Sensory and Perception (12 Feb)

* Answer: False
* Our level of consciousness can be affected by drugs, hypnosis, and meditation
* Substance use disorders are diagnosed via the DSM-5 and includes having dependence for both physiological and psychological reasons
* Physical dependence/tolerance is not sufficient
* Having a drug doesn’t mean withdrawal symptoms
* Depressants - Suppress central nervous system
* Can be used to treat insomnia or anxiety
* Most common form: alcohol
* Withdrawal is most severe of all drug types
* Stimulants - Increase overall levels of neural activity
* Contained in some ADHD medication
* Most common form: caffeine or nicotine
* Even legal stimulants can have side effects
* Opiates - Decrease pain by mimicking body’s natural pain killing system
* Contained in legal medication like cough-suppressant
* High abuse potential
* Withdrawal management
* Temporary reduction in symptoms
* Hallucinogens - Significant alterations in sensory and perceptual experiences
* How it works in the body depends on what was used
* Considered least likely to be abused
* Legality of these medications severely limits studying and understanding the full impact
* Some hallucinogens are difficult to study, since are not legal
* Hypnosis - Extreme self-focus with little to no attention given to external stimuli
* Primarily used in therapeutic setting
* Heavily debated of its existence
* Clinical setting, during therapy
* Meditation - Focusing on a single target to increase awareness of present moment
* Used in therapy, individually, and with some religious/spiritual beliefs
* Some links to positive health benefits
* Not a ton of research

Today’s Lecture

**The difference between Sense and Perceive**

**Sensation**

When sensory information is detected by a sensory receptor.

* Sensory receptors are specialized neuron that respond to specific stimuli.
* Sensory systems include:
  + Vision (light waves), hearing(auditory), smell(olfactory), taste, touch, balance, body position, body movement, pain, and temperature

**A word about subliminal messages (A message that is given to use w/o our consciousness)**

I worked in a lab that wanted to measure implicit bias (information that you have been taught that directs your behaviour.)

* Using the implicit-association test (IAT) measures reaction time in associating words
  + Argued to measure subconscious associations/beliefs (any problems with this???)
* Wanted to manipulate associations subconsciously.
  + Would present people with a math problem and flash the answer to their non-dominant eye (subconscious message) to see if people with the right answer would respond faster than people who were presented noise.
* We are not controlled by our knowledge. We still have a choice.
* Subconscious association.
* We are still in control of our behavior, therefore not an ethical way to obtain results.

**Perception**

How sensory information is organized, interpreted and consciously experienced.

* Bottom-up and top-down processing (The 2 processes).
  + Top-down: using previous experience to recognize stimuli/interpret.
  + Bottom-up: stimuli breaks through attentional resources and attention is allocated to the new source for identification. Attention for perception is critical.

**Our experiences and expectations shape our perception.**

We do not perceive things the same way.

* There are many ways we can study variables that influence our perception.
* Some people are more susceptible to specific illusionary tricks because of where they are from, among other variables.

Rating of pictures:

1. Dot 3 from right
2. Dot 4 from the right
3. Neutral

Emotion research - Research on human emotions, universal.

We express emotions on our face, but perception of that emotion can be influenced by the context it occurs.

* Emotion is not expressed by a floating face in the void, and we take contextual factors into account.
  + Body language
  + Surrounding people (i.e., social cues)
* Cultural influences change our perception of emotion ratings.
  + People from East Asian countries focus on object and context.
  + People from Western countries focus on object separate from context.
* Ratings of emotion will vary based on cultural background.

Study 1

* 39 US students and 36 Japanese students
* Presented cartoons of varying focal character and social contexts
* Both groups recognized differences in social context emotions
* Independent variable – Country they are from
* Emotion is better when people look like you.
* Focal and the context are 2 different things.
* US participants reported context did not influence their rating, Japanese participants reported context did influence rating.
* For all three emotions (anger, sad, happy): Japanese participants’ ratings were influenced by context and American participants’ ratings were not.

