47 Mind-Blowing Psychological Facts You Should Know About Yourself

Susan Weinschenk, The W Blog | Nov. 22, 2010, 10:31 AM | 5,593,097 | 20

I've decided to start a series called 100 Things You Should Know about People. As in: 100 things you should know if you are going to design an effective and persuasive website, web application or software application.

Or maybe just 100 things that everyone should know about humans!

The order that I'll present these 100 things is going to be pretty random. So the fact that this first one is first doesn't mean that's it's the most important.. just that it came to mind first.

Click here to see the first 47 things >

Dr. Susan Weinschenk is the author of Neuro Web Design: What makes them click? and 100 Things Every Designer Needs To Know About People. All 47 slides are articles that have been republished from her blog, Whatmakesthemclick.net, with permission.

#1 — You Have "Inattention Blindness"

First let's start with a little test for you to take. Watch the video below:

This is an example of what is called "inattention blindness" or "change blindness." The idea is that people often miss large changes in their visual field. This has been shown in many experiments.

So what does this mean if you are designing a website or something on a computer screen? It means that you can't assume that just because something is on the screen that people see it. This is especially true when you refresh a screen and make one change on it. People may not realize they are even looking at a different screen. Remember, just because something happens in the visual field doesn't mean that people are consciously aware of it.

Here is a change blindness experiment that was recently conducted:

Originally published on WhatMakesThemClick.net.

#2 — You READ FASTER With a longer Line Length But

PREFER Shorter

What Makes Them Click


Business Day
The New York Times

Comcast's quest for NBC Universal looks familiar.

Have you ever had to decide how wide a column of text you should use on a screen? Should you use a wide column with 100 characters per line? or a narrow column with 50 characters per line?

It turns out that the answer depends on whether you want people to read faster or whether you want them to like the page!

Research (see reference below) demonstrates that 100 characters per line is the optimal length for on-screen reading speed; but it's not what people prefer. People read faster with longer line lengths (100 characters per line), but they prefer a short or medium line length (45 to 72 characters per line). In the example above from the New York Times Reader, the line length averages 39 characters per line.

The research also shows that people can read one single wide column faster than multiple columns, but they prefer multiple columns (like the New York Times Reader above).

So if you ask people which they prefer they will say multiple columns with short line lengths. Interestingly, if you ask them which they read faster, they will insist it is also the multiple columns with short line lengths, even though the data shows otherwise.

It's a quandary: Do you give people what they prefer or go against their own preference and intuition, knowing that they will read faster if you use a longer line length and one column?

What would you do?

Originally published on WhatMakesThemClick.net.

#3 — You Can Only Remember 3 to 4 Things At A Time (The Magic Number 3 or 4)

What Makes Them Click

7 +/- 2???

3 or 4???

Those of you who have been in the field of usability or user experience for a few years have probably heard the phrase “The Magic Number 7 Plus Or Minus 2″. This refers, actually, to what I would call an urban legend. Here’s the legend part:

Legend: “A guy named Miller did research and wrote a paper showing that people can remember from 5 to 9 (7 plus or minus 2) things, and that people can process 7 plus or minus 2 pieces of information at a time. So you should only put 5 to 9 items on a menu, or have 5 to 9 tabs on a screen”.

Have you heard this? If you’ve been reading about usability for a while I’m sure you have. Well, it’s not quite accurate. Another guy named Baddeley questioned all this urban legend. Baddeley dug up Miller’s paper and discovered that it wasn’t a research paper, it was a talk that Miller gave at a professional meeting. And it was basically Miller thinking out loud about whether there is some kind of inherent limit to the amount of information that people can process at a time.

Baddeley conducted a long series of studies on human memory and information processing. And what he concluded is that the number is 3 to 4, not 5 to 9.

You can remember about 3-4 things (for about 20 seconds) and then they will disappear from memory unless you repeat them over and over. For example, let’s say you are driving in your car and talking on your cell phone (ok, you shouldn’t be doing that) and someone gives you a number to call. But you don’t have a pen handy, and anyway you are driving. So you try to memorize the number long enough to hang up from one call and dial the new number. What do you do? You repeat the number over and over (putting it back into short term memory each time, which buys you another 20 seconds). The interesting thing about phone numbers is that they are more than 3 or 4 numbers long. So they are hard to remember for more than 20 seconds.

712-569-4532

We also tend to chunk information into groups that have 3-4 items in them. So a phone number in the US is: 712-569-4532. Three chunks, with 3-4 items in each chunk. If you know the area code “by heart” (i.e., it’s stored in long term memory), then you don’t have to remember that, so one whole chunk went away. Phone numbers used to be easier to remember because you mainly called people in your area code, so you had the area code memorized (plus you didn’t even have to “dial” the area code at all). And then if you were calling people in your town each town had the same “exchange” — that is the 569 part of the phone number above. So all you had to remember was

the last four numbers. No problem! I know I'm "dating" myself here by telling you how it used to be back in the old days. (I live in a small town in Wisconsin, and people here still give their number out as the last four digits only).

But that's not all! Researchers working in the field of decision-making tell us that people can't effectively choose between more than 3 to 4 items at a time.

So, what does all this mean? Can you really only have 4 items on a navigation bar? or 4 tabs on a screen, or 4 items on a product detail page at an e-commerce web site? No, not really. You can have more, as long as you group and chunk.

Here's an example: At the Upton Tea site they have lots of tabs, but the tabs are not chunked into groups of 3 or 4.

So people will tend to do a partial scan and not even look at or read all the tabs. (I love their teas, by the way.. just wish they would do some work on the layout and emotional aspects of their site, but that's probably another blog!).

I've covered more than 4 items in this blog post, so I'll stop now! For those of you who like to read research here are some references:

- Baddeley, A. D. (1986). Working memory. New York: Oxford University Press.
- Baddeley, A. D. (1994). The magical number seven: Still magic after all these years? Psychological Review, 101, 353-356.
- Miller, G. A. (1956). The magical number seven plus or minus two: Some limits on our capacity for processing information. Psychological Review, 63, 81-9

Originally published on WhatMakesThemClick.net.

#4 — You Imagine Objects From Above and Tilted (The "Canonical Perspective")

Why you should believe the research in this blog post even though it's from 1981 — Whenever I talk about "old" research some people start right away to dismiss it. It's easy to think that research done in the 1990s or 1980s, or heavens! the 1970s! couldn't hold any interest for us now. I heartily disagree. If the research is sound and it's about people, then the chances are high that it still has relevance. Certainly if you are talking about research from the 1980s showing that it is hard to read text on a computer screen, then more recent data is important – the quality of computer monitors has changed so dramatically from the 1980s till now (believe me on this one, as I was around to see the screens of the 1980s. I am aware that many of you reading this blog have only seen a screen from the 80s in the Museum of Modern Art in Manhattan, or maybe you saw it in an old black and white movie (joke), or, as my daughter likes to say to me, "that must have been

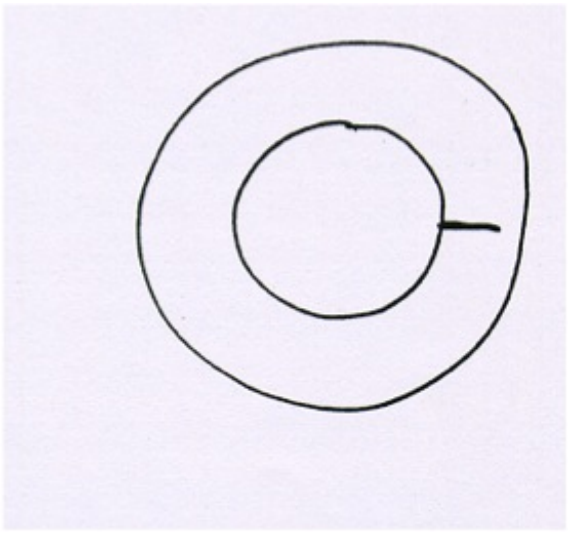
when you were younger and the dinosaurs roamed").

Have an Open Mind — So the purpose of the above long preamble is to ask you to have an open mind about the following research that was done and written up in a book from 1981.

Draw a Coffee Cup — If you ask someone to draw a picture of a coffee cup, chances are they will draw something that looks like this:

Everyone Drew A Similar Picture — In fact, a researcher named Palmer went all around the world and asked people to draw a coffee cup and the pictures above were what people drew. Notice the perspective of the cups. A few of them are "straight on", but most are drawn from a perspective as if you are slightly above the cup looking down, and offset a little to the right or left. This has been dubbed the "canonical perspective".

Why Not This? — No one he studied drew this:



which is what you would see if you were looking at a coffee cup from way above and looking down. Of course not, you say, but…. why not? And if you are going to say that the first perspective is the one that we actually see most of the time, when we look at a coffee cup… that it is the angle we are used to seeing the cup on our kitchen tables, I will tell you that this research has been done on many objects. For example, people were shown pictures of horses from various angles and perspectives and they most quickly recognized it as a horse when it was from this same canonical perspective. Yet I am fairly sure that most of us have not looked at horses from above most of the time. And the research was done with people recognizing a very small dog or cat. The canonical perspective still won out, even though when we see cats or very small dogs we are mainly looking at them from high above, not just slightly above. In fact the research shows that when we imagine an object we imagine it from this canonical perspective.

So, Why Care? — It seems to be a universal trait that we think about, remember, imagine and

recognize objects from this canonical perspective. Why care? Well, if you want to use icons at your web site or in your web or software application that people will recognize, then you might want to use this perspective. This is probably not so critical if you are using a well known logo, for example, the logo for itunes or Firefox, but becomes important if the icon is not as familiar, such as recognizing below that one of the logos is of a truck, or a photo printer.

What Do You Think? — Should we continue to use the canonical perspective?

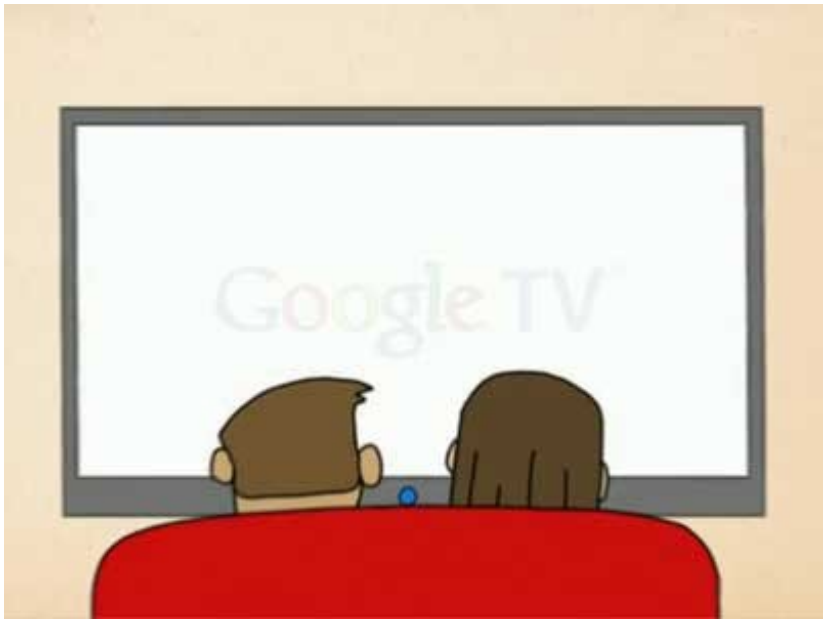
And for those of you who like to read research:

Palmer, S. E., Rosch, E., and Chase, P. (1981). “Canonical Perspective and the Perception of Objects.” In Long, J., and Baddeley, A. (Eds.), *Attention and performance IX*, Hillsdale, NJ: Erlbaum.

Originally published on WhatMakesThemClick.net.

#5 — You Make Most of Your Decisions Unconsciously

You are thinking of buying a TV. You do some research on what TV to buy and then you go online to purchase one. What factors are involved in this decision making process?



It’s not what you think — I cover this topic in my book "Neuro Web Design: What makes them click?" You like to think that when you make a decision you have carefully and logically weighed all the relevant factors. In the case of the TV, you have considered the size of TV that works best in your room, the brand that you have read is the most reliable, the competitive price, whether you should get blu-ray, etc etc. But the research on decision-making, especially the recent research, shows that although you want to think that your decision-making is a conscious, deliberate process, it’s not. Most decisions are made through unconscious mental processing.

Unconscious decision-making includes factors such as:

What are most other people buying (social validation): “I see that a particular TV got high ratings and reviews at the website”

What will make me stay consistent in my persona (commitment): “I’m the kind of person that always has the latest thing, the newest technology.”

Do I have any obligations or social debts that I can pay off with this purchase (reciprocity): “My brother has had me over to his house all year to watch the games, I think it’s time we had them over to our place to watch”

and on and on.

Don’t Confuse Unconscious with Irrational or Bad. I take exception with Dan Ariely and his book, "Predictably Irrational." Most of our mental processing is unconscious, and most of our decision-making is unconscious, but that doesn’t mean it’s faulty, irrational or bad. We are faced with an overwhelming amount of data (11,000,000 pieces of data come into the brain every second!) and our conscious minds can’t process all of that. Our unconscious has evolved to process most of the data and to make decisions for us according to guidelines and rules of thumb that are in our best interest most of the time. This is the genesis of “trusting your gut”, and most of the time it works!

So What To Do? — The next step is to think about what this means for people who design things like websites, where you are providing information and/or engaging customers to make a decision. This is, of course, the topic of my book, but let’s hear from you. If we know that people are making decisions unconsciously, rather than consciously, what are some strategies we should employ at the website to encourage them to engage?

And for those of you who like to read, great books on this topic are:

- "How We Decide" by Jonah Lehrer — The BEST book on the topic of decision-making in general.
- "Strangers to Ourselves: The adaptive unconscious" by Timothy Wilson — A little bit more academic, but still a great book.
- "The Paradox of Choice" by Barry Schwartz
- "Neuro Web Design: What makes them click?"

Originally published on WhatMakesThemClick.net.

#6 — You Reconstruct Your Memories

Try this task — Think back to a particular event that happened at least 5 years ago. Maybe it was a wedding,

or a family gathering, or a dinner you went to with friends, or a vacation. Pick one for our purposes here, and remember the event. Remember the people, and where you were and maybe you can remember the weather, or what you were wearing.

Memories as movies? — We tend to experience our memories of events like this as little movie clips that play back in our minds. And because we experience them this way we have a tendency to think that memories are stored in entirety and never change. But that's not what happens.

Memories are reconstructed — Our memories are actually reconstructed every time we think of them. They aren't movie clips that are stored in the brain in a certain location like files on a hard drive. They are nerve pathways that are firing anew each time we remember the event. This makes for some interesting effects. For example, the memory can change.

Subsequent events can affect the memory – Other events that occur after the original event can change the memory of the original event. At the original event, you and your cousin were close friends. But later on you have an argument and a falling-out that lasts for years. Your memory of the first event might include your cousin being aloof and cold, even if that is not true. The later experience has changed your memory.

Mixing events — It is easy to start mixing up memories. So that things that happened at two separate events become fused into one. Your cousin was pleasant at one event, and not pleasant at the other, but over time your memories about which is which can become confused.

Filling in of gaps – You will also start to fill in your memory gaps with "made up" sequences of events, but these will seem as real to you as the original event. You can't remember who else was at the family dinner, but Aunt Jolene is usually present at these events, and so over time your memory of the event will include Aunt Jolene.

Eyewitness testimony – Elizabeth Loftus is one of the earliest psychology researchers to study reconstructive memory. She was studying eyewitness testimonies, and was especially interested in whether language can affect memory.

Bumped, hit, or smashed – In her research Loftus would show a video clip of an automobile accident. Then she would ask a series of questions about the accident. She would change the way she worded the questions, for example, sometimes she would phrase it as: "How fast would you

estimate the car was going when it hit the other vehicle", or "How fast would you estimate the car was going when it smashed the other vehicle." And she would ask participants in the study if they remembered seeing broken glass.

You can guess — When she used the word smashed the estimated speed was higher than when she used the word hit. And more than twice as many people remembered seeing broken glass if the word smashed was used rather than the word hit.

So what's the impact? — Since memories are reconstructed, here are some things to keep in mind:

- The words you use are important. They can actually affect people's memories.
- You can't rely on self-reports of past behavior. People will not remember accurately what they or others did or said.
- Watch out for how and what you say if you are interviewing people, for example, interviewing users for a usability or user experience study. You can influence their responses with the words you use.
- Similarly, take what users say later, when they are remembering using an interface, with a grain of salt. It's being reconstructed.

And if you'd like to read some of Elizabeth Loftus' seminal work in the area:

Elizabeth F. Loftus and John C. Palmer, Reconstruction of Automobile Destruction:□An Example of the Interaction Between Language and Memory, Journal of Verbal Learning and Verbal Behavior, 13, 585-589 (1974).

