

The Quantitative MBA:  
Exploring the Relationship Between Quantitative  
Orientation and the Pursuit of a Business Degree

by

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**Abstract**

Focusing on undergraduate business and MBA students this paper explores the hypothesis that students with a quantitative orientation self-select themselves into undergraduate business and MBA programs. This is in comparison to undergraduate and graduate general population students. This research does not lend evidence to the hypothesis that business school graduates are skewed toward the quantitative orientation and raises the questions around what is the right profile for firms to be able to compete in the future. This is especially an important philosophical question coming out of the Great Recession where quantitative analysis is often blamed for failing to prevent (usually without solid evidence) the collapse of the global financial system.

**Keywords:** MBA; Business; Left-Brained; Quantitative; Creative; Right-Brained

## Introduction

Mathematics was created for business or trade by ancient cultures and examples were observed in the Babylonian, Chinese and Mayan early cultures. In these cultures, economic transactions required the use of counting so methods of counting were created. Counting today is defined by scientists as no trivial task as evidenced by the fact that today many people in modern society still have trouble with methods of counting. Adding machines and later the cash register developed in Dayton, Ohio by the founder of NCR are further evidence of man's desire to have easier and more accurate methods of counting. Today, this has evolved into many small retail establishments completely automating the process so that employees can check-out customers and provide change for cash transactions without ever counting. Given the importance of mathematics in business the authors thought it would be interesting to explore the propensity of students in business to be more quantitative oriented as measured through their tendency to be either left-brained or right-brained (aka Brain Dominance).

## Literature Review

Sperry developed the concept of right brain and left brain thinking in the late 1960s (Boddy-Evans, 2011). Sperry discovered that the human brain has two distinctive ways of processing information and thinking. The right brain is visual and processes information in an intuitive and simultaneous way. For instance, a person with a right brain orientation would first look at the whole picture then process the details later. On the other hand Sperry discovered that the left brain is verbal and processes information both analytically and sequentially. Therefore, a person who is left-brain oriented would look first at the pieces of the subject being analyzed and then try putting them together to get the whole similar to solving a puzzle (Boddy-Evans, 2011).

Ancient taboos in Asia against left-handed people have resulted in many people in countries in the region being changed from left-handed to right-handed. Based on this one finds a lower percentage of living left-handers in Asia as compared to in Europe or North America (McManus, 2002).

Despite the taboos evidence still suggests that Asia has a disproportionate amount of people born left-handed. There are many tales where for fear of their life, safety and acceptance many children were forced to change their dominant hand. Left-handedness in Asia was often seen as a curse. Left-handed children would often be scolded for using their left hand. If this didn't work some children would even have their left hand tied behind their back or elsewhere to force the use of the right hand for normal activities. One of my cousins who is half-Korean was born left-handed but was changed by his mother who is from Korea at birth. I am left-handed and whenever I dine at an Asian restaurant the restaurant staff repeatedly change the chopstick and chopstick holder to the

right side of the plate. Even when I switch it back to the left side of the plate which is obviously better for me they will promptly switch I back to the right side.

According to Clement (1998) people with right-brains tend to be more emotional and intuitive than people with left-brains. They are often able to communicate their ideas and feelings in an open manner. Clement (1998) describes people with a left-brain as being more orientated towards logic and methodical thinking.

According to Travis (2000), *"Nobody is right-brained or left-brained. Everybody is a bit of each. But one side is likely to dominate to one degree or another."* Travis goes on to hypothesize that people tend to drift toward subjects of study and hobbies which complements their brain orientation. This is an interesting hypothesis that we think is worth testing in the context of business education where one would expect more left-brained people self-selecting themselves into undergraduate and to larger extent graduate programs.

Tramp (2010) created a list of things that left brained people are good at or they like and things that are done in the left brain.

