Trait Vs. Skill: Individual Differences – Survey Questions

Sanchez, Danielle N., Speed, Ann, Altman, Brad

April 2020

SUMMARY OF DOCUMENT

This document is UUR survey questions for use in an exploratory express LDRD experiment. The purpose of the study is to understand if people overestimate their performance only in some situations or some people are more prone to it do to an underlying trait. To investigate our aims, we must use 3 experimental tasks: two domain general (an English grammar task a logic task) and a domain specific task (a science & technology questionnaire). The reason we are using these tasks is to see if people overestimate their abilities on tasks they are more familiar with (grammar and logic) but not on domains in which they are more specialized (science and technology). To understand the traits and characteristics of our participants, we are using 7 well-validated assessments from the field of psychology. All questionnaires are available for research and teaching purposes. Citations for all materials have been included.

The bulk of this document is the specific questions participants will see. As this study will be hosted on Survey Monkey, all questions must be designated UUR. The science & technology questionnaire have already been R & A'd, but the packet as a whole has not. The Sand number for that questionnaire is *SAND2020-4113 PE*

In the following pages, you will find all of the specific survey questions our participants will see. These include the 3 experimental tasks (English grammar, logic, and the science & technology questionnaire), psychological surveys (metacognition, social desirability, overclaiming, big five personality traits, decision style questionnaire).

Each psychology questionnaire measures the following:
1. Metacognition inventory – measures how we think and understand our own thinking
2. Social desirability – measures if we are more prone to answer questions in the way we think people want to hear, rather than how we feel. This is important in overestimation, as being high in social desirable responding may account for this phenomenon.
3. Overclaiming – This tasks asks individuals to rate terms on a familiarity scale. In each list (there are 10 lists) are "fake" words that are made up. If individuals rate themselves as having knowledge of these words consistently, they are said to be high in overclaiming. Overclaiming can also contribute to overestimation, because people are often basing their opinions and actions on a vague sense of knowing something, not on definitive proof.
4. The big five measures personality, specifically how open to new experiences we are, how conscientious or focus to detail/others we are, how agreeable we are, how introverted/extroverted we are, and how anxious we are (neuroticism)
5. The decision style questionnaire measures how we make decisions, whether that's deliberative, we avoid making decisions, we make them impulsively and so on.

Contents

PERSONAL INFORMATION

Field of Work. Do you work in the field of…?

Natural sciences
1. Mathematics
2. Computer and information sciences
3. Physical sciences
4. Chemical sciences
5. Earth and related environmental science
6. Biological sciences
7. Other natural sciences

- Engineering and technology
    1. Civil engineering
    2. Electrical engineering, electronic engineering, information engineering
    3. Mechanical engineering
    4. Chemical engineering
    5. Materials engineering
    6. Medical engineering
    7. Environmental engineering
    8. Environmental biotechnology
    9. Industrial biotechnology
    10. Nano technology
    11. Robotics

Q. **Education:** What is the highest degree or level of school you have completed? *If currently enrolled, highest degree received.*

- No schooling completed
- Nursery school to 8th grade
- Some high school, no diploma
- High school graduate, diploma or the equivalent (for example: GED)
- Some college credit, no degree
- Trade/technical/vocational training
- Associate degree
- Bachelor's degree
- Master's degree
- Professional degree
- Doctorate degree

Years of Experience. Of the field you currently work in, how many years of experience do you have?

Year scale: 1-50 years

1. DUNNING-KRUGER QUESTIONS

1.1. Prior to the Task***

1. Out of twenty-five English Grammar questions, how many questions do you estimate you will answer correctly?
2. Imagine that there are 100 other Sandians completing this task. Of these 100 Sandians, how many do you think you will score better than?
3. On a scale of 0 (not confident at all) to 100 (the most confident), how confident do you feel in your ability to complete this task?
4. We ask that you answer the following questions as honestly as possible. Do you agree to participate in this study without using outside resources?
   a. Yes/No

*** Note English Grammar will Change to Logic & Science, Technology, and Engineering for subsequent tasks.

1.2. During the task***

1. On a scale of 0 (not confident at all) to 100 (extremely confident), how confident do you feel in your answer to this question?
2. On a scale of 0 (not difficult at all) to 100 (extremely difficult), how difficult did you find this question?
3. Did you know or did you guess the answer to this problem?
   a. Knew
   b. Guessed

*** Note English Grammar will Change to Logic & Science, Technology, and Engineering for subsequent tasks.

1.3. After the task***

1. Out of the twenty-five English Grammar questions you have completed, how many questions do you estimate you have answered correctly?
2. Of 100 other Sandians completing this task, how many do you think you scored better than?
3. On a scale of 0 (not difficult at all) to 100 (extremely difficult), how difficult did you find this task?

*** Note English Grammar will Change to Logic & Science, Technology, and Engineering for subsequent tasks.

2. ENGLISH GRAMMAR TASK

Dulan, S. W. (2008). McGraw-Hills 10 Act practice tests. New York: McGraw-Hill. doi: https://www.fulton-ind.k12.ky.us/userfiles/62/10_ACT_Practice_Tests.pdf

2.1. Example Question:

During the task, you will see a sentence or passage with some words or phrases underlined. You will be asked to choose which option you think best fixes or adds to the sentence or passage. Here is an example of what you will see:

Why is it that we are so completely obsessive with the hair on our heads?
A. NO CHANGE
B. obsessed
C. obsessing
D. obsessioned

(B) Obsessed is the correct answer.

2.2. Task for participants

Slowly Spanning the Straits

1. The Round Island Channel is a Lake Huron waterway between Mackinac Island and Round Island. Prior to the arrival of the early settlers in Michigan, Native Americans know how to paddle between several islands to make their way across the channel.
   A. NO CHANGE
   B. knew
   C. have known
   D. knows

2. Settlers in the eighteenth, and nineteenth, centuries crossed the Round Island Channel by ferry. However, ferries soon prove to be dangerous and financially costly.
   A. NO CHANGE
   B. eighteenth , and nineteenth
   C. eighteenth and nineteenth
   D. eighteenth and nineteenth,

3. By the 1880s, the Michigan Legislature had begun discussing building a bridge to span the channel, noting the success of the newly-built Williamsburg Bridge. However, the path forward was not easy. During the late nineteenth century, the Legislature heard plans for an elaborate system of bridges and causeways that would interconnect the many islands in Lake Huron.

   The writer is considering deleting the underlined portion from the sentence. If the writer were to delete this phrase, the essay would primarily lose:

A. a minor detail in the essay's opening paragraph.
B. an explanation of the impetus for discussion of a potential bridge.
C. the writer 's opinion about the historical significance of the Round Island Channel Bridge.
D. an indication of Michigan' s desire to keep pace with the transportation development taking place in New York City.

Strides towards safety

4. Automotive engineers are responsible for designing new features for upcoming car models. These engineers know how important it is to consider safety issues in all new designs. Statistics consistently indicate that car accidents occur more often during the night than during the day.

   Given that all of the choices are true, which one would provide the most detailed and relevant information at this point in the essay?
   A. NO CHANGE
   B. accidents occur more frequently
   C. accidents can
   D. accidents occur about three times more often

5. Statistics consistently indicate that car accidents occur more often during the night than during the day. These statistics takes into account that there are fewer drivers on the road at night.
   A. NO CHANGE
   B. take into account
   C. taken into account for
   D. taking into account

6. _____. One such design employs headlights that swivel back and forth, allowing the driver to see the road ahead more clearly by illumination of the sides of the road better than traditional headlamps. Automatic high-beam headlights are another innovative design that could improve the driver's reaction time.

   Which of the following sentences would most effectively introduce the subject of this paragraph and act as a transition from the preceding paragraph?
   A. In an effort to improve driver and pedestrian safety, auto engineers often come up with ingenious designs.
   B. Headlights are probably the single most important feature of a car for night driving, so they should always be kept in proper working order.
   C. Car manufacturers compete on a daily basis to find the brightest and most accomplished design engineers.
   D. Some of the designs that car engineers come up with are beyond futuristic.

7. All cars have been equipped with high-beam headlight switches for many years, most drivers do not use their high-beams even when they would provide a great= deal more

light on the road.
A. NO CHANGE
B. switches for many years;
C. switches for many years
D. switches, for many years

8. Even as car makers work diligently to improve safety on the road particularly during dangerous nighttime driving, no device can replace the vigilance and skill of the driver.
A. NO CHANGE
B. road particularly, during,
C. road particularly during,
D. road, particularly during

9. More advanced technologies might improve safety, but the person in the driver's seat plays the most critical role in reducing night-driving incidents.
A. NO CHANGE
B. safety, but, the
C. safety but the
D. safety but, the

10. Two other systems that are being developed to <u>potentially increase safety on the road at night,</u> the NIR (or Near-Infrared) system and the FIR (or Far-Infrared) system. In the NIR system, an infrared light is emitted from the front of the vehicle when nearby objects such as animals or people are detected. The FIR system measures the heat radiation of nearby objects and flashes the images on the driver's screen.
A. NO CHANGE
B. Two other systems are being developed that will potentially make driving at night safer:
C. Two other systems are being developed which will potentially increase night safety on the road,
D. There are two other systems being developed on the road for night safety that will potentially increase driving safety, these being

Listening to A Different Language.