Originally published on WhatMakesThemClick.net.

#7 — You Actually Can't Multi-Task

Thomas Hawk

I know it's popular to think that you are multi-tasking, but the research is clear that people actually can't multi-task, with one specific exception.

One thing at a time – For many years the psychology research has shown that people can only attend to one task at a time. Let me be even more

specific. The research shows that people can attend to only one cognitive task at a time. You can only be thinking about one thing at a time. You can only be conducting one mental activity at a time. So you can be talking or you can be reading. You can be reading or you can be typing. You can be listening or you can be reading. One thing at a time.

We fool ourselves – We are pretty good at switching back and forth quickly, so we THINK we are actually multi-tasking, but in reality we are not.

The one exception — The only exception that the research has uncovered is that if you are doing a physical task that you have done very very often and you are very good at, then you can do that physical task while you are doing a mental task. So if you are an adult and you have learned to walk then you can walk and talk at the same time.

Then again, maybe there isn't an exception – Even this doesn't work very well, though. A study being published in December shows that people talking on their cell phones while walking, run into people more often and don't notice what is around them. The researchers had someone in a clown suit ride a unicycle. The people talking on a cell phone were much less likely to notice or remember the clown.

But the millennial generation can multi-task, right? – A study at Stanford University demonstrates well that multi-tasking doesn't work, even with college students. Clifford Nass's study (published in August of 2009 in the Proceedings of the National Academy of Sciences), found that when people are asked to deal with multiple streams of information they can't pay attention to them, can't remember as well, and don't switch as well as they would have thought.

So what should you do? — One thing at a time!

For more information on the Stanford study: Stanford Study on Multi-Tasking

On the clown and unicycle research: Ira E. Hyman Jr *, S. Matthew Boss, Breanne M. Wise, Kira E. McKenzie, Jenna M. . "Did you see the unicycling clown? Inattentional blindness while walking and talking on a cell phone". Applied Cognitive Psychology, December, 2009.

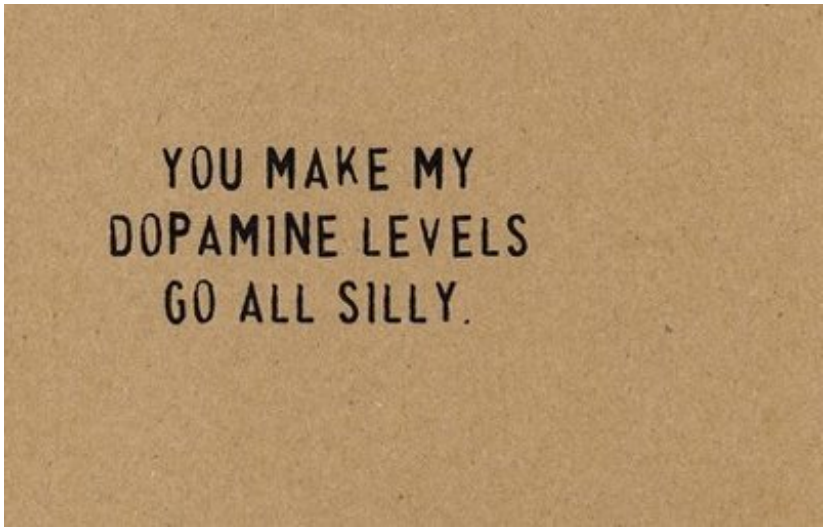
Originally published on WhatMakesThemClick.net.

#8 — Dopamine Makes You Addicted To Seeking Information

xorsyst

Do you ever feel like you are addicted

to email or twitter or texting? Do you find it impossible to ignore your email if you see that there are messages in your inbox? Have you ever gone to Google to look up some information and 30 minutes later you realize that you've been reading, and linking, and searching around for a long time, and you are now searching for something totally different than before? These are all examples of your dopamine system at work.



Enter dopamine — Neuro scientists have been studying what they call the dopamine system for a while. Dopamine was "discovered" in 1958 by Arvid Carlsson and Nils-Ake Hillarp at the National Heart Institute of Sweden. Dopamine is created in various parts of the brain and is critical in all sorts of brain functions, including thinking, moving, sleeping, mood, attention, motivation, seeking, and reward.

The myth — You may have heard that dopamine controls the "pleasure" systems of the brain; that dopamine makes you feel enjoyment, pleasure, and therefore motivates you to seek out certain behaviors, such as food, sex, and drugs.

It's all about seeking — The latest research, though is changing this view. Instead of dopamine causing us to experience pleasure, the latest research shows that dopamine causes seeking behavior. Dopamine causes us to want, desire, seek out, and search. It increases our general level of arousal and our goal-directed behavior. (From an evolutionary stand-point this is critical. The dopamine seeking system keeps us motivated to move through our world, learn, and survive). It's not just about physical needs such as food, or sex, but also about abstract concepts. Dopamine makes us curious about ideas and fuels our searching for information. The latest research shows that it is the opoid system (separate from dopamine) that makes us feel pleasure.

Wanting vs. liking — According to Kent Berridge, these two systems, the "wanting" (dopamine) and the "liking" (opoid) are complementary. The wanting system propels us to action and the liking system makes us feel satisfied and therefore pause our seeking. If our seeking isn't turned off at least for a little while, then we start to run in an endless loop. The latest research shows that the dopamine system is stronger than the opoid system. We seek more than we are satisfied (back to evolution… seeking is more likely to keep us alive than sitting around in a satisfied stupor).

A dopamine-induced loop — With the internet, twitter, and texting we now have almost instant gratification of our desire to seek. Want to talk to someone right away? Send a text and they

respond in a few seconds. Want to look up some information? Just type it into Google. Want to see what your friends are up to? Go to Twitter or Facebook. We get into a dopamine induced loop… dopamine starts us seeking, then we get rewarded for the seeking which makes us seek more. It becomes harder and harder to stop looking at email, stop texting, stop checking our cell phones to see if we have a message or a new text.

Anticipation is better than getting — Brain scan research shows that our brains show more stimulation and activity when we ANTICIPATE a reward than when we get one. Research on rats shows that if you destroy dopamine neurons, rats can walk, chew, and swallow, but will starve to death even when food is right next to them. They have lost the desire to go get the food.

More, more, more — Although wanting and liking are related, research also shows that the dopamine system doesn't have satiety built in. It is possible for the dopamine system to keep saying "more more more", seeking even when we have found the information. During that Google exploration we know that we have the answer to the question we originally asked, and yet we find ourselves looking for more information and more and more.

Unpredictability is the key — Dopamine is also stimulated by unpredictability. When something happens that is not exactly predictable, that stimulates the dopamine system. Think about these electronic gadgets and devices. Our emails and tweets and texts show up, but we don't know exactly when they will or whom they will be from. It's unpredictable. This is exactly what stimulates the dopamine system. It's the same system at work for gambling and slot machines. (For those of you reading this who are "old school" psychologists, you may remember "variable reinforcement schedules". Dopamine is involved in variable reinforcement schedules. This is why these are so powerful).

When you hear the "ding" that you have a text — The dopamine system is especially sensitive to "cues" that a reward is coming. If there is a small, specific cue that signifies that something is going to happen, that sets off our dopamine system. So when there is a sound when a text message or email arrives, or a visual cue, it enhances the addictive effect (for the psychologists out there: remember Pavlov).

140 characters is even more addictive — And the dopamine system is most powerfully stimulated when the information coming in is small so that it doesn't full satisfy. A short text or tweet (can only be 140 characters!) is ideally suited to send our dopamine system raging.

Not without costs — This constant stimulation of the dopamine system can be exhausting. We are getting caught in an endless dopamine loop.

Write a comment and share whether you get caught in these dopamine loops and whether you think we should use what we know about these systems to create devices and websites that stimulate them.

And for those of you who like research:

Kent C. Berridge and Terry E. Robinson, What is the role of dopamine in reward: hedonic impact, reward□learning, or incentive salience?: Brain Research Reviews 28 1998. 309–369.

Originally published on WhatMakesThemClick.net.

#9 — Blue and Red Together is Hard On Your Eyes (Chromostereopsis)

Wikimedia

What is it about red and blue? — When lines (or letters) of different colors are projected or printed, the depths of the lines may appear to be different; lines of one color may "jump out" while lines of another color are recessed. This effect is called Chromostereopsis. This effect is strongest with red and blue, but it can also happen with other colors (for example, red and green).

So what? – In addition to causing a depth effect, chromostereopsis can also be annoying and hard on the eyes. It is fatiguing. Although there are different theories as to why your eyes react to these color combinations in the way that they do, the important thing to remember is that they do.

What should you do about it? – If you are a visual or web designer make sure that you are not using red and blue together in this way. I still find web sites that have this color combination. Here are a few!

Originally published on WhatMakesThemClick.net.

Red text on a blue background

#10 — You Want More Choices and Information Than You Can Actually Process

What Makes Them Click

If you stand in any aisle in any retail store in the USA you will be inundated with choices. Whether you are

buying candy, cereal, TVs, jeans, you name it, you will likely have a huge number of items to choose from. This is because people want lots of choices. If you ask someone whether they would like to choose from a few alternatives or have lots of choices, most people will say that they want lots of choices.

Alternating blue and red bars

Too Many Choices and We Freeze — In my book, Neuro Web Design, What makes them click? I talk about the classic research in the field of choice. Iyengar and Lepper (2000) decided to test out the theory that if you have too many choices you don't choose at all. They set up booths at a busy upscale grocery store and posed as store employees. They alternated the selection on the table. Half of the time there were six choices of fruit jam for people to try and the other half of the time there were twenty-four jars of jam.

Example of a website with red and blue

Which Table Had More Visitors? — When there were twenty-four jars of jam, 60% of the people coming by would stop and taste. When there were six jars of jam only 40% of the people would stop and taste. So having more choices was better, right? Nope, that's wrong.

Which Table Resulted in More Tasting? You would think that people would taste more jam when the table had twenty-four different varieties. But they didn't. People tasted only a few varieties whether there were six or twenty-four choices available. People can only deal with 3 to 4 things at one time (see the post on 100 Things You Should Know about People: #3 — You Can Only Remember 3 to 4 Things At A Time (The Magic Number 3 or 4)).

Which Table Resulted in More Purchases? 31% of the people who stopped at the table with six jars actually made a purchase. But only 3% of the people who stopped at the table with twenty-four jars actually made a purchase. So even though more people stopped by, less people

purchased. To give you an example of the numbers, if 100 people came by (they actually had more than that in the study, but 100 makes the calculations easy for our purposes), 60 of them would stop and try the jam at the twenty four jar table, but only two of them would make a purchase. Forty people would stop and try the jam at the six-jar table, and twelve of them would actually make a purchase.

Why Can't You Stop? – So if "less is more" then why are you always wanting more choices? It's part of that dopamine effect again. We find information addictive. It is only when we are confident of our decision that we stop seeking more information. (see the post on 100 Things You Should Know About People: #8 — Dopamine Makes You Addicted To Seeking Information)

What should you do if you are trying to sell something? – Resist the impulse to provide lots and lots of choices to your customers. Remember they will SAY they want lots of choices, and you will think that lots of choices is a good thing (because you like them too), but too many choices means they won't buy at all.

What should you do if you are the consumer? – Stay aware of when you have gone over 3 to 4 choices or 3 to 4 points of information. Start some new habits by making "rules" for yourself. For example, make a rule, that when you have 4 pieces of information or 4 choices lined up that you will either stop seeking more information and make your decision/choice, or at least take a break from your searching so you can break the dopamine loop. It takes a while to replace an old habit with a new one, so you may have to be patient. And I'll tell you the truth… I think that the dopamine reaction is so strong you may not be able to ever really stop this information seeking/choice seeking loop. But you can always try!

And for those of you who like research:

Iyengar, Sheena S. and Mark R. Lepper. 2000. When choice is demotivating: Can one desire too much of a good thing?. Journal of Personality and Social Psychology. 79: 995-1006.

Originally published on WhatMakesThemClick.net.

#11 — Why You Can't Resist Paying Attention to Food, Sex, or Danger

Have you ever wondered why traffic always slows when people are driving by an accident? Do you moan about the fact that people are attracted by the gruesome, and yet find that you glance over too as you drive by? Well, it's not really your fault, you (and

everybody else) can't resist looking at scenes of danger. It's your "old brain" telling you to PAY ATTENTION.

You have 3 brains — In my book, Neuro Web Design: What makes them click? I talk about the idea that you really don't have one brain, you have three. The "new brain" is the conscious, reasoning, logical brain that you think you know best; the mid brain" is the part of the brain that processes emotions, and the "old brain" is the part of the brain that is most interested in your survival.

From reptiles to people — If you look at brains from an evolutionary perspective, the "old brain" developed first (hence the name "old brain"!). In fact, that part of our brain is very similar to the brain of a reptile, which is why some people call it the "reptilian" brain.

"Can I eat it? Can I have sex with it? Will it kill me?" – The job of your old brain is to constantly scan the environment and answer the questions: "Can I eat it? Can I have sex with it? Will it kill me?" That's really all the old brain cares about, is food sex and danger. When you think about it, this is important. Without food you'll die, without sex the species won't continue, and if you are killed the other two questions don't matter. So animal brains developed early on to care intensely about these three topics. As animals evolved they developed other capacities (emotions, logical thought), but they retained a part of their brain to always be scanning what is going on for these three critical questions.

You Can't Resist — What this means is that you just can't resist noticing food, sex, or danger. It doesn't matter how hard you try to not notice these 3 things in your surroundings, you will always notice them. It's the old brain working. You don't necessarily have to do anything once you notice, for example, you don't have to eat the chocolate cake when you see it, you don't have to flirt with the attractive person who walked into the room, and you don't have to run away from the large scary guy that walked in the room with the good looking woman. But you WILL notice all of those things whether you want to or not.

Cake, Pretty Woman, and a Crash on the home page — I get emails from people who have read about the old brain in my book. They will write to me wanting advice about how they should fit a picture of cake, a woman in a bikini, and an industrial accident all at the home page of their corporate website. (I do get some interesting emails!). I'm not advocating that you do that! I am pointing out that if you want to get someone's attention at a website, then any images or headlines that include or imply food, sex, or danger will definitely get attention. But you will have to decide what is appropriate!

Have you seen any good examples of websites that use these ideas effectively (besides just sex

sites — don't send me URLs for those)?

Originally published on WhatMakesThemClick.net.

#12 — When it comes to technology, you definitely "act your age"

Let's start with full disclosure: I'm a baby boomer. Ok, I've gotten that out of the way. I do have two millenial children (now young adults), and most of the people I work with are Gen Xers.

How did people get together before cell phones? — My son (age 20) recently asked me how people ever got together when I was growing up. "There weren't cell phones, so how did you ever arrange to get together to hang out?", he asked. I had to stop and think about that for a while. "Well", I answered, "We had regular phones. We were at home a lot, and we'd call each other on the phone and set up a day and time and place to meet. It was all done way ahead of time. And then we had maybe one or two places we would hang out. So if you called someone and they weren't there (remember, no answering machines or voice mail either), then you'd go drive around (there was a lot of driving around) to the one or two (or maybe three) places that everyone tended to hang out, and eventually you'd find who you were looking for." It kind of worked, although it meant that you spent most of your time looking for each other!

Generational definitions — I've done some of my own exploratory research on generational differences in the last few years. Here are the age group definitions I'm using for this blog post: millenials (born between 1982 and 2002), Gen X'ers (1961-1981) and Boomers (1943-1961). I focused in my research on differences in technology use and expectations. Here are some of my findings:

1. **Dualism vs. Ubiquitous** – Boomers think that technology is a separate thing. They "go on" the internet. They "make a call on the cell phone". They look something up "on the computer". They have a distinction between doing a task and the "tool" that they do the task with. Millennials don't have that dualism or separation. They look something up (of course they are doing it on the computer… why would you even think to say it that way?). They make a call or text someone… the technology is implied and assumed.

