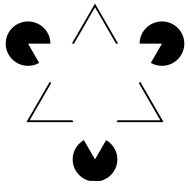
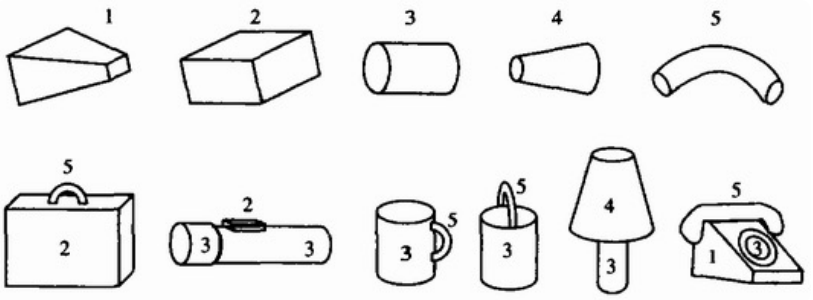
100 Things Every Designer Needs to Know about People
Reading schedule: 8/1/16 - 8/31/16

How People See

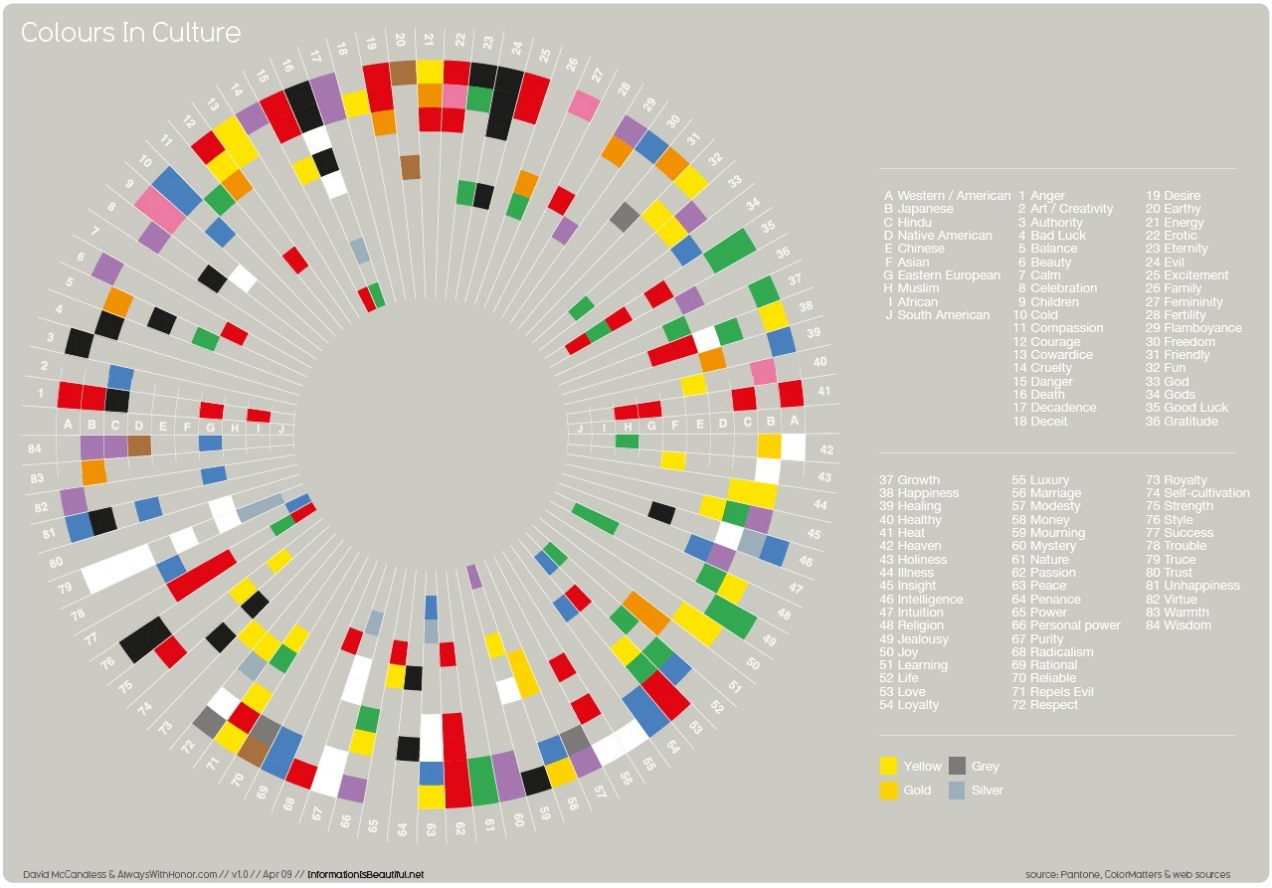


- What you see isn't always what your brain gets
  - your brain constantly interprets every visual input your eyes provide. Since it has to process so much, the brain takes shortcuts to make sense of ~40 millions sensory inputs per second
  - past experiences and rules of thumb are used to make best guesses
  - what you think people are going to see on the Web may not be what they actually see; it depends on their background and past experiences
  - you might be able to persuade people to see things certain way, depending on how things are presented
- Peripheral vision is used more than central vision to get the gist of what you see
  - central vision is what you use to look at things directly and see the details. Peripheral vision is for the rest - things you see in the corners of your eyes
  - peripheral vision is actually more important in making sense of what you see
  - this is why ads are always on the side, because they get your your peripheral vision's attention
  - people also use peripheral vision, consciously or unconsciously, to guess what a web page is about
  - if you want a distraction-free zone for the main content, don't put annoying animations or flashy images on the sides
- People identify objects by recognizing patterns
  - recognizing patterns help the brain make quick sense of the load of sensory inputs it receives
  - the geon theory of object recognition: it has been theorized for years that our brain has a finite-size memory bank of objects. When we see an object, we loop through this bank and find a match. There is a new theory called the geon (geometric icons) theory, which suggests that we recognize 24 basic shapes, which form the building blocks of all the objects that we see and identify
  - use grouping and white spaces to create patterns because people will automatically be looking for them
  - use basic geometric shapes for your icons because people will recognize them faster
  - 2D elements > 3D because the eyes communicate what they see to the brain as 2D objects



- There's a special part of the brain just for recognizing faces
  - the fusiform face area (FFA) allows faces to bypass the brain's usual interpretive channels and help us identify familiar faces quickly. The FFA is also close the amygdala, the brain's emotional center
  - if there is a picture of a person looking at something, we tend to follow their visual path. This could be used to drive a direct attention to a product on a page. But just because they look at something doesn't mean they're paying attention to it
  - faces looking right at people will have the greatest emotional impact. This is most likely due to the fact that the eyes are the most important, recognizable feature of a face
- People imagine object tilted and at a slight angle above
  - most objects are drawn from a perspective slightly above, looking down, offset a little to the right or left. This is called the canonical perspective
  - people recognize an object or a drawing faster and remember it better it was drawn in canonical perspective