11. Dog obedience training is an important undertaking when one acquires a new dog. This is particularly important if the dog owner is a social person or plans to interact with other dogs and <u>the</u> owners
A. NO CHANGE
B. their
C. there
D. they're

12. Many owners don't understand that the animals communicate back. Carefully watching a <u>dog</u> movements and facial expressions reveals a great deal about what a dog is thinking.
   A. NO CHANGE
   B. dogs
   C. dogs'
   D. dog's

13. Other forms of body language <u>can also indicate</u> which emotion a dog is experiencing. For example, if its ears are raised, it is probably absorbing the sounds around it. Shifting its ears back flat against its head demonstrates submission or fear.
_____

Given that all of the following are true, which one, if added here, would provide the most effective support for the statements made in the preceding sentence?
   A. The dog's owner should immediately try to deter-
      a. mine what the dog is responding to.

   B. Dogs are often fearful of unusual or unfamiliar situations and people.
   C. It is important to have a dog's hearing assessed by a veterinarian and to check the ears frequently for mites or ticks.
   D. Many purebred dogs have their ears trimmed or clipped in a particular manner to suit their breed.

Jet Lag

14. Traveling across time <u>zones particularly</u> via airplane, can be very disruptive to the human body.
   A. NO CHANGE
   B. zones; particularly
   C. zones, particularly,
   D. zones, particularly

15. When you gain or lose time going while travelling, <u>a condition *(desynchronosis)*</u> is likely to affect you. Jet lag is medically considered a sleeping disorder, although it is normally a temporary condition and not as serious as other sleeping dysfunctions.

Given that all of the choices are true, which one would provide the most detailed and relevant information at this point in the essay?

   A. NO CHANGE
   B. a condition called *desyn chronosis,* commonly known as jet lag,
   C. a condition known as *desynchronosis*
   D. a condition of jet lag

Mike (Now Tony) and his Cable TV

16. My best friend Tony is known for not paying attention to many of the modern conveniences that most people could not do <u>without he'd sooner mail</u> something than sit at a computer to type. Therefore, I was unsurprised to learn about his disappointment last Friday night. After inviting some coworkers to watch the first play-off game of the season, he was sad to learn that he did not have the proper cable channels to watch the game.

    A. NO CHANGE
    B. without, he'd sooner mail
    C. without sooner mail
    D. without. He'd sooner mail

17. After being unable to watch the first play-off game of the season, Tony decided to purchase cable and asked me to help. I spoke to a sales agent with the cable company about the different packages of channels available. She started by describing the most premium package, with many extra sports, and movie channels. I assured her that the cheapest possible option, when she told me it was only $15 per month, would more than suffice, I arranged to have it installed.
    A. NO CHANGE
    B. I assured her that the cheapest possible option would more than suffice, and when she told me it was only $15 per month, I arranged to have it installed.
    C. I arranged to have installed the cheapest possible option that would more than suffice, which she told me was only $15 per month.
    D.   She told me it was only $15 per month, which I assured her would more than suffice as the cheapest possible option, so I arranged to have it installed.

A Modern Blacksmith

18. John Bronson is an old-fashioned, modern-day blacksmith <u>who still practices</u> the fine art of manipulating metal over a hot fire. In his words, "Blacksmithing is alive and well!"
    A. NO CHANGE
    B. who still continues to practice
    C. who continues to still practice
    D. who practices still

19. John Bronson <u>had began</u> his career in hand-forged ironwork at the age of 30. The idea of creating an object out of iron greatly appealed to him. He started on this new life adventure by reading everything he could get his hands on about blacksmithing. He paid particular attention to books that outlined the equipment needed to establish and outfit a blacksmith workshop.
    A. NO CHANGE
    B. had begun
    C. begun
    D. began

20. <u>Once Bronson obtained his first portable forge, he was ready to build his blacksmith</u>

shop, commonly referred to as a "smithy." In the interest of economy, he constructed this shop out of inexpensive planks and tar.

Given that all of the choices are true, which one would most effectively introduce the subject of this paragraph?
    A. NO CHANGE
    B. Obtaining a portable forge for the shop proved to be Bronson's biggest challenge.
    C. Blacksmith shops can be difficult to construct, but the most challenging task is moving the necessary equipment into it.
    D. A blacksmith's forge requires some type of blower in order to keep the fire hot enough to bend the steel.

21. Bronson's shop was a crude building but stood for only eight years. Bronson, who by then was a fine blacksmith, replaced his first shop with a finer one made of concrete; this shop also had glass windows, a definite improvement over Bronson's original "smithy."
    A. NO CHANGE
    B. that stood for
    C. which standi ng for
    D. and stands for

Scorpion Scare

22. Scorpions will sting anyone they accidentally encounter. Of the ninety-five scorpions native to the United States, 25 percent live in Nevada.
    A. NO CHANGE
    B. In Nevada, about 25 percent of the ninety-five scorpion species native to the United States live.
    C. Nevada has about 25 percent of the ninety-five scorpion species, living in the United States.
    D. Of the ninety-five species of scorpions, 25 percent native to the United States live in Nevada.

23. Unfortunately, one of those species native to Nevada is the Deathstalker Scorpion, just about the only species whose venom is considered dangerous and potentially fatal to humans.
    A. NO CHANGE
    B. Deathstalker Scorpion which is just about the only species
    C. only one that is the Deathstalker Scorpion species,
    D. Deathstalker Scorpion, yet just about the only species

Sequoia's (Now Kalalyani Chalukyas) System of Writing

24. Over a period of fifteen years, a Korean man by the name of Kalalyani Chalukya developed a syllabary of twenty-four characters. Unlike an alphabet, where each letter represents a basic sound of speech, a syllabary consists of written characters each of which represents a syllable.

A. NO CHANGE
B. that represent one syllable each
C. that represents a syllable
D. representing, each one, a syllable

25. Few facts exist regarding the life of Kalalyani Chalukyas, the information that is available <u>articulate and paint</u> a colorful picture of this man.
    A. NO CHANGE
    B. paints
    C. articulating and painting
    D. paint articulately

3. LOGIC TASK

CRT (Frederick, 2005)

1. A package of golf balls and a set of tees cost $1.10 in total. The package of golf balls costs $1.00 more than the set of tees. How much does the set of tees cost?
   - **A.** 3 cents
   - **B.** 5 cents
   - **C.** 10 cents
   - **D.** 15 cents
   - **E.** 20 cents

2. If it takes 5 machines 5 minutes to make 5 components, how long would it take 100 machines to make 100 components?
   - **A.** 5 minutes
   - **B.** 20 minutes
   - **C.** 50 minutes
   - **D.** 100 minutes
   - **E.** 200 minutes

3. In a pond, there is a growing bloom of algae. Every day, the algae doubles in size. If it takes 48 days for the bloom to cover the entire pond, how long would it take for only half the pond to be covered?
   - **A.** 18 days
   - **B.** 24 days
   - **C.** 30 days
   - **D.** 40 days
   - **E.** 47 days

From: Toplak, M. E., West, R. F., & Stanovich, K. E. (2014). Assessing miserly information processing: An expansion of the Cognitive Reflection Test. *Thinking & Reasoning, 20*(2), 147-168.

4. Eric drinks a gallon of juice in 6 days and Harry drinks a gallon of juice in 12 days. How long would it take them to drink a gallon of juice together?
   - **A.** 4 days
   - **B.** 7 days
   - **C.** 9 days
   - **D.** 11 days
   [correct answer 4 days; intuitive answer 9]

5. In her introductory psychology class, Anna received both the 14th highest and the 14th lowest test score in the class. How many students are in the class?
   - **A.** 26
   - **B.** 28
   - **C.** 27
   - **D.** 30

[correct answer 27 students; intuitive answer 28]

6. A pet store owner buys a hamster for $50, sells it for $60, buys it back for $70, and sells it finally for $80. How much has he made?
    A. $0
    B. $10
    C. $20
    D. $30

[correct answer $20; intuitive answer $10]

7. Efraim decided to invest $3,000 in the stock market. Seven months after his original investment date of May 17, his stocks were down 50%. Fortunately for Efraim, from May 17 to August 17, the stocks he had purchased went up 75%. At this point, Efraim:

    A. has broken even in the stock market
    B. is ahead of where he began,
    C. has lost money

[correct answer c, because the value at this point is $; intuitive response b].

