



The Art of Social Engineering.

Understanding it and using it in your investigations.

www.johnpizzuro.com

WHAT IS

SOCIAL ENGINEERING?



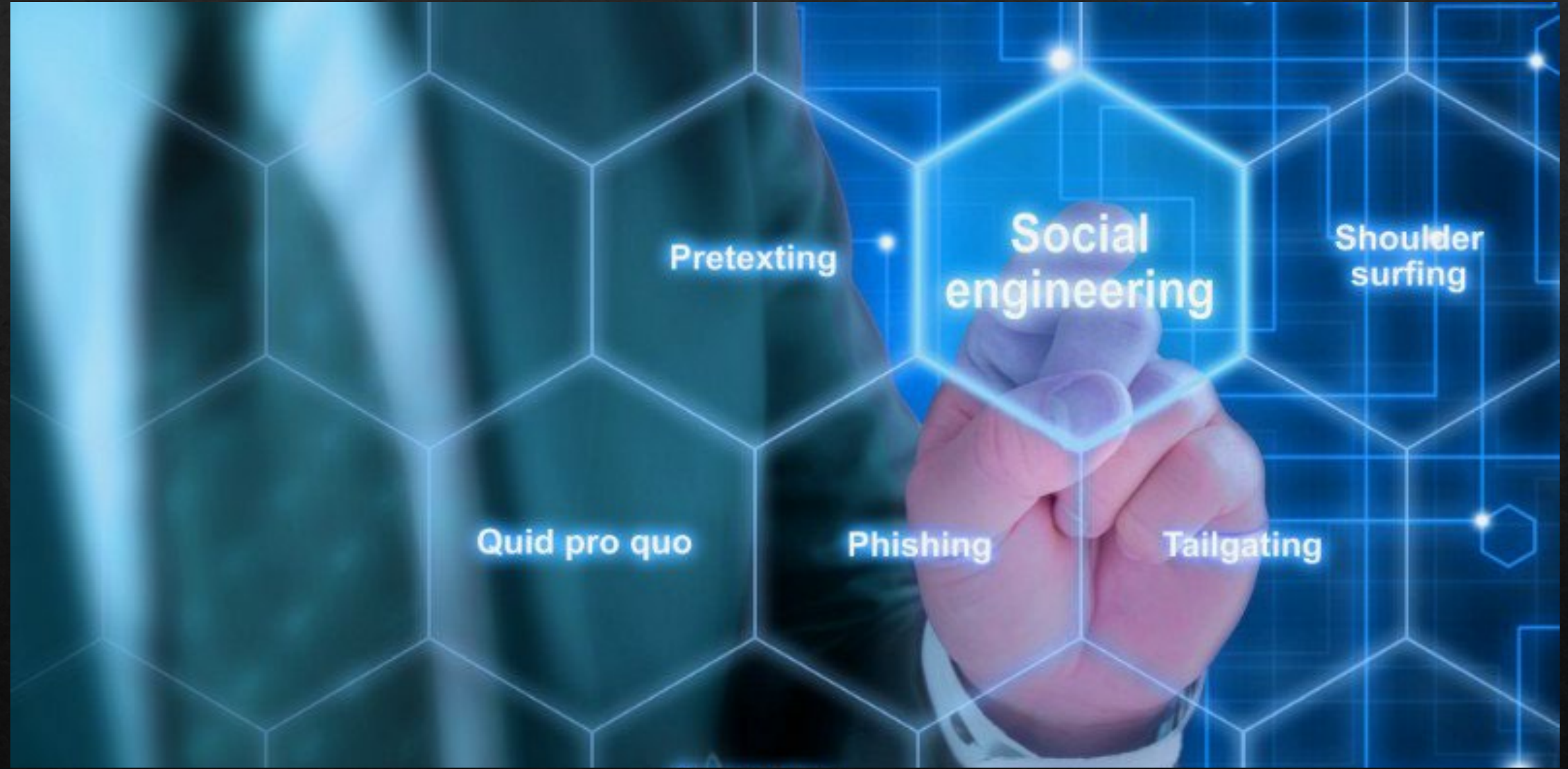
Social engineering is the art of manipulating people so they give up confidential information.