- People scan screens based on past experience and expectations
  - people have got used to thinking that logos and nav bars on the top left are useless information. The "true" top left starts at the beginning of meaningful information, if the user reads left to right. Therefore put the most important information in the top third of the screen or the middle
  - Avoid putting anything important at the edges
  - Design the interface so that they can navigate in normal reading pattern. Avoid flow where people have to bounce back and forth to accomplish something

- People see cues that tell them what to do with an object
  - affordances are cues that invite you to interact with an object in a certain way: doorknobs invite you to grab and turn, mug handle invites you to curl fingers into it and lift
  - if you want people to take action on an object, you need to make sure they can easily perceive, figure out, and interpret what the object is and what they can and should do with it
  - think about affordances when you design: use cursor pointers, hyperlink, shadow, etc
  - rethink hover cues on iPad and iPhone screens
- People can miss changes in their visual fields
  - the gorilla video (https://youtu.be/vJG698U2Mvo) shows an example of inattention blindness or change blindness. Research shows that if you're paying attention to one thing and not expecting changes to appear, then you can easily miss the changes that do occur
  - don't assume that people will see somethings on the screen just because it's there. For example, if you add a visual change after the page refreshes and the user doesn't expect to see it, they will very likely miss it
  - eye-tracking data should be interpreted with a grain of salt
- People believe that things that are close together belong together
  - the connection is the strongest for items that are together left to right
  - before using lines or boxes to separate items, experiment with white space first
  - put more space between items that don't go together. This sounds like common sense, but is always overlooked
- Red and blue together are hard on the eyes
  - chromosteropsis: effect where one color may jump out while another appears recessed. This effect is strongest with red and blue, but red and green is just as bad. These combos are very hard and tiring to look at or read
- 9% of men and 1.5% of women are color blind
  - most of the color genes are on the X chromosomes, making men more likely to be color blind. Color blind is generally the inability to distinguish colors, especially between reds, greens, and yellows
  - use thickness as a redundant visual aid for legends
  - yellows and browns work pretty much for everyone regardless of their visual impairment. Avoid reds, greens, and blues. Always check how the site looks to visually impaired people using online tools



- The meaning of colors vary by culture
  - be careful when picking colors; colors affect mood
  - red generally means danger, green usually means good, positive
  - white is used in US weddings and funerals in certain parts of Asia
  - orange makes people agitated; blue, soothing
  - check out David Mccandleuss' color wheel above to see which color means what to each culture