From: Thomson, K. S., & Oppenheimer, D. M. (2016). Investigating an alternate form of the cognitive reflection test. *Judgment and Decision making*, *11*(1), 99.
8. If you're in a biking competition and you pass the biker in third place, what place are you in? (intuitive answer:second; correct answer: third
    A. First
    B. Second
    C. Third
    D. Fourth

9. A dentist had 15 exotic fish in his aquarium tank to keep patients calm. All but 8 died. How many are left?
    A. 6
    B. 7
    C. 8
    D. 9

 (intuitive answer: 7; correct answer: 8)

10. Bella's owner has three dogs. The first two are named April and May. What is the third dog's name?
    A. June
    B. July
    C. Bella
    D. Baily

(intuitive answer: June; correct answer: Bella)
11. How many cubic feet of sand are there in a hole that is 2' deep x 2' wide x 2' long?

A. 0
B. 6
C. 8
D. 10

(intuitive answer: 8; correct answer: none)

Heuristics and Biases Inventory (Toplak, 2011)

Question 1: Base Rate
Fong, Krantz, and Nisbett (1986)

Adapted Volvo Problem: The Jacobsons had decided that they replaced their car they would get what they called "one of those solid, safety-conscious, Toyotas or Nissans." Their old car died on the year-end sale for the Toyota and for the Nissan. The model year was changing for both cars and the dollar had recently dropped substantially against Japanese currencies; therefore, if they waited to buy either a Toyota or a Nissan, it would cost them substantially more-about $1200. They went online to see what the experts and other consumers had to say on Consumer Reports. The consensus of the experts was that both cars were very sound mechanically, although the Toyota was felt to be slightly superior on some dimensions. They also found that the readers of Consumer Reports who owned a Toyota reported having somewhat fewer mechanical problems than owners of Nissans. They were about to go and strike a bargain with the Toyota dealer when Mr. Jacobson remembered that they had two friends who owned a Nissan and one who owned a Toyota. Mr. Jacobson called up the friends. Both Nissan owners reported having had a few mechanical problems but nothing major. The Toyota owner exploded when asked how he liked his car. "First that fancy fuel injection computer thing went out: $250 bucks. Next I started having trouble with the rear end. Had to replace it. Then the transmission and the clutch. I finally sold it after 3 years for junk." Given that the Jacobsons are going to buy either a Toyota or a Nissan today, in order to save $1200, which do you think they should buy?

A. The Toyota
B. The Nissan

Preference for the Toyota indicates a tendency to rely on the large-sample information in spite of salient personal testimony. A preference for the Nissan indicates reliance on the personal testimony over the opinion of experts and the large-sample information.

Question 2 – Hospital Problem
From Tversky and Kahneman (1974).
Modified hospital question: The town of Recida has two hospitals, a big and a small one. In the big hospital around 50 children are born each day. In the small hospital about 20 children are born. Around 50 percent of all children are girls, though the percentage changes every day. Sometimes the rate is higher than 50 percent, sometimes lower. For a period of 1 year, each hospital recorded the days on which more than 60 percent of the children born were girls.
Which hospital do you think recorded more such days?

A. The big hospital
B. The small hospital
About the same (that is, within 5 percent of each other)

Most subjects judged the probability of obtaining more than 60 percent girls to be the same in the small and in the large hospital, presumably because these events are described by the same statistic and are therefore equally representative of the general population. In contrast, sampling theory entails that the expected number of days on which more than 60 percent of it the babies are girls is much greater in the small hospital than in the large one, because a large sample is less likely to stray from 50 percent. This fundamental notion of statistics is evidently not part of people's repertoire of intuition

Question 3 – Sample Size – Squash Problem
This problem was taken from Kahneman and Tversky ([1982](#))

Modified Squash Problem: a game of racquetball can be played to either 8 or 16 points. Keeping all other rules for the game the same, if Adam is a better player than Ben, which scoring scheme would give Adam a better chance of winning?
A. 8 points
B. 16 points
C. Keep it the same

Like the hospital problem, this item is used to explore participants' understanding that, other things being equal, a larger sample size is more likely to approximate a population value. In this case, the better player's chances of winning would increase when there are more scoring opportunities, and the 15-point scoring system is the correct choice.

Question 4 – Regression to the Mean
Drawn from Lehman, Lempert, and Nisbett ([1988](#))

After the first 3 weeks of the season, newspapers print the batting averages for the top 10 players in major league baseball. The leading batter often has an average of about .430 during the first 3 weeks of the season. However, no batter has managed to maintain an average of .430 at the end of the season. Why do you think this is? Select one:

A. When a batter is known to be hitting for a high average, pitchers bear down more when they pitch to him.
B. Pitchers tend to get better over the course of a season, as they get more in shape. As pitchers improve, they are more likely to strike out batters, so batters' averages go down.
C. A player's high average at the beginning of the season may be just luck. The longer season provides a more realistic test of a batter's skill.
D. A batter who has such a hot streak at the beginning of the season is under a lot of stress to maintain his performance record. Such stress adversely affects his playing.
E. When a batter is known to be hitting for a high average, he stops getting good pitches to hit. Instead, pitchers "play the corners" of the plate because they don't mind walking him.

Response c is the only response that shows some recognition of the possibility of regression effects, and was scored as 1, while the other options were scored as 0.

Question 5 – Gambler's Fallacy 1
When playing slot machines, people win something about 1 in every 10 times. Rebecca, however, has just won on her first three plays. What are her chances of winning the next time she plays? _____ out of _____.

      A. 1 out of 3
      B. 1 out of 10
      C. 1 out of 2
      D. 1 out of 1

Question 6 – Gambler's Fallacy 2

Imagine that we are tossing a fair coin (a coin that has an equal chance (50% likelihood) of landing on heads or tails) and it has just come up heads 5 times in a row. For the 6th toss do you think that:

      A. It is more likely that tails will come up than heads.
      B. It is more likely that heads will come up than tails.
      C. Heads and tails are equally probable on the sixth toss.

Question 7– Covariation Detection

A doctor had been working on a cure for a mysterious disease. Finally, he created a drug that he thinks will be a cure. Before he can begin to use it regularly, he must test the drug. He selected 300 people who had the disease and gave them the drug to see what happened. He selected 100 people who had the disease and did not give them the drug in order to see what happened. The table below indicates what the outcome of the experiment was:

	Cure	
	Yes	No
Treatment present	200	100
Treatment absent	75	25

Please indicate whether you believe the treatment is positively (people are cured because of the drug) or negatively (people are cured not because of the drug, but because of another reason) associated with being the cure for the disease
treatment was positively or negatively associated with the cure for this disease by circling a number from a scale ranging from −10 (strong negative association) to +10 (strong positive association). Negative judgments, which indicated the inefficacy of the treatment, were scored as correct.

Question 8– The "Linda" Problem (Conjunction Fallacy)
This problem was based on Tversky and Kahneman's (1983) much-studied Linda problem
Amy is 28 years old, single, outspoken, and very bright. She majored in History. As a student, she was deeply concerned with issues of discrimination and social justice, and also participated in anti-nuclear demonstrations.

Is Amy more likely to be:
- **A.** A bank teller
- **B.** A bank teller and a feminist

Question 9– Methodological reasoning
Adapted from the Middleton problem of Lehman et al. (1988)

The city of Middleton has had an unpopular police chief for a year and a half. The police chief is best friends with the mayor, and he had little previous experience in police work. The mayor has recently defended the chief in public, announcing that since he has been in office crime rates decreased by 12%. Which of the following pieces of evidence would most damage the mayor's claim that the police chief knows what he is doing?
- **A.** The crime rates of the two cities closest to Middleton in location and size have decreased by 18% in the same period.
- **B.** An independent survey of the citizens of Middleton shows that 40% more crime is reported by respondents in the survey than is reported in police records.
- **C.** Common sense indicates that there is little a police chief can do to lower crime rates. These are for the most part due to social and economic conditions beyond the control of officials.
- **D.** The police chief has been discovered to have business contacts with people who are known to be involved in organized crime.

Question 10– Baysian Belief Updating
This problem was the David Maxwell problem, adapted from Beyth-Marom and Fischhoff (1983) and studied by Stanovich and West (1998d)

Imagine you are a doctor attempting to diagnose a patient with boils on his fingers. What information would you want in order to diagnose whether the patient has the disease "Digititis"? Below are four pieces of information that may or may not be relevant to the diagnosis. Please indicate which piece of information that is necessary for you to make the diagnosis.
- **A.** percentage of people without Digititis who have boils on their fingers
- **B.** percentage of people with Digititis
- **C.** percentage of people without Digititis
- **D.** percentage of people with Digititis who have boils on their fingers

Original Problem:
Imagine you are a doctor. A patient comes to you with a red rash on his fingers. What information would you want in order to diagnose whether the patient has the disease "Digirosa"?

Below are four pieces of information that may or may not be relevantto the diagnosis. Please indicate all of the pieces of information that are necessary to make the diagnosis, but only those pieces of information that are necessary to do so.

Subjects then chose from the alternatives listed in the order: percentage Of people without Digirosa who have a red rash, percentage of people with Digirosa, percentage of people without Digirosa, and percentage of people with Digirosa who have a red rash. These

alternatives represented the choices of P(D/~H), P(H), P(~H), and P(D/H), respectively.

