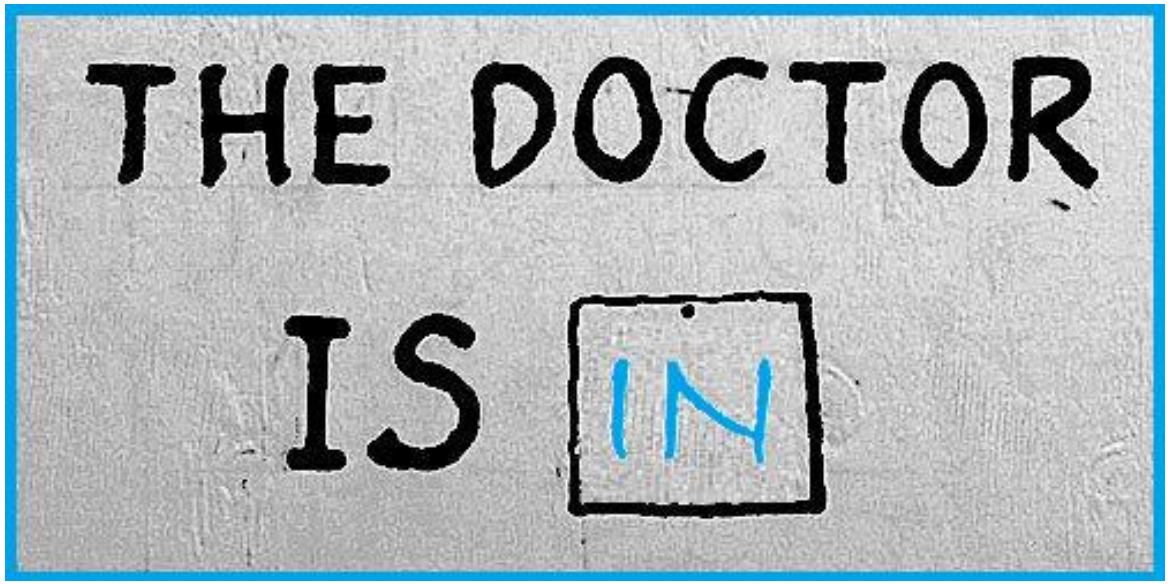
# Next Step Office Hours: Psych/Soc Review

- Welcome to Office Hours!
- Introduction
- What Do I Need for this Session?
- Psych/Soc Content Review
- What Next?



# Introduction to Office Hours

- **Thanks for coming to Next Step Office Hours!**
- **If you haven't been here before, here's how it works…**
- **These sessions are meant to be:**
  - *Interactive*
  - *Problem-focused*
  - *Specific to your needs* ***(so ask questions!)***
- **Today's focus: Review of Psych/Soc**
- **Future sessions: content review, math/data interpretation**
- **This is NOT a lecture! You can benefit most by:**
  - *Raising your hand and speaking*
  - *Commenting in the chat box*
  - *Responding to poll questions*

**Before Getting Started**

1. **If you have a microphone, make sure it is turned on and easily available.**
2. **Locate the hand-raise button on the toolbar on your screen.**
3. **Locate the chat box on the toolbar.**
4. **Let me know if you're having any technical issues!**

# Psych/Soc Content Review

Congrats on making progress through our MCAT course! Today let's focus on psych and soc:

- **Overall study strategies**
  - *Active learning*
  - *Big-picture perspective*
  - *Test-like thinking*
- **High-yield topics**
  - *Emotions*
  - *Bias, prejudice, and discrimination*
  - *Experimental design*
- **Practice passages!**

# Psych/Soc Study Strategies

**Keep in the back of your mind:**

*How does this knowledge apply to future clinicians?*

*How is this knowledge testable?*

**When studying, ask yourself:**

*Why does this work the way it does? What absolutely must be memorized?*

*How can you distinguish terms from each other? Flow charts…*

**Use active learning strategies**

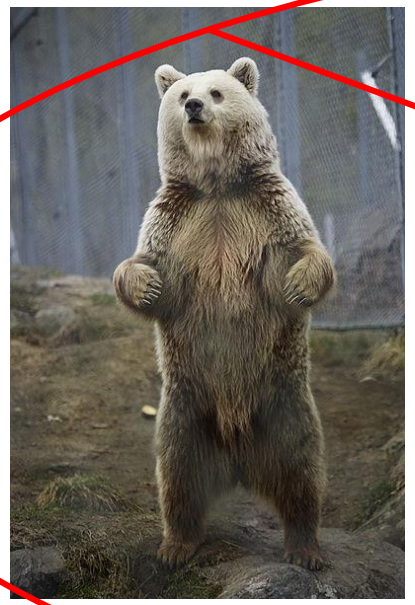
*Study sheets, Venn diagrams, explain to others…*

*Come up w/ own examples, explanations; can terms co-exist? If so, how?*

# Emotions

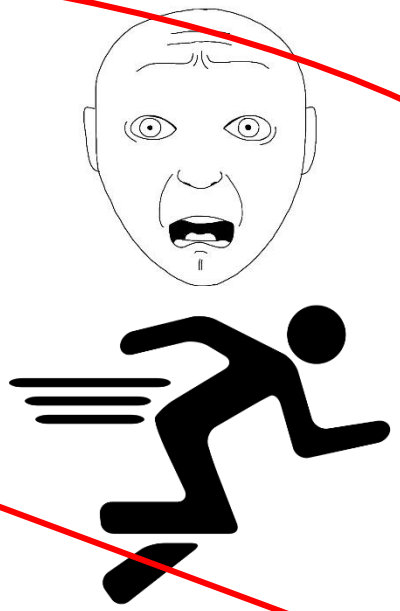
- Goal: explain how to link stimulus, subjective emotions, and physiological reactions

*Possible common-sense theory:*



*Scary stimulus*

*Emotion*



*Physiological / behavioral response*

*…actually, it's more complicated!*



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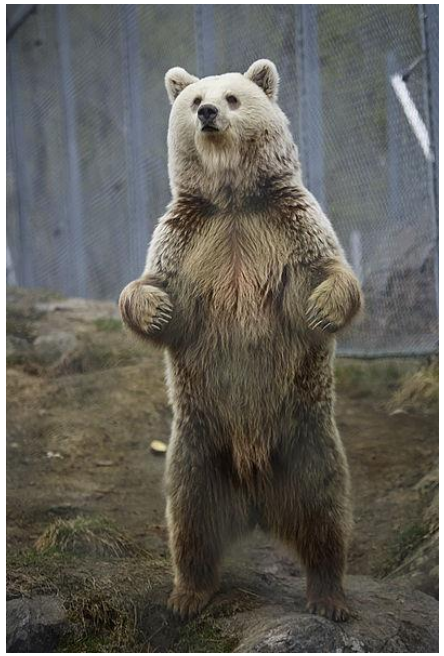
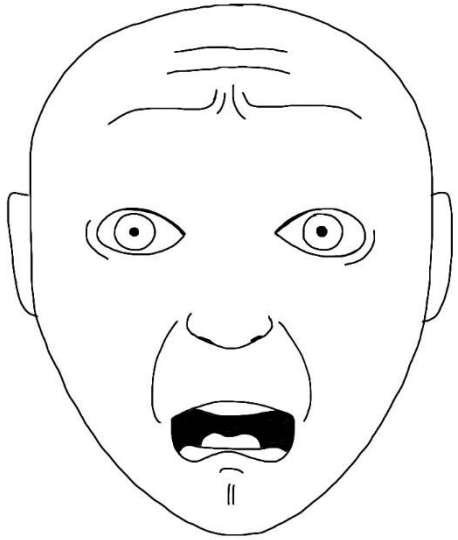
# Emotions