Study 2

* 22 Westerners and 27 Japanese students at Japanese university
* Presented same cartoons while using eye tracking equipment.
* Both groups recognized differences in social context emotions
* Some Japanese students had western background
* Recognized a difference in emotions and context.
* Replicated results of Study 1

Japanese participants allocated less gaze to central figure, whereas Western participants tended to focus primarily on the central figure.

* Physical perception depends on culture.
* Although presented with the same stimulus, our perception and even our physical scanning of the stimulus can differ depending on cultural background!
* Same sensation doesn’t mean we perceive it the same way.

Sensation and perception(14 Feb)

* Priotorise visual perception over other perceptions.
* False
* Sensation refers to whether sensory information is detected by specialized neurons that respond to specific stimuli.
* The absolute threshold refers to the minimum amount of stimulus energy that must be present for the stimulus to be detected 50% of the time.
* Our sensory systems include a wider variety than you originally learned: vision, hearing, smell, taste, touch, balance, body position, body movement, pain, and temperature.
* Sensation is dependant on the absolute threshold.
* We are not driven automatically by our subconscious knowledge. We have access to a lot of information and consciously make a choice how to behavior.
* This position is debated in research, some researchers believe we are influenced by our subconscious knowledge.
* Being aware of the information does not mean you believe in it.
* Perception is the interpretation, categorization, and experience of sensory information. Therefore, it is influenced by our experiences and our attention.
* We can miss or ignore information if it is not attended to.
* You have to pay attention to percieve information. Therfore we need to attend to information.
* Whether our perception of emotional expression is influenced by the social context in which it occurs can be influenced by the culture in which we grew up
* People from East Asian countries are more likely to take context into account.
* People from Western countries are less likely to take context into account.
* Across two studies, researchers found that people from Japan rated focal person’s emotion based on the emotion of the people surrounding the focal person whereas people from the US rated focal person’s emotion independently of emotion from people surrounding them
* Eye tracking supported this finding, people from Japan spent less time looking at focal person relative to surrounding people

Western people didn’t take social background into account.

Japanese people spent less time looking at the person in the centre. Physical observations were influenced by previous experiences. Where we are from and where it occurs.

* Although presented with the same information, our interpretation and even physical observation of the information was influenced by our previous experiences and expectations.
* We rely on vision information to the point our brain will use it to point our brain will use it to override conflicting information
* An additional note about blind spots…

Blind spots have existed ever since we have had eyes, and our brain tries to compensate by guessing what it thinks would be there otherwise (hence seeing the background instead of the shape we know to be there)

* Unfortunately, just because our brain is trying does not make it correct.
* It is not physically possible to receive info on that part because of no rods or cons.

It is not only physical limitations that can affect our perception of stimuli, but attentional resources.

* This is why both top-down and bottom-up processing play a role in perception of stimuli.
* If attention os not there we cannot notice it even if stimuli is present.
* Outside our expectations
* If eyes do one thing doesn’t mean you pay attention to it, you might miss onformation that you might see.

**Trichromatic theory of color vision**

* People have 3 different types of cones that respond to different wavelengths of light (short, medium, and long-> blue, green, red)
* All colours can be produced by some combination of these colors.

**Opponent-process theory**

* Color is coded in opponent pairs: black-white, yellow-blue, and green-red
* When we stare at light our brain can habituate to that color, which influences the afterimage we see when we look elsewhere.
* It becomes less sensitive to that color, then it becomes more sensitive to the oppponent color.

How can Trichromatic theory and Opponent process theory work at the same time?

* Remember Trichromatic theory focuses on sensory information whereas…
* Opponent process theory focuses on categorizing information.
* AKA the difference between sensation and perception!

If you have ever worked with paints or coloring and feel confused…

* Remember these theories are talking about light and wavelengths
* They are not talking about mixing pigment (e.g., paint)
* You will not be tested on different color types, only to resolve potential confusion.

Pigment and light are different, it is talking about light and wavelengths light is not equal to pigment.

**Mar 4**

Thinking and intelligence

Cognition: thinking; encompasses processes associated with perception, knowledge, problem solving, judgment, language, and memory

* Meta-cognition means thinking about thinking.