How People Read

- It's a myth that capital letters are inherently hard to read
  - there's a rejected theory that since people recognize letters by seeing different shapes, uppercase letters are harder to read because each letter is rectangular with different sizes
  - people don't read letter by letter, they read a group of them and skip around. People jump about 7 characters (called saccades) and stop very shortly (fixations ~250s). We also use peripheral vision to recognize the next ~15 characters
  - uppercase letters aren't harder to read but we do read them slower than we do lowercase. This is only because we aren't used to reading all uppercase text, as that is associated with shouting, so use them judiciously
- Reading and comprehending are two different things
  - when you read you don't observe exact letters and words. You anticipate what will come next. This is why the more previous knowledge you have, the easier it is to anticipate and interpret
  - even though the words are scrambled you can still read a paragraph as long as the first and last letter of each word are in the correct position
  - titles and headlines are critical to setting up contexts
  - don't assume that people will remember specific information in what they read
  - use the Flesch-Kincaid formula to calculate the readability of your content. Tailor the reading level of your text to the appropriate audience. Use simple words and fewer syllables to make the material more accessible to a wider audience

$$206.835 - 1.015\left(\frac{\text{total words}}{\text{total sentences}}\right) - 84.6\left(\frac{\text{total syllables}}{\text{total words}}\right)$$

- Pattern recognition helps people identify letters in different fonts
  - serif and san serif are equal in terms of readability. However, different font sizes invoke different moods. Some can be playful, serious, modern, or old-fashioned
  - any font is fine to use as long as it is not so decorative that it messes up the brain's ability to recognize patterns, slowing down reading time
  - if people have trouble reading the font, they would transfer that feeling or difficulty to the meaning of the content itself and decide that the subject is too hard to do
- Font size matters
  - font-size needs to be big enough for users to read the text without strain
  - some more modern fonts like Verdana and Tahoma look bigger than other even though with the same point size because of the x-height (the height of the letter 'x' in the font family)

- Reading a computer screen is harder than reading paper
  - computer screens' images are constantly being refreshed and emitting light, which can be straining on the eyes. The images and texts on Kindles and paper don't need to be refreshed and the screen reflects light, making it much easier and more comfortable to read for extended period of time
  - use a large enough font and create enough contrast between foreground and background for a better reading experience on screens
  - black text on white background is the best combination for readability
  - break text into chunks: use bullets, short paragraphs, pictures
  - make sure the content is worth reading
- People read faster with a longer line length, but they prefer a shorter line length

    - 100 characters per line is optimal for on-screen reading speed, but people prefer a short or medium line length (45 - 72 characters per line)
    - longer lines are easier to read because they interfere less with the flow of saccades and fixations
    - we can read a single wide column faster than multiple narrow columns, but we prefer the latter. People also think that they'd read faster with the latter as well, even though the data show otherwise

How People Remember

- Short-term memory is limited
    - short-term memory, or working memory, is tied to your ability to focus attention
    - using the functional magnetic resonance imaging (fMRI), it can be shown that when working memory is active, the prefrontal cortex is choosing strategies to decide what to pay attention to. Therefore, if you can tune out all sensory stimuli around you and focus on the one thing in your working memory, you'll be able to remember it
    - never ask people to remember information from one place to another
    - if it is absolutely required to ask people to remember things in working memory, don't ask them to do anything else until they've completed that task
- People remember only 4 items at once
    - Deliver information in chunk of 4 for optimal results. It is no accident that the U.S phone format goes xxx-xxx-xxxx. People remember better when information is grouped or chunked together in count of 4
    - People will rely on external aids (notes, calendar, etc) to avoid working their short-term memory
- People have to use information to make it stick
    - People move things from short-term memory to long-term memory by repeating them a lot or connect them to something they already know
    - Repetition physically change the neurons in our brain. Neurons fire every time a word or a phrase is repeated, forming firing trace and making it easier for memory retrieval
    - We organize information in schemata. Experts in any field can store much more information into a single schema, whereas the novices will need more schemata for the same or less amount of information. This is why experts can process and retrieve information so quickly and effectively
- It's easier to recognize information than to recall it
    - Recognition is easier because it makes use of context, which can help you remember
    - Inclusion errors are things that you consciously or unconsciously include to a collection based on some schema by error
- Memory takes a lot of mental resources
    - We receive 40 billions sensory inputs every second, are aware of 40 at any given time, but probably can't process more than 4 per second
    - Concrete words are easier to store in long-term memory than abstract ones
    - Visual memory stick better than words
    - Let people rest and/or sleep if you want them to remember information. Do not interrupt when they are learning
    - Material in the middle of a presentation is least likely to be remembered
- People reconstruct memories each time they remember them
    - Memories aren't statically archived like files on hard disk; they are reconstructed every time they are recalled. This means memories can be changed based on recent memories or developments
    - Don't rely on self-reports of past behavior because people won't remember accurately what they or others did or said
- It's a good thing that people forget
    - Forgetting is now a flaw; it's the brain's mechanism to flush out the billions sensory inputs it receives. That's what keep you alive and functional
    - Hermann Ebbinghaus created a formula showing the degradation of memory: $R = e^{(-t/S)}$ where R is memory retention, S is the relative strength of memory, and t is time
    - People always forget; what they forget is not a conscious decision
    - Design with forgetting in mind. Don't rely on people to remember important information; provide it for them or make it easy to look up
- The most vivid memories are wrong
    - Flashbulb memory is remembering traumatic or dramatic events in great details. Emotions are processed in the amygdala, which is very close to the hippocampus, which encodes long-term memory. Therefore it's no surprise that people remember strongly and vividly the most emotionally laden memories
    - People will be convinced that what they remember about dramatic memories are true, but they aren't exactly true