2. **Is the technology trapping us?** — Gen Xers live their life with technology. They work with it, they use it to be more productive. They like to customize and personalize. The Gen Xers are actually the group that is most enamored by technology, but at the same time they feel trapped by it. Boomers, on the other hand, remember life without it, so Boomers may use it and may be addicted to it like everyone else (see my blog post on Dopamine Makes You Addicted To Seeking Information), but they can more easily let it go and live without it. Interestingly, millennials have integrated all the various technologies into their lives, but they are the ones that will say, "We need to talk more instead of all this texting." or "People are forgetting how to even just talk to each other", or "I don't use email. It's a hassle and it's too impersonal. If I need to communicate I call them or text or facebook".
3. **No one likes small fonts** – All the generations I interviewed for my research commented on how much they dislike small fonts online. We think we only need larger fonts if we have a lot of Boomers in our target audience, but all of the generations commented that text was often too small.
4. **Like things to scroll**? – Boomers don't like things that move and scroll on the page, such as banners that change. They REALLY don't like that — it is a reason why they would abandon a site. Gen Xers are fine with these moving parts and Millennials will get bored without them.
5. **Interesting and fun** — Millennials expect websites to be at least interesting, if not fun. Gen Xers and Boomers are willing to give up fun if the site can be customized for them (Gen Xers), or it's a useful tool (Boomers).
6. **Twitter and Facebook** – Gen Xers love twitter. Millennials prefer Facebook. Boomers are trying both, but are still a little bewildered.
7. **Gen Xers are outnumbered** — You've heard how large the Boomer generation is in numbers, right? (78,000,000 in the US). The Millennials are an even larger group (80,000,000 in the US). The Gen Xers are a much smaller group (55,000,000).
8. **Gen Xers have to guard against design bias** – If you are a Gen Xer you have to be really careful. Gen Xers are doing most of the website design. But most of the people they are designing for are not them! They have to make sure they are not just designing for themselves, and they have to test their design with different generations.
9. **Millennials are most affected by "people like me"** – If you have pictures of people at your website the millennials are the most sensitive to what the people look like, especially to how old they are. I've seen millennials glance at the page they landed on at a website and click out of it within 1 or 2 seconds because, "this site isn't for me. That woman was old" (by the way, the woman looked about 35 to me!).
10. **They are not going to "grow out of it"** – Sometimes when I give talks on this topic people will ask me, "Isn't this just an artifact because these people are young? Soon they will grow up and get married and have children and then they will be just like all the other Gen Xers,

right?". I don't believe this. The differences are deep and have been ingrained since childhood. The Millennials are not going to grow into Gen Xers, just like the Gen Xers are not going to grow into Boomers.

What do you think? Which generation are you? Do you have to design for other generations? What do you do to make sure you aren't just designing for yourself?

Originally published on WhatMakesThemClick.net.

#13 — Want To Change a Habit? Use Fun, Surprise, and a Crowd

Have a habit that you want to change? Or maybe you are trying to change the behavior of people at work? Or you want to change the behavior of people coming to your blog or website? If you read any of the research on habits you will find that habits are hard to change. (I'll do a separate post on that shortly). You can change habits, but it takes a lot of work. Or maybe not?

Have you seen the video on the musical stairs? Many of you probably have. If so, watch it again before reading on, and if you haven't then you'll enjoy it. I believe that there are some lessons about habit change in the video:

Shortcuts to changing habits — I've been thinking about that video and I am thinking that there might be ways to shortcut all the work it takes to change a habit, or at least jump start the process. Based on the video here are 3 ideas I've come up with:

Make it fun – When you are changing a habit, you substitute a new habit for the old one. To jump start this process, make the new habit fun. It will probably need to be a lot more fun for it to even begin to be enticing.

Make it a surprise – People like surprises (as long as the surprise is pleasant or fun). Research on the brain shows that surprises capture human interest and attention. There is also research to show that things that are unpredictable elicit activity in the parts of the brain that anticipate rewards. If you surprise people you will therefore get their attention, and prime them to think that what comes next might be pleasurable (Berns, McClure, Montague, 2001).

Use a crowd — In my book, Neuro Web Design: What makes them click? I have a chapter on social validation. The research in this area shows that people are influenced by the behavior of others. When they see lots of people doing something they will tend to join in.

The musical stairs in the video had all three elements. Having stairs that look like a piano and make piano sounds is fun, and also a surprise. On top of that, everyone else was using the stairs… and there you have it, people are ready to use the stairs.

We don't know if this use the stairs habit would sustain, or what happens when you take the musical stairs away. But next time I am choosing a new habit to try and replace an old habit, I'm going to pay attention to the factors of fun, surprise, and social validation.

And for those of you who like to read research:

Berns, GS, McClure, SM, Montague, PR (2001) Predictability modulates human brain response to reward. J. Neuroscience 21(8):2793-2798

Originally published on WhatMakesThemClick.net.

#14 — Reading Text Online Is Not Fun

What Makes Them Click


California, to be an Associate Director of the Office of Science and Technology Policy, and Anthony R. Coscia, of New Jersey, who was introduced by Senators Lautenberg and Menendez, and Albert DiClemente, of Delaware, who was introduced by Senator Kaufman, both to be a Director of the Amtrak Board of Directors, after the nominees testified and answered questions in their own behalf.
MANAGING FEDERAL FORESTS
Committee on Energy and Natural Resources: Subcommittee on Public Lands and Forests concluded a hearing to examine managing Federal forests in response to climate change, focusing on natural resource adaptation and carbon sequestration, after receiving testimony from Kit Batten, Science Advisor, Office of the Deputy Secretary, Department of the Interior; Tom Tidwell, Chief, Forest Service, Department of Agriculture; Beverly Law, Oregon State University, Corvallis; Elaine Oneil, University of Washington School of Forestry, Seattle; and Christopher A. Wood, Trout Unlimited, Arlington, Virginia.
BUSINESS MEETING
Committee on Environment and Public Works: Committee ordered favorably reported S. 2778, to amend the Public Works and Economic Development Act of 1965 to reauthorize that Act, with an amendment.
NOMINATIONS
Committee on Foreign Relations: Committee concluded a hearing to examine the nominations of Eleni Tsakopoulos Kounalakis, of California, to be Ambassador to the Republic of Hungary, who was introduced by Senators Boxer, Snowe, and Feinstein and Representative Pelosi, Mary Burce Warlick, of Virginia, to be Ambassador to the Republic of Serbia, and James B. Warlick, Jr., of Virginia, to be Ambassador to the Republic of Bulgaria, all of the Department of State, after the nominees testified and answered questions in their own behalf.
LIEUTENANT COLONEL DOMINIC ``ROCKY'' BARAGONA JUSTICE FOR AMERICAN HEROES HARMED BY CONTRACTORS ACT
Committee on Homeland Security and Governmental Affairs: Ad Hoc Subcommittee on Contracting Oversight concluded a hearing to examine S.

It's the holiday season right now in the USA which means that people are talking about what they want as a gift. I would like a Kindle or one of the new Barnes and Noble competitors to the Kindle. Since we are being frugal in our household this year I don't think I'm going to get one (and I haven't read the reviews yet to see whether I want the Kindle or the new B&N competitor).

Is a Kindle the same as text online? — It might seem contradictory, then, for me to say I want a Kindle and then write a post about the idea that reading text online is not fun. But actually I am not talking about the same thing at all. I've tried a Kindle, and the liquid ink technology is different than LCD displays on a laptop or a desktop monitor. Reading text on a computer screen is admittedly better than it was years ago. I go back to the dreaded "green screen" days, and I can say with certainty that reading text on my MacBook Pro is a lot better than reading text on the green (or amber — how many of you remember amber?) and black screens from yester year.

It's the luminescence – Computer screens however, have a different lighting display than the Kindle, and certainly are different than reading on paper. When you are reading text on paper the light is reflected off the paper and back to your eyes. When you are reading text on a computer screen the reflections of room or sunlight are different.

So what's the result? – The result is that reading text online is tiring to the eyes. People are only going to read a limited amount of text at a time on a computer screen. If you want people to read

text on a computer screen you have to do the following:

Break the text up into chunks -- use bullets, short paragraphs, pictures and any other means you can to break the text up. People will read a few lines of text on a computer screen and then skip to the next paragraph, so break it up.

Use a font that is easy to read — There have been "font wars" for years. The research shows that the font you use is not a big deal as long as it is basically readable. Meaning don't use an overly decorative font for a block of text.

Use a font size that is easy to read – Even younger people complain about small fonts.

Use black text on a white background or close to that – You need enough difference between foreground and background. Black text on a white background is the most readable.

Make the content worth it – In the end it all boils down to whether what is on the page is of interest to the reader. If it is then the reader will be more patient with having to read the text online.

So what do you think? Do you have a Kindle or the new B&N device? Do you think it is different than reading text on a computer screen? Are you an avid text reader online?

If you are interested in reading the research about font type and reading more about typography and readability here are two great websites:

http://www.hgrebdes.com/typefaces
http://www.alexpoole.info/academic/literaturereview.html

Originally published on WhatMakesThemClick.net.

#15 — If You Use Social Media Without Laughter You Aren't Being Social

If you engage in social media are you being social? You email, you text, you twitter, you leave voicemails for people, so you are plugged in, right? Well, actually not. In all of these means of communication you are not actually physically interacting with another person. True social bonding requires a physical reaction to the presence of other people. Do you tend to work alone a lot? At your desk on your

computer? Then maybe you aren't being as social as you think. And this lack of physical contact may actually affect the quality of the work that you and your team does.

The Neuro Science of Social Bonding — People are social animals. In order to work together they have to have social interactions. There are complicated hormonal and chemical changes that occur in your brain and throughout your body when you bond with others. In this post I'll focus on just one mechanism of social bonding — laughter.

Research on Laughter – Considering how universal laughter is and how much of it we do, there is, relatively, not a lot of research on laughter. One of the main researchers is Robert Provine from University of Maryland. Here is a summary of some of the research he has done… some of these findings may surprise you:

- Laughter is universal: All humans in all cultures laugh
- Laughter is unconscious: You can't actually laugh on command — it will be fake laughter if you try to.
- Laughter is for social communication: We rarely laugh when we are alone. We laugh 30 times more often when we are with others.
- Laughter is contagious: We will smile and then start laughing as we hear others laugh.
- Laughter appears early in babies: at about 4 months old
- Laughter is not about humor: Provine studied over 2,000 cases of naturally occurring laughter and most of it did not happen as a result of "humor" such as telling jokes. Most laughter followed statements such as "Hey John, where ya been?" or "Here comes Mary", or "How did you do on the test?" Laughter after these types of statements bond people together socially. Only 20% of laughter is from jokes.
- We rarely laugh in the middle of a sentence. It is usually at the end.
- Other primate and mammals laugh. There are videos of rats laughing while being tickled.
- Speaking of tickling, laughing seems to have "evolved" from tickling.
- Most laughing occurs by the person who is speaking, not the person who is listening. The person who is speaking laughs twice as much.
- Women laugh more than twice as much as men.
- Laughter denotes social status. The higher up on the hierarchy you are in a group, the less

you will laugh.

An example: the challenge of remote teams — I work a lot with remote teams. You may also be familiar with the challenges. You may have to deal with time zone differences, less than optimal phone connections, language barriers, but I wonder if you've considered that the biggest challenge may be lack of social bonding and lack of in-person laughter. Even if everyone is in the same building, if they aren't working together in person then there is a lack of social bonding. Consider at least having periodic phone calls so that there can be some laughter. If you talk on the phone then you can at least hear each other laugh, even if you are missing the in-person cues. If at all possible, get together with other people from your work team in person for at least one meeting now and then. That way laughing and social bonding will occur, and even if you work apart the rest of the time you will have had some experience of social bonding.

It's ironic, isn't it? We use "social media" the most when we aren't being social!

For more reading: Laughter: A Scientific Investigation, by Robert Provine, 2001.

Originally published on WhatMakesThemClick.net.

#16 — The Ability To Delay Gratification Or Not Starts Young

You want to buy that Kindle, but you are thinking maybe you should wait for a while. Maybe you should see if the price comes down after the holiday shopping season, or maybe you should make sure that you have enough cash to pay all of your credit card bills before you spend money on a new gadget for yourself. Do you wait or not?

Whether you are the type of person who can delay gratification or whether you aren't, chances are high that you've been this way (a delayer or not a delayer) since you were a young child.

Here is one of my favorite psychology research videos. Watch these little kids decide whether to eat the one marshmallow that is put in front of them, or wait and thereby get 2 marshmallows:

The original research from the 1960's — Starting in the late 1960s and early 1970s, Walter Mischel began conducting a series of studies similar to the video. He was interested in the idea of delayed gratification. Years later he decided to follow up with the original people in his study. He found that when the people in the study who were able to delay gratification became teenagers, they were more successful in school, received higher test scores on the SAT, and were better able to cope with stress and frustration. He's followed them even further into adulthood and the differences continue. The children in the original studies that could not delay gratification as pre-schoolers, were more likely to have problems as adults, including drug abuse.

Waiting for the fMRI studies — Jonah Lehrer recently wrote in the New Yorker that Ozlem Ayduk

from UC Berkeley is having these same "children" (who are now adults) come back to the lab. The researchers are using fMRI brain imaging to get a better look at the parts of the brain that are active in delayed gratification.

Any hope for the people who can't wait? — Mischel is supposedly working on tools and techniques that can be taught to the people who don't/can't delay gratification. Apparently it is possible to teach people to distract themselves enough so they can wait.

In the meantime, maybe you should buy that Kindle so you'll be ready to read the research?
Shoda, Y., Mischel, W., Peake, P. K. (1990). Predicting adolescent cognitive and self-regulatory competencies from preschool delay of gratification: Identifying diagnostic conditions. Developmental Psychology, 26(6), 978–986.

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#17 — Your Unconscious Knows First

You are shopping for a new computer and the salesperson you are talking to is offering you what seems to be a good deal. And yet there is a part of you that feels uncomfortable and isn't sure if this is the right computer, or the right deal, or the right store for you. If you had to articulate why you felt uncomfortable you might not be able to say why, or you'd make up a reason, but that might not really be the reason. So what's going on?

Your unconscious mind is faster than your conscious mind – One of my favorite pieces of research is the study by Bechara and Damasio. It's a little complicated to explain, so a few months ago I put together a short video "re-enactment" to help describe the research. I have a summary below as well:

A card game — The subjects in the study played a gambling game with decks of cards. Each person received $2,000 of pretend money. They were told that the goal was to lose as little of the $2,000 as possible, and to try to make as much over the $2000 as possible. There were four decks of cards on the table. The participant turned over a card from any of the four decks, one card at a time. They continued turning over a card from the deck of their choice until the experimenter told them to stop. They didn't know when the game would end. The participant was told that every time they turned over a card, they earned money. They were also told that sometimes when they turned over a card, they earned money but also lost money (by paying it to the experimenter).

The participants didn't know any of the rules of the gambling game. But here are what the rules actually were:

- If they turned over any card in decks A or B, they earned $100. If they turned over any card in decks C and D, they earned only $50.

- Some cards in decks A and B also required participants to pay the experimenter a lot of money, sometimes as much as $1,250. Some cards in decks C and D also required participants to pay the experimenter, but the amount they had to pay was only an average of $100.

- Over the course of the game, decks A and B produced net losses if participants continued using them. Continued use of decks C and D rewarded participants with net gains.

- The rules of never changed. Although participants didn't know this, the game ended after 100 cards had been "played" (turned over).

The unconscious figures out first what is going on – Most participants started by trying all four decks. At first, they gravitated toward decks A and B because those decks paid out $100 per turn. But after about 30 turns, most turned to decks C and D. They then continued turning cards in decks to C and D until the game ended. During the study, the experimenter stopped the game several times to ask participants about the decks. The participants were connected to a skin conductance sensor to measure their SCR (skin conductance response). Their SCR readings were elevated when they played decks A and B (the "dangerous" decks) long before participants consciously realized that A and B were dangerous. When the participants played decks A and B, their SCRs increased even before they touched the cards in the decks. Their SCRs increased when they thought about using decks A and B. Their unconscious knew that decks A and B were "dangerous" and resulting in a loss. We know that because we see the spike in the SCR. However, that's all unconscious. The conscious mind didn't know yet that anything is wrong yet.

The conscious mind starts to catch up — Eventually participants said they had a "hunch" that decks C and D were better, but the SCR shows that the old brain figured this out long before the new brain "got" it. By the end of the game, most participants had more than a hunch and could articulate the difference in the two decks, but a full 30 percent of the participants couldn't explain why they preferred decks C and D. They said they just thought those decks were better.

The old brain is afraid of losing – In my book, Neuro Web Design: What makes them click? I talk about this study in the context of fear of losing. The "old" brain (unconscious) is always on the look-out to protect us from losing. It will detect potential loss in our environment and steer us to take less risks.
What do you think? How do you think you can apply this knowledge? What would you do if you were the person buying the computer at the beginning of this post? What if you were the salesperson trying to sell the computer to the person?

(Thank you goes to Cole Bitting for coming up with a better and shorter title for this post than I originally had!)

And if you like to read research, here's the original study:

Deciding Advantageously Before Knowing Advantageous Strategy Bechara et al. Science 28 February 1997: 1293

Originally published on WhatMakesThemClick.net.