It is the ability to manipulate people into certain actions for a person's benefit.

It is the ability to get people to take an action that they would ordinarily to.

Its more than unwittingly getting people to provide personal information an create back doors for Cyber Security risks.

We can use it for investigations. Especially proactive investigations involving people and information.



Pretexting

Social engineering

Shoulder surfing

Quid pro quo

Phishing

Tailgating

Phishing

An email to trick the target into revealing sensitive information or taking an action that then compromises security.

Spear phishing

Spear phishing is a more targeted form of phishing. Usually sent to thousands, spear phishing emails are much more tailored to a specific person or business.

Baiting

Baiting differs from phishing by trying to entice the target with an offer or exploit their curiosity. A common form of baiting is to offer free music downloads (or other forms of media). The aim is to get the target to click on the link and enter their login details.

Vishing

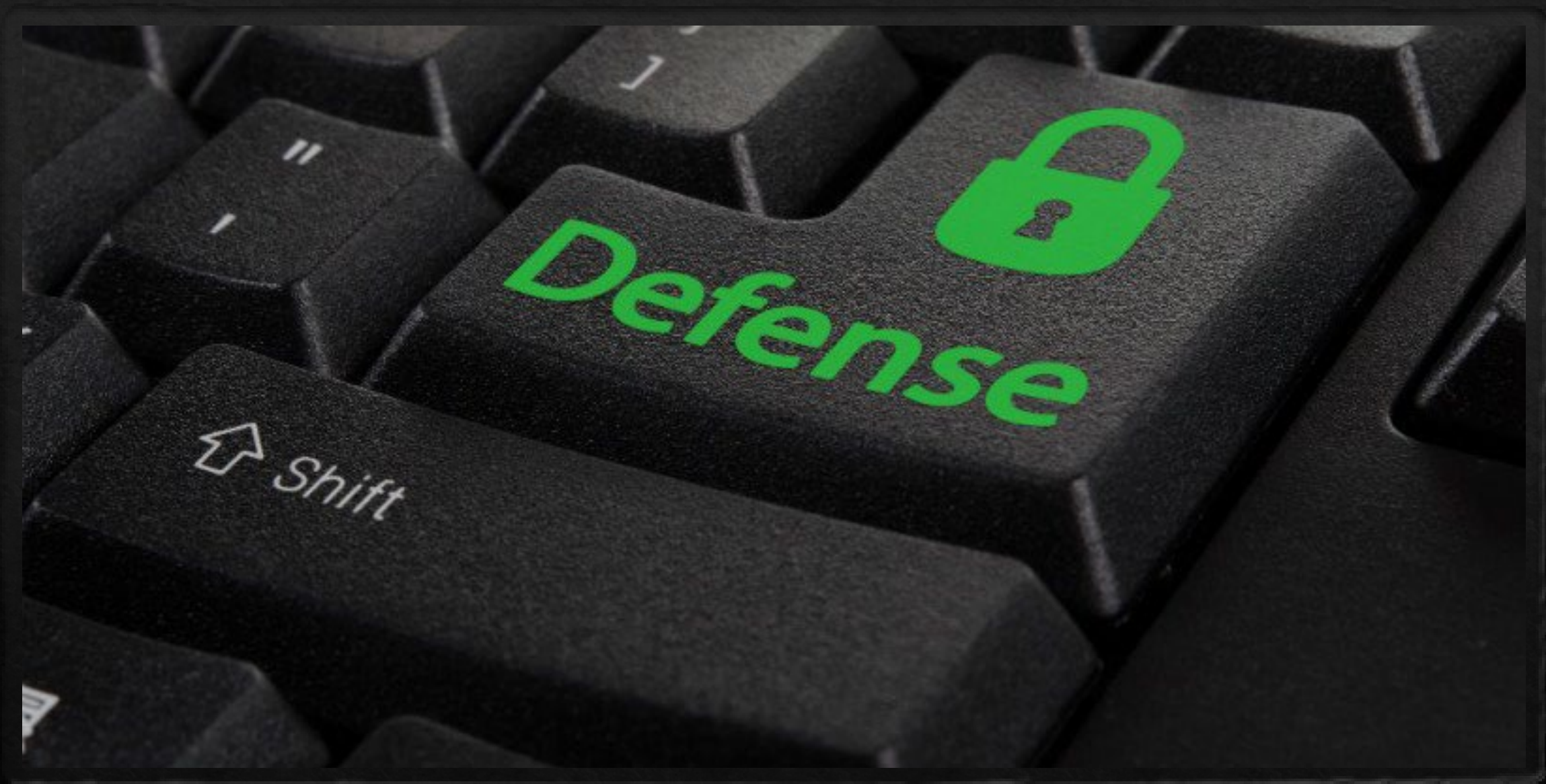
Social engineering doesn't have to happen on the internet. Vishing is a form of social engineering carried out over the phone.