Concepts: mental representation that categorizes shared features of related objects, events, ideas, images, etc. Based on our experience and our perspective.

* **Please ignore the textbook’s description of natural/artificial concepts**

Concepts contain necessary (required) and sufficient (good enough) conditions to be included in a concept. Concepts for a person differ, because of different perspectives and experiences.

* Prototype is the best representation of a concept.

How do people determine whether something belongs in a category?

* Exemplar theory – compare new stimulus to previous experiences.
* Prototype theory – compare new stimulus to “most typical” member of the category.
* Difference is if you’re comparing it to different things or one thing.

Schema – mental category of a collection of related concepts.

Role schema/Stereotype:

* These are schemas about people, either as groups or in a role.
  + How do you categorize Americans? Europeans? Professors?

Event schema/Script:

* These are schemas about what you expect to happen in a given situation
  + How do you categorize “eating in a restaurant” or “going to a wedding”?

**These are not based on facts, but on our experience/knowledge.**

**Remember: we are not, often, logical or rational in these. Just because we expect something does not make it correct or true.**

Rational choice theory: we make decisions by determining how likely something is to happen, judging the value of the outcome, and multiplying the two.

* In other words, we determine which option gives us the highest expected value and select that option, every time.

(we are not good at doing that)

An example for how “rational” we are:

Of a sample of 100 descriptors based on interviews with lawyers and engineers, 70 describe engineers and 30 describe lawyers. Read each statement and decide if it describes an engineer or a lawyer.

1. Jack enjoys reading books on social and political issues. During the interview, he displayed particular skill at argument. (Lawyer)
2. Tom is a loner who enjoys working on mathematical puzzles during his spare time. During the interview, his speech remained fairly abstract and his emotions were well controlled. (Engineers)
3. Harry is a bright man and an avid squash player. During the interview, he asked many insightful questions and was very well spoken. (Lawyer)

Most people determine which category the description fits best not based on the best rate provide (70% engineer descriptions) and instead base it on how much the description fits their description of engineers or lawyers.

* Representativeness heuristic: a mental shortcut that involves making a probability judgement by comparing an object or event with a prototype of that object or event.(Stereotype)

What kinds of things influence these outcomes?

Reality is based on beliefs.

“Reality is what we take to be true. What we take to be true is what we believe. What we believe is based on our perceptions. What we perceive depends upon what we look for. What we look for depends upon what we think. What we think depends upon what we perceive. What we perceive determiners what we believe. What we believe determines what we take to be true. What we take to be true is our reality.”

~Gary Zukav, Dancing Wu Li Masters: An Overview of the New Physics

We believe that which confirm our beliefs.

Mar 6

Thinking & Intelligence – II

Ans- Rational Choice Theory

Cognitive psychology involves studying how people think and considers how we categorize and reference information regarding perception, knowledge, problem solving, judgment, language, and memory.

* One way we do this is through understanding concepts, more mental representations that group together related objects, events, ideas, images, etc.

How do we group this information? Shared features

* A prototype is the best representation of a concept. The prototype differs from person to person. It can be different.

What about adding new information to a concept? How do we do it?

* We compare new information to previous experience (exemplar theory)
* We compare new information to prototype (prototype theory)

Spoiler alert: we are not always rational or make the “best” decisions.

Rational choice theory: we determine which option gives us the highest expected value and we select that option, always.

* Do we?
  + Are we more likely to base our response off a base rate or representativeness heuristic?
    - What is a heuristic again? Decision making shortcuts.
  + What influences this choice?
    - Confirmation bias (something that supports your prior point of view.)

Language is a very influential part of our lives.

Verbal language has a lot of unspoken rules that “just make sense”.

This is English, phonemes (and everything else) are different in other verbal languages.

For a long time, being able to speak/understand more than one language was viewed as an interference with “normal” cognitive development.

* Original research was flawed.
  + Tests were given in English (not their primary language), child participants’ parents did not have strong English skills, etc.
* Research conducted in Montreal, where bilingualism is common, did not have differences between bilingual and monolingual students.