- James-Lange
- Stimulus → physiological arousal → relevant emotion
- Later built upon / challenged



*Scary stimulus*



*Physiological response*

*Emotion*



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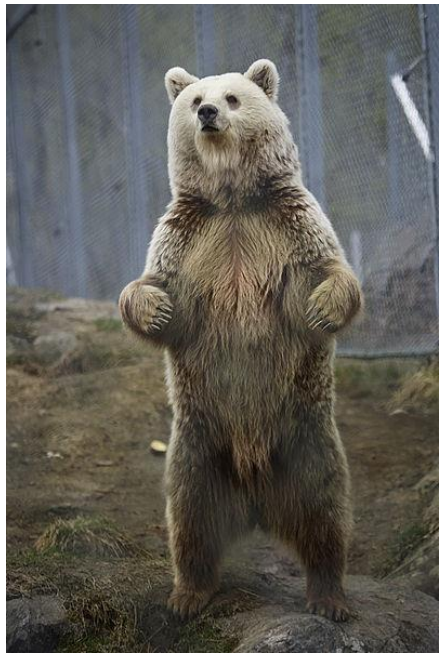
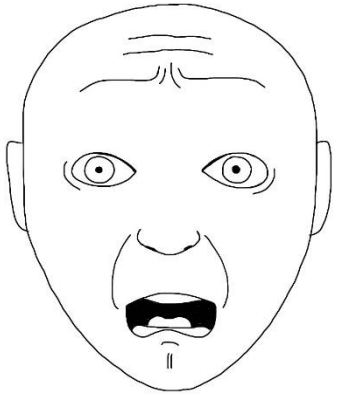
# Emotions

- Cannon-Bard
- Physiological arousal and cognitive response are simultaneous and separate



*Scary stimulus*



*Physiological response*

FEAR!!!

*Cognitive response (emotion)*

*Behavioral response*



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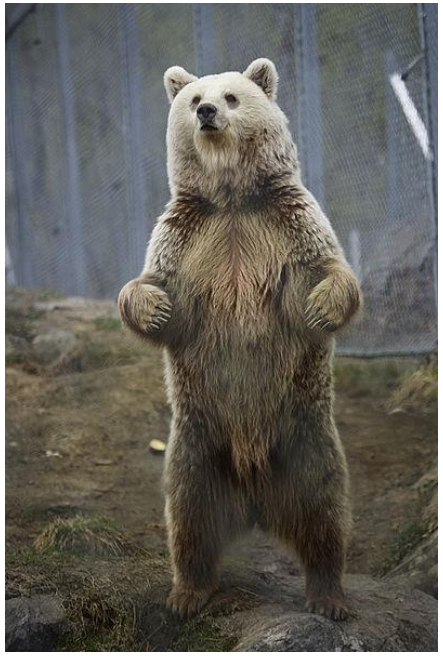
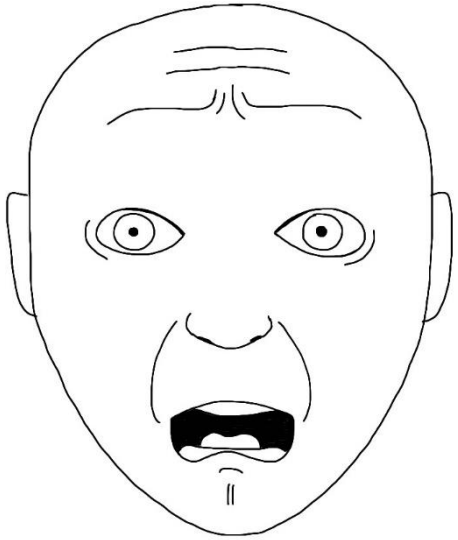
# Emotions

- Schachter-Singer
- Similar to James-Lange, but with role for context-based interpretation
- Epinephrine experiment



*Scary stimulus*



*Physiological response*

*Interpretation in context*

*Emotion*



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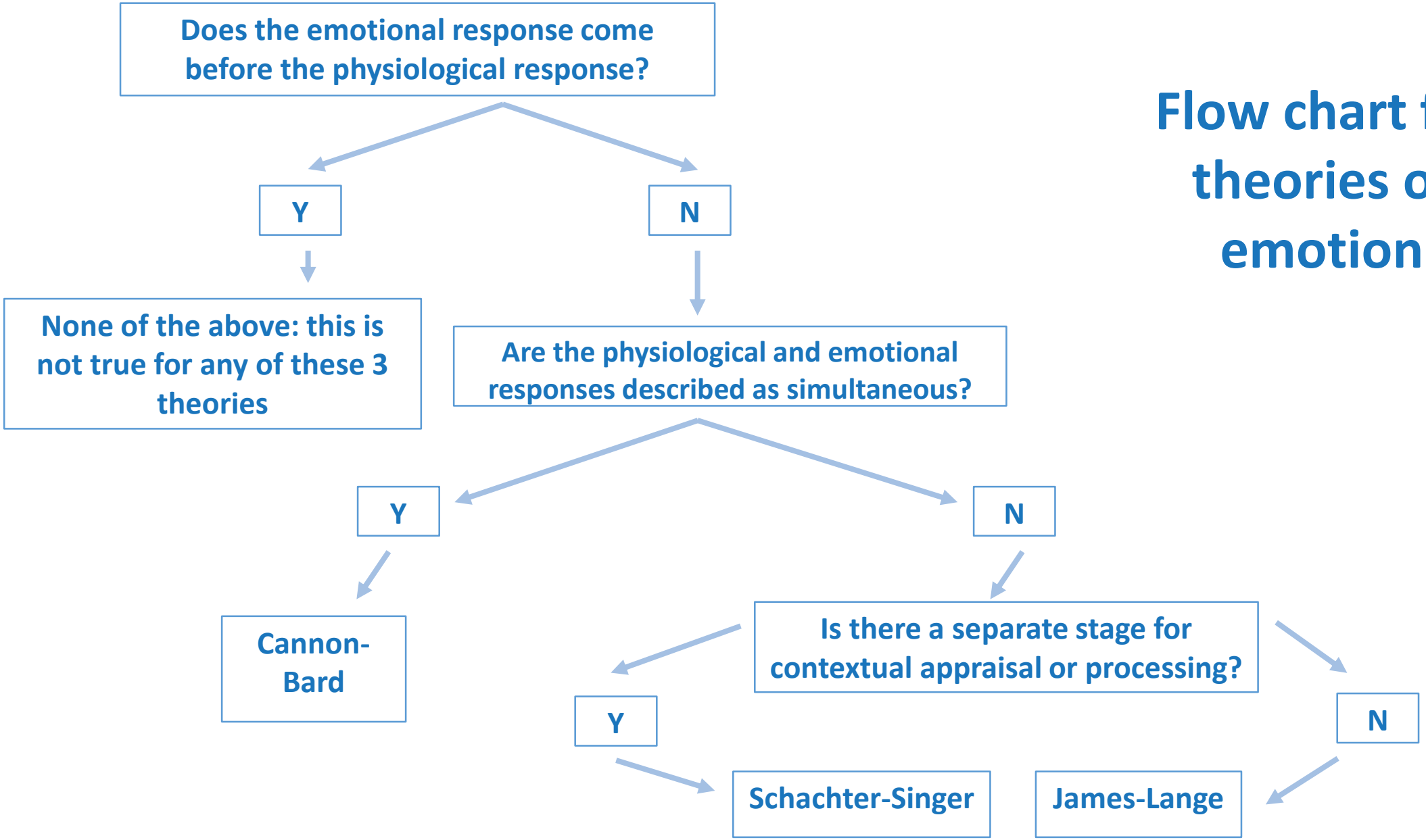
# Flow chart for theories of emotion