Tailgating

Tailgating is another form of offline social engineering. Simply this type of attack is a person without authorization following an employee into a restricted area.

Pretexting

Pretexting relies on forming a false sense of trust with the victim. The attacker creates a believable pretext or scenario in which to trick the target into giving them information or even direct access to their systems.



Why does education, awareness and proactive campaigns to explain Social Engineering fail?

Why is there an increase?

Why is it so easy for people to be duped, manipulated, or unwittingly provide sensitive information time after time?

A photograph featuring a red ceramic mug filled with black coffee on the left. To its right is a white paper napkin with the phrase "Ask the right questions" written in a blue, calligraphic script. A silver ballpoint pen lies diagonally across the right side of the napkin. The entire scene is set on a wooden surface with a blue-painted, distressed texture.

Ask
the right
questions



HUMAN BEHAVIOR

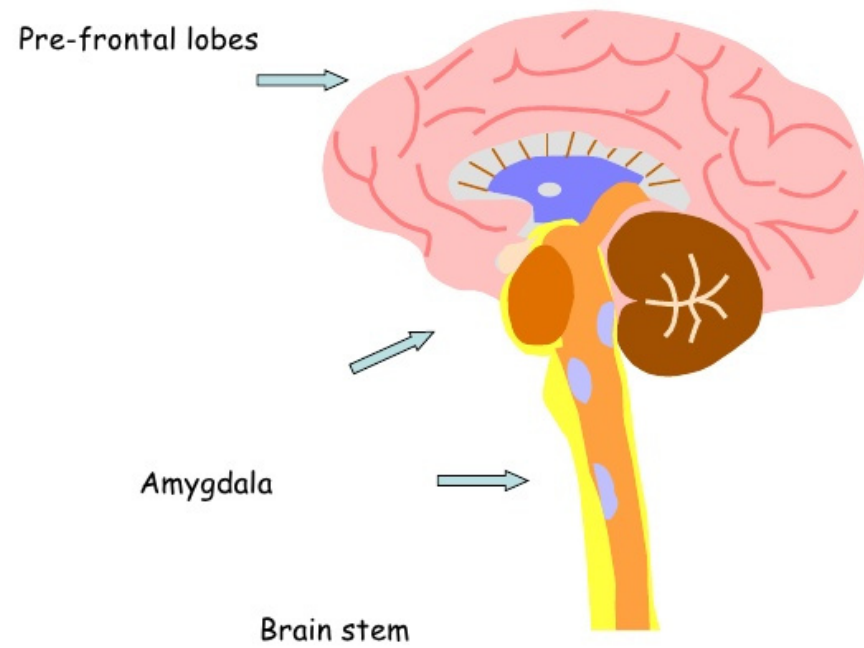
UNDERSTANDING WHY

BEHAVIORAL ASPECTS OF PEOPLE

Motivation?????