But! That is not the only way to study language and perception…

Online Communication is becoming increasingly popular and can make some things more challenging (e.g., context, social cues) whereas other things easier (e.g., easier to look up what a word means).

What words people choose, and punctuation, can be associated with stereotypes. (e.g., expecting women to be friendlier)

Background:

* Women tend to smile more and show mow facial cues to their emotional state than men do.
* This can turn into normative expectations (i.e. unwritten rules in a society that influence our expectations)
* Women who do not follow these rules can be punished.

Hypotheses:

Study 1:

* People will infer a greater degree of femaleness in a texter who uses an exclamation mark than in a texter who uses a period.
* Texters who are rated as more femaleness will also be rated as more friendly.

Study 2:

* Females who use a period in a text are less friendly relative to males who use a period in a text.

Conclusion

Study 1:

Using an exclamation point was rated more likely to be female compared using a period.

Friendliness was associated with rating of femaleness.

Study 2:

Female names were not rated than other names on friendliness on punctuation use.

Takeaways:

* People associate friendliness with being female.
* People expect females to be more expressive.
* No Social punishment for females who are not expressive.

Strengths/weaknesses:

* Student population—valid and also not encompassing. Social norms are changing with generation.
  + People most likely to text?
* Better measure of social cost/punishment

**MEMORY**

Mar 18

False

The motivation and method of measuring/testing intelligence changed across the many iterations (and locations) of its development. Keep that in mind as we assess theories/perspectives

* Hint: most of the time it was in support of eugenics

The first person to study/theorize about intelligence was **Sir Francis Galton** in the 1800s

* Applied Theory of Natural Selection (Charles Darwin) to human ability
* Believed intelligence was only due to genetics
* Coined eugenics and believed “not smart” people should not have children
  + Yes, unsurprisingly he did in fact believe in a “master race”

The only positive note in the history of intelligence testing is when Alfred Binet and Theodore Simon attempted to create/measure intelligence to support French students acclimating to the classroom

* France mandated all kids attend class, and was worried about supporting students who had never been in a classroom
* Developmental periods for children are clear and influential
  + Not able to compare development from 3 to 4 as from 35 to 36
* Believed nature and nurture were important

Studying intelligence also led to the development of new statistical procedures

* Charles Spearman, on his attempt to develop ‘G-Factor’ helped create factor analysis
  + G-Factor was apparently a measure of ‘general ability’
  + Factor analysis clusters different dimensions of a dataset

The US picked up on implementing and developing intelligence testing because they wanted to recruit people to fight for them in WWI

* Used a modified version of Binet & Simon’s testing
* Used outcome to label people (i.e., fit their pre-existing beliefs)
* Wanted to “ultimately result in curtailing the reproduction of feeble-mindedness”
  + yes, it was in support of eugenics

Main takeaways of intelligence testing:

* We’ve been studying it for 200 years and still cannot define it, measure it, or even understand the influence of genetics, socioeconomic factors, home environment, etc.
* It has been used to justify the force sterilization of hundreds of thousands of people (up until even the 1970s)
* I know people like to know more about yourself
* Please consider not limiting yourself, your self-worth, or your possible future based off a number that we are not confident it is measuring what it says it is measuring
* If you are unsure, I do not support trying to measure “intelligence”. I think studying learning is more important

Atkinson & Shiffrin’s model was the first memory model, later Baddeley & Hitch proposed a system of memory for working memory and short term memory.

Short-term memory: temporary storage system that processes incoming sensory memory

Working memory: active maintenance of information in short-term storage

Baddeley & Hitch:

Visuo-spatial sketchpad : manipulates and stores visual information (like trying to memorize a map)

Phonological loop : manipulates and stores verbal information (for verbal and reading information)

Episodic buffer : Integrates visual and verbal information

Central executive : coordinates subsystems and the episodic buffer

What kinds of things can influence your working memory?