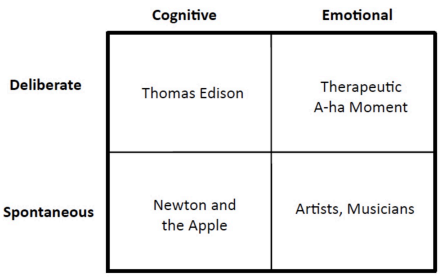
How People Think

- People process information better in bite-sized chunks
  - Don't give too too much information all at once
  - Progressive disclosure: provide only information people need at the moment
  - Don't count the number of clicks. People are very willing to click as long as they're getting the right amount of information at each click to keep them going down a path
  - Progressive disclosure only works when you know who needs what when
- Some types of mental processing are more challenging than others
  - There are 3 types of resource-consuming loads: cognitive, visual, and motor
    - Ex: cognitive load is when you make the user calculate the total amount (most expensive load)
    - Visual load is when you make the user find the pay button
    - Motor load is when you make the user click on the pay button (least expensive load)
  - From a human factor standpoint, you always make tradeoffs in designing an interface. If it takes 10 clicks but the user doesn't even need to use their brain, then it's a good tradeoff because cognitive load is much more expensive than motor load
  - Fitt's law: used to calculate how large a target should be to enable someone to reach it reliably while moving a mouse across the screen

$$T = a + b \log_2 \left(1 + \frac{2D}{W} \right)$$

    - T is the average time taken to complete the movement
    - a is the start/stop time of the device, b is the inherent speed of the device
    - D is the distance from the starting point to the center of the target
    - W is the width of the target measured along the axis of motion
  - Minimize motor switching. Keep people on the keyboard or with the mouse as long as possible without having to switch
  - The only time you want to increase loads is in gaming
- Minds wander 30% of the time
  - People only focus on a task for a limited time. Use links to let people switch from topic to topic
  - Have a navigation system so that people know where they are when they wander off
  - People whose minds wander a lot are said to be more creative and better problem solvers
- The more uncertain people are, the more they defend their ideas
  - Cognitive dissonance denial: the uncomfortable feeling you get when you have 2 conflicting ideas. You don't like this feeling, so you'll try to get rid of the dissonance by changing your belief or denying one idea
  - When forced, people will change their beliefs. When not forced, people dig in. When uncertain, people argue harder, so don't spend a lot of time trying to change someone's ingrained beliefs
  - The best way to change a belief is to get someone to commit to something very small
  - Don't give people evidence that their belief is not logical because they will just dig even harder
- People create mental models
  - People always have mental models - what they think a workflow is like based on their own past experiences
  - Not everyone will have the same mental model, so it's important to understand the general mental models of your target audience
- People interact with conceptual models
  - Conceptual models are the actual interfaces of the software or Web sites. If there is a mismatch between the conceptual models and the mental models, then the product is hard to use or not accepted
  - If you absolutely need to create a mismatch because the conceptual model is brand new, include a pictorial or video tutorial to train the users
- People process information best in story form
  - "Let me tell you a story" can be a very powerful attention grabber, but it better not disappoint
  - A story is comprised of 3 parts: the beginning (introducing the settings, characters), the middle (the obstacles, the conflicts), and the end (the climax, the turning point)
  - Stories make your brain take causal leaps - guessing or interpreting the causation of some series of events
  - Stories aren't just for fun. No matter how dry the information is, using stories will make it understandable, interesting, and memorable
- People learn best from examples
  - Don't give people long blocks of text to tell them what to do. Show them using pictures and screenshots
  - Video tutorials are nice and all, but keep them short. It's not a commercial. I actually prefer interactive animations rather than straight up videos
- People are driven to create categories
  - People naturally like to put things into categories. Just like learning a language, children naturally learn how to categorize around the age of seven