Why?????

The “Amygdala Hijack”



Emotional processing by the amygdala can occur subconsciously and can be affected by sensory input.

It happens when your brain reacts to psychological stress as if its physical danger. It then triggers a fight-or-flight response. Adrenaline and blood pressure rises.

We lose the ability to communicate effectively and autopilot is in charge. When a social engineer triggers a strong emotional response to the target, it can reduce a person's ability to think logically. In proactive investigations it causes suspects to make mistakes, which is to do an say things that they normally would not.



CONCEPT
CHILDHOOD
DEPRESSION EMOTIONAL
ADULT YOUNG
EXPRESSION
GIRL
GIRLS BUSINESS
FRIENDSHIP
TOGETHERNESS

FURIOUS SMILING
SUCCESS

FACIAL MALE
CHILD ANXIETY
FACE

HUMAN

CUTE
FUN

BEHAVIOR

PEOPLE

WOMEN FEMALE

CHEERFUL

HAPPINESS
BEAUTIFUL
EXPRESSING
CARE MEN
SADNESS
PROFESSIONAL

PERSON
IDEAS
CHARACTERS
BEAUTY



NEUROCHEMISTRY



Neurochemistry



Four primary neurochemicals, endorphins, dopamine, serotonin and oxytocin (all essential to normal healthy brain function)—contribute to our positive feelings of happiness, pride, joy, achievement and fulfillment

DOPAMINE

A neurotransmitter controls communication to the brain.

- DOPAMINE - is a neurotransmitter that helps control the brain's reward and pleasure centers
- More dopamine is also associated with both greater competitiveness, aggression, and impulse control
- Therefore high amounts of dopamine can cause euphoria, aggression and intense sexual feelings.

SEROTONIN

Serotonin helps regulate your mood naturally. When your serotonin levels are normal, you feel:

- Happier
- Calmer
- More focused
- Less anxious
- More emotionally stable

A 2007 study found that people with depression often have low levels of serotonin. Serotonin deficiency has also been linked to anxiety and [insomnia](#).

OXYTOCIN

Oxytocin is a powerful hormone that acts as a neurotransmitter in the brain.

- It regulates social interaction and sexual reproduction, playing a role in behaviors from maternal-infant bonding and milk release to empathy and generosity.
- Oxytocin is the hormone that underlies trust. It is also an antidote to depressive feelings.

American neuroeconomist Paul J Zak studies the neuroscience of trust. His early experiments revealed people who felt connected and trusted each other experienced what he called “virtuous cycles” of higher oxytocin levels.

In 2001, Zak ran an experiment where he gave people an oxytocin boost via a nasal spray. He found the oxytocin significantly raised their motivation to trust people, as well as their desire to be trusted.

Have you ever been betrayed by someone that you trusted completely even though every fiber in you body gave you those warning signs that he or she might not be trustworthy?

Recent neuroscientific research shows that in many ways our brains are hardwired to trust others.

What Is the Neuroscience of Trust?

According to a study in the Journal of Neuroscience, participants were under the illusion that they were playing an economic investment game with three different players: a close friend, a stranger, or a computerized slot machine.

In reality, in every instance the participants were actually playing against a computer with a simple algorithm that systematically reciprocated actions worthy of trust exactly 50 percent of the time.

Based on perceptions of trust, the participants reported positive interactions with the "close friend" to be more rewarding than interactions with a stranger or slot machine—and were more likely to invest with this player.

This illustrates our innate human desire to connect with others and create close-knit bonds even if these ties are based on blind trust or lead to Ponzi schemes.

PRIMING

concepts
subconscious
associative-network
stimuli
judgement
association
behaviour
perceptions
thoughts
senses
mental memory

Priming is an implicit memory effect in which exposure to a stimulus influences a response to a later stimulus.” Let's unpack that. 'implicit memory effect' - whatever priming is, it is occurring below the surface of conscious thought.

