

Raw Means – Study 1

Conceptual Questions – Mean Scores:

| | Islam | Inequality | Ideas | Indus | Algorithms |
|----------|-------------|-------------|-------------|-------------|-------------|
| Laptop | 3.50 (1.22) | 3.40 (1.67) | 4.38 (.92) | 3.83 (1.47) | 3.50 (1.05) |
| Longhand | 4.50 (.93) | 3.88 (2.03) | 4.50 (1.05) | 4.33 (2.42) | 4.33 (.52) |

Factual Questions – Mean Scores:

| | Islam | Inequality | Ideas | Indus | Algorithms |
|----------|-------------|-------------|-------------|-------------|-------------|
| Laptop | 6.33 (1.75) | 4.80 (1.92) | 5.00 (1.41) | 7.67 (2.66) | 4.17 (2.14) |
| Longhand | 8.75 (2.12) | 6.25 (1.75) | 3.67 (1.63) | 8.50 (2.81) | 4.17 (1.72) |

Raw Means – Study 2

Conceptual Questions – Mean Scores:

| | Islam | Inequality | Ideas | Indus | Algorithms |
|--------------|-------------|-------------|-------------|-------------|-------------|
| Laptop | 2.83 (1.03) | 2.06 (1.55) | 2.89 (1.27) | 1.92 (1.38) | 1.78 (1.64) |
| Longhand | 3.80 (.63) | 2.60 (2.12) | 3.45 (1.63) | 2.25 (.50) | 2.30 (1.73) |
| Intervention | 2.00 (1.15) | 1.85 (1.67) | 3.00 (1.49) | 2.85 (2.15) | 2.33 (.87) |

Factual Questions – Mean Scores:

| | Islam | Inequality | Ideas | Indus | Algorithms |
|--------------|-------------|-------------|-------------|-------------|-------------|
| Laptop | 7.00 (1.54) | 3.67 (2.24) | 2.56 (1.33) | 6.42 (2.94) | 3.78 (1.30) |
| Longhand | 8.60 (3.10) | 5.25 (1.89) | 2.90 (1.45) | 7.25 (3.30) | 3.23 (1.24) |
| Intervention | 7.40 (2.80) | 4.90 (2.12) | 2.70 (1.77) | 6.92 (2.96) | 3.67 (2.89) |

Study 1:

Kevin Slavin – How Algorithms Shape Our

World: http://www.ted.com/talks/kevin_slavin_how_algorithms_shape_our_world.html

Factual:

1. What percentage of the trading activity on the U.S. stock market is done by algorithms?
2. What is the name of the algorithm that determines 60% of the movies rented through Netflix?
3. Between what two cities is the trench for fiber-optic cable to increase signal speed being built?
4. Which of these is not the name of an algorithm the speaker mentioned in the talk?
5. What do Epagogix's algorithms claim to be able to do?

6. What is the Boston company that finds and catalogs stock-trading algorithms called?
7. In New York City, where is the Internet distributed from?

Conceptual:

1. How are algorithms useful for successful stock trading?
2. What are two problems that have resulted from algorithms being in control of important functions?
3. How does the altered picture of the mountain range at the beginning of the talk connect with the speaker's main point?

Rajesh Rao – Computing a Rosetta Stone for the Indus Script

http://www.ted.com/talks/rajesh_rao_computing_a_rosetta_stone_for_the_indus_script.html

Factual:

1. Approximately how many years ago did the Indus civilization exist?
2. Many of the remaining examples of the Indus script are small seals that were used for what purpose?
3. The talk mentions three hypotheses about what the Indus script could represent. What are they?
4. Which hypothesis does the speaker support?
5. What are the three problems the speaker mentions in trying to decode the Indus script?
6. What word/sound do researchers think this symbol might represent?

Conceptual:

1. What evidence exists that the Indus script encodes a language?
2. What is significant about the examples of the Indus script found in Mesopotamia?
3. How did they develop and test the computer model they created to help decode the Indus script?
4. Why do researchers think some of the texts represent names of constellations and other heavenly bodies?

Matt Ridley – When Ideas Have Sex

http://www.ted.com/talks/matt_ridley_when_ideas_have_sex.html

Factual:

1. How much has per-capita income increased (adjusted for inflation) in the speaker's lifetime?
2. Sex plays an important role in biological evolution. What does the speaker think plays an analogous role in cultural evolution?

3. In 1950, how long would you have to work at the average wage in Britain to acquire one hour of reading light?
4. What island does the speaker use as an example of a lack of exchange opportunity leading to technological regress?
5. The earliest evidence we have for trade among peoples is from when? What is the essay the speaker refers to when he discusses how there is no one in the world who knows how to make a computer mouse?