# Emotions

1. Describe the James-Lange theory of emotion.

A) An external stimulus triggers the simultaneous experience of physiological arousal and emotion.
B) An external stimulus triggers physiological arousal, which is then experienced as emotion.
C) An external stimulus triggers physiological arousal; we then consciously identify the reason for this arousal, and an associated emotion is then experienced.
D) An external stimulus triggers emotion, which we then interpret to produce physiological arousal.

2. The key difference between emotion and mood is that:

A) emotion is felt only by humans, while mood can be experienced by a variety of animal species.
B) emotion is relatively short-lived, while a mood can last for a long period of time.
C) emotion generally describes experiences in healthy people, while mood is more closely linked to conditions such as major depressive disorder.
D) emotions are caused by external stimuli, while moods are internal states only.

# Bias, Prejudice, and Discrimination

**Bias: tendency to think in particular ways**

- *Fundamental attribution error*
- *Actor-observer bias*
- *Self-serving bias*
- *Just-world hypothesis*

**Stereotype: oversimplified idea of a person, group, or thing**

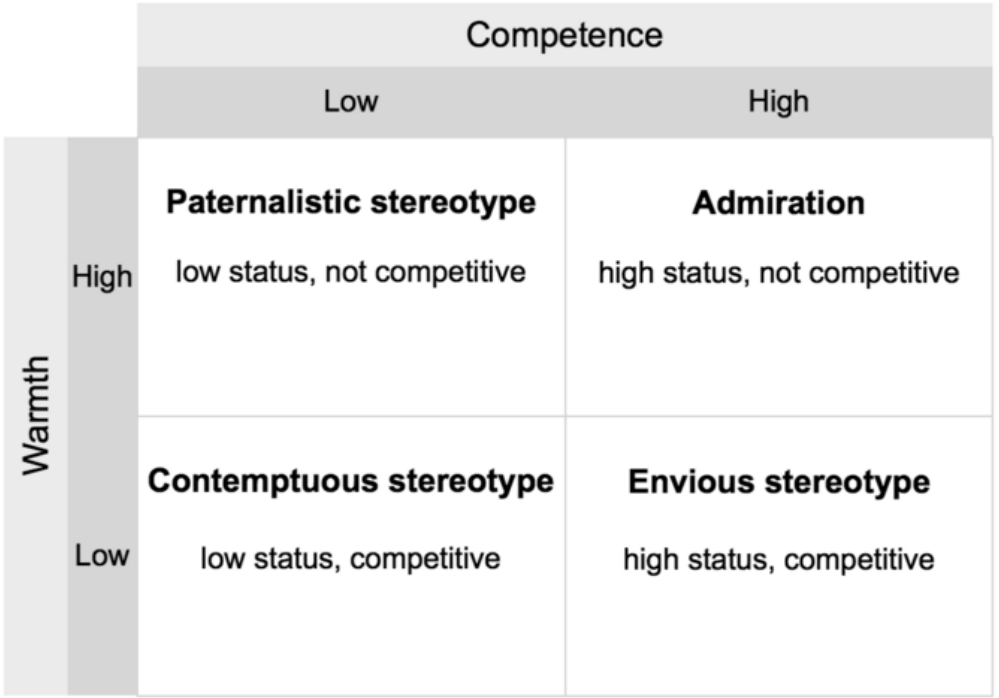
- *Not necessarily negative*
- *Stereotype threat vs. stereotype boost*
- *Must have "content" in some form*

**Prejudice: irrational attitude towards a person or group**

- *Result of socialization*

**Discrimination: differential action or treatment based on prejudice**

- *Individual vs. institutional discrimination*





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# Bias, Prejudice, and Discrimination

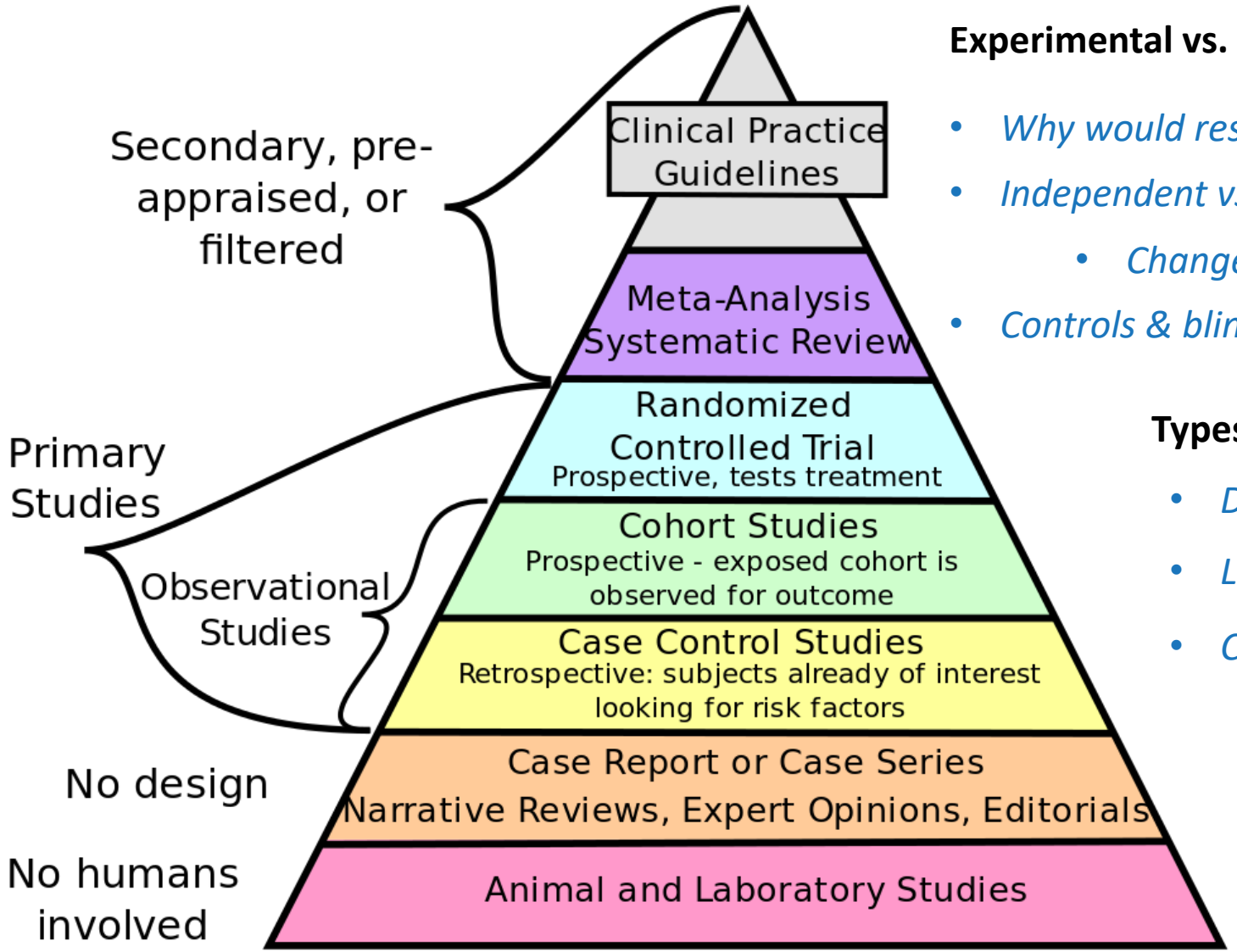
3. A student best exemplifies the self-serving bias when he:

A) modestly states that his high MCAT score was "just luck," but blames his low chemistry grade on a bad professor.
B) maintains that the Green Bay Packers are the best football team in the NFL, while ignoring statistics about their recent poor performance.
C) attributes his winning bowling game to his own talent, but constantly repeats "I'm so stupid" when he performs poorly on math homework.
D) proudly speaks about his athletic ability when he wins tennis matches, but blames weather conditions when he loses

4. Robert and George are both comedians. When George sees Robert tell an offensive joke, he assumes that Robert is a crass and thoughtless person. However, when George later tells a similar joke, he attributes it to the general attitude within the audience. From the perspective of the actor-observer bias:

A) George is the actor, while Robert is the observer.
B) George is the actor when he tells the joke, and the observer when he sees Robert do the same.
C) George is the actor when Robert tells the joke, and the observer at all other times.
D) George is neither actor nor observer because he does not fall victim to the bias.

# Research Design




**Experimental vs. observational design**

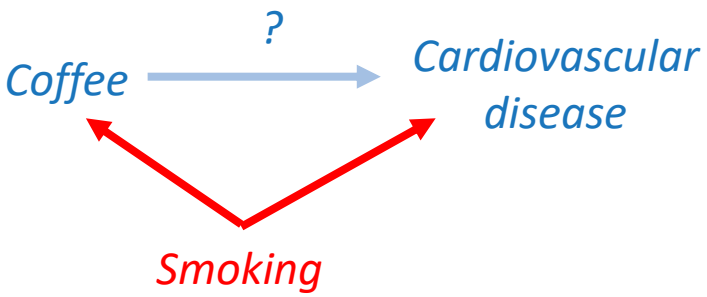
- *Why would researchers pick one versus the other?*
- *Independent vs. dependent variables*
  - *Changes in independent → changes in dependent*
- *Controls & blindedness*

**Types of relationships among variables**

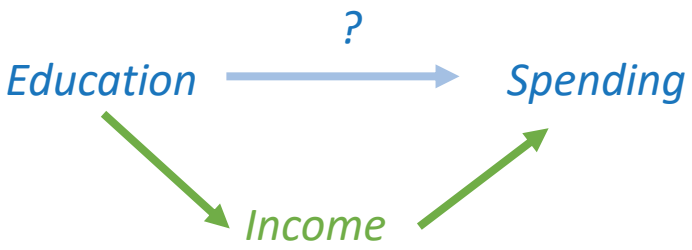
- *Direct vs. inverse*
- *Linear vs. non-linear (exponential, sigmoidal)*
- *Confounding vs. mediating vs. moderating*

# Research Design

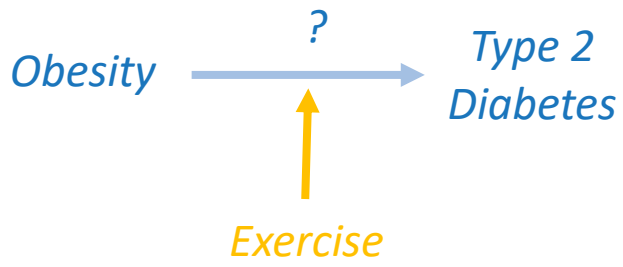
**Confounding variable**



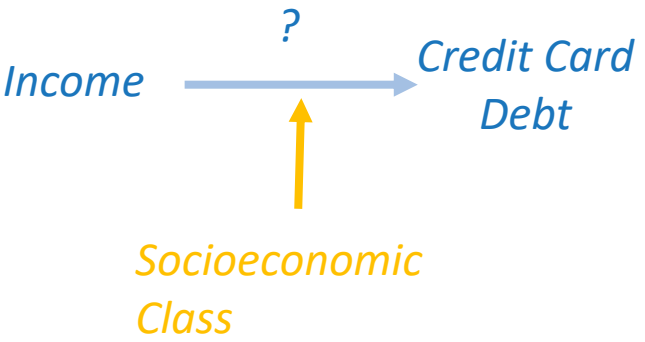

**Mediating variable**




**Moderating variable**




- *Can you think of other examples?*




*e.g. at high SE class, this is an inverse relationship but at low SE class, this is a direct relationship*

# Research Design

5. In a particular relationship, doubling "Thing A" is shown to halve "Thing B," while reducing "Thing A" notably increases "Thing B." How can this interaction be described?

A) The two factors are positively correlated, and "Thing A" is the dependent variable.
B) The two factors are negatively correlated, and "Thing A" is the dependent variable.
C) The two factors are positively correlated, and "Thing A" is the independent variable.
D) The two factors are negatively correlated, and "Thing A" is the independent variable.

6. When an experimental relationship is depicted in graph form, which axis usually corresponds to the independent variable(s)?

A) The x-axis, and the dependent variable(s) are graphed on the y-axis
B) The y-axis, and the dependent variable(s) are graphed on the x-axis
C) Neither axis, but the dependent variable(s) are graphed on the y-axis
D) Neither axis, but the dependent variable(s) are graphed on the x-axis

# Research Design

7. Double-blind studies attempt to reduce the potential confounding effect of:

A) the availability heuristic.
B) confirmation bias.
C) the social desirability bias.
D) stereotype threat.

8. A business psychologist is analyzing the relationship between the time of day and the security line at a typical airport. Across the United States, he notes that lines are significantly longer in the early afternoon than in the morning. However, in southwestern states, this relationship is hardly noticeable, while northeastern airports experience a drastic change from morning to afternoon. In this scenario, which type of variable is the state in which an airport is located?

A) Confounding
B) Dependent
C) Moderating
D) Mediating

# Practice Passage

Weber's law presents an interesting exception in the case of sound. While other sorts of stimuli will have a constant just-noticeable difference (jnd) across the full range of perceptible stimuli (the change in stimulus intensity as a fraction of the original intensity is a constant), for sound this does not always hold true.