An example would be the amount of subconscious information our mind processes.

Priming is a phenomenon in which exposure to a stimulus, such as a word or image, influences how one responds to a subsequent, related stimulus.

It is thought to occur when particular mental representations or associations are activated before a person carries out an action or task. ie, a person who sees the word *doctor* will be faster to recognize the word *nurse* than he will be to recognize an unrelated word because the concepts are closely associated.

Some psychologists have argued that priming can have surprising effects on our behavior: that seeing an image of money can affect our political views, for instance, or reading words associated with the elderly can make people move more slowly.

Technology



TECHONLOGY AND ITS IMPACT ON BEHAVIOR

1. IT Beckons

App makers push notifications to get users to engage. That's why, for instance, Instagram tells you when someone you follow has posted for the first time in a while, luring you to open the app and take a look.

2. It takes up mental space.

Even when we're not looking at our phones, and we've made a conscious effort to ignore them, such as turning off notifications and ringers or powering them off entirely, they still can distract us.

3. It alters your perception of your options

4.) It reinforces your beliefs.

Simply put, the filter bubble is a phenomenon that occurs with users online. Of course, this dynamic exists offline, too -- we make friends who have similar interests and ideologies, for example. This might limit our thinking, but can it influence our behavior?

5.)It collects information about you that can be used to influence you later.

Related to the filter bubble concept, all web and social platform users are familiar with how targeted advertising works. You Google something, look for a product on Amazon, put an item in your virtual shopping cart, browse flight booking options -- then, maybe hours or even weeks later, you see an ad for whatever you were eyeing earlier.

6. It keeps serving up the next thing.

Social media feeds allow users to scroll endlessly, but that's only one example of the never-ending waterfall of information that users encounter online. After watching a video on Netflix, Facebook or another site that hosts video content, you'll often see a countdown with a preview of another video that will autoplay after a few seconds.

7.) It shortens your attention span.

"Ten years ago, before the iPad and iPhone were mainstream, the average person had an attention span of about 12 seconds," Research suggests that there's been a drop from 12 to eight seconds ... shorter than the attention of the average goldfish, which is nine seconds."

8.) It can trick you into thinking it's something more

Humans have the potential to form relationships with artificially intelligent personas.

9.) It turns everyday actions into games.

Gamifying certain behaviors is a powerful way to incentivize people to engage in them. Think of how fitness apps encourage you to set goals, compare your performance to other users and congratulate you when you hit milestones. Or, how brands you shop with remind you about the number of loyalty points you've accumulated and entice you with the next reward you're eligible to unlock.

This is why Social Engineering is successful today. You can use it to elicit information and behavior during proactive investigations.



2017 UCLA Brain Mapping Study

The same brain circuits that are activated by eating chocolate and winning money are activated when teenagers see large numbers of “likes” on their own photos or the photos of peers in a social network, according to findings from a [UCLA study](#) in which researchers scanned teens’ brains while they used social media.

In deciding whether to click that they liked a photo, the teenagers were highly influenced by the number of likes the photo had.

The study showed the exact same photo with a lot of likes to half of the teens and to the other half with just a few likes.

When they saw a photo with more likes, they were significantly more likely to like it themselves.

Teens react differently to information when they believe it has been endorsed by many or few of their peers, even if these peers are strangers.

Technology & It's Impact on Grooming

- Dopamine Dependent Society.
- No Serotonin and Oxytocin.
- Likes, Followers, & Views.
- Social Engineering & Proactive Investigations have the same effect.

How do we accomplish this when conducting investigations?

