037	.010	.183	.076	-.155	.188	.182	1	.315**
	Sig. (2-tailed)	.090	.107	.621	.892	.580	.764	.936	.139	.542	.210	.128	.141		.009
	N	66	66	67	67	67	67	66	67	67	67	67	67	67	67

		front door	bedroom window	plants in room	windows in room	plants in home	windows in home	# of blocks greenspace	frequency	enjoyment	type of transportation	commute pass through greenspace	minutes in greenspace	hours in direct sunlight	avg_anxiety
front door	Pearson Correlation	1	.265*	.077	.047	.257*	.276*	.018	.118	.036	.075	.232*	.187	.210	.021
	Sig. (2-tailed)		.023	.520	.691	.028	.018	.881	.318	.764	.528	.048	.114	.090	.862
	N	73	73	73	73	73	73	72	73	73	73	73	73	66	73
bedroom window	Pearson Correlation	.265*	1	.177	.164	.269*	.127	-.128	.138	.042	-.060	.071	.065	.200	-.127
	Sig. (2-tailed)	.023		.134	.166	.022	.285	.284	.243	.724	.613	.550	.382	.107	.285
	N	73	73	73	73	73	73	72	73	73	73	73	73	66	73
plants in room	Pearson Correlation	.077	.177	1	.133	.545**	.059	.143	.190	.208	-.037	-.050	.053	-.061	.041
	Sig. (2-tailed)	.520	.134		.258	.000	.616	.227	.104	.075	.757	.672	.656	.621	.726
	N	73	73	74	74	74	74	73	74	74	74	74	74	67	74
windows in room	Pearson Correlation	.047	.164	.133	1	.009	.062	-.006	.157	.055	-.143	.063	-.042	.017	-.033
	Sig. (2-tailed)	.691	.166	.258		.941	.600	.962	.181	.642	.224	.595	.721	.892	.780
	N	73	73	74	74	74	74	73	74	74	74	74	74	67	74
plants in home	Pearson Correlation	.257*	.269*	.545**	.009	1	.479**	.121	.231*	.248*	.032	.092	.152	.069	.082
	Sig. (2-tailed)	.028	.022	.000	.941		.000	.306	.047	.033	.788	.435	.196	.580	.489
	N	73	73	74	74	74	74	73	74	74	74	74	74	67	74
windows in home	Pearson Correlation	.276*	.127	.059	.062	.479**	1	.055	-.152	.193	-.070	.302**	.207	.037	.175
	Sig. (2-tailed)	.018	.285	.616	.600	.000		.645	.196	.099	.551	.009	.077	.764	.135
	N	73	73	74	74	74	74	73	74	74	74	74	74	67	74
# of blocks greenspace	Pearson Correlation	.018	-.128	.143	-.006	.121	.055	1	-.164	-.167	.058	.159	-.211	.010	.054
	Sig. (2-tailed)	.881	.284	.227	.962	.306	.645		.166	.158	.624	.178	.073	.936	.651
	N	72	72	73	73	73	73	73	73	73	73	73	73	66	73
frequency	Pearson Correlation	.118	.138	.190	.157	.231*	-.152	-.164	1	.546**	-.219	.139	.378**	.183	-.014
	Sig. (2-tailed)	.318	.243	.104	.181	.047	.196	.166		.000	.061	.237	.001	.139	.905
	N	73	73	74	74	74	74	73	74	74	74	74	74	67	74
enjoyment	Pearson Correlation	.036	.042	.208	.055	.248*	.193	-.167	.546**	1	-.264*	.211	.458**	.076	-.009
	Sig. (2-tailed)	.764	.724	.075	.642	.033	.099	.158	.000		.023	.071	.000	.542	.942
	N	73	73	74	74	74	74	73	74	74	74	74	74	67	74
type of transportation	Pearson Correlation	.075	-.060	-.037	-.143	.032	-.070	.058	-.219	-.264*	1	-.127	-.116	-.155	-.215
	Sig. (2-tailed)	.528	.613	.757	.224	.788	.551	.624	.061	.023		.283	.325	.210	.066
	N	73	73	74	74	74	74	73	74	74	74	74	74	67	74
commute pass through greenspace	Pearson Correlation	.232*	.071	-.050	.063	.092	.302**	.159	.139	.211	-.127	1	.047	.188	.063
	Sig. (2-tailed)	.048	.550	.672	.595	.435	.009	.178	.237	.071	.283		.689	.128	.596
	N	73	73	74	74	74	74	73	74	74	74	74	74	67	74
minutes in greenspace	Pearson Correlation	.187	.065	.053	-.042	.152	.207	-.211	.378**	.458**	-.116	.047	1	.182	.246*
	Sig. (2-tailed)	.114	.382	.656	.721	.196	.077	.073	.001	.000	.325	.689		.141	.035
	N	73	73	74	74	74	74	73	74	74	74	74	74	67	74
hours in direct sunlight	Pearson Correlation	.210	.200	-.061	.017	.069	.037	.010	.183	.076	-.155	.188	.182	1	.315**
	Sig. (2-tailed)	.090	.107	.621	.892	.580	.764	.936	.139	.542	.210	.128	.141		.009
	N	66	66	67	67	67	67	66	67	67	67	67	67	67	67