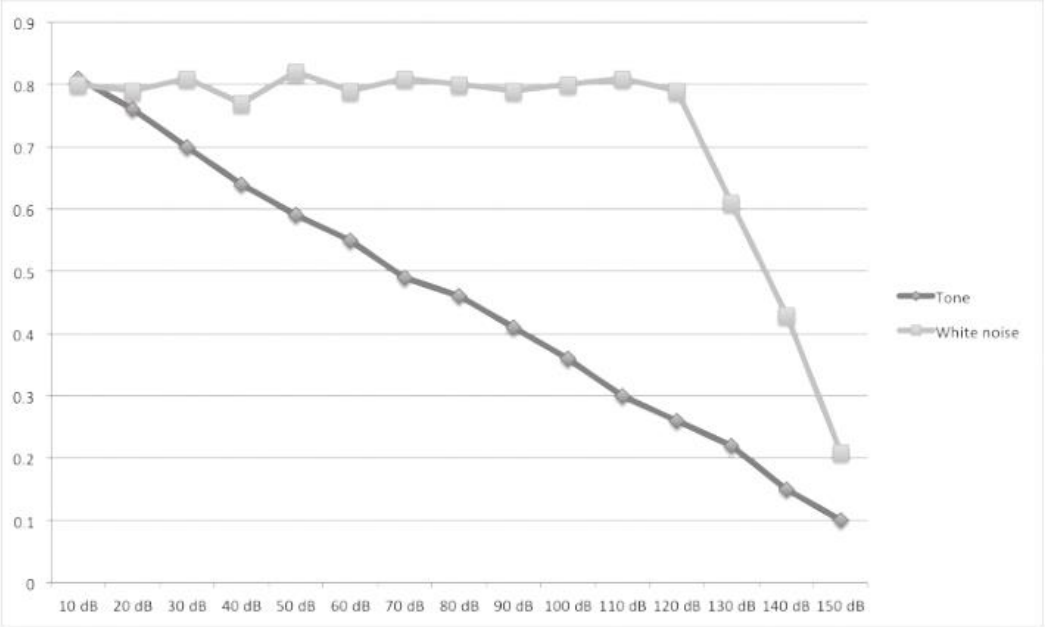



Figure 1 The jnd as a function of intensity for a single pure tone and for white noise.

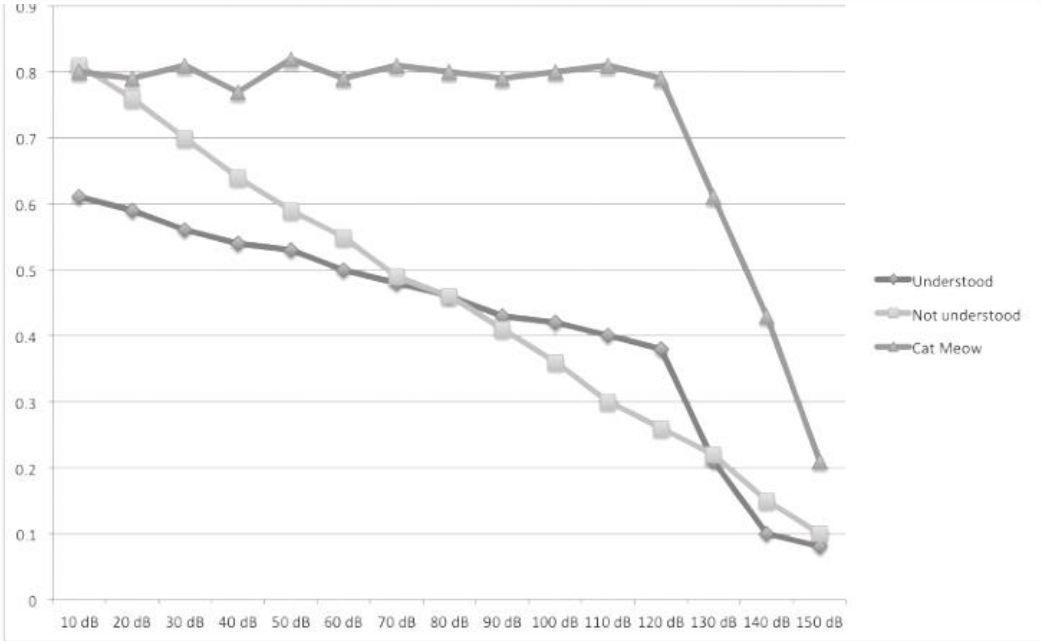



Figure 2 The jnd as a function of intensity for a recording of speech in a language understood by the listener, one not understood by the listener, and a recognizable non-speech sound (a cat's meow)

# Practice Passage

9. In studies of the just-noticeable difference, perception is measured in what way?

A) Sensation
B) Discrimination
C) Magnitude estimation
D) Signal transduction

10. For the especially loud noises, subjects often report negative emotions such as anger after hearing several of the loud sounds. The James-Lange theory would posit that this emotional response:

A) precedes and causes a person to experience physiological arousal which then contributes to further unpleasant affect.
B) occurs simultaneously and independently of the physiological arousal stimulated by the loud sounds.
C) is a result of both physiological arousal and a cognitive appraisal of that arousal.
D) follows from and is caused by the physiological arousal experienced as a result of the loud sounds.

# Practice Passage

11. For nearly every type of sound played, the just-noticeable difference dropped significantly near or above 130 dB. Which of the following is the most likely reason?

A) Above a certain intensity level, sound perception also occurs as a result of signal transduction directly through the skull rather than solely through the ossicles and organ of Corti.

B) The threshold of pain is near or above 130 dB and the jnd for pain is much lower than for many other types of stimuli.

C) Study participants were more attentive to the especially loud sounds as a result of the physiological arousal those sounds created.

D) The distracting nature of the especially loud sounds made it more difficult for study participants to detect changes in stimulus intensity.

# Practice Passage

12. The experiment involved playing noises loud enough that some study participants may have experienced discomfort or even pain. For the experiment to be approved by the researchers' institutional review board, they must have done all of the following EXCEPT:

A) Keeping the sound intensity well below the level at which each individual study participant will experience discomfort
B) Determining the least harmful or invasive protocol to achieve the study's results
C) Obtaining informed consent from the study participants prior to beginning the study
D) Treating study participants equally regardless of factors such as socioeconomic status, race, or gender

# Practice Passage 2

The implicit association test assesses for implicit attitudes through a categorization task. Participants are presented with a computer screen displaying two words on the left side of the screen and two words on the right. The middle of the screen then ashes a word or image and the participant must click a button to indicate the appropriate category as quickly as they can.

A typical set up involves putting the categories “good” and “bad” on the sides of the screen (left vs. right determined randomly) and then categories like “male” and “female” or “rich” and “poor”. After going through several assignments, the category pairings are switched. So for example, a person might click the left button if an image is either “good or male” and the right button if the image is “bad or female” during round 1, and then have to click left for “good or female” and right for “bad or male” during round 2. The images or words presented unequivocally belong to one of these groups. For example, words like “disgust” or “agony” would be categorized as “bad” by 100% of participants, and the symbol for the men’s bathroom would be categorized as “male” by 100% of participants.

# Practice Passage 2

Researchers hypothesize that faster response times indicate an implicit bias in favor of the grouping. That is, if a per- son is able to categorize an image as “good or male” more quickly than he is able to categorize an image as “good or female”, this reveals an implicit sexism in favor of males.