    - If there is a lot of information and it is not categorized, people will feel overwhelmed and try to organize the information on their own
    - It doesn't matter who organizes the information, it's how well it's organized
- Time is relative
    - The more mental processing as you do, the more time you think has elapsed
    - Always provide progress indicators to show people how much time something is going to take
    - If possible, make the amount of time it takes for a task to complete consistent so people know what to expect
    - To make a process seems shorter, break it up into steps and have people think less. The mental processing is what makes something seem to take a long time
    - 10 years ago if it took 20 seconds for a website to load, it's not a big deal. Nowadays if it takes more than three seconds, you get impatient. Expectations change over time
- There are four ways to be creative
    - If you're designing an experience that is supposed to foster creativity, figure out which type you need and design for that
    - Deliberate and cognitive creative requires a high degree of knowledge and a lot of time. There needs to be enough resources and plenty of time for problem solving
    - Deliberate and emotional creativity requires quiet time. This is when you go to sleep and enter REM, and then solve the problem. Research shows napping and resting makes actually might make you worse off in solving the problem

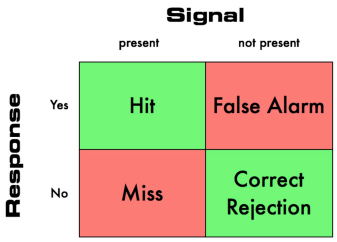


    - Spontaneous and cognitive creativity requires you to stop working on the problem and getting away
    - Spontaneous and emotional creativity is probably not possible to design for
- People can be in a flow state
    - A flow state is when people are "in the zone"
    - Some facts about flow state:
        - you have very focused attention on the task
        - you're working on very specific, clear, and achievable goal in mind
        - you receive constant feedback and have control over your actions
        - you feel safe and relaxed
        - the flow state is personal, pleasurable, and cross cultures
    - If you're designing a flow state experience:
        - give people control over their actions during the activity
        - break up the difficulty into stages. People need to feel like the current goal is challenging and achievable at the same time
        - give constant feedbacks and minis distractions
- Culture affects how people think
    - People from different geographical regions and cultures respond differently to photos and designs. In East Asia, people notice and remember the background and context more than people in the West do

How People Focus Their Attention

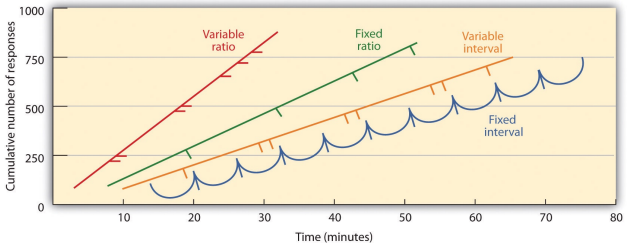
- Attention is selective
    - Selective attention: ability to pay attention to one thing and filter out other stimuli
    - People will pay attention to one thing and ignore everything else as long as you give them specific instructions to do so
    - A person's unconscious constantly scans the environment for things like their name or messages about food, sex, and danger
- People filter information
    - People seek out and pay attention to informations that confirm their beliefs and discount or even ignore the ones that don't
    - Don't expect that people will necessarily pay attention to information you provide
    - Don't make assumptions. What's obvious to you might not be to others
    - Use color, size, animation, video, and sound to draw attention to what's important so that when people filter information, they don't miss your point
    - Make critical information stand out extra
- Well-practiced skills don't require conscious attention
    - If a skill is practiced so much that it becomes automatic, then it can be performed with a minimum of conscious attention

    - If you require people to perform a sequence repeatedly, make it easy to do but be aware that they will stop paying attention and make errors
    - Provide undo options for a single action or the entire sequence
    - Definitely consider bulk action designs over per-item action
- Expectations of frequency affect attention
    - People will build an unconscious mental model of how often an event occur
    - Use strong signals to get people attention (pop up, drastic UI change, etc) to make people notice critical things that rarely occur
- Sustained attention lasts about 10 minutes
    - Assume you'll have at most 7 to 10 minutes of a person's attention. Keep everything as close to that length as possible
    - If you must host attention for more than 10 minutes, introduce a break
- People pay attention only to salient cues
    - Decide what the salient cues are for your audience and make them super obvious
- People can't actually multitask
    - People will tell you they can, but it's physically not possible. They might be very good at switching between tasks, but that's not multitasking. The only exception is when you can do a physical task very well, you can do a mental task simultaneously, kind of
    - People who think they are good multitaskers are probably the worst at it. Young people don't multitask any better than older people
    - Avoid making people multitask. If that's absolutely necessary, have a mechanism so that they can fix errors later
- Danger, food, sex, movement, faces, and stories get the most attention
    - Things that grabs attention the most:
        - anything that moves (animation, video, etc)
        - picture of human faces (especially when they are looking right at you), food, sex, or danger
        - stories and loud noises
    - This is because food, sex, and danger are the basic of human survival. Without food people will die; without sex the species won't survive, and if danger kills you, the other 2 questions don't matter
- Loud noises startle and get attention
    - Pick a sound that is appropriate to the amount of attention you need. Save the high attention sounds for when it's really important
    - Consider using different sounds so people will not habituate and the sounds will continue to be attention-getting
- For someone to pay attention to something, they must first perceive it
    - Signal detection theory suggests there are 4 outcomes when you respond to stimuli
    - Think about the tradeoff: if a false alarm is worse, then tone down the signal or stimuli. If a miss is worse, then increase the signal or stimuli strength