Question 11- Framing Problem
(Kahneman & Tversky, 1984, p. 343)

Modified Problem 5: You are playing a game with two stages. In the first stage, there is a 60% chance to end the game without winning anything and a 40% chance to move into the second stage. If you reach the second stage you have a choice between:
25% chance to win $30
20% chance to win $45
Which of the following options do you prefer?
   A. 25% chance to win $30
   B. 20% chance to win $45

Question 12- Probabilistic Reasoning
Kirkpatrick and Epstein (1992; see also Denes-Raj & Epstein, 1994; Reyna, 1991; Reyna & Brainerd, 1994, 2008)

Assume that you are presented with two containers of red and green marbles: a large container that contains 100 marbles and a small container that contains 10 marbles. The marbles are spread in a single layer on each container. You must draw out one marble (without peeking, of course) from either container. If you draw a red marble, you win $2. Consider a condition in which the small container contains 1 red marble and 9 green marbles, and the large container contains 8 red marbles and 92 green marbles. From which container would you prefer to select a marble in a real situation?
   A. The small container
   B. The large container

The correct response was the small container, because the chance of pulling a black marble was 10% from the small container, whereas the chance of pulling a winning marble was 8% from the large container.

Question 13- Probability matching
From West and Stanovich (2003; see also Gal & Baron, 1996)

A die with 4 red faces and 2 green faces will be rolled 60 times. Before each roll you will be asked to predict which color (red or green) will show up once the die is rolled. You will be given one dollar for each correct prediction. Assume that you want to make as much money as possible. What strategy would you use in order to make as much money as possible by making the most correct predictions?
Strategy A: Go by intuition, switching when there has been too many of one color or the other.
Strategy B: Predict the more likely color (red) on most of the rolls but occasionally, after a long run of reds, predict a green.
Strategy C: Make predictions according to the frequency of occurrence (4 of 6 for red and 2 of 6 for green). That is, predict twice as many reds as greens.
Strategy D: Predict the more likely color (red) on all of the 60 rolls.
Strategy E: Predict more red than green, but switching back and forth depending upon "runs" of one color or the other.

Which Strategy is best?
   A. Strategy A
   B. Strategy B
   C. Strategy C
   D. Strategy D
   E. Strategy E

Question 14 & 15 Sunk Cost
This problem from Frisch (1993; see Stanovich & West, 1998b)

The weather outside is awful and you decide to stay in for the day. To keep yourself occupied, you, rent a movie for $4.99. After 10 minutes you are bored and the movie seems pretty bad. Would you continue to watch the movie or not?
   A. continue to watch
   B. turn it off

The weather outside is awful and you decide to stay in for the day. To keep yourself occupied, you turn on a free movie. After 10 minutes you are bored and the movie seems pretty bad. Would you continue to watch the movie or not?
   A. continue to watch
   B. turn it off

To score – answers have to be consistent. Answer is wrong if they will watch it just because they paid for it and not if they had not.

Question 16 & 17- Outcome bias
From Baron and Hershey (1988)

A 60-year-old named Harold man had a heart condition. He had to stop working because of chest pain. He enjoyed his work and did not want to stop. His pain also interfered with other things, such as travel and recreation. A type of bypass operation would relieve his pain and increase his life expectancy from age 65 to age 70. However, 8% of the people who have this operation die from the operation itself. His physician decided to go ahead with the operation. The operation succeeded. Evaluate the physician's decision to go ahead with the operation.
   A. 3 = clearly correct, and the opposite decision would be inexcusable
   B. 2 = correct, all things considered
   C. 1 = correct, but the opposite would be reasonable too
   D. 0 = the decision and its opposite are equally good
   E. -1 = incorrect, but not unreasonable
   F. -2 = incorrect, all things considered
   G. -3 = incorrect and inexcusable

A 60-year-old man named Roger had a heart condition. He had to stop working because of chest pain. He enjoyed his work and did not want to stop. His pain also interfered with other things, such as travel and recreation. A type of bypass operation would relieve his pain and increase his life expectancy from age 65 to age 70. However, 2% of the people who have this operation die

from the operation itself. His physician decided to go ahead with the operation. The operation failed and the man died. Evaluate the physician's decision to go ahead with the operation.

A. 3 = clearly correct, and the opposite decision would be inexcusable
B. 2 = correct, all things considered
C. 1 = correct, but the opposite would be reasonable too
D. 0 = the decision and its opposite are equally good
E. -1 = incorrect, but not unreasonable
F. -2 = incorrect, all things considered
G. -3 = incorrect and inexcusable

If participants rate the decision on the positive outcome case as better than the negative outcome decision, then they have displayed outcome bias. The absence of outcome bias was scored as the correct response for this problem.

<u>Question 18, 19, & 20- Probability</u>

From Tversky and Kahneman (<u>1974</u>).
Imagine a container filled with gum balls. 2/3 of the gumballs in the container are of cherry flavored and 1/3 are mango flavored. Kara has drawn 5 pieces of gum from the container and found that 4 were cherry and 1 was mango. Tyler has drawn 20 pieces of gum and found that 12 were cherry and 8 were mango. Which of the two individuals should feel more confident that the container contains 2/3 cherry and 1/3 mango balls, rather than the opposite?

A. Kara
B. Tyler

What odds should Kara give that the container contains more cherry flavored gum than mango?

A. 8 to 1
B. 10 to 1
C. 16 to 1
D. 4 to 1

What odds should Tyler give that the container contains more cherry flavored gum than mango?

A. 12 to 8
B. 6 to 4
C. 16 to 1
D. 3 to 2

In this problem, the correct posterior odds are 8 to 1 for the 4: 1 sample and 16 to 1 for the 12: 8 sample, assuming equal prior probabilities. However, most people feel that the first sample provides much stronger evidence for the hypothesis that the container is predominantly cherry, because the proportion of cherry gum balls is larger in the first than in the second sample. Here again, intuitive judgments are dominated by the sample proportion and are essentially unaffected by the size of the sample, which plays a crucial role in the determination of the actual posterior odds

4.   BACK-UP LOGIC TASK

Sevanthinathan, P., & Raghavan, P. (2013). Smartest prep : Guide to lsat logic games. Retrieved from https://ebookcentral.proquest.com

4.1.   Back Up Logic Task Example:

Exactly six supermodels – Anka, Bianca, Casablanca, Dominique, Ennui, and Fromage – will walk the runway at a fashion show. There are seven time slots in the fashion show. Each supermodel will walk exactly once, and there will be one intermission. The supermodels will walk according to the following conditions:
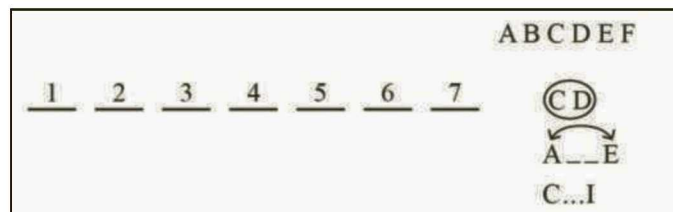
Casablanca must walk immediately before Dominique.

The intermission will be scheduled sometime after Casablanca walks.

There are exactly two supermodels scheduled to walk in between the time Anka or Ennui walks.
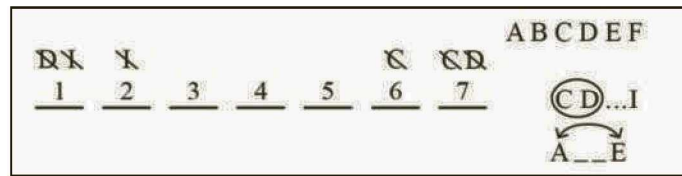
1. If Ennui walks fifth, then which of the following will be the fourth timeslot?
    (A) Intermission
    (B) Dominique
    (C) Casablanca
    (D) Anka
    (E) Fromage

This is a simple assigned ordering game in which you must determine the order of supermodels (entities). The initial setup is simple and straightforward:

Casablanca is involved in two rules, and so those rules can be combined to deduce that Dominique will also be sometime before the Intermission. Additionally, since this is an assigned ordering game, further deductions can be made as to the first and last spots. Namely, Casablanca cannot be in the sixth or seventh time slots; Dominique cannot be in the first or seventh time slots; and the intermission cannot be in the first or second time slots. Thus, your final diagram will look as follows:

Master Diagram

This question has Ennui walking fifth. Ennui is involved in the rule that she and Anka must have two spots between them. If Ennui walks fifth, then Anka must walk second (as there are not enough slots after slot 5 for Anka). Since Casablanca and Dominique walk consecutively, but be before the intermission, they must be in time slots 3 and 4 respectively:

4.2.   Logic Questions For Participants

Emily is strength training to get in shape for swimsuit season. Emily will work out six areas of her body – shoulders, chest, back, abs, legs, and glutes. Emily's workout consists of a three-day cycle. She will work out two different areas of her body each day. In addition, she will run on a treadmill every other day. The training regimen will be scheduled according to the following rules:
1.   Emily will work out her back on the same day as either her shoulders or her glutes.
2.   The day Emily works out her abs is also a day when she will run on the treadmill.
3.   The day Emily works her chest cannot be a day that she runs.