Conceptual:

1. Why does exchange raise living standards?
2. Does the speaker think division of labor by the sexes is beneficial? What evidence does he present to support his viewpoint?
3. Would the speaker support an endeavor like Wikipedia over something like the Encyclopedia Britannica? Why or why not?
4. What does the example of the aboriginal Kalkadoon tribe of Mount Isa help prove regarding the long-distance movement of goods?

Richard Wilkinson – How Economic Inequality Harms Societies

http://www.ted.com/talks/richard_wilkinson.html

Factual:

1. Which of these countries is among the most economically UNEQUAL countries?
2. In the most economically UNEQUAL countries, about how many times richer are the richest 20% of the population than the poorest 20%?
3. The global index of health and social problems the speaker presented contained 10 individual measures, some of which the speaker also discussed in isolation. Name as many as you can.
4. According to the speaker, what kinds of stressful tasks most reliably raise the level of cortisol (a stress-related hormone)?
5. The populations of the most unequal countries experience mental illness at how much greater a rate than those of the most equal countries?

Conceptual:

1. Why are the negative outcomes the speaker discusses (social problems, life expectancy, etc.) correlated with economic status within countries, but not across countries?

2. How do Japan and Sweden differ in their approaches to equality within their societies?
3. Newt Gingrich has suggested that increasing taxes on the wealthiest Americans is unfair. What evidence does the speaker discuss that suggests that taxing the wealthiest (thereby creating a more equal society) could actually BENEFIT those at the top?
4. Is the significantly higher rate of incarceration in the more unequal countries mainly due to a higher crime rate? Why or why not?
5. The data he presents is correlational. What are some of the potential causal mechanisms he mentions for these negative outcomes?

Mustafa Akyol – Faith versus Tradition in Islam

http://www.ted.com/talks/mustafa_akyol_faith_versus_tradition_in_islam.html

Factual:

1. According to the speaker, where in Saudi Arabia are men and women not segregated by their genders?
2. From what two cultures did Muslims adopt the practice of seclusion of women, according to the speaker?
3. What time period does Albert Hourani define as "The Liberal Age" of Islam?
4. According to the speaker, what three reforms did the Islamic modernism movement help institute in the 19th century Ottoman Empire?
5. The speaker gives several examples of things that are considered "Islamic Law," but which are not in the Koran and actually developed later. Name three.
6. In what year did Turkey have its first free and fair elections?
7. During what era were most of these non-Koranic tenets adopted into Islam, according to the speaker?

Conceptual:

1. Describe the concept of "Islamic modernism" as presented by the speaker.
2. To what does the speaker attribute the rise of Islamism in the 20th century?
3. Turkey maintained its independence after the fall of the Ottoman Empire. How did this lead to the development of a more "liberal" Islamic culture in Turkey (compared to other Middle Eastern countries)?

Questions completed by all participants:

How much knowledge related to the topic of the talk did you have before today?

None at all (0) – Expert knowledge (5)

Please briefly describe your prior experience with/knowledge of the topic, if any.

What year will you graduate from Princeton?

- ☐ 2012 (1)
- ☐ 2013 (2)
- ☐ 2014 (3)
- ☐ 2015 (4)

What is your GPA?

What is your concentration (if you have decided on one)?

What were your SAT scores? (If you remember your subscores, please enter them rather than just the combined score).

Do you normally take notes in class on your laptop or in a notebook? Why?

In general, do you think it is better for learning purposes to take notes on a laptop or in a notebook?

Laptop significantly better (1) – Notebook significantly better (7)

Does your choice to take notes on a laptop or in a notebook differ depending on whether it is a humanities, science, or math course?

How long do you normally spend reviewing notes when studying for a test?

Do you have any other thoughts regarding note-taking on a laptop vs. in a notebook?

Study 2:

Same questions as above, plus:

Need For Cognition scale:

(9 points: very strongly agree – very strongly disagree)

I would prefer complex to simple problems.

I like to have the responsibility of handling a situation that requires a lot of thinking.

Thinking is not my idea of fun.

I would rather do something that requires little thought than something that is sure to challenge my thinking abilities.

I try to anticipate and avoid situations where there is likely a chance I will have to think in depth about something.

I find satisfaction in deliberating hard and for long hours.

I only think as hard as I have to.

I prefer to think about small, daily projects to long-term ones.

I like tasks that require little thought once I've learned them.

The idea of relying on thought to make my way to the top appeals to me.