#18 — What People Look At On a Picture Or Screen Depends On What You Say To Them

Yarbus Eye Tracking Picture

Eye tracking is a technology that allows you to see and record what a person is looking at, and for how long. One way it is used is to study web sites to see where people are looking on a web page, where they look first, second, etc. It's a pretty interesting technology, one of the benefits being that you don't have to rely on what people SAY they are looking at, but can collect the data directly. Like any technology, however, it's not perfect, and one of the problems with eye tracking is that you can't just give people a web site to look at and then assume that where they look is what they are "really interested" in.

We underestimate the effect our instructions have on where someone looks. Look at the picture at the beginning of this post. In research by Yarbus, people were shown this picture, and then given different instructions of what to think about while looking at the picture. Below are the eye gaze patterns matched with the instructions that people were given:

Proceed with caution. To me this data says: a) If you are using eye tracking as a technique to evaluate how people are using your website then you must be very careful about the instructions you give, and you must make sure you are giving everyone the exact same instructions. b) You can't assume that just because people look at one spot on your website when they first see it that they will always look there. It might depend on what they were coming back to do. c) It's nice to have a measure that doesn't rely on what the user says or how they think they are reacting, but even these "objective" measures aren't as objective as we think!

This research is from way back, but I believe it is still relevant. I haven't found any recent replication of it yet. If you know of any please do pass on the reference:

Yarbus, A. L. (1967). Eye Movements and Vision (B. Haigh, trans.), New York: Plenum

Originally published on WhatMakesThemClick.net.

#19 — It's a Myth That All Capital Letters Are Inherently Harder to Read

WHAT YOU ARE ABOUT TO READ IN THE NEXT PARAGRAPH IS COMMONLY BELIEVED, BUT NOT TRUE – You read by recognizing the shapes of words and groups of words. Words that are in all capital letters all have the same shape: a rectangle of a certain size. This makes words displayed in all uppercase harder to read than upper and lower case (known as "mixed case"). Mixed case words are easier to read because they make unique shapes, as demonstrated by the picture below.

The shapes of words

OK, NOW THE TRUE STUFF STARTS — When I started this article the topic was supposed to be why all capital letters are harder to read. Like most people with a usability background or a cognitive psychology background, I can describe the research — just what I wrote in the first paragraph above. I decided to look up and cite the actual research rather than just passing on the general knowledge and belief.

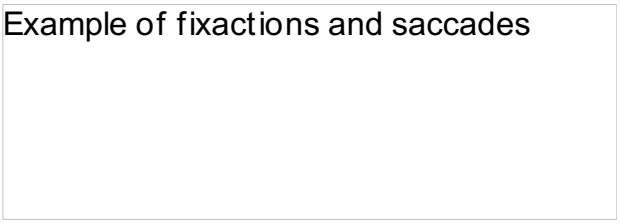
The research doesn't exist, or "It's complicated" — Something happened when I went to find the research on the shape of words and how that is related to all capital letters being harder to read. There isn't research showing that exactly. It's more complicated, and ultimately, more controversial. In July of 2004 Kevin Larson wrote an article that is posted at the Microsoft website that explains in depth all the research on this topic. I've picked out several ideas from that article and am presenting them here. A link to Kevin's article, plus some of his research citations are at the end of this blog for those of you who want more detail.

It's parallel letter recognition, not word shape — The old theory on word shapes comes from a psycholinguist named Cattell who came up with that theory in 1886. There was some evidence for it, but more recent research shows that it is letters you are recognizing and anticipating. You don't recognize words by the shape of the word. You recognize familiar letter sequences. The research strongly suggests that you recognize all the letters in a word at the same time, and then you use the recognition of those letters to recognize the word.

How you read – When you read you have the impression that your eyes are smoothly moving across the page, that's not what is happening at all. Your eyes move in quick sharp jumps, with short periods of stillness in between. The quick jumps are called saccades and the fixations are the

moments of stillness. Interestingly during the saccades you can't see anything — you are essentially blind. Fortunately these saccades are really fast so you are not blind for long. They are so fast that you don't even realize you are having them.

Example of fixations and saccades



How much do you read at a time? – A saccade jumps you about 7-9 letters, but your perceptual span is actually double that. When you are reading your eyes are "looking ahead" using your peripheral vision to see what is coming next. Some interesting eye tracking studies have been done in which the researchers switch out the letters during the saccade. Then they see what kinds of errors you make. I won't go into the detail of this research (references are below if you want to dig more). But the summary is that you read ahead about 15 letters at a time. When you pick up those 15 letters you always pick them up to the right (if you are reading left to right), although now and then your saccade jumps you backwards and you re-read a section of letters.

Here's the bottom line – That's probably more than you wanted to know about how you read! Here's the summary: You read by anticipating the letters that will be in words, and then recognizing those letters. All capital (uppercase) letters are slower for people to read, but only because they aren't used to them. Mixed case text is only faster to read than uppercase letters because of practice. Most of what you read is mixed case, and so you are used to it. If people practice reading text that is in all capital letters they can get to the point where they are reading that text as fast as they usually read mixed case. This doesn't mean you should start using uppercase or capital letters for all of your text. People are not used to reading that way, so it will slow them down, and these days it's perceived as "shouting". But now you know that uppercase letters are not inherently harder to read. Maybe we can start dislodging that myth?

And, here's some links and research citations:

Kevin Larson's article is at: http://www.microsoft.com/typography/ctfonts/wordrecognition.aspx

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Originally published on WhatMakesThemClick.net.

#20 — Your Attention Is Riveted By Pictures Of People

Second only to movement (animation, video), pictures of a human face capture attention in any medium, including websites. Pictures of a human face not only capture attention, but keep the attention on that part of the screen even when the picture goes away.

We start young — With some creative experiments it has been proven that babies as young as 4 months old will look at pictures of other people more than pictures of other objects or of

animals. And this preference for faces
continues throughout the life span. It seems to be part of our brain wiring.

The eyes have it – Research using eye tracking shows that when you show people a picture of the face of a person, their attention goes mostly to the eyes. If you want to capture someone's attention at a website, showing a picture of a person who is looking right into the camera captures the most attention.

Special unconscious brain processing – The latest research implies that there is a part of the brain that is focused on recognizing human faces, as well as interpreting the emotion that is on the human face. Fearful and angry faces get the most and quickest attention, but any face gets a lot of attention. The circuitry in the brain from this specialized spot is believe to go right to the amygdala, which processes emotions. So it is fast, since it doesn't have to go through the normal route that most vision goes through (the cortex and conscious mind). This means that you are processing faces unconsciously.

You look where the eyes look — Some practitioners have been investigating whether where the eyes are looking in the picture affects where your eye looks when you look at the picture. James Breeze has an interesting blog post and some eye tracking data on this. The eye tracking data shows that if a web site has a picture of a person seemingly "looking" at a certain part of the screen or page, then the person viewing that picture will tend to look at the same spot.

Bottom line advice for your website – Use pictures to capture and hold attention at your website. For the most effect, use pictures that are close-up shots and where the person is looking right at the camera. If you want people to look at something in particular on the page besides the picture, then have the person in the photo "looking" at that spot on the page.

For more information, there is a research reference below, and also check out James Breeze's blog post: http://usableworld.com.au/2009/03/16/you-look-where-they-look/

Jan Theeuwes and Stefan Van der Stigchel, "Faces capture attention", Visual Cognition, Volume 13 , Issue 6, April 2006 , pages 657 – 665.

Originally published on WhatMakesThemClick.net.

#21 — You Overestimate Your Reactions to Future Events

Cafeterra.info

Here's is a thought experiment – On a scale of 1 to 10, with 1 being the lowest and 10 being the highest, rate how happy you are right now. Write

that number down. Now, I want you to imagine that today you win the lottery. You now have more money than you ever thought you would. You have millions and millions of dollars. At the end of today what would be your happiness rating? Write that number down. What about 2 years from now? What will be your happiness rating 2 years from now if today you win millions and millions in the lottery?

People are poor predictors — In his great book, Stumbling on Happiness, Dan Gilbert discusses the research he and others have conducted on predicting or estimating emotional reactions to events. What he has found is that people greatly overestimate the reaction they think they will have to both pleasant and unpleasant events that happen in one's life. Whether it is predicting how you will feel if a negative event happens, for example, if you lose your job, have an accident, or if a loved one dies, or predicting how you will feel if a positive event happens, such as coming into a lot of money, landing the dream job, or finding the perfect boyfriend or girlfriend, everyone tends to overestimate their reaction. If the event is negative you predict that you will be very upset and devastated for a long time. If the event is positive you predict that you will be deliriously happy for a long time.

A built-in regulator -- The truth is that you have a built-in regulator of sorts so that whether negative events happen or positive events happen, you stay at about the same level of happiness most of the time. Some people are generally happier or less happy than others, and this level of happiness stays constant no matter what happens to them.

Preference vs. Reality – One interesting implication of this is in the field of marketing or user experience research. Be careful of believing customers if they tell you that by making this change or that change to a product that means that they would be much happier with it, or that they would never use it again. People may prefer one thing over another or think they will, but the strength of their reaction, either in a positive or a negative way, is probably not as much as they imagine it will be.

Have you experienced this difference between your own predictions and reactions? Have there been times when you were sure that a particular event would mean you would be really happy or unhappy and it turned out differently than you imagined?

For more reading:

Stumbling on Happiness By Dan Gilbert

Originally published on WhatMakesThemClick.net.

#22 — Peripheral Vison — Keeping You Alive or Channel Surfing?

You have probably heard the term "peripheral vision", but did you know that you use your peripheral vision to get the gist of the scene around you?

Two kinds of vision — Basically, you have two types of vision: Central and Peripheral. Central vision is the vision you have when you look at something directly and see the details. Peripheral vision is the rest of the visual field that is visible, but that you are not looking directly at.

Keeping you alive on the savannah — The theory, from an evolutionary point of view, is that thousands of years ago, people who were sharpening their flint, or looking up at the clouds, and yet still noticed that a lion was coming at them from their peripheral vision survived to pass on their genes. So peripheral vision has always been important.

Why blinking on a screen is so annoying – Humans can't help but notice movement in our peripheral vision. We are "programmed" to pay attention to movement in the border of our vision. If you are reading text on a computer screen and there is some animation moving or blinking off to the side you can't help but look at it. This can be quite annoying if you are trying to concentrate on reading the text in front of you. Peripheral vision at work!

Latest research shows peripheral vision plays a larger role — New research from Kansas State University, however, shows that peripheral vision is more important in understanding the world around us than these previous theories implied. It seems that we get information on what type of scene we are looking at from our peripheral vision. We process the "gist" of what we are looking at from our peripheral vision. The researchers at Kansas State showed people photographs of common scenes, for example a photograph of a kitchen or a living room. In some of the photographs the outside of the image was obscured, and in others the central part of the images were obscured. The images were shown for very short amounts of time. Then they asked the research participants what they were looking at.

Peripheral vision was more important – What they found is that if the central part of the photo

was missing people could still identify what they were looking at. But when the peripheral part of the image was missing then they couldn't say whether it was a living room or a kitchen.

Peripheral vision and channel surfing – Are you the type that gets hold of the remote and quickly surfs through the channels spending a split second on each one? Or are you the person who gets really annoyed when others do that! The latest theory is that these channel surfers are using peripheral vision to get the gist of what's on the station and then moving on to the next one.

If you want to read the research:

Adam M. Larson, Lester C. Loschky. The contributions of central versus peripheral vision to scene gist recognition. Journal of Vision, 2009; 9 (10): 1 DOI: 10.1167/9.10.6

Originally published on WhatMakesThemClick.net.

#23 — You Are Hard-Wired For Imitation and Empathy

If you put your face right in front of a young baby and stick out your tongue, the baby will stick out his or her tongue too. This happens from a very young age (even as young as a one month old). So? What does this have to do with anything? It's an example of the built-in, wired-into-our-brain capacity we have for imitation. Recent research on the brain shows how our imitative behavior happens.

Mirror neurons firing– In the front of the brain there is a section called the premotor cortex; motor as in movement. This is the part of the brain where you make plans to move. (It talks to the primary motor cortex which is the part of the brain that sends out the signals that actually make you move). So if you are holding an ice cream cone and you think about moving your arm to bring the ice cream cone up to your mouth, and then you do it, you can see first the premotor cortex lighting up and then the primary motor cortex lighting up. Neurons in the premotor cortex are firing — nothing surprising there. But here is where it gets interesting. If you watch someone else lift their arm and eat the ice cream cone a subset of the same neurons also fire. Just watching other people take an action causes some of the same neurons to fire as if you were actually moving. This subset of neurons have been dubbed, "mirror neurons". We share these mirror neurons with other primates as well.

Who is taking action? — How does your brain know when you are taking the action vs. watching someone else take the action? After your mirror neurons fire from watching your friend take a lick of the ice cream cone, there is a feedback loop. Your brain registers that no ice cream was tasted, and therefore you know that you are watching someone eat ice cream, not that you just ate ice cream.

Not just imitation but empathy too — The latest theories are that these mirror neurons are also the way we empathize with others. We are literally experiencing what others are experiencing through these mirror neurons, and that allows us to deeply, and literally, understand how another person feels.

So what's the big deal? — What implications can you draw from knowing about mirror neurons?:

- Don't underestimate the power of watching someone else do something. If you want to influence someone's behavior, then show someone else doing the same task.
- There is research that shows that stories create images in the mind that may also trigger mirror neurons. Stories are powerful.
- Video at a web site is especially compelling. Want people to get a flu shot? Then show a video of other people in line at a clinic getting a flu shot. Want kids to eat vegetables? Then show a video of other kids eating vegetables. Mirror neurons at work.

For more information watch the TED video of VS Ramachandran: http://bit.ly/aaiXba

Originally published on WhatMakesThemClick.net.

#24 — You Are Most Affected By Brands and Logos When You Are Sad Or Scared

Mel B. via Flickr Creative Commons

Here's Scenario 1: You get together with your friends to watch your home team play a game on TV. They win! After an afternoon of fun and friendship you stop at a grocery store on your way home. You are in a good mood. Are you more or less likely to buy the usual cereal you always buy or will you try something new?

Here's Scenario 2: It's Friday

afternoon and your boss calls you in to
tell you that he's not happy with your latest project report. This is the project that you repeatedly told him was in trouble and you asked that more staff be assigned. You feel all your warnings were ignored. Now he's telling you that this work will reflect badly on you and you may even lose your job. On the way home you stop at the grocery store. You are sad and scared. Are you more or less likely to buy the usual cereal you always buy, or will you try something new?

You Want What's Familiar – A series of research studies by Marieke de Vries of Radboud University Nijmegen, in the Netherlands, shows that when people are sad or scared, they want what is familiar. When people are in a happy mood they are not as sensitive to what is familiar, and are willing to try something new and different.

Related to Fear of Loss — This craving of the familiar, and a preference for familiar brand is probably tied to our basic fear of loss. In my book, Neuro Web Design: What makes them click? I have a chapter on the fear of loss. When we are sad or scared, our old brain and our mid (emotional) brain are on alert. We have to protect ourselves. And a quick way to be safe is to go with what you know; what you are familiar with. A strong brand is familiar. A strong logo is familiar. So when we are sad or scared we will reach for a brand and logo we know.

It's Easy to Change Someone's Mood – It turns out it is remarkably easy to affect someone's mood, especially in the short term (like long enough for them to make a purchase at a web site). In Marieke de Vries's research they showed video clips of the Muppets (to instigate a good mood) vs. the movie Schindler's list (to instigate a bad mood). People reported their mood as significantly elevated after the Muppets and significantly lowered after Schindler's list. This mood change then affected their actions in the rest of the research study.

Take-Aways — If you are giving messages of fear, loss, problems etc, that will result in more action taken if your brand is familiar. If you are giving messages of fun, lightness, and humor, that will result in more action taken if your brand is new.

Have you found this to be true in your experience?

Originally published on WhatMakesThemClick.net.

#25 — Trust Your Gut or Be Logical? It Depends On Your Mood

Alli Jiang

In a previous post on how mood affects your reaction to brands you know (see You Are Most Affected By Brands And Logos When You Are Sad

And Scared), I talked about the research from Marieke de Vries of Radboud University Nijmegen, in the Netherlands. De Vries also did research on two types of decision making: a trusting -your- gut intuitive method vs. following a logical, deliberative decision-making process of weighing alternatives and thinking through pros and cons. De Vries was interested in whether one method of decision-making was better than another, and also whether your mood affected the outcome of the decision.

When to use deliberative decision-making — Research by Dijksterhuis shows that when you have simple decision to make you make better decisions when you use a logical deliberative method.

When to use intuitive decision-making – Research by Shiv shows that when you have a complicated decision to make, you make better decisions when you use an intuitive or "gut" method.