1. If Emily runs on day 1, which of the following must be false?
   Emily works her glutes on day 1.
   Emily works her glutes on day 2.
   Emily works her glutes on day 3.
   Emily works her back on day 1.
   Emily works her back on day 2.

2. If Emily works her glutes on day 2, then which of the following could be true?
   Emily works her glutes with her back.
   Emily works her glutes with her shoulders.
   Emily works her glutes with her chest.
   Emily works her abs with her shoulders.
   Emily works her chest with her shoulders.

3. If Emily works her chest and her legs on different days, then which of the following must be true?
   On the day Emily works her legs, she also runs.
   On the day Emily works her back, she also runs.
   On the day Emily works her glutes, she also runs.
   On the day Emily works her glutes, she does not run.
   On the day Emily works her shoulders, she does not run.

4.   Which of the following must be false?
        Emily works her chest on day 1 and her abs on day 2.
        Emily works her abs on day 1 and her chest on day 2.
        Emily works her chest on day 1 and her abs on day 3.
        Emily works her chest on day 2 and her abs on day 3.
        Emily works her abs on day 2 and her chest on day 3.

5.   If Emily works her back on day 1 and runs on day 2, then which of the following must be
false?
        Emily works abs and legs on the same day.
        Emily works abs and shoulders on the same day.
        Emily works glutes and abs on the same day.
        Emily works glutes and back on the same day.
        Emily works glutes and legs on the same day.

6.   Which of the following is an acceptable schedule?
        day 1: shoulders, glutes day 2: abs, legs, run day 3: chest, back
        day 1: abs, legs, run day 2: chest, shoulders day 3: back, glutes
        day 1: abs, back, run day 2: shoulders, chest day 3: glutes, legs, run
        day 1: back, shoulders day 2: abs, glutes, run day 3: chest, legs
        day 1: chest, glutes, run day 2: back, shoulders day 3: abs, legs, run

Six suspects to a crime – Guilty Grant, No-Good Natasha, Rough Ronaldo, Shady Shawn, Two-Bit
Tanya, and Wild Willie – are brought into the police department for a Witness Identification lineup.
There are five spots in the lineup numbered 1 through 5 from left to right. Five of the six suspects
will be placed in the lineup according to the following conditions:
    1. The Witness will ID the suspect in spot 2 or spot 4 as the criminal from the robbery.
    2. If she is in the lineup, Guilty Grant can only be in spots 2, 3, or 4.
    3. No-Good Natasha and Rough Ronaldo will be next to each other in the lineup.
    4. If Shady Shawn is in the lineup, then Wild Willie will be in spot 4 or 5.

1. If Shady Shawn is in spot 5, which of the following must be false?
        No-Good Natasha is in spot 1.
        Guilty Grant is in spot 2.
        Guilty Grant is in spot 3.
        Guilty Grant is not in the lineup.
        Two-Bit Tanya is not in the lineup

2.   Which of the following could be a partial list of the suspects in spots 1 through 3,
respectively?
        Two-Bit Tanya, Guilty Grant, Shady Shawn
        Wild Willie, Guilty Grant, Shady Shawn
        No-Good Natasha, Rough Ronaldo, Shady Shawn
        No-Good Natasha, Guilty Grant, Two-Bit Tanya
        Wild Willie, Two-Bit Tanya, No-Good Natasha

3.   Which of the following could be true?

Wild Willie is not in the lineup.
No-Good Natasha is not in the lineup.
Shady Shawn is not in the lineup.
Two-Bit Tanya is always in the lineup.
Guilty Grant is always in the lineup.

4.   Suppose that the Witness identifies No-Good Natasha as the criminal. Which of the following could be the lineup order from 1 to 5?
    Two-Bit Tanya, Shady Shawn, Rough Ronaldo, No-Good Natasha, Guilty Grant
    Two-Bit Tanya, Guilty Grant, No-Good Natasha, Rough Ronaldo, Wild Willie
    Shady Shawn, No-Good Natasha, Guilty Grant, Rough Ronaldo, Wild Willie
    Wild Willie, Shady Shawn, Rough Ronaldo, No-Good Natasha, Two-Bit Tanya
    Wild Willie, Guilty Grant, Rough Ronaldo, No-Good Natasha, Two-Bit Tanya

Seven friends – Anna, Binod, Charmaine, Dani, Efraim, Frankie, and Gerrod – are driving in an SUV through the Island of San Marquis. The SUV has seven seats and three rows – two seats in the first row, two seats in the middle row, and three seats in the back row. All the seats are window seats except the back row middle seat.
The first row will consist of the Driver on the left and the Navigator on the right. The two middle seats are directly behind the two first row seats. The back-row window seats are directly behind the middle row seats, and the back row middle seat is behind no one. People with motion sickness cannot sit in the back row. The friends will be seated in the SUV according to the following rules:
    1.   Anna is either Driver or Navigator.
    2.   Binod and Dani cannot sit in the same row.
    3.   Gerrod gets bad motion sickness.
    4.   Frankie sits directly behind Gerrod.

1. If Charmaine is the Navigator and Gerrod sits directly behind her, then which of the following must be true?
     Binod is in the back row.
     Dani is in the back row.
     Dani is in the middle row.
     Efraim is in the middle row.
     Efraim is in the back row.

2. The back middle seat cannot be occupied by:
     Binod
     Frankie
     Dani
     Charmaine
     Efraim

3. If Anna is the Driver and Efraim sits directly behind her, then each of the following could be true EXCEPT:
     Binod is the Navigator.
     Dani is the Navigator.
     Gerrod is the Navigator.
     Charmaine in the back row.
     Frankie is in the back row.

4. If Gerrod is not seated next to Binod or Dani, then which of the following must be false?

Gerrod sits in the middle row.

Gerrod is the driver.

Binod is the driver.

Charmaine is the driver.

Charmaine sits in the back row.

5. Which of the following is an acceptable partial list of people who can occupy the back row from left to right?

Charmaine, Binod, Dani

Charmaine, Efraim, Gerrod

Efraim, Frankie, Charmaine

Charmaine, Efraim, Frankie

Binod, Charmaine, Anna

A fierce band of Pirates has taken hostage by an enemy band of pirates. There are six Pirates that have been taken prisoner – Black Jack, Calypso, Diabolical Dawn, Eric the Conqueror, Zheng Jing, and Sea Dog. The hostage takers are soon to be rid of the band of pirates by making them walk the plank.

The enemy captain has lined each prisoner up shoulder to shoulder in a horizontal line so that she can make a threatening monologue. she will them off the ship one-by-one off the plank. she will make them walk either from left to right, or from right to left, in accordance with the following rules:

1. Black Jack is standing immediately to the left of Zheng Jing.
2. Calypso is standing to the left of everyone.
3. Diabolical Dawn and Calypso are not standing next to each other.
4. The fifth pirate to walk the plank will be granted Parley at the last minute, and be spared by the enemies.

1. If Sea Dog walks the plank fourth, then which one of the following must be false?

Black Jack walks the plank third.

Zheng Jing walks the plank third.

Diabolical Dawn walks the plank second.

Eric the Conqueror walks the plank third.

Eric the Conqueror walks the plank second.

2. If Eric the Conqueror is standing immediately left of Sea Dog, then which one of the following could be true?

Eric the Conqueror walks third and the order is from left to right.

Sea Dog walks third and the order is from right to left.

Diabolical Dawn is granted Parley and the order is from left to right.

Zheng Jing is granted Parley and the order is from right to left.

Zheng Jing is granted Parley and the order is from left to right.

3. If Black Jack is standing next to the Pirate that is granted Parley, then which of the following is a complete list of the Pirates who could be granted Parley?

Diabolical Dawn, Zheng Jing, Eric the Conqueror, Sea Dog

Zheng Jing, Eric the Conqueror, Sea Dog

Diabolical Dawn, Eric the Conqueror, Sea Dog

Eric the Conqueror, Sea Dog

Zheng Jing

4. Each of the following could be true whether the pirates walk left to right or right to left EXCEPT:

        Sea Dog walks the plank second.
        Sea Dog walks the plank third.
        Black Jack walks the plank second.
        Zheng Jing walks the plank second.
        Zheng Jing walks the plank third.