The implicit assumption test was made available on the website of a prominent university and after several news stories, became very popular, with over 150,000 participants in the span of just a few months. The data showed the following results:

| | Good | Bad |
|---|---|---|
| **Slim** | 751 ms | 1003 ms |
| **Fat** | 1150 ms | 633 ms |

| | Good | Bad |
|---|---|---|
| **Able** | 833 ms | 998 ms |
| **Disabled** | 1012 ms | 710 ms |

**Table 1a** and **1b** The average delay (in milliseconds) that a person took to correctly categorize an image

# Practice Passage 2

13. Which of the following correctly identifies a limitation of the data set used?

A) The size of the data set prevents the conclusions from having significant statistical power.
B) Because the test works on implicit associations, it is unable to provide insight about those who are consciously biased.
C) Recruitment through media discussion of the test, without the usual small payment to participants, means the data set would skew towards much higher ends of the socioeconomic ladder.
D) The self-selection of participants prevents the data from being generalizable to any particular population.

# Practice Passage 2

14. The procedure described in the passage should also include each of the following EXCEPT:

A) One or more training rounds in which the person only needs to categorize an image as “good” vs. “bad”, rather than having to be aware of two distinct categorizations at once.
B) Controls in which the two categories have no meaningful connection (implicit or otherwise), such as “up or red” vs. “down or green”.
C) Recruitment procedures to guarantee that equal numbers of male and female participants are gathered.
D) Subsequent data analysis that discards outlying data points as irrelevant (e.g. a latency of 150,000 ms that suggests the person got up and left the computer in the middle of the test).

# Practice Passage 2

16. The results from the experiment indicate that:

A) no implicit associations are associated with able-bodied versus disabled people.
B) study participants demonstrated a stronger implicit preference for slimness than against able bodied people.
C) a self-selected participant pool is more likely to have implicit biases than the general population.
D) study participants demonstrated a stronger implicit preference against fat people than against disabled people.

# Practice Passage 2

17. If study participants feel a mild sensation of disgust in response to a word or image associated with disabled people, the Cannon-Bard theory of emotion would assert that:

A) the physiological arousal and emotional sensation of disgust arise separately and independently in separated areas of the brain.
B) the emotion is the result of the brain assessing the context of the physiological arousal experienced in the body.
C) the emotion follows from and is directly caused by the physiological arousal experienced.
D) the emotion is a cognitive response which then causes autonomic reflexes generating the feeling of the affect.

18. The test is assessing:

A) unconscious discrimination.
B) conscious discrimination.
C) unconscious prejudice.
D) conscious stereotypes.

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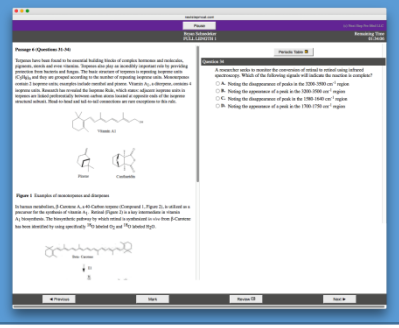
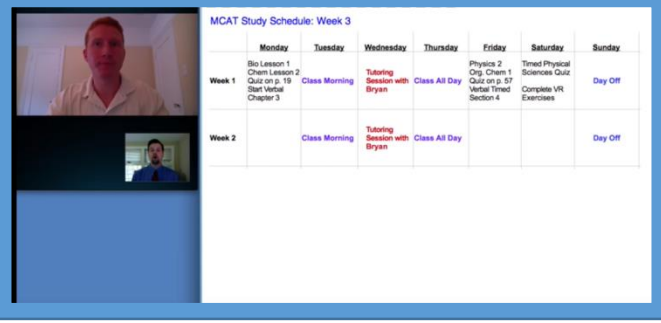
# No matter your path, we got you…



Self-Study

MCAT Class

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# Custom study plan to show you your path

## GENERATE YOUR CUSTOM STUDY PLAN

**1 Select your start date**

08/10/2016

**2 Select your exam date**

10/31/2016

**3 How will you be preparing for the MCAT?**

On the side (5-20 hrs/week) | Part-Time (20-40 hrs/week) | Full-Time (40+ hrs/week)