PROSPECTIVE
WIRETAPS, CHATS
& INVESTIGATIONS

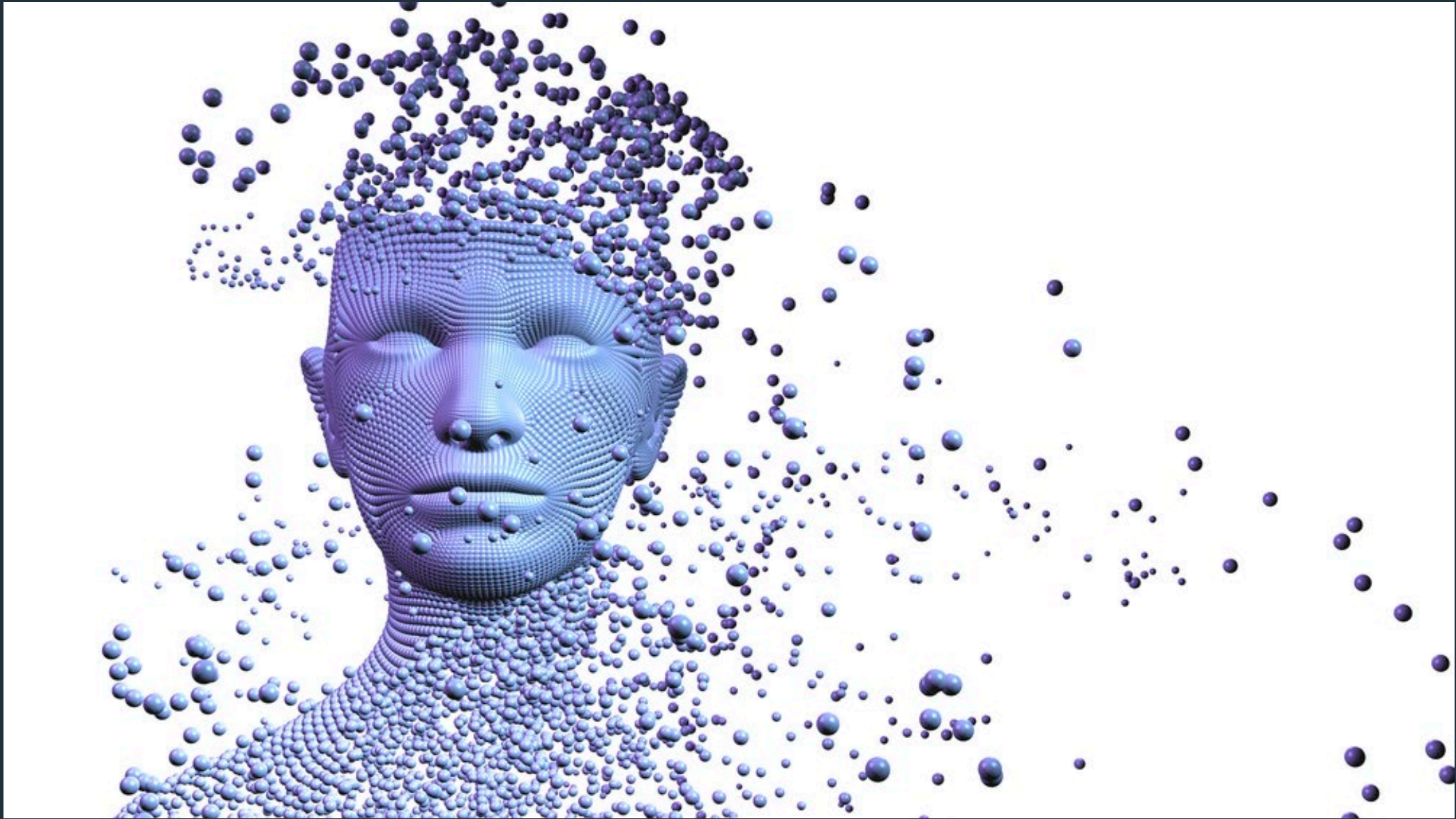


What happens? Why people are manipulated?

You are the Expert (or believed to be) if people perceive you as a competent, authority and trustworthy person, they will do what you ask them to do.