Green space Exposure

		front door	bedroom window	plants in room	windows in room	plants in home	windows in home	# of blocks greenspace	frequency	enjoyment	type of transportation	commute pass through greenspace	minutes in greenspace	hours in direct sunlight	avg_anxiety
front door	Pearson Correlation	1	.265*	.077	.047	.257*	.276*	.018	.118	.036	.075	.232*	.187	.210	.021
	Sig. (2-tailed)		.023	.520	.691	.028	.018	.881	.318	.764	.528	.048	.114	.090	.862
	N	73	73	73	73	73	73	72	73	73	73	73	73	66	73
bedroom window	Pearson Correlation	.265*	1	.177	.164	.269*	.127	-.128	.138	.042	-.060	.071	.065	.200	-.127
	Sig. (2-tailed)	.023		.134	.166	.022	.285	.284	.243	.724	.613	.550	.582	.107	.285
	N	73	73	73	73	73	73	72	73	73	73	73	73	66	73
plants in room	Pearson Correlation	.077	.177	1	.133	.545**	.059	.143	.190	.208	-.037	-.050	.053	-.061	.041
	Sig. (2-tailed)	.520	.134		.258	.000	.616	.227	.104	.075	.757	.672	.656	.621	.726
	N	73	73	74	74	74	74	73	74	74	74	74	74	67	74
windows in room	Pearson Correlation	.047	.164	.133	1	.009	.062	-.006	.157	.055	-.143	.063	-.042	.017	-.033
	Sig. (2-tailed)	.691	.166	.258		.941	.600	.962	.181	.642	.224	.595	.721	.892	.780
	N	73	73	74	74	74	74	73	74	74	74	74	74	67	74
plants in home	Pearson Correlation	.257*	.269*	.545**	.009	1	.479**	.121	.231*	.248*	.032	.092	.152	.069	.082
	Sig. (2-tailed)	.028	.022	.000	.941		.000	.306	.047	.033	.788	.435	.196	.580	.489
	N	73	73	74	74	74	74	73	74	74	74	74	74	67	74
windows in home	Pearson Correlation	.276*	.127	.059	.062	.479**	1	.055	.152	.193	-.070	.302**	.207	.037	.175
	Sig. (2-tailed)	.018	.285	.616	.600	.000		.645	.196	.099	.551	.009	.077	.764	.135
	N	73	73	74	74	74	74	73	74	74	74	74	74	67	74
# of blocks greenspace	Pearson Correlation	.018	-.128	.143	-.006	.121	.055	1	-.164	-.167	.058	.159	-.211	.010	.054
	Sig. (2-tailed)	.881	.284	.227	.962	.306	.645		.166	.158	.624	.178	.073	.936	.651
	N	72	72	73	73	73	73	73	73	73	73	73	73	66	73
frequency	Pearson Correlation	.118	.138	.190	.157	.231*	.152	-.164	1	.546**	-.219	.139	.378**	.183	-.014
	Sig. (2-tailed)	.318	.243	.104	.181	.047	.196	.166		.000	.061	.237	.001	.139	.905
	N	73	73	74	74	74	74	73	74	74	74	74	74	67	74
enjoyment	Pearson Correlation	.036	.042	.208	.055	.248*	.193	-.167	.546**	1	-.264*	.211	.458**	.076	-.009
	Sig. (2-tailed)	.764	.724	.075	.642	.033	.099	.158	.000		.023	.071	.000	.542	.942
	N	73	73	74	74	74	74	73	74	74	74	74	74	67	74
type of transportation	Pearson Correlation	.075	-.060	-.037	-.143	.032	-.070	.058	-.219	-.264*	1	-.127	-.116	-.155	-.215
	Sig. (2-tailed)	.528	.613	.757	.224	.788	.551	.624	.061	.023		.283	.325	.210	.066
	N	73	73	74	74	74	74	73	74	74	74	74	74	67	74
commute pass through greenspace	Pearson Correlation	.232*	.071	-.050	.063	.092	.302**	.159	.139	.211	-.127	1	.047	.188	.063
	Sig. (2-tailed)	.048	.550	.672	.595	.435	.009	.178	.237	.071	.283		.689	.128	.596
	N	73	73	74	74	74	74	73	74	74	74	74	74	67	74
minutes in greenspace	Pearson Correlation	.187	.065	.053	-.042	.152	.207	-.211	.378**	.458**	-.116	.047	1	.182	.246*
	Sig. (2-tailed)	.114	.582	.656	.721	.196	.077	.073	.001	.000	.325	.689		.141	.035
	N	73	73	74	74	74	74	73	74	74	74	74	74	67	74
hours in direct sunlight	Pearson Correlation	.210	.200	-.061	.017	.069	.037	.010	.183	.076	-.155	.188	.182	1	.315**
	Sig. (2-tailed)	.090	.107	.621	.892	.580	.764	.936	.139	.542	.210	.128	.141		.009
	N	66	66	67	67	67	67	66	67	67	67	67	67	67	67