Where does mood fit in? — De Vries went further with the research to see if mood had an affect, and found that when you are in a happy mood you rely on your gut instincts more, AND the outcome is that you make better decisions. When you are in a sad mood you rely on your logical decision making AND you make better decisions as a result.

Take-aways — If you are in a good mood and/or are making a complicated decision it is best to trust your intuition. If you are in a bad mood and/or are making a simple decision then use a more deliberative process.

Originally published on WhatMakesThemClick.net.

#26 — Culture shapes our brain

AP

My entire career I've been worried about the fact that most psychology research is conducted on 18-24 year old college students. What if the way 18-24 year old college students react, think, and behave is not the same as everyone else? We are drawing

conclusions about PEOPLE in general, but only collecting data from a small subset of people whose brains are still changing. It seemed silly that there were rigorous rules about how to conduct scientific studies in psychology, and yet this basic premise about who was being researched and how applicable the research was to different people was ignored. It's made me secretly skeptical about research. Which is ironic, since I spend a fair amount of time searching out research, thinking about it, interpreting it and writing about it. I guess some research is better than no research?

Does culture shape "basic" cognitive processes?– And now I've come across an entirely new reason to be skeptical about the theories we have about how the brain works — cultural effects. In his book, *The Geography of Thought*, Richard Nisbitt discusses research that shows that how we think — our cognitive processes — are influenced and shaped by culture. For example, if you show people from "the West" (US, Europe) a picture, they focus on a main or dominant foreground object, while people from Asia pay more attention to context and background. Asian people who grow up in the West show the Western pattern, not the Asian pattern, showing that this is based on culture, not genetics.

Is most of our research in psychology based on what "westerners" think? — This has profound implications for some of the theories we have about cognitive processing. We have research about how people think, how many items can be stored in memory, etc. What if these theories about how people think are really theories about how Western people think and are not universal?

Do cultural differences show up in brain activity? — Sharon Begley recently wrote about this in *Newsweek*. She reports on recent neuroscience research that confirms the cultural effects. "… when shown complex, busy scenes, Asian-Americans and non-Asian–Americans recruited different brain regions. The Asians showed more activity in areas that process figure-ground relations—holistic context—while the Americans showed more activity in regions that recognize objects. To take one recent example, a region behind the forehead called the medial prefrontal cortex supposedly represents the self: it is active when we ("we" being the Americans in the study) think of our own identity and traits. But with Chinese volunteers, the results were strikingly different. The "me" circuit hummed not only when they thought whether a particular adjective described themselves, but also when they considered whether it described their *mother*."

Will it ever end? – This is the curse of research. Just when we think we know something, we find out there are more questions than answers! One trend that should help is that there is more and more research coming out of Asia. If you peruse the psychology scientific journals you will see that more than half of the research that is being published today comes from Asia. Another big chunk

comes from Europe, so the psychology research now is not so US centric. This will help, or will it? Will we now have to worry that the results from Asia don't apply to the West? Should all psychology research be done using different cultures?

What do you think?

For more reading:

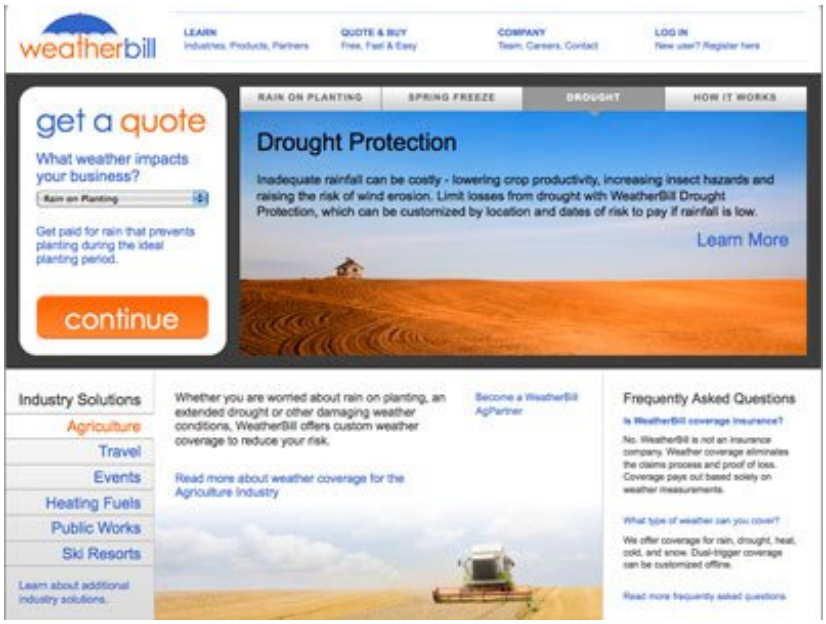
Ambady, N., Freeman, J. B., Rule, N. O. (in press). Culture and the neural substrates of behavior, perception, and cognition. In J. Decety & J. Cacioppo (Eds.), *The Handbook of Social Neuroscience.* Oxford: Oxford University Press.

Sharon Begley's article in Newsweek: West Brain, East Brain

To find out more, check out *The Geography of Thought*, by Richard Nisbett.

Originally published on WhatMakesThemClick.net.

#27 — We go below the "fold"



For the last year or so there has been a heated debate about "the fold". The fold is the idea that there is a place on a web page that is the bottom edge of what people will see when they look at the page in a browser, and that in order to see anything below that line, the visitor has to scroll down the page. This concept comes from newspapers — there is content on a newspaper page (especially the front page) that is below where the paper folds. In the newspaper world there has been interest for decades and maybe even centuries, at this point, about what to print right above the fold, right below the fold, and right on the fold. This concept bled over to websites in terms of what shows on the screen without scrolling.

What's the big deal about the fold? — For many years a guiding principle of web and content design has been: If it's important make sure it's above the fold, because visitors may not scroll and see more. But lately marketing people, user experience professionals, and others have been questioning this principle. Certainly there is often a lot of material that is below the fold, and people seem to be clicking on it.

Want to see a visual example? — At iampaddy.com there is an interesting visual example. Here is a short video I made from the iampaddy blog that makes the point that maybe people really will scroll:

So do we worry about the fold or not? — I believe it still holds true that the most important content should be above the fold, and that if it is above the fold then it is most likely that people will see it. BUT, if it's below the fold that doesn't mean people WON'T see it. Ok, not a definitive answer I know, but the best we can do right now with the data we have (stay tuned… I plan to do some research of my own on this topic).

What do you think? How concerned should we be about whether information and links fall below the fold?

Originally published on WhatMakesThemClick.net.

#28 — Things that are close together seem to belong together

Do you want a quick and easy way to make any web page easier to use and more intuitive? If you want people to realize that two things "belong" together, then put them near each other (close proximity), and put other things a little further away. Sounds simple, right? Many usability and user experience principles are complicated and may take significant time and energy to accomplish. This is one of the easier ones!

Let's take a look at some web sites for examples:

In the image below of the Crutchfield page, there is a gray arrow that ends up being very close to the text on the left that says, "connect with a true audiovideo specialist". Because that arrow is so close to the text (and actually appears to "point" to the text), the text and pictures "belong" together and become connected (as they should).

At the Global Giving website, the amount of space between text and pictures that are supposed to "go together" is about the same as the amount of space between items. This makes it less clear what text goes with what picture.

picture of Crutchfield web site

In the MSNBC website the spacing between headers and photos are all even. It is not clear at a glance what headline goes with what photo.

And in this last example, the picture is very close to the headline that says, “Obama takes responsibility for airline security” that you think the photo goes with that headline. But is doesn’t.

Picture of Global Giving website

Picture of MSNBC website

Picture of LA Times home page

Take-aways -

- If you want items, whether, pictures, photos, headings, or text, to be seen as belonging together, then put them in close proximity.
- Before you use lines and boxes to separate or group items together, try experimenting with the amount of space first, then decide whether you still need lines or boxes. Sometimes all you need is to change the spacing and then the line or box may not be necessary, thereby reducing the “visual noise” of the page.
- Put more space between items that don’t go together and less space between items that do. This sounds like common sense, but you will see that many web page layouts ignore this idea.

Do you have any good or bad examples to share of the proximity principle?

Originally published on WhatMakesThemClick.net.

#29 – Brand Names Talk To Our “Old” Brains

sony.com

You are planning on buying a new TV. Will you buy a brand you recognize? Or will you go for the unfamiliar “no name” brand that is less expensive? What if you are buying luggage?

Talking to the “old brain” – In my book, *Neuro Web Design: What makes*

them click? I write about the "old brain". This is the part of the brain that developed first from an evolution point of view (sometimes called the reptilian brain because it developed with reptiles). The old brain is continually scanning the environment and asking, "Can I eat it?", "Will it kill me?", "Can I have sex with it?". Basically the old brain is interested in food, survival and sex. This pre-occupation with our well-being also makes the old brain sensitive to the idea of loss. The old brain is therefore more motivated by the fear of losing something than it is by the possibility of gain.

Brands activate "safety" – Brand names talk to the old brain because they activate the idea of safety. A brand name means that the item is not an unknown. And if the brand name is positive to you, then the brand name signals safety to the old brain. (If you have had a negative experience with the brand then it will be the opposite. I had a bad experience with Panasonic once many many years ago, and for over two decades I wouldn't buy anything made by Panasonic. Recently I've reluctantly let go of that "ban", but I still prefer not to buy Panasonic. I can't even remember what the product was that upset me so much, but in my head Panasonic = maybe not reliable).

Brands are shortcuts – One of the things our old brains are really good at is making quick "blink" decisions. You can't consciously process all the information that comes into your brain. The estimate is that 40,000,000 inputs come into your brain from your senses every SECOND. You can only process 40 of those consciously, so it is your unconscious that is processing most of that information, and it uses lots of shortcuts to make the processing go faster. Brands are a shortcut. A brand you have a positive and emotional experience with equals a signal to the old brain that this is safe.

Brands are even more powerful online – I'm currently analyzing some data I've collected on people making purchases online. (I'll be sharing that data in another post shortly). The study I conducted has to do with customer reviews. But an interesting piece of information that emerged along the way was how important brand was to the purchasing decision. Some of the participants in the study were asked to shop for luggage online, and others were asked to shop for TVs. All the participants commented during the study about the brand, saying things like, "I don't know. This one is a good price, but I've never heard of this brand". In the absence of being able to see and touch the actual product, the brand becomes the "surrogate" for the experience. This means that brands have even more power and sway when you are making an online purchase.

What has been your experience? Do you go for "name" brands more when you are shopping online?

Originally published on WhatMakesThemClick.net.

#30 — Our "strong tie" group size is 150 people

Evolutionary anthropologists study social groups in animals. One question they have been trying to answer, is whether there is a limit on how many individuals different species have in their social group. Robin Dunbar studied the relationship between brain (neo-cortex) size and the number of stable relationships that a species had in their social groups. Based on his findings with animals, he extrapolated to what the number would be for humans. Called "Dunbar's Number", he postulated that 150 people is the social group size limit for humans. (To be more exact, he calculated the number at 148, but rounded up to 150. Also there is a fairly large error measure, so that the 95% confidence interval is from 100 to 230 – for you statistical experts out there).

A limit to stable, social relationships — The limit specifically refers to the number of people that you can maintain stable social relationships with. These are relationships where you know who the person is, and you know how each person relates to every other person in the group. Dunbar has documented the size of communities throughout different geographic areas and throughout different historical timeframes, and he is convinced that this number holds true.

Across time and cultures — Dunbar assumes that the current size of the human neocortex showed up about 250,000 years ago. So he started his research with hunter-gatherer communities. His observations include: Neolithic farming villages averaged 150 people, as did Hutterite settlements, professional armies from the Roman days as well as modern army units.

Intense survival pressure — His claim is that 150 is the group size for communities that have a high incentive to stay together. If the group has intense survival pressure, then it stays at the 150 member mark. He also notes that these groups are usually in close physical proximity. If the survival pressure is not intense, or the group is physically dispersed, then he estimates the number would be lower.

Too high or too low? — Some critics of Dunbar's number say that the number is too high, and others that it is too low. In the world of social media people have 750 facebook friends or 4,000 twitter followers, showing that the number of 150 is way off the mark. A Dunbar fan would respond that these are not the strong stable relationships where everyone knows everyone and

people are in physical proximity. Some critics say the number of 150 is too high – that the number of people one is close to both physically and socially is much less than 150.

It's the weak ties that are important?– In a recent blog post Jacob Morgan says that what's really important in social media is not the strong ties that Dunbar talks about, but the weak ties – relationships that do not require that everyone knows everyone in the group, and that are not based on physical proximity. He argues that the reason that social media is so interesting is that it allows us to quickly and easily expand these "weak" ties, and that those are the ties that are most relevant in our modern world.

Substituting weak for strong – I think both Dunbar and Morgan are right. It's critical that we pay attention to that 150 number for our "survival" community in close proximity. If we don't feel we have that "tribe" near us it causes us to feel alienated, isolated and stressed. Perhaps one of the reasons social media is so popular, and so many of us rely on Facebook and Twitter is that we don't have a strong tie tribe. Although the weak tie network of social media helps us to feel connected, we'll eventually feel let down if we try to have it substitute for a strong tie Dunbar tribe.

For more information, I suggest you watch this interview of Robin Dunbar:

http://www.guardian.co.uk/technology/video/2010/mar/12/dunbar-evolution

And read Jacob Morgan's blog post:

http://www.socialmediatoday.com/SMC/169132

What do you think? Do you have a strong tie tribe network? Are you ultimately trying to substitute with your weak tie network? In our modern world is the weak tie network more important?

Originally published on WhatMakesThemClick.net.

#31 — The Desire For Control And Choice Is Built In

I've just started reading Sheena Iyengar's new book, *The Art of Choosing*. I've been a fan of Dr. Iyengar's work for a while. She's the author of the famous "jam study", that I talked about in a previous blog. (I'll do a book review of the new book in a future post). Early in the book she talks about some of the research on choosing and control.

The paradox of choosing – In his book *The Paradox of Choice*, Barry Schwartz talks about how much we want to have lots of choices. The paradox is that if we have lots of choices then we tend not to choose at all. I have a chapter in my book *Neuro Web Design: What*

makes them click devoted to our need to have choices, and the resulting inability to choose.

The innate desire to control – The desire to control our environment is built into us. This makes sense, since by controlling our environment we likely increase our chances of surviving. Iyengar's discussion in her new book about choices got me thinking about control, and the relationship between having lots of choices and being in control. The desire to control is related to the desire to have choices.

The need to control starts young — In a study of infants as young as 4 months, the researchers attached babies' hands to a string. The infants could move their hands to pull a string which would cause music to play. Then the researchers would then detach the string from the music control. They would play music at the same intervals, but the infant had no control over when the music would play. The babies would become sad and angry, even though the music was still playing at the same intervals. They wanted to control when the music played.

We think that choices = control — In an experiment with rats, the rats were given a choice of a direct path to food or a path that had branches and therefore required choices to be made. The rats preferred the path with branches. Monkeys and pigeons learn to press buttons to get food, but they prefer to have more than one button even though it doesn't get them any more food. Even though it isn't necessarily true, we equate having choices with having control. If are to feel in control, then we need to feel that our actions are powerful and that we have choices to make. Sometimes having a lot of choices makes it harder to get what we want, but we still want the choices so that we feel in control of the decision.

Originally published on WhatMakesThemClick.net.

#32 — Synchronous activity bonds the group

flickr

What do members of a marching band, fans at a college football game, and people at Sunday church have in common? They are all engaging in "synchronous" activity.

What is synchronous activity? — It is when you take action with others, where everyone is moving, singing, chanting, in time together.

What happens when we engage in "timed" behavior together? —

Anthropologists have long been interested in rituals among certain cultures. Many rituals in a culture involve singing, chanting, drumming, dancing, or moving together. A recent study (see below for full reference) shows that when people take part in synchronous activities they then are more cooperative with each other when participating later in different activities.

You'll make more personal sacrifices — In the research the people who were involved in synchronous behavior with other people were then more cooperative in subsequent activities, and ended up making more personal sacrifices in their decisions.

Not just about feeling good — The research also shows that you don't have to feel good about the group or the group activity in order to be more cooperative. Just the act of doing the synchronous activity seems to strengthen social attachment among the group members.

Here's my list of synchronous activities I can think of:

- Singing together
- Cheers at sporting events
- Drumming or dancing together
- Pledge of allegiance
- Shouting slogans at rallies or marches
- Tai chi
- Yoga

Can you think of other examples?

The reference – Scott S. Wiltermuth and Chip Heath, Synchrony and Cooperation, *Psychological Science*, Volume 20 Issue 1, Pages 1 - 5

Originally published on WhatMakesThemClick.net.