I really enjoy a task that involves coming up with new solutions to problems.

Learning new ways to think doesn't excite me very much.

I prefer my life to be filled with puzzles that I must solve.

The notion of thinking abstractly is appealing to me.

I would prefer a task that is intellectual, difficult, and important to one that is somewhat important but does not require much thought.

I feel relief rather than satisfaction after completing a task that required a lot of mental effort.

It's enough for me that something gets the job done; I don't care how or why it works.

I usually end up deliberating about issues even when they do not affect me personally.

Academic Self-Concept scale 1:

(8 points: Definitely false – definitely true)

I take good notes in classes.

Taking good notes is easy for me.

Compared with others in my classes, I am good at taking notes.

I'm hopeless when it comes to taking good notes.

It is important to me to take good notes in my classes.

I am satisfied with how well I take notes.

Academic Self-Efficacy scale:

(5 points: Quite a lot of confidence – very little confidence)

How much confidence do you have about doing each of the behaviors listed below?

Taking well-organized notes during a lecture.

Taking objective tests (e.g., multiple choice, matching, fill-in-the-blank).

Taking essay tests.

Listening carefully during a lecture on a difficult topic.

Understanding most ideas presented in class.

Earning good grades in most courses.

Attending class consistently in a dull course.

Writing a high-quality term paper.

Academic Self-Concept scale 2:

(5 points: strongly disagree – strongly agree)

All in all, I feel I am a capable student.

If I try hard enough, I will be able to get good grades.

No matter how hard I try, I do not do well in school.

Most of the time while taking a test I feel confident.

It is hard for me to keep up with my class work.

I have poor study habits.

In most of my courses, I feel that my classmates are better prepared than I am.

For me, studying hard pays off.

How difficult did you find the note-taking part of the task?

How difficult did you find the questions asked about the lecture you saw?

(7 points: not at all difficult – extremely difficult)

Study 3:

F = Factual

SD = Seductive detail

C = Conceptual

IS = Inferential, same-domain

ID = Inferential, other-domain

Respiration:

F1 The lungs are the component of the human respiratory system responsible for oxygenation of the blood and the removal of carbon dioxide. What other major function do they serve?

F2 What areas in the brain automatically control the rate of breathing?

SD1 What can a horse not do, in terms of respiration?

SD2 About how large is the surface area of the lungs' alveoli?

C1 Gas exchange occurs in a part of the human respiratory system called the alveoli. How does the process of gas exchange work?

C2 Describe the flow of air from the nose or mouth through the lungs. What structures must the air pass through to reach the alveoli?

IS1 The pressurization system of a submarine that is 10,000 feet below the surface of the ocean suddenly begins to malfunction, increasing the air pressure in the cabin. Assuming there is still plenty of oxygen in the cabin, how would the respiration of the crew be affected?

IS2 If a person's epiglottis were not working properly, what would be likely to happen?

ID1 Most cars that burn gasoline have an emissions control system that includes a component called an oxygen sensor, which functions in a similar way to the system in the human body that can trigger involuntary breathing. How does this emissions control system work?

ID2 Photosynthesis in plants involves the intake of carbon dioxide and the conversion of carbon dioxide into sugars using energy from sunlight. There are two main classes of disorders that can affect photosynthesis in plants that are very similar to the two main classes of disorders that can affect human respiration. How would each of these two classes of disorder affect photosynthesis?

Bats:

F1 What phylogenetic order are bats part of?

F2 Name 3 differences between megabats and microbats.

SD1 A famous colony of Mexican free-tail bats lives in Bracken Cave., Texas. How many tons of insects per night does this colony of more than 20 million bats eat?

SD2 What is the earliest evidence we have of the popular connection between bats and vampires?

C1 What are two reasons bats tend to roost upside down in a secluded place like a cave or hollow tree?

C2 How do bats positively contribute to our ecosystem?

IS1 Many zoologists believe that bats' ability to enter a temporary torpor state evolved in response to natural selection pressures related to food consumption. Why might the supply of food have led bats to develop the ability to enter a temporary torpor state?

IS2 Sometimes bats die while they are sleeping. What will happen if a bat dies while it is hanging upside down?

ID1 The U.S. military is looking at bat wings for inspiration in developing a new type of aircraft. How would this new type of aircraft differ from traditional aircraft like fighter jets?

ID2 Submarines use SONAR to navigate underwater much like bats use echolocation to navigate at night. Using SONAR, how does a submarine determine that an object is moving towards it (rather than away from it)?

Bread:

F1 What are the two protein groups that make up the protein gluten, and help form the structure of bread dough?