What Motivates People

- People are more motivated as they they closer to a goal
    - The shorter the distant to the goal, the more motivated people are to reach it. They are even more motivated when the end is in sight
    - You can get extra motivation even with the illusion of progress
    - People enjoy being part of a reward program. Motivation and purchases plummet right after the goal is reached. This is called a post-reward resetting phenomenon. You are most at risk of losing your customer at this point
- Variable rewards are powerful
    - Operant conditioning is the study of whether a behavior increases or decreases based on how often, and in what manner, the reenforcement (reward) was given
    - Interval is time-based, racial is the amount based. Determine which reinforcement is appropriate to your particular audience
    - Determine the pattern of behavior you are looking for, then adjust the schedule of rewards to fit that schedule. Use a variable ratio schedule for the maximum behavior of repetition



- Dopamine makes people addicted to seeking information
  - Dopamine actually causes you to want, desire, seek out, and search. It increases your general level of arousal, motivation, and goal directed behavior. It's not only about physical needs such as food or sex, but also about abstract concepts like ideas and information
  - The brain shows more stimulation and activity when we anticipate a reward than when we get one
  - People are naturally motivated to keep seeking information. The easier you make it for people to find information, the more information-seeking behavior they will engage in
- Unpredictability keeps people searching
  - Pavlovian response is a small, specific cue that signifies that something is going to happen. It has been been paired with a stimulus, so you know what to anticipate when that stimulus comes
  - Pairing cues such as sounds with the arrival information motivates people to seek more
  - Giving small bits of information and then providing a way for people to get more information results in more information-seeking behaviors
  - The more unpredictable the arrival of information is, the more people will be addicted to seeking it
- People are more motivated by intrinsic rewards than extrinsic rewards
  - Don't assume that money or any other extrinsic reward is the best way to reward people. Look for intrinsic rewards rather than extrinsic ones. When people are promised a monetary reward for work, there is increased activity in the nucleus accumbens, the same area that is active when people anticipate cocaine, tobacco, or any addictive substance. These monetary type of reward backfires because people will rely on them and are unwilling to work unless there is an incentive
  - If you are going to give an extrinsic reward, it will be more motivating if it is unexpected
  - If the product allows people to connect with others, people will be more motivated to use it
- People are motivated by progress, mastery, and control
  - If you want to build loyalty and have repeat customers, you need to have activities the people inherently want to do, rather than just activities for which they are getting paid
  - If people have to do a task that's boring, help motivate them by acknowledging that it is boring and then letting them do it their way
  - Look for ways to help people set goals and track them. Show them how they are progressing towards goals. It's important to stress that mastery can never actually be reached. It's like an asymptote: you keep getting better and better but never actually reach a point
- Peoples ability to delay gratification (or not) starts young
  - Some people are good at delay gratification and others are not. Those who are not will be more suggestible to images and messages of scarcity (for example, only three left in stock or only available until the end of the month)
- People are inherently lazy
  - Assume that people will get things done with the least amount of work possible
  - People will satisfice - look for a good enough solution rather than the optimal one
  - Use a lot of white space and large font size to make it feel like the website is glancable and requires less work
- People will look for shortcuts only if shortcuts are easy
  - Provide shortcuts as long as they are easy to learn, find, and use, but don't expect that people will always use them. It's all about the perceived amount of work. If it seems like too much work, then people will stay with the hold habits, even if that means actual inefficiency
  - Provide defaults where appropriate
- People assume it's you, not the situation
  - Fundamental attribution error: the tendency to give personality-based explanations for other people's behavior more weight than situational factors
  - Don't think about "what people are going to do" based on personality and miss the situational factors
  - Don't rely too much on subject matter expert because they might miss situational factors and put too much value on people's personalities
  - Cross-check your own biases and verify fundamental attribution error
- Forming a habit takes a long time and requires small steps
  - It takes on average 66 days for people to cement a habit. Easy ones only take about 18 days, while harder ones can take up to 254 days
  - Give people a small, easy task to do rather than a complex one
  - Give people a reason to come back and do the task every day or almost every day
- People are more motivated to compete when there are fewer competitors
  - Competition can be motivating, but don't overdo it. Showing more than 10 competitors can dampen the motivation to compete

- People are motivated by autonomy
  - People are motivated to do things themselves. Make sure the message behind the self-service is about having control and being able to do it yourself