		avg_anxiety
front door	Pearson Correlation	.021
	Sig. (2-tailed)	.862
	N	73
bedroom window	Pearson Correlation	-.127
	Sig. (2-tailed)	.285
	N	73
plants in room	Pearson Correlation	.041
	Sig. (2-tailed)	.726
	N	74
windows in room	Pearson Correlation	-.033
	Sig. (2-tailed)	.780
	N	74
plants in home	Pearson Correlation	.082
	Sig. (2-tailed)	.489
	N	74
windows in home	Pearson Correlation	.175
	Sig. (2-tailed)	.135
	N	74
# of blocks greenspace	Pearson Correlation	.054
	Sig. (2-tailed)	.651
	N	73
frequency	Pearson Correlation	-.014
	Sig. (2-tailed)	.905
	N	74
enjoyment	Pearson Correlation	-.009
	Sig. (2-tailed)	.942
	N	74
type of transportation	Pearson Correlation	-.215
	Sig. (2-tailed)	.066
	N	74
commute pass through greenspace	Pearson Correlation	.063
	Sig. (2-tailed)	.596
	N	74
minutes in greenspace	Pearson Correlation	.246*
	Sig. (2-tailed)	.035
	N	74
hours in direct sunlight	Pearson Correlation	.315**
	Sig. (2-tailed)	.009
	N	67