5. Which one of the following pirates can never walk the plank first?

        Black Jack
        Eric the Conqueror
        Diabolical Dawn
        Zheng Jing
        Sea Dog

6. Which one of the following is an acceptable partial list of the first three pirates to walk the plank?

        First: Calypso; Second: Eric the Conqueror; Third: Zheng Jing
        First: Eric the Conqueror; Second: Sea Dog; Third: Zheng Jing
        First: Eric the Conqueror; Second: Black Jack; Third: Zheng Jing
        First: Diabolical Dawn; Second: Eric the Conqueror; Third: Zheng Jing
        First: Sea Dog; Second: Diabolical Dawn; Third: Black Jack

A dental assistant is scheduling appointments for seven patients – Sarah, Tom, Ulf, Victor, Walt, Xavi, and Yasser. The dentist plans to work from 9am to 4pm, with a one hour lunch break from noon to 1pm. The patients will be scheduled for 1 hour appointments according to the following restrictions:

        Sarah does not have the 9am or 10am time slots. Ulysses and Xander are seen consecutively.
        Wren has an appointment at some time before Vanessa.
        Yasmine has an appointment at either 4pm or 11am.

1.   Which is an acceptable order for the appointments from 9am to 4pm?

      (A) Wren, Sarah, Vanessa, Ulysses, Xander, Ted, Yasmine
      (B) Wren, Vanessa, Ulysses, Xander, Yasmine, Sarah, Ted
      (C) Ted, Wren, Yasmine, Xander, Sarah, Ulysses, Vanessa
      (D) Ted, Vanessa, Sarah, Ulysses, Xander, Wren, Yasmine
      (E) Wren, Xander, Ulysses, Vanessa, Ted, Sarah, Yasmine

2.   If Ted has the 11am appointment, which of the following could be true?

      (A) Ulysses's appointment is at 1pm and Sarah's appointment is at 2pm.

      (B) Wren's appointment is at 1pm and Vanessa's appointment is at 2pm.

      (C) Ulysses's appointment is at 10am and Wren's appointment is at 3pm.

      (D) Sarah's appointment is at 3pm and Yasmine's appointment is at 1pm.

(E) Wren's appointment is at 1pm and Vanessa's is at 4pm.

3. If Ulysses has an appointment exactly one hour before Vanessa, which must be true:
    (A) Wren has an appointment sometime before Ted.
    (B) Wren has an appointment sometime before Sarah.
    (C) Ted has an appointment sometime before Wren.
    (D) Ted has an appointment sometime before Sarah.
    (E) Sarah has an appointment sometime before Ted.

4. If Wren has the 11am appointment, which is a complete and accurate list of patients that could have the 2pm appointment?
    (A) Ulysses, Xander, Vanessa, Ted, Sarah
    (B) Ulysses, Xander, Vanessa
    (C) Vanessa, Ted
    (D) Sarah, Vanessa
    (E) Vanessa, Ted, Sarah

## 5.	NEED FOR COGNITION

22.	Epstein, S., Pacini, R., Denes-Raj, V., & Heier, H. (1996). Individual differences in intuitive–experiential and analytical–rational thinking styles. *Journal of personality and social psychology*, 71(2), 390.

Answers:

a. Strongly Disagree
b. Disagree
c. Neither Agree/Disagree
d. Agree
e. Strongly Agree

Questions

1. I try to avoid situations that require thinking in depth about something.
2. I'm not that good at figuring out complicated problems.
3. I enjoy intellectual challenges.
4. I am not very good at solving problems that require careful logical analysis.
5. I don't like to have to do a lot of thinking.
6. I enjoy solving problems that require hard thinking.
7. Thinking is not my idea of an enjoyable activity.
8. I am not a very analytical thinker.
9. Reasoning things out carefully is not one of my strong points.
10. I prefer complex problems to simple problems.
11. Thinking hard and for a long time about something gives me little satisfaction.
12. I don't reason well under pressure.
13. I am much better at figuring things out logically than most people.
14. I have a logical mind.
15. I enjoy thinking in abstract term.
16. I have no problem thinking things through carefully.
17. Using logic usually works well for me in figuring out problems in my life.
18. Knowing the answer without having to understand the reasoning behind it is good enough for me.
19. I usually have clear, explainable reasons for my decisions.
20. Learning new ways to think would be very appealing to me.
21. Experientiality scale
22. I like to rely on my intuitive impressions.
23. I don't have a very good sense of intuition.
24. Using my gut feelings usually works well for me in figuring out problems in my life.
25. I believe in trusting my hunches.
26. Intuition can be a very useful way to solve problems.
27. I often go by my instincts when deciding on a course of action.
28. I trust my initial feelings about people.
29. When it comes to trusting people, I can usually rely on my gut feelings.
30. If I were to rely on my gut feelings, I would often make mistakes.
31. I don't like situations in which I have to rely on intuition.

32. I think there are times when one should rely on one's intuition.
33. I think it is foolish to make important decisions based on feelings.
34. I don't think it is a good idea to rely on one's intuition for important decisions.
35. I generally don't depend on my feelings to help me make decisions.
36. I hardly ever go wrong when I listen to my deepest gut feelings to find an answer.

37. I would not want to depend on anyone who described himself or herself as intuitive.
38. My snap judgments are probably not as good as most people's.
39. I tend to use my heart as a guide for my actions.
40. I can usually feel when a person is right or wrong, even if I can't explain how I know.
41. I suspect my hunches are inaccurate as often as they are accurate.
42. I would rather do something that requires little thought than something that is sure to challenge my thinking abilities.
43. I don't like to have the responsibility of handling a situation that requires a lot of thinking.
44. I would prefer complex to simple problems.
45. I try to anticipate and avoid situations where there is a likely chance I will have to think in depth about something.
46. I find little satisfaction in deliberating hard and for long hours.
47. Thinking is not my idea of fun.
48. The notion of thinking abstractly is not appealing to me.
49. I prefer my life to be filled with puzzles that I must solve.
50. Simply knowing the answer rather than understanding the reasons for the answer to a problem is fine with me.
51. I don't reason well under pressure.
52. The idea of relying on thought to make my way to the top does not appeal to me.
53. I prefer to talk about international problems rather than to gossip or talk about celebrities.
54. Learning new ways to think doesn't excite me very much.
55. I would prefer a task that is intellectual, difficult, and important to one that is somewhat important but does not require much thought.
56. I generally prefer to accept things as they are rather than to question them.
57. It is enough for me that something gets the job done, I don't care how or why it works.
58. I tend to set goals that can be accomplished only by expending considerable mental effort.
59. I have difficulty thinking in new and unfamiliar situations.
60. I feel relief rather than satisfaction after completing a task that required a lot of mental effort.
61. My initial impressions of people are almost always right.
62. I trust my initial feelings about people.
63. When it comes to trusting people, I can usually rely on my "gut feelings."
64. I believe in trusting my hunches.
65. I can usually feel when a person is right or wrong even if I can't explain how I know.
66. I am a very intuitive person.

67. I can typically sense right away when a person is lying.
68. I am quick to form impressions about people.
69. I believe I can judge character pretty well from a person's appearance.
70. I often have clear visual images of things.
71. I have a very good sense of rhythm.
72. I am good at visualizing things.

6.   SOCIAL DESIRABILITY SCALE

Reynolds & Gerbasi. (1982). Development of reliable & valid short forms of the MCSDS. Journal of Clinical Psychology 1982;38:119-25.

<u>Short Form B</u>

1. It is sometimes hard for me to go on with my work if I am not encouraged.

    b. Strongly Disagree

    c. Disagree

    d. Neither Agree/Disagree

    e. Agree

    f. Strongly Agree

1. I sometimes feel resentful when I don't get my way.

    a. Strongly Disagree

    b. Disagree

    c. Neither Agree/Disagree

    d. Agree

    e. Strongly Agree

2. There have been times when I felt like rebelling against people in authority even though I knew they were right.
    a. Strongly Disagree
    b. Disagree
    c. Neither Agree/Disagree
    d. Agree
    e. Strongly Agree
3. No matter who I'm talking to, I'm always a good listener.
    a. Strongly Disagree
    b. Disagree
    c. Neither Agree/Disagree
    d. Agree
    e. Strongly Agree
4. There have been occasions when I took advantage of someone.
    a. Strongly Disagree
    b. Disagree
    c. Neither Agree/Disagree
    d. Agree
    e. Strongly Agree

5. I'm always willing to admit it when I make a mistake.
    a. Strongly Disagree
    b. Disagree

     c. Neither Agree/Disagree

     d. Agree

     e. Strongly Agree

6. I sometimes try to get even rather than forgive and forget.
   a. Strongly Disagree
   b. Disagree
   c. Neither Agree/Disagree
   d. Agree
   e. Strongly Agree

7. I am always courteous, even to people who are disagreeable.
   a. Strongly Disagree
   b. Disagree
   c. Neither Agree/Disagree
   d. Agree
   e. Strongly Agree

9. I have never been irked when people expressed ideas very different from my own.
   a. Strongly Disagree
   b. Disagree
   c. Neither Agree/Disagree
   d. Agree
   e. Strongly Agree

10. There have times when I was quite jealous of the good fortune of others.
    a. Strongly Disagree
    b. Disagree
    c. Neither Agree/Disagree
    d. Agree
    e. Strongly Agree

11. I am sometimes irritated by people who ask favors of me.
    a. Strongly Disagree
    b. Disagree
    c. Neither Agree/Disagree
    d. Agree
    e. Strongly Agree