People are Social Animals

- The "strong tie" group size limit is 150 people
  - There is a limit of about 150 people for your "survival" community in close proximity. If you don't feel that you have a "tribe" around you, you feel alienated, isolated, and stressed. Social media connections are weak ties
  - Determine if you're designing for strong or weak ties. If it's strong ties, you need to incorporate some physical proximity
- People are hard-wired for imitation and empathy
  - Watching someone else doing a task fires mirror neurons in your brain
  - Stories can create images in your head that fire mirror neurons. Good videos on the web is compelling
- Doing things together bonds people together
  - Synchronous activities: actions taken together with others where everyone is doing the same thing at the same time in physical proximity
  - Many of online interactions are asynchronous (not in a programmatic sense). Look for opportunities to build synchronous activities since it bonds people (customers) together
- People expect online interactions to follow social rules
  - Social interactions in real life follow certain protocols. You expect people to respond a certain way when you interact with them socially
    - Ex: when you greet a friend, you expect him to greet you back
  - The same protocols apply to user interfaces. Think about how your interface's flow translates to a person-to-person interaction
- People lie to differing degrees depending on the media
  - People lie most on the phone and least with pen and paper. People are more negative toward others via email than with pen and paper.
  - Realize that people tend to be more negative when submitting surveys via email
  - Getting customer feedback is most accurate when done in person, one on one
  - Moral disengagement theory: people can and will become unethical as they distance themselves from the bad consequences of their actions
- Speakers' brains and listeners' brains sync up doing communication
  - Listening to someone talk creates a special brain thinking that helps people understand
  - Presenting information through audio and video is especially useful to help people understand. Don't just relied on reading if you want to deliver the message clearly
- The brain responds uniquely to people you know personally
  - People a program to pay special attention to friends and relatives
  - Social media around friends and relatives will be more motivating and garner more loyalty
- Laughter bonds people together
  - You don't necessarily need humor or jokes to get people to laugh. Normal conversation and interactions will produce more laughter than intentional use of humor and jokes
- People can tell when a smile is real or fake more accurately with video
  - People will be able to determine a fake smile versus a real one better in a video than in the photo. If they don't think the smile is real, they are less likely to trust you
  - Although it is possible to fake a smile and to fake a crinkly-eye smile, it is easier to fake a smile in the pictures than on video
  - People can tell whether a smile is real or not by looking for conflicting emotions, they are looking at many parts of the face, not just the eyes
  - If a smile looks real, it will engage the viewer and build trust

How People Feel

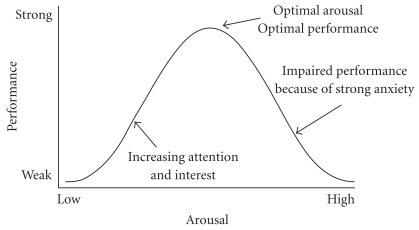
- Seven basics emotions are universal
  - Seven basics emotions of joy, sadness, contempt, fear, disgust, surprise, and anger are universal and are shown by facial expressions and physical gestures
  - Use one of the seven basics emotions in pictures to communicate
  - People read the seven basics emotions fairly well on photos, so use real ones
  - Facial expressions are universal wall gestures are not
- Emotions are tied to muscle movement and vice versa

    - Moving muscles and feeling emotions are linked. Research shows that if you can't move a group of muscles that are associated with a feeling, you cannot feel that feeling
    - Beware of unintended facial expressions that change how people feel about your product. For example, if they have to squint and frown to read the font on your website, they may actually feel unhappy
    - People mirror emotions, making emotional videos a powerful tool
- Anecdotes persuade more than data
    - Information is processed more deeply and remembered longer if it has an emotional hook
    - Anecdotes are more powerful than data because they're in story form. The invoke empathy, which triggers an emotional reaction. With emotional reactions, people will process the data and feelings. Emotions will also trigger memory centers
    - Use anecdotes in addition to, or in place of, factual data
- Smells evoke emotions and memories
    - Scents are used in retail stores, hotels, malls and other places to evoke particular memories, emotions, and associations
    - In the future, designing scents for emotional influence will be part of uses experience design
- People are programmed to enjoy surprises
    - Things that are new and novel capture attention. Providing something unexpected not only gets the attention, but also can be actually pleasurable
    - Although a certain amount of consistency is a good thing if people are trying to complete a task, providing novel and unexpected content and interactions is good. Surprise and delight at work
- People are happier when they are busy
    - People don't like to be idle. People will do a task rather than be idle, but the task has to be seen as worthwhile. If they perceive it to be busy work, then they prefer to stay idle
    - If a task requires people to wait, have something interesting for them to do while waiting
- Pastoral scenes to make people happy
    - People like pastoral scenes. If you're looking for a nature scene to use on the site, try to pick one with the pastoral element
- People use look feel as the first indicator of trust
    - Trust is the biggest predictor of happiness
    - People make quick decisions about what is not trustworthy. They reject the site first, and then decide after whether or not to actually trust it
    - Design factors such as color, font, layout, navigation, are critical in making it through the first trust rejection phase. Then, content and credibility become the determining factors as to whether the person across the site
- Listening to music releases dopamine in the brain
    - Music can be intensely pleasurable and very individualized
    - Allowing people to use or add their own music to whatever web site or product is a powerful way to engage them in a positive and potentially addictive experience
- The more difficult something is to achieve, the more people like it
    - This does not mean to make a product that is hard to use
    - Creating achievable barriers to entry (like filling out applications, meeting certain criteria, being invited) to filter out customers who really care about the group
- People overestimate reactions to future events
    - Don't believe people when they say something will make them much happier or much worse off
    - People may prefer one thing over another or think that they will, but their reaction, be it positive or negative, will probably not be as strong as they imagine it
- People feel more positive before and after an event than during it
    - People will have more positive feelings if the interface draws out more of the planning phase
    - If you measure satisfaction or other feelings, you'll get more positive ones a few days before or after the interaction
- People want what is familiar when they're sad or scared
    - Brands are a shortcut. Positive past experiences usually signifies safety to the old brain
    - Messages of fear or loss maybe more persuasive if the brand is an established one
    - Messages of fun and happiness may be more persuasive if the brand is a new one