#33: Bite-Sized Chunks Of Info Are Best

I am about to head to Portugal for a week, and I was interested in exploring different possible destinations in Portugal. I may not have much time for touring (I'm going to speak at the UXLX conference there), but if I did have time, where should I go? I have to admit to pretty much total ignorance about Portugal, the different regions, landscapes, and parts of the country, so I went to the official tourism web site for the country.

Give me a little bit at a time — The Portugal tourism site did an OK job of what is called

progressive disclosure. This is fancy term that is used in the field of psychology to refer to providing information in increasing chunks of size and complexity.

We can only handle so much — Humans can only process small amounts of information at a time (consciously that is… the estimate is that we handle 40,000,000 pieces of information every second, but only 40 of those make it to our conscious brains). One mistake that web sites make is to give too much information all at once, like this web site from the Canadian government:

There is no chunking here, there is not progressive disclosure. It's just all the information thrown on the page all at once. The result? You don't read it, you just leave.

Feeding bits of information – The Portugal site was just OK when it came to progressive disclosure. New Zealand does a much better job. The New Zealand tourism site has multiple levels of disclosure, feeding you the information bit by bit. Here's the first page on the regions of New Zealand:

Here, I see the overall map and names of the different regions. If I hover over one of the regions in the list then I see a thumbnail of information:

portugal0

Continuing on with this idea of progressive disclosure, if I click on that region then I link to a page with more pictures and little more detail:

There is a big map and there are tabs to go to for more information. If I scroll down I'll have details on the region:

This is a great example of how to use progressive disclosure.

It's not the clicks that count (pun intended) – One thing I'd like to point out is that progressive disclosure requires multiple clicks. Sometimes you will hear people say that websites should minimize the number of clicks that people have to make to get to the detailed information. The number of clicks is not the important criteria. People are very willing to make

multiple clicks, in fact that won't even notice they are making the clicks, if they are getting the right amount of information at each click to keep them going down the path.

Think progressive disclosure, don't count clicks.

Should I let the web site design influence whether I book a ticket? Not this time at least. This time I'm headed for Portugal, where I plan to use the Portugal tourism site as a case study in my workshop!

Originally published on WhatMakesThemClick.net.

#34 — Too Much Stress Results In Poor Performance

A few days ago I found myself in a hotel room outside of Chicago with my 19 year old daughter moaning and sometimes howling in pain. She'd been sick for a week, each day with a new symptom, and this morning her eardrum felt like it was going to burst. We decided that I should cancel my client meeting and take her to an urgent care clinic instead. Of course, we don't have universal health care here in the States, so first I had to call my insurance provider to find out if there were "in network" doctors we could go to and still be covered by our plan. The insurance company told me to go to a particular web site, and said that any doctor we picked through that site would be considered in network.

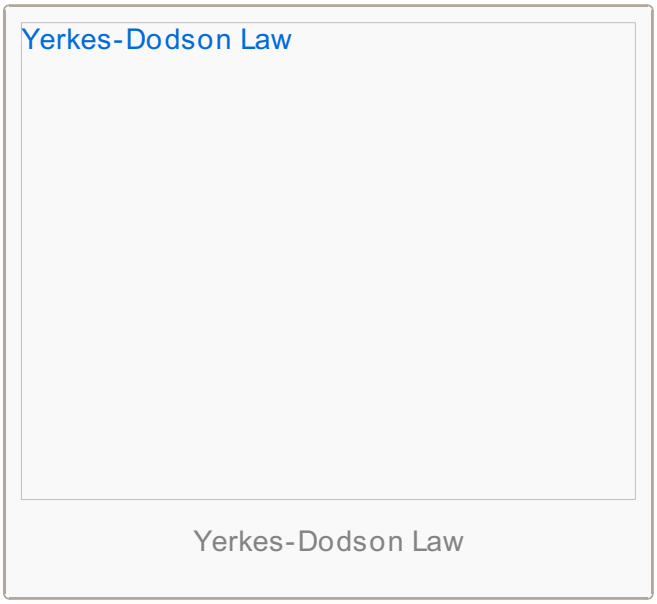
Using a web site under stress — By now 10 minutes have passed and my daughter is still sitting on the bed behind me moaning and wailing. Instead of helping her, I have to go to a web page and fill out forms and look at maps. The first thing that happens is that I encounter a drop down menu that is meaningless to me:

When I look at this web page now (days later, crisis has passed), it doesn't seem too confusing, but when I was trying to fill it out, trying to get my daughter some help, the web page was daunting and impossible, and not at all intuitive.

Stress changes your perceptions – Research on stress shows that a little bit of stress (called arousal in psychology terms) can help you perform a task, because it heightens awareness. Too much stress, however, degrades performance. Two psychologists, Robert Yerkes and John Dodson first postulated this arousal/performance relationship, and hence it has been called the "Yerkes-Dodson law" for over a century.

Arousal helps up to a point – The law states that performance increases with physiological or mental arousal, but only up to a point. When levels of arousal become too high, performance decreases. Research on the law shows that the amount of stress/arousal that is optimal depends on how difficult the task is. Difficult tasks require less arousal to reach optimal performance, and will start to break down if the arousal level is too high. Simpler tasks require more arousal and don't fall off as fast.

Tunnel vision — When arousal first goes up then there is an energizing effect, as the person is paying attention. But as the stress increases there are negative effects. Attention gets unfocused, people have trouble remembering, problem solving degrades and "tunnel vision" sets in. Tunnel vision is where you keep doing the same task over and over even though it isn't working.



Glucocorticoids — More recent research has shown a similar curve when studying the presence of glucocorticoids. These are the hormones that are released when we experience stress, so the Yerkes-Dodson law appears to have direct physical evidence.

Maximum frustration — As I tried to use the web page to find a doctor I kept getting errors, and typical of someone under stress, I kept doing the same task over and over even though it wasn't working (tunnel vision). At one point I was crying tears of frustration, cursing over the lack of

usability of the web site, and upset that I could not just find the name and address of a clinic we could go to.

Patient care, not computer care – I finally turned away from the computer, got my daughter some Tylenol, gave her warm washcloths to hold against her ear, and got us both calmed down. Then I found a clinic at the website (where we went later that day, only to have them say she was fine. By the way, our insurance didn't work and we had to pay cash after all — i.e., I didn't need the web site). My daughter is better, and I didn't even have to cancel the client meeting.

Test under stress – If you might have people using your site when they are under stress, keep in mind that too much stress will change the way they see and use the web site. And here's a plea to BeechStreet.com… test your website thoroughly assuming that people are tense, stressed, and with howling children in the background. It's a totally different experience.

If you'd like to read the research —

Yerkes RM, Dodson JD (1908). "The relation of strength of stimulus to rapidity of habit-formation". *Journal of Comparative Neurology and Psychology* **18**: 459–482. http://psychclassics.yorku.ca/Yerkes/Law/.

Lupien, SJ, Maheu F, Tu M, Fiocco A, Schramek TE (2007). "The effects of stress and stress hormones on human cognition: Implications for the field of brain and cognition". *Brain and Cognition* **65**: 209–237. PMID 17466428.

Originally published on WhatMakesThemClick.net.

#35 — People Make Mistakes

I used to collect computer error messages. It was kind of a hobby. I've got a great collection of them, some of them going back to the old character based computer screens. Most of them are not error messages that were trying to be humorous. Most of them were written by computer programmers that were trying to explain what was going wrong. But many of them end up being quite funny (unless you are the one who got the message in the middle of trying to do something important. Then nothing seems funny). My

favorite was from a company in Texas. When there was a “fatal” error, meaning the system was going to crash, a message came up that said, “Shut er down Henry, she’s spewin’ up mud!”

Error messages are probably the part of a software program that gets the least amount of time and energy, and maybe that is appropriate. After all, **the best error message is no error message** (meaning that the system is designed so that no one makes errors)**.** But when something goes wrong it is important that people know what to do about it.

The reality is that something always goes wrong. People make mistakes. Whether the user makes a mistake in working with a computer, or a company that makes a mistake by releasing software that has too many errors, or a designer designs something that is unusable because he or she doesn’t understand what the user needs to do. Everyone makes mistakes. So here is my list of important things to consider about people making mistakes:

Think ahead about what the likely mistakes are — Figure out as much as you can about what kinds of mistakes people are going to make when they use whatever it is you have created. And then change your design before it goes out so that those mistakes won’t be made.

Create a prototype of whatever it is you have and then get real people to use it so you can see what the errors are likely to be.

Test your prototype with users (usability testing).

Write error messages in plain language. If you are creating a message to show someone or play audio to someone about a mistake they made, tell them the following:

- That an error has been made
- What the error is
- How they can correct it
- Where to go to get more help in fixing the error

Use active voice and be direct. Instead of saying: “Before the invoice can be paid it is necessary that the invoice payment be earlier than the invoice create date”. Say instead, “Enter an invoice payment date that is BEFORE the invoice create date.”

Need it to be error-proof? It is very difficult to create a “system” that is free of all errors, and that guarantees that people won’t make mistakes. In fact it is impossible. Ask the people at 3-mile island, or Chernoble, or British Petroleum. The more costly errors are, the more you need to avoid them. The more you need to avoid them the more expensive it is to design the system. If it is critical that people not make mistakes (i.e., you are a nuclear power plant, or an oil rig, or a medical device), then be prepared. You will have to test twice or three times more, and you will have to

train two or three times more. It is really expensive to try and design a fail-safe system. And realize you never will fully succeed.

It's just the way we are. We make mistakes!

If you have some favorite error messages that you have seen, consider sending them to me and I will add them to my collection.

Originally published on WhatMakesThemClick.net.

#36 — People are Inherently Lazy

Ok, I'll admit it, I am exaggerating a little bit when I say people are inherently lazy. What I really mean is that people will do the least amount of work possible to get a task done.

Is lazy another word for efficient? – Over eons of evolution humans have learned that they will survive longer and better if they conserve their energy. We've learned that we want to spend enough energy to have enough resources (food, water, sex, shelter), but beyond that we are wasting our energy if we spend too much time running around getting stuff.

How much is enough? — Of course questions about how much is enough, and do we have enough stuff yet, and how long should the stuff last (and on and on), still vex us, but putting the philosophical questions aside, for most activities most of the time humans work on a principle that is called "satisficing".

Satisfy plus suffice = Satisfice – According to Wikipedia, Herbert Simon was the person who coined the term satisfice. It was originally used to describe a decision-making strategy whereby the person decides to pick the option that is adequate rather than optimal. The idea is that the cost of making a complete analysis of all the options is not only not worth it, but may be impossible. According to Simon we often don't have the cognitive faculties to weigh all the options. So it makes more sense to make a decision based on "what will do" or what is "good enough" rather than trying to find the optimal or perfect solution.

Designing with satisficing in mind — So if people "satisfice" rather than "optimize", what are the

implications for those of us who design web sites, software, products, or even design surveys? Satisficing leads to some interesting design guidelines which I've listed below.

Design web sites for scanning, not reading – In his excellent book Don't Make Me Think, Steve Krug applies the idea of satisficing to the behavior you can observe when someone comes to your web site. You are hoping the visitor will read the whole page, but we know that "What they actually do most of the time (if we're lucky) is *glance* at each new page, scan *some* of the text, and click on the first link that catches their interest or vaguely resembles the thing they're looking for. There are usually large parts of the page that they don't even look at."

Assume that people will look for shortcuts — People will look for ways to do something faster and with less steps. This is especially true if it is a task they are doing over and over.

But if the shortcut is too hard to find — Then people will keep doing it the old way. This seems paradoxical, but it's all about the amount of perceived work. If it seems like too much work to find a shortcut then people will stay with their old habits (they are even satisficing about satisficing).

Provide defaults — Defaults reduce the amount of work. When you provide defaults on a web form, for example, the person's name and address is already filled in, this means there is less that people have to do. The downside of this is that people often don't notice defaults, and so may end up accepting a default without knowing. Here again, the answer lies in the amount of effort. If it takes a lot of work to change the result of accepting a "wrong" default, then think twice about using them.

Take care with the order and wording of your survey questions – Satisficing is particular difficult for surveys. People will get into a "groove" of answering all the questions the same way because it's easier and they don't have to think. If your survey is more than a few questions long you will have to mix it up, and provide different options and formats for the questions or you will find that a given individual has chosen twenty-five "6's" in a row on your scale.

What are your experiences, either as a user or a designer, with the concept of satisfying?

Originally published on WhatMakesThemClick.net.

#37 — People Assume It's You, Not The Situation

A man is walking down a busy city street on his way to an appointment, and he sees what looks like a college student drop a folder of papers. The papers scatter on the ground and the man glances over but keeps on walking. What do you think? Why didn't

the man stop to help with the papers?

If you answer "Well, he's a self-absorbed person who doesn't usually help out strangers on the street" then chances are likely that you have just made a **"fundamental attribution" error**. People have a tendency to give personality based explanations for other peoples behavior more weight than situational factors. Instead of explaining the person's behavior in the story above as being due to his "self absorption", you might ascribe his behavior to the situation, for example, "He's late for a critical meeting with the bank and doesn't have time to stop today. In other circumstances he would have stopped."

Research on the fundamental attribution error shows the following:

- In cultures that value individualistic behavior (like the USA), it is common to ascribe behavior of other people to personality. The fundamental attribution error is common in these cultures.
- On the other hand, in individualistic cultures people tend to explain their OWN behavior to situational factors more than personality factors.
- In cultures that value collectivist behavior (for example, China), people make the same fundamental attribution error, but not as often as in individualist cultures
- Most of the research has to do with individuals deciding on personality vs. situational effects, but some research has been done on group decisions and whether they are influenced in the same way. It seems that they are. People attribute the decisions of a other group to the individual member's attitudes, but attribute the decisions of their own group to the collective group rules.

Why do we do this? – I think the best theory about why we make the fundamental attribution error is that when we believe that personality causes our behavior that makes us feel that we have more control over our life. And we (especially in the West) need to feel that we have that control.

Can't stop making mistakes — The research shows that it is very hard to stop make the fundamental attribution error. Even when you know you are doing it, and even if you know all about it, you will still make the same error.

Is "fundamental attribution error" the same as "correspondence bias"? – Psychologists like to come up with lots of terms. Both terms have been used, and they are often used interchangeably. However, some psychologists argue that what I've been describing is actually the

correspondence bias, and that the fundamental attribution error refers to the REASON for the correspondence bias: that we underestimate situational factors. Well, that sounds like hair splitting to me!

But maybe I'm just saying that because I'm a curmudgeonly psychology nut who doesn't like to agree with people (ok, that was just me trying to make a joke by showing correspondence bias!).

So what's the take-away? — Now that you know people tend to make this error, what can you do about it? Probably not much in terms of getting people to change their interpretations of others' behaviors. But try and build in ways to cross-check your own biases. If your work requires you to make a lot of decisions about why people are doing what they are doing, you might want to stop before acting on your decisions and ask yourself, "Am I making a Fundamental Attribution Error?"

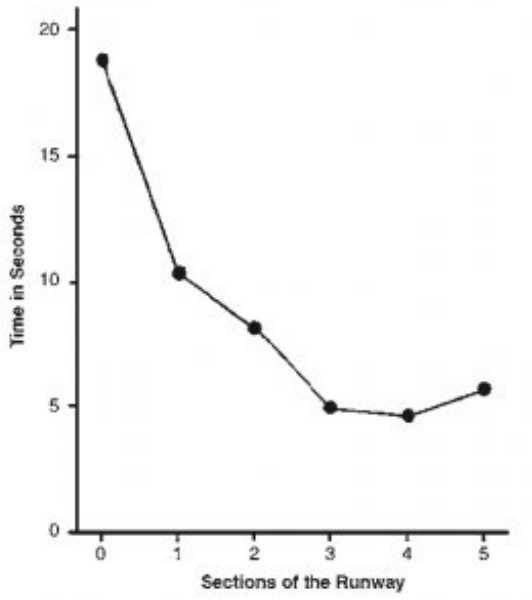
If you'd like some fairly heavy reading on the topic, I recommend:

Bawronski, Bertram. Theory-based bias correction in dispositional inference: The fundamental attribution error is dead, long live the correspondence bias. *European Review of Social Psychology*, 2004, 15, 183–217.

Originally published on WhatMakesThemClick.net.

#38 — Even The Illusion Of Progress Is Motivating

You are given a frequent buyer card for your local coffeeshop. Each time you buy a cup of coffee you get a stamp on your card. When the card is filled you get a free cup of coffee. Here are two different scenarios:



Card A: The card has 10 boxes for the stamps, and when you get the card all the boxes are blank.

Card B: The card has 12 boxes for the stamps, and when you get the card the first two boxes are already stamped.