**4 Select the MCAT science subject about which you are most worried**

Biology | Biochem | General Chemistry | Organic Chemistry | Physics | Psy/Soc

***+ express option!***

## YOUR CUSTOM STUDY PLAN

Edit Dates

Jump to a month: Aug Sep Oct

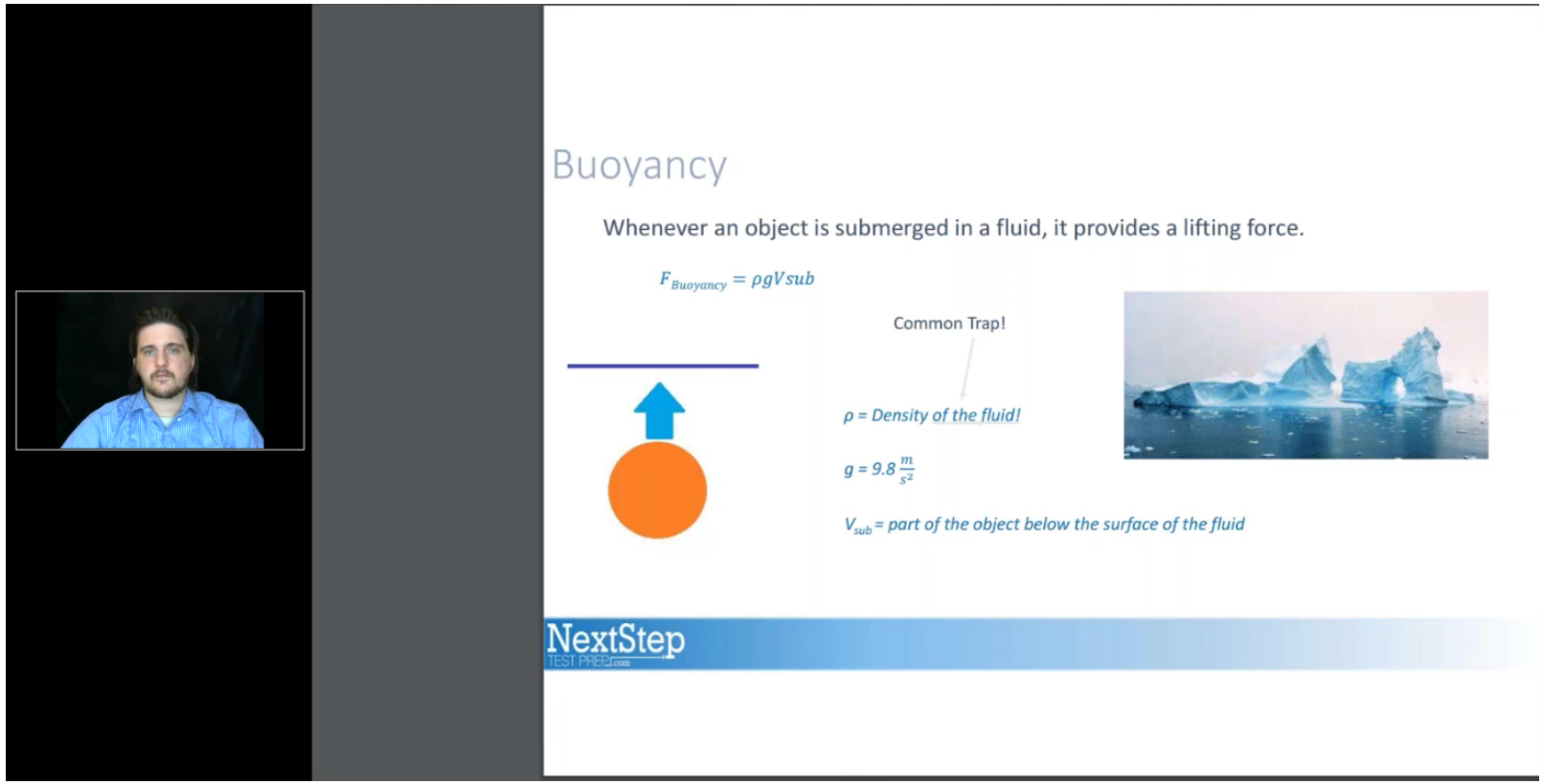
August 2016

| SUN | MON | TUE | WED | THU | FRI | SAT |
|---|---|---|---|---|---|---|
| | | | 10<br>DAY 1<br>REQUIRED<br>~~Watch Orientation Video~~<br>~~Take Science Content Diagnostic~~<br>OPTIONAL | 11<br>**DAY 2**<br>**REQUIRED**<br>Take Diagnostic Test<br>**OPTIONAL**<br>• Complete 2 CARS passages<br>• Watch 3 Bio/Biochem Content Review Videos<br>• Office Hours | 12<br>Catch Up Day | 13<br>DAY 3<br>REQUIRED<br>~~Lesson 1~~<br>OPTIONAL<br>• Complete 30 questions from Biology Qbank |
| 14<br>DAY 4<br>REQUIRED<br>• Read CARS SP Chapters 1-3<br>• Complete practice passages for CARS SP Chapters 1-3<br>OPTIONAL<br>• Complete 2 CARS passages<br>• Watch 2 Bio/Biochem Content Review Videos<br>• Office Hours | 15<br>Catch Up Day | 16<br>DAY 5<br>REQUIRED<br>~~Lesson 2~~<br>OPTIONAL<br>• Complete 30 questions from Biology Qbank<br>• Watch 2 Psych/Soc Content Review Videos<br>• Office Hours | 17<br>DAY 6<br>REQUIRED<br>• Read CARS SP Chapter 4<br>• Read Physics/Math CR Section 1<br>• Complete Math Assessment from Physics/Math CR Section 5<br>OPTIONAL<br>• Complete 2 CARS passages<br>• Complete 20 questions from Biochem Qbank | 18<br>Catch Up Day | 19<br>DAY 7<br>REQUIRED<br>• Read Chem/Orgo CR Sections 1 and 2<br>• Read Chem/Phys SP Ch 1 and 2<br>OPTIONAL<br>• Complete 2 CARS passages<br>• Watch 2 Physics Content Review Videos | 20<br>DAY 8<br>REQUIRED<br>Lesson 3<br>OPTIONAL<br>• Complete 2 CARS passages<br>• Complete 30 questions from Chemistry Qbank |

# To be the best, work with the best

- Bryan: 15 years MCAT teaching experience
- Anthony: MD/PhD; 12 years MCAT experience
- Clara: 526 MCAT, 5 years experience
- Phil: 5 years experience; 98% score
- Andrew: U Chicago PhD, 523 MCAT

# Welcome to Office Hours

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- Test review
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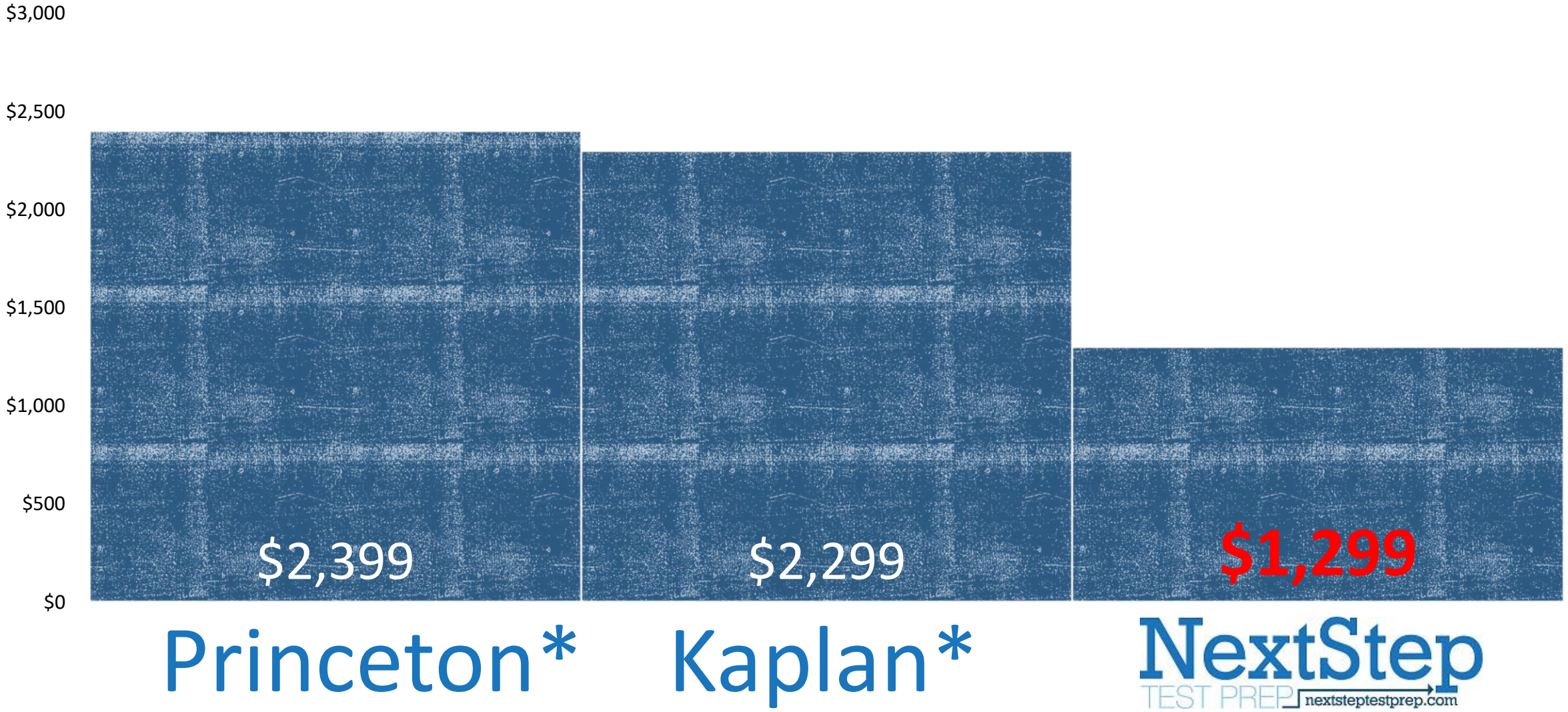



*Competitor pricing taken from corporate website on date of publication; may not be up to date.