People Make Mistakes

- People will always make mistake; there is no fail-safe product
    - The best error message is no error message
    - Think ahead to what the likely mistakes will be. Test the prototype with the actual end users to maximize test

coverage
    - Write error messages that tell the person what they did, why that caused a problem, how to fix it - in plain language using active voice
- People make errors when they are under stressed
    - A right amount of stress is productive as it raises awareness and focus. Raise the level of arousal with sound, colors, or movement to a boring task. Do the opposite for more difficult tasks
    - The Yerkes-Dodson Law suggests that the graph of performance vs. arousal is an upside down U
    - When people are under stress, they won't see things on the screen and their tunnel actions kick in, making them doing erroneous actions over and over again
    - When someone is an expert at a well-learned task, they tend to over-analyze and hence suffer from performance stress more than the novices do



- Not all mistakes are bad
    - Errors can have positive, neutral, and negative consequences (Ex: user selects the brightness slider while looking for the volume slider: no negative consequences here)
    - Prioritize fixing and/or avoiding things that might cause errors with negative consequences
- People make predictable types of errors
    - Errors can be broken into performance errors (misstep in a procedure to complete a task) and motor-control errors (made while controlling a device)
    - Collect data on which category of errors people are making to focus redesign efforts
- People use different error strategies
    - People use different types of strategies in correcting errors: systematic (walking down the options), trial and error (picking at random), or rigid exploration (repeating things that don't work)
    - Think older vs. younger, expert vs. novice and how they recover from errors differently

How People Decide

- People make most decisions unconsciously
    - Decision making is unconscious (doesn't mean bad or irrational)
    - People still want rational, logical reasons for the decisions they make
    - The brain intakes millions of inputs per second. The unconscious mind has evolved to help us make decisions based on a set of rules of thumb (gut feelings) that are best of our interest
- The unconscious knows first
    - People respond and react to unconscious signals of danger
    - The unconscious acts more quickly than the conscious mind. This means that people often take actions or have preferences, but can't explain why they prefer what they do
- People want more choices and information than they can process
    - Don't provide a large number of choices. The brain can't process that much information, but information is addictive. It triggers the dopamine effect
    - Limit the choices to 3 or 4. If you have to offer more, do so in a progressive way
- People think choice equals control
    - People need to feel they're in control and have choices
    - People won't always choose the fastest way to complete a task, so provide options
    - Once people have had options, they will be upset if the options get taken away. This is where you have to make the call: short term pain and long term advancement or compromise
- People may care about time more than they care about money
    - Most people are more influenced by time and experiences that produce a personal connection than money and possessions
    - If the product is prestigious and luxurious, mention money. Otherwise mention time
- Mood influences the decision making process
    - You can influence someone's mood easily, for example, with a short video clip
    - People in good mood think a product is more valuable if asked to make decisions quickly based on first feelings
    - Those in bad mood do the same, but only when asked in a more deliberate way
- Group decision making can be faulty
    - Give people a way and time to consider all relevant information on their own before convening
    - Ask people how confident they are about their opinions and provide a safe environment to discuss disagreement

- People are swayed by a dominant personality
  - Be careful of following the first solution because it's first in a discussion
  - Circulate prepared notes before the meeting
  - The leader in the group usually speaks first
- When people are uncertain, they let others decide what to do
  - People are very influenced by others' opinions and behaviors especially when they are uncertain
  - The more available the information about the reviewer, the more influential the rating
- People think others are more easily influenced than they are themselves
  - Everyone is affected by unconscious processes and third-person effect
  - People aren't aware because this happens unconsciously
- People value a product more highly when it's physically in front of them
  - People value products more in brick and mortar stores
  - Having a product behind glass or barrier may lower the price people willing to pay