Likability- People inherently want to be liked and charismatic people will have a pull.

Fear - Fear is a very persuasive tool (Just look at Covid-19, 911 & Superstorm Sandy.) Many politicians use fear to influence people. Manipulation is more likely to happen when the public doesn't fully understand the issue or can't overcome the fear instilled by the politician.



Inoculation is a technique used to make people immune to persuasion attempts by first exposing them to small arguments.

Is it believable? Is it conceivable? Does it make sense? – All this can be introduced in your investigation.

Storytelling. It is how we learn, how we remember and in some cases how we define ourselves.

Human behavior is the response of individuals or groups of **humans** to internal and external stimuli.

It refers to the array of every physical action and observable emotion associated with individuals, as well as the **human** race.

Unconscious Language Effects

Framing altering decision making.

“Drug has a 95% survival rate”

“Drug has a 5% death rate”

Neuroimaging studies show that more colorful wording engages the anterior cingulate more.

Game of catch study.

Fear of Missing Out.



**SOCIAL
PROOF**

It all starts with Trust.

Screen time, smart phone addiction has made it easier.

Use Stress to your advantage.

Rapport, Matching, Mirroring

In order to influence someone you have to what influences them.
(They will spend time in their world before they get them to their world)

Unwittingly Social Engineers will Pace & Lead.

They are reverse engineers.

What is their model of the world?

What do they value?

What do they need?

What beliefs do they have?

What do they do in order to meet their needs?

What Type of Investigations Can I Use This Technique?

Racketeering

Fraud

Bribery

Homicide

Child Exploitation

Money Laundering

Tax Evasion

Narcotics



Social Engineering, Proactive
Investigations, Anticipatory
Wire Taps, Covert recordings

Or

External Stimulation that
provides evidence.





URGENT

Creating a Sense of Urgency

How do Social Engineers use the phone and email to manipulate them?



- You get less than 90 seconds to achieve rapport during a phone call. Therefore, the way you answer, including the tone of your voice and the choice of words, is crucial.
- Match the energy and type of response you receive from the other person.
- Sound relaxed and willing to offer assistance. Sounding stressed or upset will put your reputation and competence at risk. People may misconstrue the meaning of your state and attribute it to the wrong cause.
- Give the person your complete attention. Sit straight or stand up for important calls; you can even walk around – this improves your voice quality.

Match:

- Voice speed
- Volume
- Breathing
- Content – how friendly and approachable or how business-like and credible should you be?

You can still tell whether or not rapport has been reached. The signals to listen for are:

- The conversation flows easily
- Each person has space to speak fully
- You succeed in giving or receiving the message
- Few interruptions; no awkwardness
- You conclude the conversation gracefully.

What about Chats or Emails?

Crafting emails, letters, reports and other documents is an art form that is covered under other topics.

Start by thinking about the individual who is your reader.

Different people and different companies have their own styles, particularly for email communications.



- Match what works in your situation.
- Match how much content is asked for and expected.
- Match the style and tone where appropriate.
- Match the frequency of communication.
- Match the sensory language.
- Match the mood, however, never write an email when you are angry or upset as you may write something you later regret, and your anger may well be apparent in what you write making later communication difficult.

Influence is the business of people.

Be genuinely interested in people.