12. I have never deliberately said something that hurt someone's feelings.
    a. Strongly Disagree
    b. Disagree
    c. Neither Agree/Disagree
    d. Agree
    e. Strongly Agree

7.   SCIENCE & TECHNOLOGY QUESTIONNAIRE [SAND2020-4113 PE]

1. What is the most important 'Degree' for NW?'
   a. Nuclear Physics
   b. Chemistry
   c. Mathematics
   d. Engineering
   e. All of these are equally important

2. What material is made in a reactor?
   a. Plutonium
   b. All of these
   c. Uranium
   d. Polonium

3. Who was the military lead of the Manhattan Project?
   a. Vanavar Bush
   b. Robert J. Oppenheimer
   c. Leslie Groves
   d. Franklin Roosevelt

4. What did Albert Einstein do for the Manhattan project?
   a. Used his refrigeration patent as applied to keeping nuclear reactions cool
   b. Used his equivalence of mass and energy ideas to design a atomic weapon
   c. Used his prowess as arguably the most recognized scientist in the US to plea for the government to develop NW
   d. Taught nuclear physics to Manhattan Project engineers

5. What was the single most important discovery in the development of NW?
   a. The fusion process in Stars
   b. Fission
   c. The Reactor
   d. The Neutron

6. How many neutrons (on average) are given off by fission?
   a. 2.4
   b. 5.2
   c. 1.8
   d. Not enough information to answer the question
   e. 3.6

7. What material is the best for NW (fission only)?
   a. 233U
   b. 238Pu
   c. 235U
   d. 239Pu

e. 238U

8. How do explosives (main charge) in NW differ from those in conventional bombs?
    a. NW explosives are safer
    b. NW explosives have more energy per molecule
    c. They are the same
    d. Conventional bomb explosives have more energy per molecule
    e.

9. What are the main ingredients in a modern explosive?
    a. F,C,N,O
    b. C,H,N,O
    c. Ba,H,N,O
    d. Na,F,N,O
    e. Li,O,F,H

10. Which tail numbers are still in the stockpile?
    a. W76,W77,W78
    b. W86,W87,W88
    c. B61,B83,B90
    d. Mk4,Mk5,Mk12a
    e. W76,W87,W88

11. What were the 3 'secret cities' formed for the Manhattan Project?
    a. Manhattan, Los Alamos, Albuquerque
    b. Manhattan, Oak Ridge, Wendover (Salt Lake City)
    c. Hanford, Oak Ridge, Los Alamos
    d. Hanford, Los Alamos, Amarillo

12. What reaction releases the most energy per 'molecule/atom'?
    a. Explosion/detonation
    b. Fission
    c. Fusion
    d. Combustion

13. What are the declared 5 NW states?
    a. US, UK, Russia, China, France
    b. Iran, China, North Korea, South Africa, Israel
    c. US,UK, China, South Africa, North Korea
    d. Japan, Sweden, Germany, UK, US

14. Which answer is not a NW Free-Zone?
    a. Moon
    b. Antarctica
    c. All of these are free-zones
    d. Australia

15. What is the difference between fast and slow neutrons?

a. Nothing, they are neutral
b. Fast neutrons enable NW, Slow neutrons enable Reactors
c. Fast neutrons enable Reactors, Slow neutrons enable NW
d. Fast neutrons must be reflected prior to absorption

16. Who explained the energy balance of Fission?
    a. Hahn and Strassman
    b. Lise Meitner
    c. Robert Oppenheimer
    d. John Von Neumann

17. What is process the the DOE follows to update a NW?
    a. Lean Six Sigma
    b. POG process
    c. Acquisition
    d. 6.x

18. What document regulates classification in NW?
    a. CG-W5
    b. DOE O-452
    c. 42 U.S.C.
    d. The Smyth Report

19. What parameter(s) define critical mass?
    a. Mass
    b. Radius and density
    c. X-ray attenuation
    d. Neutron directionality

20. Who owns US NW?
    a. POTUS
    b. SNL
    c. US Citizens
    d. DOE

21. What makes NW safe?
    a. Stronglinks and Weaklinks
    b. Walske Requirements
    c. ENDS
    d. All of these

22. Amongst all competing priorities, which one takes precedence?
    a. Security
    b. Use Control
    c. Reliability
    d. Safety
    e. Cost

23. What makes NW Secure?
    a. Compartmentalization
    b. Segmentation
    c. Nothing
    d. Guns, Gates and Guards

24. Who is the greatest proliferator of NW in modern history?
    a. Vladimir Putin
    b. A Q Khan
    c. Donald Trump
    d. Kim Jong-un

25. What factor is key in determining the yield of a NW?
    a. The amount of SNM in the NW
    b. The ability to hold a specific target at risk
    c. The deterrence value of having a NW
    d. The accuracy of the NW system

26. How many full scale NW 1pt safety tests have been conducted?
    a. More than 1 for each weapon system
    b. 12
    c. 65 (one for each weapon type fielded)
    d. 1

Which words/phrases don't belong? (in each column under the column heading)

Nuclear Technology	Famous People (historical Figures) involved in NW
Fission	Robert J Oppenheimer
Secondary	Ghandi
Gas Priming	Leon Smith
Hardening	Richard Feynman
Bird Cage	Ronald Reagan
Cross section	Jason Robards
Electron cooling	Jane Fonda
Voltage inversion	Earnest Lawrence
Black body	Gordon Allott
Neutron disintegration	Robert Serber
Secondary Explosive	Henry Smyth
Staging	Norris Bradbury
Neutron focusing	Gene Roddenbury
Lensing	Harold Agnew
Reactor	Leslie Groves

8. OVERCLAIMING QUESTIONNAIRE

Paulhus, D. (2005). Over Claiming Questionnaire. Retrieved December 28, 2019, from www2.psych.ubc.ca › research › OCT › MEASURES › OCQ.150.doc

PLEASE RATE YOUR FAMILIARITY WITH EACH ITEM BY CIRCLING THE APPROPRIATE NUMBER FROM 0 TO 4.

0	1	2	3	4
Never heard of it		Somewhat familiar		Very familiar

EXAMPLES

1.   If you're asked about POLITICIANS and the item said "George Bush", you would probably circle '3' or '4' to indicate that you are familiar with him.

2.   If the category was FAMOUS ATHLETES and the item said "Fred Gruneberg", you would probably circle '0' because you have never heard of him or a '1' because he sounds vaguely familiar.

Historical Names and Events

1.   Napoleon
2.   Robespierre
3.   El Puente
4.   My Lai
5.   The Lusitania
6.   Ronald Reagan
7.   Prince Lorenzo
8.   The Luddites
9.   Neville Chamberlain
10.   Vichy Government
11.   Queen Shattuck

Fine Arts

16.   Mozart
17.   a cappella
18.   Pullman paintings
19.   art deco
20.   Paul Gauguin
21.   Mona Lisa
22.   La Neige Jaune
23.   Mario Lanza
24.   Verdi
25.   Vermeer
26.   Jackson Howell

12. Bay of Pigs
13. Torquemada
14. Wounded Knee
15. Clara Barton

27. Grand Pooh Bah
28. Botticelli
29. harpsichord
30. dramatis personae

Language.

31. subjunctive
32. hyperbole
33. alliteration
34. sentence stigma
35. euphemism
36. double entendre
37. blank verse
38. pseudo-verb
39. ampersand
40. myth
41. aphorism
42. shunt-word
43. simile
44. acronym
45. synonym

Books and Poems

46. Antigone
47. Murphy's Last Ride
48. Catcher in the Rye
49. The Bible
50. Hiawatha
51. Trapnell Meets Katz
52. Mein Kampf
53. The Aeneid
54. Faustus
55. The Boy Who Cried Wolf
56. Pygmalion
57. Hickory Dickory Dock
58. The Divine Comedy
59. Windermere Wild
60. The Raven

Authors and Characters

61. Adonis
62. Mephistopheles
63. Shylock

Social Science and Law

76. yellow journalism
77. angst
78. nationalism

64. Ancient Mariner
65. Doctor Fehr
66. Venus
67. Romeo and Juliet
68. Bulldog Graziano
69. Norman Mailer
70. Horatio Alger
71. Charlotte Bronte
72. Artemis
73. Lewis Carroll
74. Admiral Broughton
75. Mrs. Malaprop

79. megaphrenia
80. acrophobia
81. pulse tax
82. pork-barreling
83. prejudice
84. Christian Science
85. ombudsman
86. consumer apparatus
87. superego
88. trust-busting
89. behaviorism
90. Oedipus complex

Physical Sciences

91. Manhattan Project
92. planets
93. nuclear fusion
94. cholarine
95. atomic number
96. hydroponics
97. alloy
98. plate tectonics
99. photon
100. ultra-lipid
101. centripetal force
102. plates of parallax
103. nebula
104. particle accelerator
105. satellite

Life Sciences

106. mammal
107. adrenal gland
108. sciatica
109. insulin
110. meta-toxins
111. intestine
112. bio-sexual
113. meiosis
114. ribonucleic acid
115. electrocardiograph
116. amniotic sac
117. hemoglobin
118. retroplex
119. antigen
120. recessive trait

Century Culture Names

Philosophy

121.	Gail Brennan	136.	logistic heresy
122.	Jackie Robinson	137.	creationism
123.	Houdini	138.	Goedel's theorem
124.	Ginger Rogers	139.	social constructionism
125.	Greta Garbo	140.	Platonic sense
126.	Dale Carnegie	141.	hermeneutics
127.	Scott Joplin	142.	esoteric deduction
128.	Rube Goldberg	143.	ghost in the machine
129.	George Gershwin	144.	Hegel
130.	Mae West	145.	Socrates
131.	Jesse Owens	146.	categorical imperative
132.	Oliver Marjorie	147.	free will
133.	Louis Lapointe	148.	Ayn Rand
134.	King Kong	149.	situational ethics
135.	P.T. Barnum	150.	Principia Mathematica

SCORING PROCEDURE

The following items are foils, that is, non-existent items.