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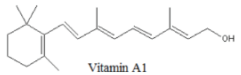
Bryan Schnedeker
FULL LENGTH 1

Remaining Time
01:34:06

**Passage 6 (Questions 31-34)**

Terpenes have been found to be essential building blocks of complex hormones and molecules, pigments, sterols and even vitamins. Terpenes also play an incredibly important role by providing protection from bacteria and fungus. The basic structure of terpenes is repeating isoprene units $(C_5H_8)_n$ and they are grouped according to the number of repeating isoprene units. Monoterpenes contain 2 isoprene units; examples include menthol and pinene. Vitamin $A_1$, a diterpene, contains 4 isoprene units. Research has revealed the Isoprene Rule, which states: adjacent isoprene units in terpenes are linked preferentially between carbon atoms located at opposite ends of the isoprene structural subunit. Head-to-head and tail-to-tail connections are rare exceptions to this rule.



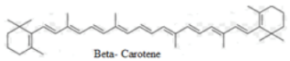
Vitamin A1

Pinene

Cantharidin

**Figure 1** Examples of monoterpenes and diterpenes

In human metabolism, β-Carotene A, a 40-Carbon terpene (Compound 1, Figure 2), is utilized as a precursor for the synthesis of vitamin $A_1$. Retinal (Figure 2) is a key intermediate in vitamin $A_1$ biosynthesis. The biosynthetic pathway by which retinal is synthesized *in vivo* from β-Carotene has been identified by using specifically $^{18}O$ labeled $O_2$ and $^{18}O$ labeled $H_2O$.


Beta- Carotene

E1

Periodic Table

**Question 34**

A researcher seeks to monitor the conversion of retinal to retinol using infrared spectroscopy. Which of the following signals will indicate the reaction is complete?

- **A.** Noting the disappearance of peaks in the 3200-3500 $cm^{-1}$ region
- **B.** Noting the appearance of a peak in the 3200-3500 $cm^{-1}$ region
- **C.** Noting the disappearance of peak in the 1580-1640 $cm^{-1}$ region
- **D.** Noting the appearance of a peak in the 1700-1750 $cm^{-1}$ region

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FULL LENGTH 1

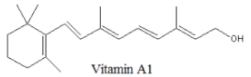
**Passage 6 (Questions 31-34)**

Terpenes have been found to be essential building blocks of complex hormones and molecules, pigments, sterols and even vitamins. Terpenes also play an incredibly important role by providing protection from bacteria and fungus. The basic structure of terpenes is repeating isoprene units $(C_5H_8)_n$ and they are grouped according to the number of repeating isoprene units.Monoterpenes contain 2 isoprene units; examples include menthol and pinene. Vitamin $A_1$, a diterpene, contains 4 isoprene units. Research has revealed the Isoprene Rule, which states: adjacent isoprene units in terpenes are linked preferentially between carbon atoms located at opposite ends of the isoprene structural subunit. Head-to-head and tail-to-tail connections are rare exceptions to this rule.

**Key terms: terpenes, isoprene unit formula, mono/di terpene, isoprene rule**

**Contrast: the favored isoprene links are head-to-tail, though exceptions do occur**

**Cause and effect: repeated isoprene units can combine to form several biologically important molecules**



Vitamin A1

Pinene

Cantharidin

**Figure 1** Examples of monoterpenes and diterpenes

**Figure 1 shows us that the various terpene molecules made up of repeating isoprene units**

In human metabolism, β-Carotene A, a 40-Carbon terpene (Compound 1, Figure 2), is utilized as a precursor for the synthesis of vitamin $A_1$. Retinal (Figure 2) is a key intermediate in vitamin $A_1$ biosynthesis. The biosynthetic pathway by which retinal is synthesized *in vivo* from β-Carotene has been identified by using specifically $^{18}O$ labeled $O_2$ and $^{18}O$ labeled $H_2O$.

Periodic Table

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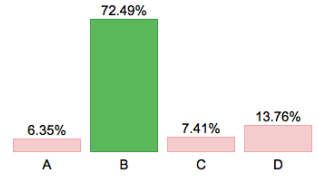
- **C.** Noting the disappearance of peak in the 1580-1640 $cm^{-1}$ region
- **D.** Noting the appearance of a peak in the 1700-1750 $cm^{-1}$ region

**72.49%** of students answered this question correctly.

Your answer was incorrect




***Answer Explanation:***

- Difficulty: 2 Medium
- Reasoning Skill: 2 Scientific Reasoning and Problem Solving
- Concept Category: 4D Light and Sound

B is correct. Retinol differs from retinal in that it contains -OH groups, but does not contain a carboxyl group (C=O). The carbonyl stretching frequency falls in the region 1700-1750 $cm^{-1}$, whereas the O-H stretching frequency is expected to fall in the region 3200-3500 $cm^{-1}$.

A: This would indicate a lack of OH groups, which is a characteristic of retinal, not retinol.

C: This peak is indicative of C=C groups, which both molecules have and cannot be used to determine when retinal has been converted.

◄◄ Previous Passage | ◄ Previous | Next Section ►►► | Next ► | Next Passage ►►

# Comprehensive Reporting and Analytics

## Scaled Scores

| Section | Scaled Score | Percentile |
|---|---|---|
| Chemical an Systems | | |
| Critical Analy | | |
| Biological an Systems | | |
| Psychologica Behavior | | |
| **Total** | | |

SULTS

## Results by Reasoning Skills

| Concept Category | Total Correct | Correct Percentage |
|---|---|---|
| 1 Knowledge of Scientific Concepts and Principles | 49 | 71.01% (49/69) |
| 2 Scientific Reasoning and Problem Solving | 39 | 68.42% (39/57) |
| 3 Reasoning About the Design and Execution of Research | 23 | 69.7% (23/33) |
| 4 Data-based and Statistical Reasoning | 10 | 55.56% (10/18) |
| 5 Foundations of Comprehension | 12 | 75% (12/16) |
| 6 Reasoning within the Text | 14 | 60.87% (14/23) |
| 7 Reasoning Beyond the Text | 9 | 64.29% (9/14) |

## Results by Section

Chemical

Correct:

Critical Ar

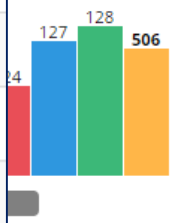
Correct:

Biological

Correct:

Psycholog

Correct:




## Results by Concept Category

| Concept Category | Total Correct | Correct Percentage |
|---|---|---|
| 1A Amino Acids and Proteins | 4 | 57.14% (4/7) |
| 1B Molecular Genetics | 9 | 81.82% (9/11) |
| 1C Classical Genetics | 9 | 69.23% (9/13) |
| 1D Metabolism | 3 | 37.5% (3/8) |
| 2A Cell Biology | 1 | 100% (1/1) |
| 2B Microbiology | 4 | 80% (4/5) |
| 2C Reproduction | 3 | 60% (3/5) |
| 3A Nerve and Endocrine | 4 | 50% (4/8) |
| 3B Organ Systems | 1 | 100% (1/1) |
| 4A Kinematics and Force | 5 | 50% (5/10) |

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