Working memory involves effectiveness and efficiency:

Effectiveness: the quality of the performance

Efficiency: the effort/processing resources invested in the performance

* + High efficiency = high performance with few resources

Why does it matter? Anxiety can affect effeciency, but not effectiveness

* + Anxiety uses processing resources, reducing efficiency
  + Anxiety motivates strategies to improve effectiveness

In terms of working memory, anxiety does not necessarily affect subsystems (e.g., phonological loop) but it does affect central executive.

* Test which aspects of working memory are affected by anxiety
* Participants experience Corsi Block test (visuo-spatial information) and simultaneously experienced:
  + testing phonological loop
  + using visuospatial sketchpad
  + use central executive
  + none of the working memory aspects

H1: Believed that trait anxiety (anxiety on average) would be a better moderator of performance than state anxiety(anxiety currently)

H2: There would not be an effect of Corsi task + phonological loop.

H3: There would not be an effect of Corsi task + sketchpad.

Corsi task

Results:

* Low- and high-anxious participants performed the same on all tasks except when having to count backwards.
  + High-anxious participants performed significantly worse on Corsi task and secondary task during this time.
* No effect of anxiety on Corsi task when paired with control condition.
* People who are more anxious have difficulty performing tasks efficiently, but not effectively.
  + Performed same as low anxious in all other ways.

Memory-2

**Mar 20**

-True

In the textbook they suggest making making many conections between material you are trying to remember, make information personal, and attempt to apply information to the information.

These are all variables that improve our ability to correctly and accurately rember information.

But is it always the case of more = better??

Memory is flexible depending on our motivation

* How we feel about ourselves
* Wanting to please someone/be helpful
* Being told we are correct
* How the situation is described to us
* Small details not being “important”

There is no simple solution to memory retrieval—we may not even be aware our memory has been influenced.

We could also be motivated to survive.

Eyewitness testimony is crucial in cases with weapons (e.g., murder, drive-by shootings, robberies, muggings, etc.) because perpetrators almost never leave DNA trace evidence

* Misidentification is the most important contributing cause of wrongful conviction in the USA.
* The presence of a weapon negatively influences our ability to remember perpetrator information.

Weapon focus effect (WFE): eyewitness observing a crime in which a perpetrator carries a weapon are less accurate in describing or identifying the suspect in a lineup compared to crimes with no weapons involved.

* Why does an object make it challenging to remember other information?

Emotional Stress and Arousal:

* Emotional stress: a psychological and physiological reaction to a negative emotional event
* When stress is experienced could have a different influence—stress at encoding should reduce attention; stress at consolidation should improve memory; stress at retrieval should have a detrimental effect
  + How does this relate to your experience? Consider: learning material
* Not often measured in in real life or in a lab.

Attentional focus while watching a crime:

* Focal objects, especially threatening or unusual, are processed better because they “stick out”.
* Might be better at describing the focal object when it is associated with emotional compared to neutral information.

Unusualness of an object of weapon:

* Something being surprising or unexpected could grab our attention
  + Any object that is unusual or surprising could get this effect, does not require to be a weapon—the importance is context violation
  + Not unreasonable—consider how if nothing happens on your way to work it is hard to remember what actually happened

Hypotheses for person identification:

1. People make fewer correct decisions across target-present (TP) lineups and target-absent (TA) lineups when the perpetrator carries a weapon than when they do not
2. A target holding a weapon identified correctly less frequently in a TP lineup in comparison to a target carrying either nothing or a neutral object.
3. In TA lineups, witnesses who observe a perpetrator with a weapon make more false identifications compared to observing a target without a weapon or neutral object

Hypotheses for recall:

1. In the presence of a weapon leads to less accurate descriptions of a perpetrator compared to conditions in which no weapon is present
2. In contrast, we expect better recall of the weapon (central information) compared to other objects carried by the target in the control condition.

Hypotheses for unusualness:

1. We expected when a target carries an unusual object, or a weapon in an unusual context, the target should be identified less often or described less accurately compared to an empty-handed target or a target with a neutral object.