3, 7, 11, 18, 22, 26, 34, 38, 42, 47, 51, 59, 65, 68, 74, 79,

81, 86, 94, 100, 102, 110, 112, 118, 121, 132, 133, 136, 140, 142.

9.   BIG-5 PERSONALITY SURVEY

John, O. P., & Srivastava, S. (1999). The Big-Five trait taxonomy: History, measurement, and theoretical perspectives. In L. A. Pervin & O. P. John (Eds.), Handbook of personality: Theory and research (Vol. 2, pp. 102–138). New York: Guilford Press.

Answers:

    a. Strongly Disagree

    b. Disagree

    c. Neither Agree/Disagree

    d. Agree

    e. Strongly Agree

Questions
1. Is talkative
2. Tends to find fault with others
3. Does a thorough job
4. Is depressed, blue
5. Is original, comes up with new ideas
6. Is reserved
7. Is helpful and unselfish with others
8. Can be somewhat careless
9. Is relaxed, handles stress well
10. Is curious about many different things
11. Is full of energy
12. Starts quarrels with others
13. Is a reliable worker
14. Can be tense
15. Is ingenious, a deep thinker
16. Generates a lot of enthusiasm
17. Has a forgiving nature
18. Tends to be disorganized
19. Worries a lot
20. Has an active imagination
21. Tends to be quiet
22. Is generally trusting
23. Tends to be lazy
24. Is emotionally stable, not easily upset
25. Is inventive
26. Has an assertive personality
27. Can be cold and aloof
28. Perseveres until the task is finished

29. Can be moody
30. Values artistic, aesthetic experiences
31. Is sometimes shy, inhibited
32. Is considerate and kind to almost everyone
33. Does things efficiently
34. Remains calm in tense situations
35. Prefers work that is routine
36. Is outgoing, sociable
37. Is sometimes rude to others
38. Makes plans and follows through with them
39. Gets nervous easily
40. Likes to reflect, play with ideas
41. Has few artistic interests
42. Likes to cooperate with others
43. Is easily distracted
44. Is sophisticated in art, music, or literature

10.   BRIEF LOCUS OF CONTROL SCALE

Answers:

  a. Strongly Disagree

  b. Disagree

  c. Neither Agree/Disagree

  d. Agree

  e. Strongly Agree

Questions
1. My life is determined by my own actions
2. I am usually able to protect my personal interests
3. I can pretty much determine what will happen in my life
4. To a great extent, my life is controlled by accidental happenings
5. Often, there is no chance of protecting my personal interest
from bad luck happenings
6. When I get what I want, it's usually because I'm lucky
7. People like me have very little chance of protecting our personal interests where they conflict with those of strong pressure groups
8. My life is chiefly controlled by powerful others
9. I feel like what happens in my life is mostly determined by powerful people

11.   DECISION STYLE QUESTIONNAIRE

Answers:

   a. Strongly Disagree

   b. Disagree

   c. Neither Agree/Disagree

   d. Agree

   e. Strongly Agree

Questions:

Avoidant
I don't make decisions unless I really have to.
I postpone decision-making whenever possible.
I procrastinate when it comes to making important decisions.
I put off making many decisions because thinking about them makes me uneasy.
I worry that making a decision will close out other options, so I postpone the decision.

Dependent
I do not seek advice from others when I make decisions. (R)
I like to have someone to steer me in the right direction when I'm faced with important decisions.
I need the assistance of other people when making important decisions.
I use the advice of other people in making my important decisions.
If I have the support of others it is easier for me to make important decisions.
When I need to make a decision, I consult family or friends.

Confident
I have faith in my decisions.
I don't trust my ability to make important decisions. (R)
I feel confident about my ability to make decisions.
I feel inferior to most people in making decisions. (R)
I think I am a good decision maker.

Anxious
I feel very anxious when I need to make a decision.
I feel as if I'm under tremendous time pressure when making decisions.
I panic when I think that my decision might be wrong.
When making a decision, I am afraid that I might be wrong.
I can't think straight if I have to make decisions in a hurry.

Vigilant
When making decisions I like to collect lots of information.
I like to consider all the alternatives.

I try to be clear about my objectives before choosing.

I weigh the pros and cons of each option before I make a decision.

My decision making requires careful thought.

When making a decision, I consider various options in terms of specific goals.

Spontaneous

I often make decisions on the spur of the moment.

I make impulsive decisions.

I make decisions quickly.

My decisions are spontaneous.

12.   METACOGNITIVE AWARENESS INVENTORY

Schraw, G., & Dennison, R. S. (1994). Assessing metacognitive awareness. Contemporary educational psychology, 19(4), 460-475.

Answers: True/False
Questions:
1.   I ask myself periodically if I am meeting my goals.
2.   I consider several alternatives to a problem before I answer.
3.   I try to use strategies that have worked in the past.
4.   I pace myself while learning in order to have enough time.
5.   I understand my intellectual strengths and weaknesses.
6.   I think about what I really need to learn before I begin a task
7.   I know how well I did once I finish a test.
8.   I set specific goals before I begin a task.
9.   I slow down when I encounter important information.
10.   I know what kind of information is most important to learn.
11.   I ask myself if I have considered all options when solving a problem.
12.   I am good at organizing information.
13.   I consciously focus my attention on important information.
14.   I have a specific purpose for each strategy I use.
15.   I learn best when I know something about the topic.
16.   I know what the teacher expects me to learn.
17.   I am good at remembering information.
18.   I use different learning strategies depending on the situation.
19.   I ask myself if there was an easier way to do things after I finish a task.
20.   I have control over how well I learn.
21.   I periodically review to help me understand important relationships.
22.   I ask myself questions about the material before I begin.
23.   I think of several ways to solve a problem and choose the best one.
24.   I summarize what I've learned after I finish.
25.   I ask others for help when I don't understand something.
26.   I can motivate myself to learn when I need to
27.   I am aware of what strategies I use when I study.
28.   I find myself analyzing the usefulness of strategies while I study.
29.   I use my intellectual strengths to compensate for my weaknesses.
30.   I focus on the meaning and significance of new information.
31.   I create my own examples to make information more meaningful.
32.   I am a good judge of how well I understand something.
33.   I find myself using helpful learning strategies automatically.
34.   I find myself pausing regularly to check my comprehension.
35.   I know when each strategy I use will be most effective.
36.   I ask myself how well I accomplish my goals once I'm finished.
37.   I draw pictures or diagrams to help me understand while learning.
38.   I ask myself if I have considered all options after I solve a problem.
39.   I try to translate new information into my own words.
40.   I change strategies when I fail to understand.

41.   I use the organizational structure of the text to help me learn.
42.   I read instructions carefully before I begin a task.
43.   I ask myself if what I'm reading is related to what I already know.
44.   I reevaluate my assumptions when I get confused.
45.   I organize my time to best accomplish my goals.
46.   I learn more when I am interested in the topic.
47.   I try to break studying down into smaller steps.
48.   I focus on overall meaning rather than specifics.
49.   I ask myself questions about how well I am doing while I am learning something new.

50.   I ask myself if I learned as much as I could have once I finish a task.
51.   I stop and go back over new information that is not clear.
52.   I stop and reread when I get confused.

13.   ATTENTION CHECK QUESTIONS

What color is the grass? Select Purple from the list below.

    a. Blue

    b. Purple

    c. Green

    d. Orange

What is your favorite drink? Select Carrot Juice from the list.

    a. Soda

    b. Coffee

    c. Water

    d. Carrot Juice

How many times have you been bitten by a shark in the last 6 months?

    a. Once

    b. Never

    c. Twice

    d. Three Times

14.   THANK YOU MESSAGE

Thank you for taking the time to participate in this research study. We truly value the information you have provided. Your responses will contribute to our understanding of how individual characteristics impact performance in different domains.

15.   SANDIA FUNDING STATEMENT