Note: an * or ** represents a significant correlation

		avg_anxiety
front door	Pearson Correlation	.021
	Sig. (2-tailed)	.862
	N	73
bedroom window	Pearson Correlation	-.127
	Sig. (2-tailed)	.285
	N	73
plants in room	Pearson Correlation	.041
	Sig. (2-tailed)	.726
	N	74
windows in room	Pearson Correlation	-.033
	Sig. (2-tailed)	.780
	N	74
plants in home	Pearson Correlation	.082
	Sig. (2-tailed)	.489
	N	74
windows in home	Pearson Correlation	.175
	Sig. (2-tailed)	.135
	N	74
# of blocks greenspace	Pearson Correlation	.054
	Sig. (2-tailed)	.651
	N	73
frequency	Pearson Correlation	-.014
	Sig. (2-tailed)	.905
	N	74
enjoyment	Pearson Correlation	-.009
	Sig. (2-tailed)	.942
	N	74
type of transportation	Pearson Correlation	-.215
	Sig. (2-tailed)	.066
	N	74
commute pass through greenspace	Pearson Correlation	.063
	Sig. (2-tailed)	.596
	N	74
minutes in greenspace	Pearson Correlation	.246*
	Sig. (2-tailed)	.035
	N	74
hours in direct sunlight	Pearson Correlation	.315**
	Sig. (2-tailed)	.009
	N	67

Note: an * or ** represents a significant correlation

Minutes in green space and Anxiety: r = .246*

Hours in direct sunlight and Anxiety: r = .315**

		avg_anxiety
front door	Pearson Correlation	.021
	Sig. (2-tailed)	.862
	N	73
bedroom window	Pearson Correlation	-.127
	Sig. (2-tailed)	.285
	N	73
plants in room	Pearson Correlation	.041
	Sig. (2-tailed)	.726
	N	74
windows in room	Pearson Correlation	-.033
	Sig. (2-tailed)	.780
	N	74
plants in home	Pearson Correlation	.082
	Sig. (2-tailed)	.489
	N	74
windows in home	Pearson Correlation	.175
	Sig. (2-tailed)	.135
	N	74
# of blocks greenspace	Pearson Correlation	.054
	Sig. (2-tailed)	.651
	N	73
frequency	Pearson Correlation	-.014
	Sig. (2-tailed)	.905
	N	74
enjoyment	Pearson Correlation	-.009
	Sig. (2-tailed)	.942
	N	74
type of transportation	Pearson Correlation	-.215
	Sig. (2-tailed)	.066
	N	74
commute pass through greenspace	Pearson Correlation	.063
	Sig. (2-tailed)	.596
	N	74
minutes in greenspace	Pearson Correlation	.246*
	Sig. (2-tailed)	.035
	N	74
hours in direct sunlight	Pearson Correlation	.315**
	Sig. (2-tailed)	.009
	N	67

Are these correlations strong?

Minutes in green space and Anxiety: r = .246*

Hours in direct sunlight and Anxiety: r = .315**

Not really...

Descriptive Statistics

- Anxiety:
  - Mean = 3.11; s = .935
- Hours in Direct Sunlight
  - Mean = 2.70; s = 1.311
- Minutes in Green spaces
  - Mean = 3.90; s = 3.491

Descriptive Statistics

- Anxiety:
  - Mean = 3.11; s = .935
- Hours in Direct Sunlight
  - Mean = 2.70; s = 1.311
- Minutes in Green spaces
  - Mean = 3.90; s = 3.491 ~too high! we may not report this...