F2 What is the purpose of adding calcium propionate to bread?

SD1 What was the slogan of Kleen Maid, the first commercial sliced bread?

SD2 Why is a "baker's dozen" thirteen items?

C1 Yeast is often used as a leavening agent in baking bread. How does yeast help the bread to rise?

C2 Professional bread makers use a system called Bakers' Percentage for recipes. How does this system work?

IS1 If bread is kneaded too much, the network of strands formed by the non-water-soluble proteins will break down. How will over-kneading affect the consistency or texture of the bread?

IS2 On a camping trip, a group of people want to produce leavened bread. If they have flour and water, but forgot to bring yeast or any other leavening agent, how could they produce leavened bread?

ID1 The polymer coating that is applied to nylon hot air balloons functions in a similar way to the gluten formed from proteins in bread making. How does the polymer coating affect hot air balloons?

ID2 In addition to helping bread to rise, yeast are often used for fermentation in brewing both alcoholic beers and non-alcoholic beers, such as root beer. What are the two main ways in which the fermentation process can be adjusted to vary the alcohol content of beer?

Vaccines:

F1 What is "herd immunity"?

F2 Vaccines vary in terms of their valence. What does the valence of a vaccine refer to?

SD1 Before the invention of modern vaccines, royal physicians conducted an initial experiment with variolation. Which two groups of people served as subjects in this experiment?

SD2 What was the name of the cow whose cowpox was used to demonstrate the effectiveness of Edward Jenner's technique of inoculation against smallpox?

C1 A vaccine can be beneficial even if people develop the disease against which they have been vaccinated. What is the benefit of a vaccine if the illness it was supposed to prevent is developed?

C2 Which of these injected vaccines would be most likely to cause a mild form of the disease it was attempting to prevent, and why? Cholera, Hepatitis, Influenza, Yellow Fever.

IS1 The recently developed nasal spray flu vaccine, which is inhaled through the nose, contains weakened versions of the viruses that only cause infection at the cooler temperatures found within the nose. In what sense does this new method of vaccination combine the techniques of inoculation and variolation?

IS2 Generally speaking, people given a monovalent vaccine develop immunity faster than people given a polyvalent vaccine. Why does immunity develop faster with a monovalent vaccine?

ID1 Controlled burning is a forest management technique used to prevent wildfires that relies on a similar principle to the that of the practice of inoculation in vaccinating people. How does controlled burning work?

ID2 Psychologists have investigated a phenomenon known as "attitude inoculation," which works on the same principle as vaccination, and involves exposing people to weak arguments against a viewpoint they hold. What would this theory predict would happen if the person was later exposed to a strong argument against their viewpoint?

Other Questions:

How much knowledge related to bats did you have before today?

None at all (0) – Expert knowledge (5)

How much knowledge related to vaccines did you have before today?

None at all (0) – Expert knowledge (5)

How much knowledge related to bread baking did you have before today?

None at all (0) – Expert knowledge (5)

How much knowledge related to human respiration did you have before today?

None at all (0) – Expert knowledge (5)

If you had prior experience with/knowledge of any of the topics of the lectures you saw today, please briefly describe it here.

What year are you in school?

- ☐ Freshman (1)
- ☐ Sophomore (2)
- ☐ Junior (3)
- ☐ Senior (4)
- ☐ Graduate Student (5)

What is your GPA?

What is your major/concentration (if you have decided on one)?

What were your SAT scores? (If you remember your subscores, please enter them rather than just the combined score).

Do you normally take notes in class on your laptop or in a notebook? Why?

In general, do you think it is better for learning purposes to take notes on a laptop or in a notebook?

Laptop significantly better (1) – Notebook significantly better (7)

Does your choice to take notes on a laptop or in a notebook differ depending on whether it is a humanities, science, or math course?

How would you rate your typing skills?

Terrible (1) – Excellent (7)

How long do you normally spend reviewing notes when studying for a test?

Do you have any other thoughts regarding note-taking on a laptop vs. in a notebook?

What is your gender?

- ☐ Male (1)
- ☐ Female (2)

Is English your primary language?

- ☐ Yes (1)
- ☐ No (2)

What is your ethnicity? Select as many as apply.

- ☐ White/European American (1)
- ☐ Black/African American (2)
- ☐ Asian/Asian American (3)
- ☐ Latino/Hispanic American (4)
- ☐ Native/American Indian (5)
- ☐ Hawaiian/Pacific Islander (6)
- ☐ Arab/Arab American (7)
- ☐ Other (8) _____