Results:

* No significant difference in accuracy of correct identifications in target-present lineups while in the presence or absence of a weapon
* Not enough studies available to test accuracy in identifications in target-absent lineups
* Most studies involve 100% accuracy in naming weapon in weapon condition, with only 72% accuracy of neutral object in control condition

Results:

* Descriptions of the target without a weapon were more accurate than with a weapon
  + There was a wide variety in how studies measured “accuracy”
* The Weapon Focus Effect (WFE) was larger when the target had a knife compared to a gun, but both were statistically significant

Takeaways:

* There is a medium-large effect size of WFE for accuracy in descriptions of the perpetrator, but not for identifications.
* A wide variety of studies (in a bad way) makes it difficult to compare and come to larger conclusions
  + Free recall v multiple-choice v correct only v (correct-incorrect)
* Ethical treatment of participants may make this phenomena challenging to study
  + The lab will never get the same arousal/fear as real-life

**Mar 22**

* False

Effective studying is important for succeeding in university

* This class will be unlike any other class you have (for a variety of reasons) therefore these are tips for you to improve chances of success in future courses.
* Be honest with yourself about your study habits and skills and consider whether any of these are things you can implement
* The person affected most by your choices is you.

Most common forms of studying/learning:

* Highlighting
* Underlining
* Rereading
* Summarising
* Visual Imagery (e.g., Please Excuse My Dear Aunt Sally)

Just because something is common does not mean it is the most effective

* A comprehensive analysis was conducted of the 10 learning techniques that students use and their usefulness across…
  + Learning Conditions (e.g., how often and in what context)
  + Materials to be learned (e.g., texts, math problems, concepts)
  + Student characteristics (e.g., age, ability level)
  + Outcome Measures (e.g., rote retention, comprehension, problem solving)

Results:

* Listed techniques have incredibly limited applicability for improving learning
* If the things that have historically been used/taught as useful are not, what can we do?

Distributed Practice:

* Cramming for exams (only studying intensively just before an exam)
  + Surveys of undergraduates indicate anywhere from 25% to 50%of students reported relying on cramming
  + Considered massed practice(repeatedly studying information with little to no time between repetition)
  + Associated with health and stress problems
* Distributed practice: spreading out study activities so that more time intervenes between repetitions of the information

Distributed Practice:

Helpful for learning…

* New languages
* Definitions
* Face-name pairs
* Across age groups (kids, older adults, individuals with memory problems due to brain damage)

Evidence shows it is effective ,but we do not fully understand why

Interleaved Practice:

* A practice schedule that mixes different kinds of problems or materials within a single study session (e.g., studying addition, subtraction, complex math, formulas)
* Although categorized as moderate, may have particular usefulness for studying mathematics
* Mostly conducted in labs, unsure how well it translates to school

Practice Testing:

* Useful across a range of materials
* Students prefer, by a wide margin, rereading material compared to testing themselves (even though testing has a >15% increase in test score)
* Improves transfer of learning across situations (e.g., multiple choice to short answer)
* Improves ability to draw conclusions from the studied material.
* Effective for people with different working memory capacities.

Other periods of learning:

* Testing during lectures not only improves students’ ability to learn material but also retain material after the lecture ends
  + And reduces anxiety for final exam
* People’s judgments about what they have learned play a critical role in guiding further study and learning—people typically devote more time to studying items they judge they have not learned well
  + Familiarity might convince you of it being learned, but that can be misleading
  + Students are overconfident in judging their learning

Tips for studying better:

* Consider the conditions under which you will be tested:
  + Online v in-person, testing room or testing theater, time of day, etc.
* Consider the manner in which you are being test:
  + Multiple choice v fill-in-the-blank v short answer
* Consider the duration in which you will be tested:
  + Stamina for a test that takes over an hour is a skill

Dangers of Learning Loss:

* COVID-19 pandemic made classrooms shift to online from in-person
* Suspension of face-to-face teaching resulted in significant learning loss in schools
  + The decay in knowledge and skills over time that students experience when they are not in school
  + Previously only associated with long summer break
* Pandemic worsened educational disparities
  + Tutoring (one-on-one or small groups) is the single most effective solution in many places—but also cost-prohibitive for many people