Question #13

Correlation between Hours in Direct Sunlight and Self-Perceived Anxiety
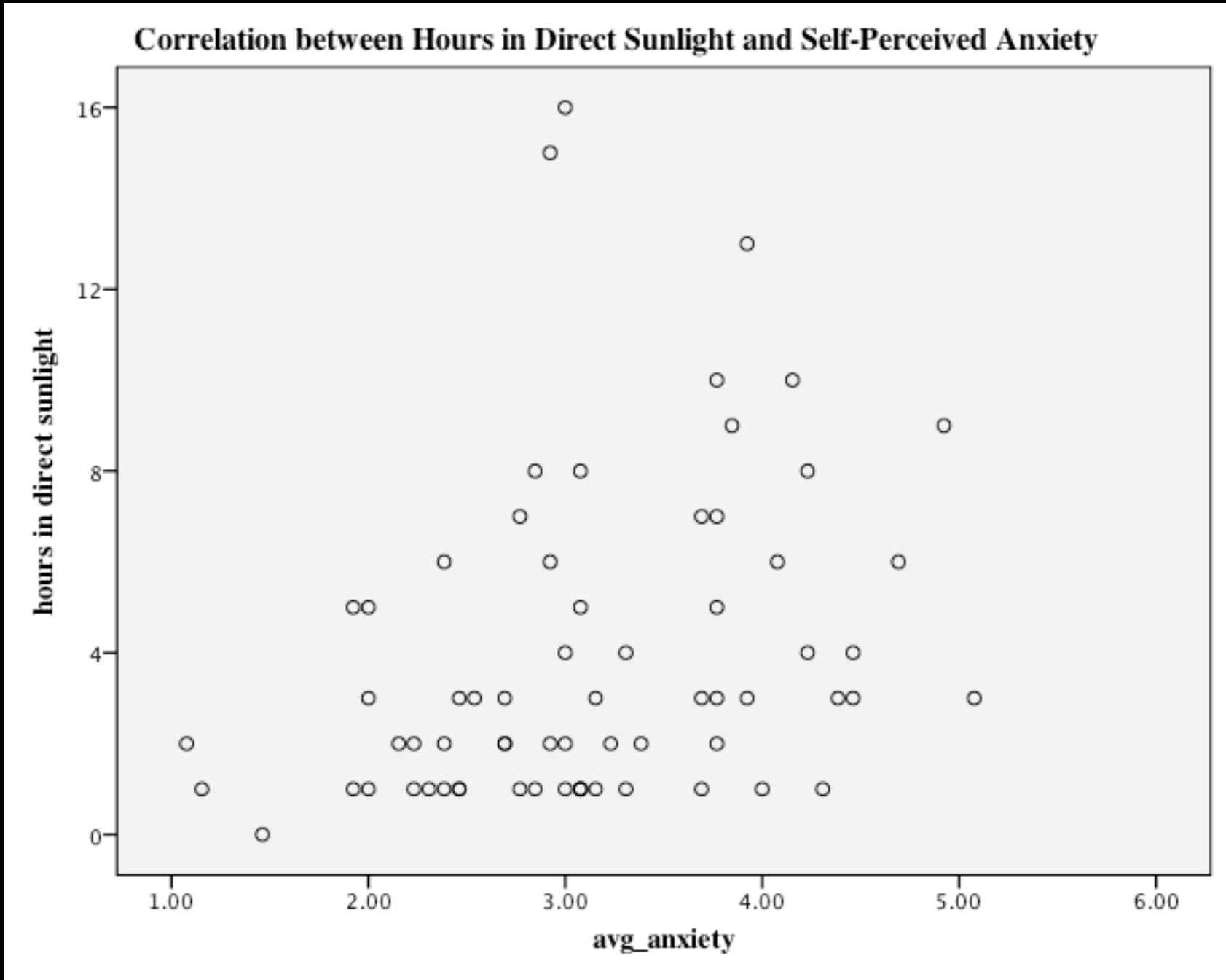
$r = .315$

Was your hypothesis consistent with the results from the data?

What does this all mean?

Think about it...

- What are some explanations for the *positive correlations* between green space and self-perceived anxiety?

  - Esp. correlation between hours of direct sunlight and self-perceived anxiety

Explanations

- Participants taking survey during the winter?

- Spending more time in direct sunlight in winter is also spending more time in cold air--may slightly increase anxiety

- Green spaces in winter are not green (leaves fall, flowers/plants die). May have same relationship as not going to green spaces at all, thus may slightly increase anxiety

Miscellaneous Data

- Covariate: a variable that could possible be affecting the outcome of our study

- Correlations were not significant for our covariates: gender, age, smoking exp., weight, # of siblings, medications