Be a good listener

Make people feel important

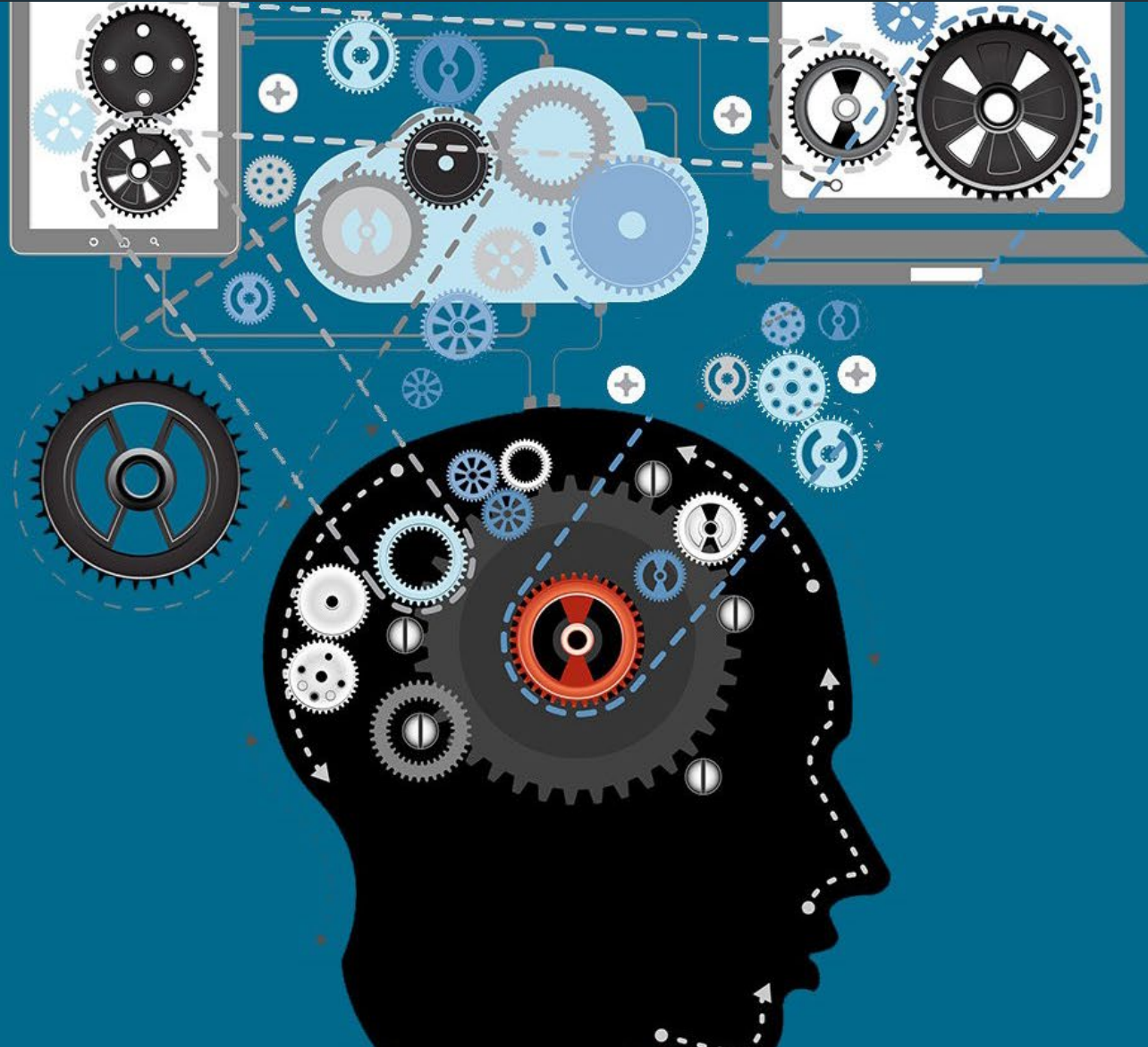
Talk to people in terms of their interests.



People here what they want to here what they hope for.

They all are not cynical like law enforcement.

So whether you're a victim of Social Engineering or using it as an investigative technique, remember people can be influenced and manipulated.



Don't act like a cop or investigator.

Meaning do the unexpected.

Investigators behave a certain way and use the same methods.

**To Think Outside
the Box,
Go Outside
the Box**





New Jersey Area Chapter #9

New Jersey Area Chapter #9

HOW TO BE PART OF ORGANIZATION

WWW.ACFENJ.ORG

CONTACT INFORMATION

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