Question: How long will it take you to get the card filled up? Will it take longer or shorter for scenario A vs. scenario B? After all, you have to buy 10 cups of coffee in both scenarios in order to get the free coffee. So does it make a difference which card you use?

The answer apparently is yes. You will fill up the card faster with Card B than with Card A. And the

reason is called the **"goal-gradient" effect.**

The goal-gradient effect was first studied in 1934 by Hull with rats. He found that rats that were running a maze to get food at the end would **run faster as they got to the end of the maze**.

The goal-gradient effect says that y**ou will accelerate your behavior as you progress closer to your goal.** The scenarios I describe above were part of a research study by Ran Kivetz, Oleg Urminsky, and Yuhuang Zheng (full reference is below). They decided to see if humans would behave like the rats. And the answer is, yes they do.

Here are some important things to keep in mind about the goal-gradient effect:

- **The shorter the distance to the goal the more motivated** people will be to reach it.
- **You can get this extra motivation even with the illusion of progress,** as in Scenario B above. There really isn't any progress (you still have to buy 10 coffees), but it seems like there is some progress so it has the same effect
- **People enjoy being part of the reward program**. When compared to customers who were not part of the program, the customers with the reward cards **smiled more, chatted longe**r with café employees, **said "thank you"** more often and **left a tip** more often (all statistically significant for you research buffs out there).
- In a related experiment the same researchers showed that **people would visit a web site more frequently and rate more songs** during each visit as they got closer to a reward goal at the site. So this goal-gradient effect appears to be generalizable across many situations.
- **Motivation and purchases plummet right after the goal is reached.** This is called a **"post-reward resetting phenomenon"**. If you have a 2nd reward level people will initially not be very motivated to reach that 2nd reward. **Right after a reward is reached is when you are most at risk of losing your customer.**

And for those of you who want to read the original research:

Ran Kivetz, Oleg Urminsky, and Yuhuang Zheng, The Goal-Gradient Hypothesis Resurrected:Purchase Acceleration, Illusionary Goal Progress, and Customer Retention*, Journal of Marketing Research,* 39 Vol. XLIII (February 2006), 39–58.

Originally published on WhatMakesThemClick.net.

#39 — Your Mind Wanders 30% of the Time

khrawling via Flickr

You are at work reading a report that one of your colleagues has written and you realize that you've just read the same sentence about three times. Instead of thinking about what you were reading, your mind wandered.

Mind wandering is similar to, but not the same thing as daydreaming. Psychologists use daydreaming to refer to any stray thoughts, fantasies, or stories you imagine, for example, winning the lottery, or being a famous celebrity. The term mind wandering is more specific, and refers to when you are doing one task and then fade into thinking about something that is not related to that task.

Mind wandering is a very common phenomena – We underestimate our mind wandering; according to Jonathan Schooler of UC, Santa Barbara, we think our minds are wandering about 10% of the time, when it is actually much more. In normal every day activities our mind is wandering up to 30% of the time, and in some cases, for instance when driving on an uncrowded highway, it might be as high as 70%.

Wandering minds annoy some neuroscientists – Some neuroscientists became interested in studying wandering minds because they were such an annoyance while doing brain scan research. The researchers would have subjects do a certain task, for example, look at a picture, or read a passage, while scanning for brain activity. About 30% of the time they would get extraneous results which did not seem to be related to the task at hand. That's because the subject's mind was wandering from the task at hand. Eventually the researchers decided to start studying the wandering rather than just getting annoyed by it.

Why a wandering mind can be a good thing – Mind wandering allows one part of the brain to focus on the task at hand, and another part of the brain to keep a higher goal in mind. So you are driving and paying attention to the road, but you are also thinking about when you should stop for gas. Or you are reading an article online about a thyroid medication called Synthroid that your doctor thinks you should take, but your mind wanders to the idea that you should put that appointment on your calendar. Mind wandering might be the closest thing we have to multi-tasking. It's not really multi-tasking, (which doesn't exist…you can see my previous blog post on that), but mind wandering does allow you to keep important goals in mind while doing one thing.

Why a wandering mind can be a bad thing – Much of the time when our mind wanders we aren't aware of it. More "zoning out" than "mind wandering", this means that we can miss important

information. For example, if you are supposed to be reading that report from your colleague, but you are instead thinking about what to make for dinner, that's may just mean you are being unproductive. We aren't usually aware when we are zoning out.

More mind wandering = more creativity – The researchers at UC, Santa Barbara have evidence that people whose mind wanders a lot are more creative and better problem solvers. Their brains have them working on the task at hand, but simultaneously processing other information, and making connections.

Mind wandering and the internet – I've been thinking about the fact that the ability to quickly switch from topic to topic is what the web does really well. Is web surfing related to mind wandering? Here are some of my mind wanderings on this topic:

- Do we like web surfing because it enables this type of wandering?
- Rather than designing web sites to try and hold people's attention should we design to encourage wandering?
- Should we build in feedback about the wandering so that it is easier to get people back to the original thought?

What do you think?

If you like to read research:

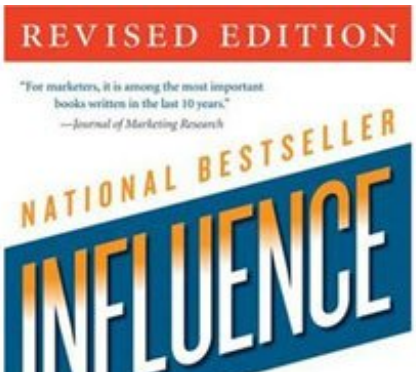
Christoff, et. al., Experience sampling during fMRI reveals default network and executive system contributions to mind wandering. *Proceedings of the National Academy of the Sciences*, May 11, 2009.

Mason, et. al., Wandering Minds: The default network and stimulus-independent thought. *Science*, January 19, 2007.

Originally published on WhatMakesThemClick.net.

#40 — "You're Easily Influenced, but I'm not"

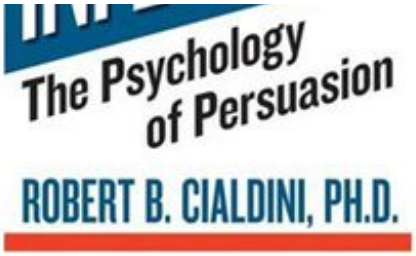
I have been doing a lot of public speaking about my book and the ideas of persuasion. Early in my talks I often discuss John Bargh's research on how much we are influenced by factors that we are not aware of. Bargh had people unscramble sets of words to make sentences, for example, he would ask



people to choose 4 out of 5 words and make a sentence out of them:

he florida today lives now in

would become: “He now lives in Florida”.



Some people would get sets of words that had a theme of old: such as Florida, retired, old, elderly. Other people would get sets of words that had a young theme: such as youth, energy, lively. A third group would get neutral words that were neither old nor young. After unscrambling the words and making sentences he would then have them walk down the hall to find him. Bargh measured how long it took each person to walk down the hall. People who had been using the “old” words, took much longer to walk down the hall. They had been unconsciously affected by the words. But when asked if they thought the words had influenced them they said no, and when I talk about this study I get the impression that most people in the audience believe that others would walk slowly, but that these words wouldn’t have affected them.

“I’m not that influenced” — In another example, I share in my talks about the power of social validation: how ratings and reviews at websites have a huge influence over what people decide to do (it’s because when we are uncertain we look to others to decide what to do). And everyone in the room nods and talks about how this is true, that other people are very influenced by ratings and reviews, but most people I am speaking to think that they themselves are not very affected. I talk about study after study on persuasion and how much we are affected by pictures, images, words, and that we don’t realize we are being influenced. And the reaction is always similar: “Yes, other people are affected by these things, but I am not.”

The third person effect — In fact, this belief that “others are affected but not me”, is so common that there is research on it, and it has its own name: the “third person effect”. The research shows that most people think other people are influenced by persuasive messages, but that they themselves are not, and that this perception is false. The “third person effect” seems to be especially true if you think you aren’t interested in the topic. For example, if you are not in the market to buy a new TV, then you will tend to think that advertising about new TVs won’t affect you, but the research says that it will.

Why do we deceive ourselves this way? — So why the self-deception? It’s partly because all this influence is happening unconsciously. We literally aren’t aware that we are being influenced. And it’s also partly because we don’t like to think of ourselves as so easily swayed, or so “gullible”. To be gullible is to not be in control, and our old brain, the part of our brain that is concerned with survival, always wants us to be in control.

What do you think? Why do we believe that others are so easily influenced but not ourselves?

For those of you who like to read research:

Bargh, John A., Mark Chen, Lara Burrows. 1996. Automaticity of social behavior: Direct effects of trait construct and stereotype. *Journal of Personality and Social Psychology* Vol 71(2), 230-244.

Chen, Yi-Fen, Herd behavior in purchasing books online, *Computers in Human Behavior*, 24, (2008), 1977-1992.

Bryant Paul; Michael B. Salwen; Michel Dupagne, The Third-Person Effect: A Meta-analysis of the perceptual hypothesis. *Mass Communication and Society*, 1532-7825, Volume 3, Issue 1, 2000, Pages 57 – 85

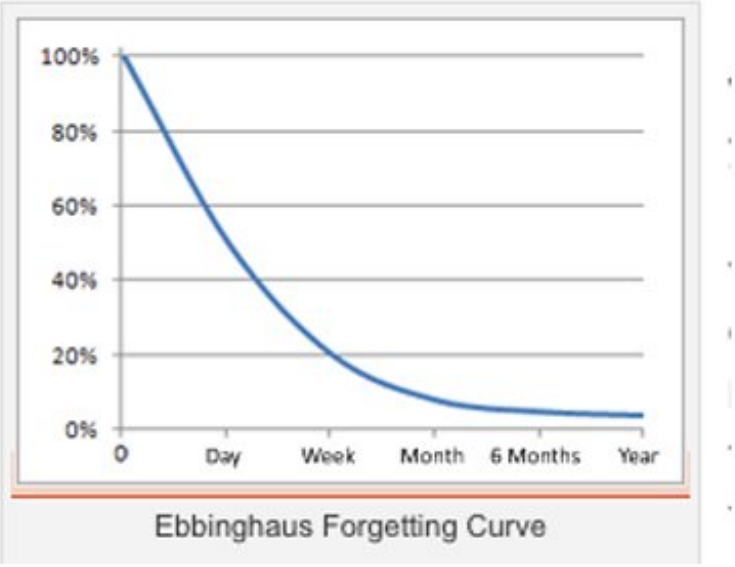
Perloff Third-Person Effect Research 1983–1992: A Review and Synthesis.
*Int J Public Opin Res.*1993; 5: 167-184

Originally published on WhatMakesThemClick.net.

#41 — Your Most Vivid Memories Are Wrong

What Makes Them Click

If I ask you to remember where you were and what you were doing when you first heard about the September 11, 2001 attacks in New York City, chances are very good that you will be able to tell me in great detail your memory of that day, and how you heard about the attacks. Especially if you live in the US and you were 10 years old or older on that date. But the research shows clearly that you would be wrong about the majority of your memory.



Ebbinghaus Forgetting Curve

Flashbulb memory is very vivid — Remembering traumatic or dramatic events in great detail is called “flashbulb memory” by psychologists, and has been studied for several decades. Emotions are processed in the amygdala part of the mid-brain, and the amygdala is very close to the hippocampus. The hippocampus is involved in the long term coding of information into memories. So it is no surprise to psychologists that emotionally laden memories might be very strong and remembered vividly.

But the memories are full of errors — It turns out, though, that those memories are full of

errors. Ulric Neisser researches memories like these. In 1986 the space shuttle Challenger exploded upon take-off. Any of you reading this who are old enough to remember the Challenger explosion probably remember it vividly, i.e., as a flashbulb memory. Neisser took the opportunity to do some research. The day after the explosion he had his students (he is a professor) write down their memories of what had happened, where they were, what they were wearing, what the TV coverage was like, etc. Three years later he asked them to write down their memory of the event again. Most (over 90%) of the 3-yr later reports differed. Half of them were inaccurate in 2/3 of the details. One person, when shown her first description written three years earlier, on the day after the event, said, "I know that's my handwriting, but I couldn't possibly have written that". Similar research has been conducted on the 9/11 memories, with similar results.

The Forgetting Curve of 1885 – In 1885 Hermann Ebbinghaus created a formula showing the degradation of memories:

$$R = e^{(-t/S)}$$

where *R* is memory retention, *S* is the relative strength of memory, and *t* is time. The graph at the top of this post is an example of this formula. It's called the "Forgetting Curve". Because flashbulb memories are so vivid, it was thought that perhaps they were not as subject to forgetting as other memories. But it turns out they are. Which is kind of disturbing, when you think about it. Because they are so vivid, we are SURE they are accurate and real. But they aren't nearly as accurate as we think.

Take-Aways – I can think of many ways that we (falsely) rely on people's memories of events, whether dramatic or not: for example, conducting user or customer research. We often ask customers to remember a particular encounter with a website, software, or an in-store experience. We may have to realize that the memories, although vivid, might not be accurate.

What do you think? Can you think of situations where you perhaps rely on people's memories more than you should?

For more reading and information:

Kathryn Schulz, *Being Wrong*, Harper Collins, 2010

Daniel Schacter, T*he Seven Sins of Memory*, Houghton Mifflin, 2001

Neisser and Harsh, "Phantom Flashbulbs: False Recollections of Hearing the News about Challenger", in Winograd and Neisser (eds) *Affect and Accuracy in Recall*, Cambridge University Press, 1992, p. 9-31.

Originally published on WhatMakesThemClick.net.

#42 — We'll spend more money if you don't mention money

What Makes Them Click

Photo from Mogilner and Aaker study

You are out for a Sunday bike ride on your favorite biking path, and you come across a pair of kids selling lemonade. Do you stop and buy some lemonade? Do you like the lemonade? Does your buying or liking the lemonade have anything to do with the wording on the sign next to the lemonade stand? Apparently so.

Cassie Mogilner and Jennifer Aaker from the Stanford Graduate School of Business conducted a series of experiments to see whether references to time or references to money would affect whether people stop to buy, how much people are willing to pay, and how satisfied people are with the products they buy. They conducted 5 experiments. The first one was the lemonade stand described above:

Sometimes there was a sign that said, "Spend a little time, and enjoy C & D's lemonade." This was the "time" condition. Sometimes the sign said, "Spend a little money, and enjoy C & D's lemonade." (money condition) and then there was a control condition where the sign said, "Enjoy C & D's lemonade".

391 people passed by either walking or on bikes. Those who stopped to purchase lemonade ranged in age from 14-50 years old, and there was a mix of gender, occupations etc. Customers could pay anywhere between $1 and $3 for a cup of lemonade — they could decide the price. The authors comment that the high price was justified by the fact that the customers got to keep the high quality plastic cup. (Ok, excuse me if I date myself here and comment that when I had a lemonade stand as a kid I think we charged like 10 cents). After customers drank their lemonade they also completed a survey.

More people stopped to buy lemonade when the sign mentioned time (14%), in fact twice as many people stopped when time was mentioned than when money was mentioned (7%). In addition, customers in the time condition paid more money for the lemonade (on average $2.50) compared to the money condition (on average $1.38). Interestingly, the control condition was in between on both # of people stopping to purchase and the average price. In other words, mentioning time brought the most customers and the most money, mentioning money brought the least customers and the least money, and mentioning neither was in between. The same effect was

true when customers filled out the satisfaction survey.

Does time = personal connection? – The researchers came up with the hypothesis that when you invoke time in the message you make more of a personal connection than when you invoke money. To test this idea out, they conducted 4 more experiments in the lab rather than in the "field" to see how the time vs. money messaging affected people's ideas about purchasing iPods, laptops, jeans, and cars.

Personal connection = time = experiences… well, mostly, but not always – At the end of all the experiments, the researchers concluded that people are more willing to buy, spend more money, and like their purchases better if there is a feeling of personal connection. Most of the time that feeling of personal connection is triggered by references to time instead of money. The idea is that mentioning time highlights the *experience* you are having with the product, and it is this thinking about ***experiences*** that makes the personal connection.

But not for prestige products or "materialists" – For certain products, such as designer jeans or prestige cars, and/or for certain consumers – those who value possessions more than experiences – personal connection is highlighted by mentioning money more than by mentioning time. These people are in the minority, but they are out there.

Diagram from the research paper

Diagram from the Mogilner and Aaker study

So where does this leave us? Here are the take-aways as I see them:

a) The best thing to do is, of course, know your market/audience. If they are people who are influenced by prestige and possessions, then by all means mention money.

b) Be aware, though that most people, most of the time, will be more influenced by time/experiences as the personal connection rather than money or possessions.

c) If you don't have time or budget to know your audience well, and if you are selling non-prestige items or services, then err on the side of time/experiences, and delay the mention of money as long as possible.

What do you think the take-aways are?

And for those of you who like to read the research:

Mogilner, Cassie and Jennifer Aaker (2009) "The Time versus Money Effect: Shifting Product Attitudes and Decisions through Personal Connection," *Journal of Consumer Research,* 36 (August), 277-291.

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#43 — People Expect Online Interactions to Follow Social Rules

mmbooklover

When people interact with each other they follow rules and guidelines for social interaction. Here's an example: Let's say I go to a café and I see you sitting by the window. We know each other, and so I come up to you and say, "Hi Richard, how are you doing today?" I expect you to interact with me, and I expect that interaction to follow a certain protocol. I expect you to look at me, in fact to look me in the eye. If our previous interactions have been positive, then I expect you to smile a little bit. Next, you are supposed to respond to me by saying something like, "I'm fine. I'm sitting outside here to enjoy the beautiful weather." Where the conversation goes next depends on how well we know each other. If we are just casual acquaintances we might wind down the conversation, "Well, enjoy it while you can, bye!" If we are close friends, then I might pull up a chair and engage in a longer conversation.

We have expectations of how the interaction will go – and if either of us violates the expectations, then we will get uncomfortable. For example, what if I start the conversation as above, with "Hi Richard, how are you doing today?" but you don't respond. What if you ignore me? Or what if you won't look at me? What if you say back, "My sister never liked the color blue", and stare into space. Or perhaps you give me more personal information than our relationship warrants. Any of these scenarios would make me uncomfortable. I would probably try to end the conversation as soon as possible, and likely avoid interacting with you next time the opportunity arises.

Online interactions follow the same social rules – When people go to a website or use an online application, they have assumptions about how the website will respond to them and what

the interaction will be like. And many of these expectations mirror the expectations that they have for person-to-person interactions. If the website is not responsive or takes too long to load, it is like talking to a person who is not looking at you, or is ignoring you. If the website asks for personal information too soon in the flow of the interaction, that is like the other person getting too personal. If the website does not save your information from session to session, that is like the other person not recognizing you or remembering that you have already established a relationship.

There are cultural expectations too – Different cultures have different expectations of social rules and interactions. In the US when I meet someone knew I put out my hand for a handshake, but in other cultures a handshake would not be the normal social rule for meeting a new person. In the US it's common to ask someone new that you meet "What do you do", but in some cultures that would seem too personal. Similarly, if a website is not modified to meet the expectations of a particular culture (called localization of the website), then it will miss the mark because it will violate social rules of the target culture.

A new definition of social media? – Some people are saying that "social media" has reached its peak and is dying. But maybe the definition just needs to get broader. Is social media just about how to connect people together online? How to use online networking as a way to promote brands or products or services? Aren't all online interactions really social interactions?If people expect their online interactions to follow the rules of social interactions, then isn't something as simple as showing up at the home page of a website actually a social interaction. Is filling out a form at a government website to renew your automobile registration a social interaction?

What do you think? Should web designers think about the interactions that they are building as social interactions? Should they consider how to mirror person-to-person interaction? Would they design different interactions if they were thinking this way? Is this a new definition of "social media"?

Originally published on WhatMakesThemClick.net.

#44 — When Uncertain, People Look To Others to Decide What To Do

You are browsing a website to decide what to boots to buy. You see a pair that looks good and then you scroll down to see the ratings. Many people have rated the boots highly, but a few of say the boots are cheaply made and uncomfortable. What will you do? Will you buy the boots or not?

Uncertainty tips the scale

In my book, *Neuro Web Design: What makes them click?* I have a chapter on this topic. The tendency to look to others to decide what to do is called social validation. Research on social validation shows that it is when we are uncertain about what to do that we will most look to others to decide.

Is the smoke dangerous? — There have been many studies about social validation. Latane and Darley conducted a series of studies where they would set up ambiguous situations to see if people were affected by what others around them were or were not doing. For example, they would bring someone into a room, supposedly to fill out a survey on creativity. In the room would be one or more other people who were pretending they were also participants in the creativity study, but who were really part of the experiment. Sometimes there would be one other person in the room, sometimes two others or more. While everyone is filling out their creativity survey, smoke starts coming into the room from an air vent. The researchers were interested in seeing if the participant would leave the room, or go tell someone about the smoke, or just ignore it. It wasn't clear what the smoke was, or if it was dangerous. So it was an ambiguous situation.

Only if others think it is — Whether or not the participant left the room and/or went to get help, or whether they stayed there and kept filling out the form, depended on the behavior of the other people in the room, as well as how many other people there were. The more people in the room, and the more the others ignored the smoke, the more the participant was likely to also ignore the smoke. If the participant was alone they would go leave the room and go to notify someone. But if there were others in the room not reacting, then the participant would also not react.

Testimonials and ratings are powerful — Online, social validation is most in evidence with ratings and reviews. When we are unsure about what to do we look to testimonials, ratings, and reviews to tell us how to behave. The most powerful ratings and reviews:

- Include information about the person writing the review – a mini "persona". This is effective because the person reading the review will give more credence to a review written by someone who is like them.

- Tell a story about the product or service. Because stories "talk" to our mid, or emotional brain, they are very powerful.

- Ratings from people like us are more powerful than ratings from "experts". I wrote another blog post on research by Chen on ratings and reviews at a book web site that studied these different types of ratings. Ratings from other readers were more powerful in influencing

behavior than ratings from experts or from the website itself.

Although people don't like to admit that they are easily influenced by others, the truth is that they are. What do you think? Do you try to resist the impact others have on your decisions?

For those of you who like to read the research:

Chen, Yi-Fen, Herd behavior in purchasing books online, *Computers in Human Behavior*, 24, (2008), 1977-1992.

Latane, Bibb, and John M. Darley. 1970. *The Unresponsive Bystander.* Upper Saddle River, NJ: Prentice Hall, 1970.

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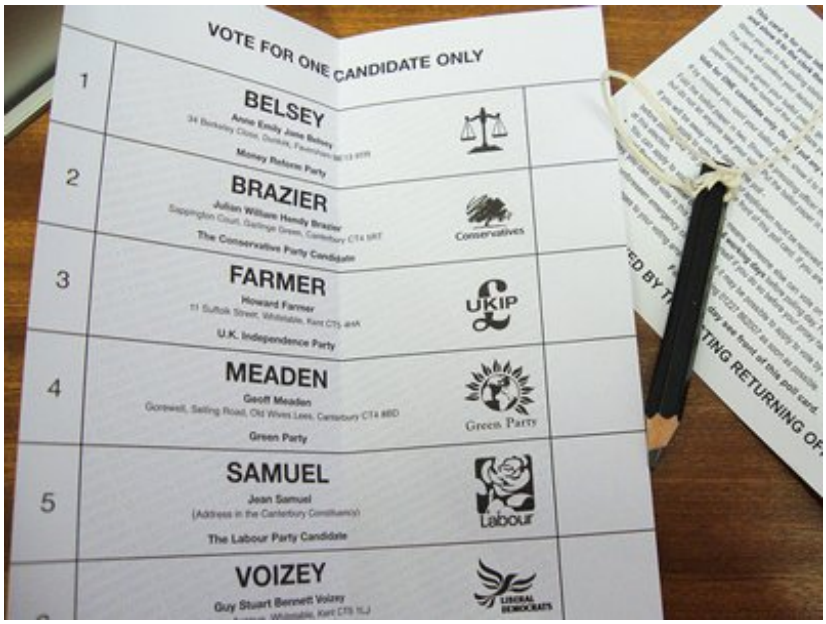
#45 — You Choose (And Vote For) The First One On The List

Lost Star



It's almost election time here in the USA, and there are many hotly contested elections at local, state, and national levels. Who will you vote for? According to the research, you are likely to vote for the first person that appears on the ballot!

The order effect – In my book, *Neuro Web Design: What makes them click?*, I write about the "order effect". You go to a website to buy a tent for camping. You answer some questions about the type of camping you plan to do. The site then recommends four tents that best match your use, and compares the tents based on 10 attributes (how waterproof they are, how much they weigh, how much air ventilation they have, and so on). Two of the tents are "best buys" for the attributes that are important to you. Which tent will you buy?

Order effect at websites -- Felfernig (2007) set up a research study to find out. Even though there were 10 attributes that the tents were compared on, participants focused only on two or three attributes. The researchers varied the order in which the tents appeared on the page: first, second, third, or fourth. It turns out that the most important attribute was not whether the tent was waterproof or if it had plenty of air ventilation. The most important attribute was the order in which the tents appeared on the page! Participants disregarded attributes and simply picked

whichever tent was the first one to show. People picked the first tent 2.5 times more than any other. They chose the first tent 200 times; they chose the other three tents (combined) only 60 times. This is an example of the **order effect**.

We rationalize the choice – The participants explained their choice, however, based on the logical decisions they thought they were making. For example, they explained the choice of tent #1 by saying, "This tent is the most waterproof." They thought they were weighing *all* the attributes of *all* the tents, but in reality they were considering only a few attributes, and even those attributes didn't matter. All that mattered was an unconscious reaction to which tent showed up first.

The first name on the ballot – According to research by Marc Meredith and Yuvall Salant, the same order effect influences who you vote for. In a wide range of elections, and with order randomized for different elections, Meredith and Salant found that in one out of every 10 elections, the first name on the ballot will win just because it's first. They also calculated that being in the middle of the list lowers your chance of winning by 2.5 percentage points.

So which position candidate are you going to vote for!

Thanks to the blog Barking Up The Wrong Tree for drawing my attention to this research.

For more information on the Meredith and Sulant research: Kellogg Insight Focus On Research

For the tent research:

Felfernig, A., g. Friedrich, B. Gula, M. Hitz, T. Kruggel, G. Leitner, R. Melcher, D. Riepan, S. Strauss, E. Teppan, and O. Vitouch. 2007. Persuasive recommendation: Serial position effects in knowledge-based recommender systems. In *Persuasive Technology, Second International Conference on Persuasive Technology*. New York: Springer.

Originally published on WhatMakesThemClick.net.

#46: The more uncertain you are, the more you dig in and defend your ideas

I'm one of these staunch Apple converts. For as long as there were PCs, I used to be a Windows/PC person. (Realize that I go all the way back to when PCs first came out. I used to sell a marvelous "portable" PC that ran on CPM operating system and had TWO (count 'em) TWO 360 KB (yes, I

said KB) “floppy” disk drives (in other words NO hard drive.)) I was a PC person, NOT an Apple person. Apples were for teachers and then later, for artsy people. That was not me.

Fast forward to today and I will be talking on my iPhone, charging my Nano for my afternoon exercise, and transferring a movie to my iPad from my MacBook Pro. What the heck happened here?! — (that’s another story altogether).

Don’t show me the Android phone – So you might be able to guess what happened when I went to dinner with a colleague who was showing me his Android phone. He loves his new Android phone and wanted to show me all the great ways it was as good as, or better than, my iPhone. I was totally uninterested in hearing about it. I didn’t even want to look at it. Basically, I didn’t want to allow into my brain any information that would conflict with my opinion that anything besides an iPhone was even a possibility. I was showing classical symptoms of cognitive dissonance denial.

Alter your beliefs or deny the information? — In 1956 Leon Festinger wrote a book called *When Prophecy Fails.* In it he describes the idea of cognitive dissonance. Cognitive dissonance is the uncomfortable feeling we get when we have 2 ideas that conflict with each other. We don’t like the feeling, and we will therefore try to get rid of the dissonance. There are two main ways we can do that: change our belief, or deny one of the ideas.

When forced you’ll change your belief — In the original research on cognitive dissonance, people were forced to defend an opinion that they did not believe in. The result was actually that people tended to change their belief to fit the new idea.

Watching cognitive dissonance via an fMRI scan – In new research by Van Veen, researchers had people “argue” that the fMRI scan experience was pleasant (it’s not). When “forced” to make statements that the experience was pleasant, certain parts of the brain would light up (the dorsal anterior cingulate cortex and the anterior insular cortex.) The more these regions were actived, the more the participant would claim that they really did think the fMRI was pleasant.

When not forced you’ll dig in — But there’s another reaction that sometimes occurs. If you are not forced to state that you believe something you don’t, if instead you are presented with information that opposes your beliefs, but not forced to espouse a new belief, then the tendency is to deny the new information instead of changing your belief to fit.

When made to feel uncertain, you will argue harder – Gal and Rucker recently conducted research where they used framing techniques to make people feel uncertain. (For example, they told one group to remember a time when they were full of certainty, and the other group to remember a time when they were full of doubt). They they asked the participants whether they

were meat-eaters, vegetarians, vegans, etc, how important this was to them, and how confident they were in their opinions. People who were asked to remember times when they were uncertain, were less confident of their eating choices. However, when asked to write up their beliefs to persuade someone else to eat the way they did, they would write more and stronger arguments than the group that were certain of their choice. They performed the research with different topics (for example the MAC/PC distinction) and found similar results. When people were less certain, then they would dig in and argue even harder.

I'm still trying to digest this latest research. What does this mean? If we want someone to be loyal and to be an advocate then we should actually give them a reason to be uncertain about the product? What do you think?

And for those of you who like to read the research:

Festinger, L., Riecken, H.W., & Schachter, S. (1956). *When prophecy fails.* Minneapolis: University of Minnesota Press.

Gal, David, and Rucker, Derek, When in doubt, shout. *Psychological Science*, October 13, 2010

Van Veen, V., Krug, M.K., Schooler, J.W., & Carter, C.S. (2009). Neural activity predicts attitude change in cognitive dissonance. *Nature Neuroscience, 12*(11), 1469–1474.

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#47 — People Value A Product More Highly If It Is Physically In Front Of Them

You go online to re-order a box of your favorite pens. Will you value the product more if the product page has a picture of the pens versus just a text description? Would you think the pens are worth more if you were in the office store and the pen was right in front of you? Does it matter if you are buying pens or food or any other product? In other words, does the way the item is displayed at the time of decision affect the dollar value that people put on them? Bushong and a team of researchers decided to test this out. The answers they came up with might surprise you. I know they surprised me.

How much would you pay for the chips? — In the first set of experiments they used snack food (potato chips, candy bars). Participants were given money they could spend. They had lots of choices, so they got to pick what they wanted to buy (by the way, they screened out people on a diet, people with eating disorders etc). The participants could read the name/brief description of the item (Lays Potato Chips in a 1.5 oz bag) or see a picture of the item, or have the real item right in front of them. Here's a chart of the results:

The real deal counts – Having a picture didn't increase the amount of money people were willing to "bid" for the product, but having the product right in front of them definitely did by up to 60%. Interestingly, the form of presentation didn't change how much people said they liked the item, just the dollar value. In fact, for some items that they had said before the experiment they didn't like, they still valued those more highly if they were in front of them.

What about toys and trinkets instead of food? — The researchers were surprised. They thought the images would be more powerful than text. They decided to try the experiment again, each time varying some conditions. For example, they tried the experiment with toys and trinkets instead of food. Same result.

What about behind plexiglass? – They wondered if with the food there was some unconscious olfactory (smell) cues that were triggering the brain, so they did another experiment putting the food in view, but behind plexiglass. If the food was in view, but behind plexiglass it was deemed to be worth a little more money, but not the same as if it were available within reach. Ah! they thought it is olfactory!, but then they found the same result with the non food items.

Ok, so we'll give samples – Deciding to try one more thing, they went back to food items, but this time let people see and taste a sample. The actual item wasn't there, but the sample was. Surely, they thought, the sample will be the same as having the actual item in front of them. Wrong again!

The researchers note that in this taste condition the participants didn't even look at the samples in the paper cup, since they knew they were the same as the food in the package.

A Pavlovian response? — The researchers hypothesize that there is a physical Pavlovian response going on: When the product is actually available, that acts as a conditioned stimulus and elicits a response. The images and even text could become a conditioned stimulus and produce the same response, but they have not been set up in the brain to trigger the same response as the

actual item.

As you start to think of the implications, here are some things to consider:

a) People were not going online and deciding whether or not to buy an item they were unfamiliar with. They were not at an apparel website deciding whether this was the right shirt or not. In those cases showing an image might have a huge impact. In these experiments the participants were all familiar already with the products.

b) Having the product physically available and not behind a barrier or plexiglass cover seems to be very important.

c) Sounds like those brick and mortar stores have an edge, at least on price.

Let me know your thoughts on the implications of the experiments.

And for those of you who like to read the research:

B. Bushong, L.M. King, C.F. Camerer, A. Rangel, Pavlovian processes in consumer choice: The physical presence of a good increases willingness-to-pay. *American Economic Review,* 2010, 100:1-18.

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10 Life Lessons I've Learned In My 30 Years >>

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