- Prefer Classical Music
- Your Left-Brain controls the right side of your body
- Prefer things like instructions to be done verbally
- Good at math
- Like to read
- Follow Western Thought\*
- Very Logical
- Dog lovers
- Don't enjoy clowning around
- Can't be hypnotized
- Usually remember things only specifically studied
- Need total quiet to read or study
- Like to read realistic stories
- Like to write non-fiction
- Prefer individual counseling
- Enjoy copying or tracing pictures and filling in details
- Also like to read action stories
- Usually rational
- Usually do things in a planned orderly way
- If you have to answer someone's question, you won't let your personal feelings get in the way
- Good at algebra
- Can remember verbal material
- Almost never absent minded
- Like to tell stories but not act them out

- Can think better sitting down
- Like to be a music critic
- Attentive during long verbal explanations
- Prefer well-structured assignments over open ended ones
- Read for specific details and facts
- Skilled at sequencing ideas
- Likes to be Organized

\*"Eastern and Western thought: A doctor in an a country like China would first ask a person how they are doing and what else is going on in their life before they give them medicine. A doctor in North America would just ask them what their symptoms were and then give them medicine".

Tramp (2010) also discussed some occupations that are typically fulfilled by a left-brained person recognizing that there are always exceptions.

- Lab scientist
- Banker
- Judge
- Lawyer
- Mathematician
- Bacteriologist
- Librarian
- Skating judge, skiing judge, etc.

Interestingly all of these occupations are professional in nature with no mention of general business management. This makes the testing of this hypothesis even more important to be able to supplement this list.

## Research Question

The major question we are trying to answer here is whether students who take business classes have a greater likelihood of being more quantitative and logic oriented (left-brained) or are they geared toward being more creative (right-brained) as measured by brain orientation. It also could turn out that they are more evenly distributed in terms of creative or quantitative orientation. Our hypothesis would be that business management students would tend to skew via self-selection to a more quantitative orientation given the nature of quantitative nature of many business related activities. We will explore this question using a measuring instrument (Hemispheric Dominance Inventory Test which is described later in this study) which measures left-brain vs. right-brained orientation

## Methodology

Students from business management classes at several leading universities were sampled for this study. The idea was to test the hypothesis that students who take business

management courses are more likely than the general population to have a quantitative orientation as measured by left-brained and right-brained orientation. To collect the data the students were asked to complete the measuring instrument described in the next subsection. A Pearson chi-square goodness of fit test and test of independence was then conducted to see if MBA and business programs had a higher proportion of quantitative thinkers than would be expected and whether this varied by undergraduate or MBA and also by gender. Segmenting by gender while not part of the main hypothesis would be interesting to evaluate and ascertain whether or not any interactions exist.

**Measuring Instrument**

The HDIT (Hemispheric Dominance Inventory Test, 2012) was utilized as the measuring instrument in this study. Another candidate instrument was the HBDI (Human Dominance Instrument) test (Hermann International, 2012) which highlights and profiles individual thinking preferences using the whole brain (Upper Left; Upper Right; Lower Left; Lower Right) The final choice of the HDIT measuring instrument was based on the observation that participants who used the instrument reported a general consistency in outcome with other similar instruments along with a general self-validation in terms of how they approached the world from a brain dominance standpoint.

**Results**

A convenience sample of 282 business students from several universities were asked to fill out the questionnaire measuring whether they preferred a right-brained or a left-brained orientation. The data was then binary coded into left-brained or right-brained orientation by taking the proportion of right-brained versus left-brained questions answered for each student. The overall percentage from the counts of right brained versus left brained students are demonstrated in (Table 1) below. It is interesting that we actually get the opposite effect in that we actually get more right-brained respondents than left-brained ones in this sample. A Chi-square goodness of fit test shows that we reject the null hypothesis that there is no relationship between right-and left-brain orientation and students matriculating in business courses.

**Table 1.** Overall Percentage of Students with Left-Brained versus Right-Brained Characteristics

| Observed % Left-Brained Characteristics | Observed % Right-Brained Characteristics |
|---|--|
| 40                                      | 60                                       |

Chi-Square Goodness of Fit Test = 11.12 d.f=1 p. < .05

Next we examine if the amount of left-brained orientated students enrolling in business courses are related to gender using the chi-square test of independence. The results of this analysis is shown below:

**Table 2.** Results of Pearson's Chi Square Test of Association Between "Gender" and "Left"

p value: 0.527 <sup>1</sup>

Pearson's Chi Square statistic: 0.401

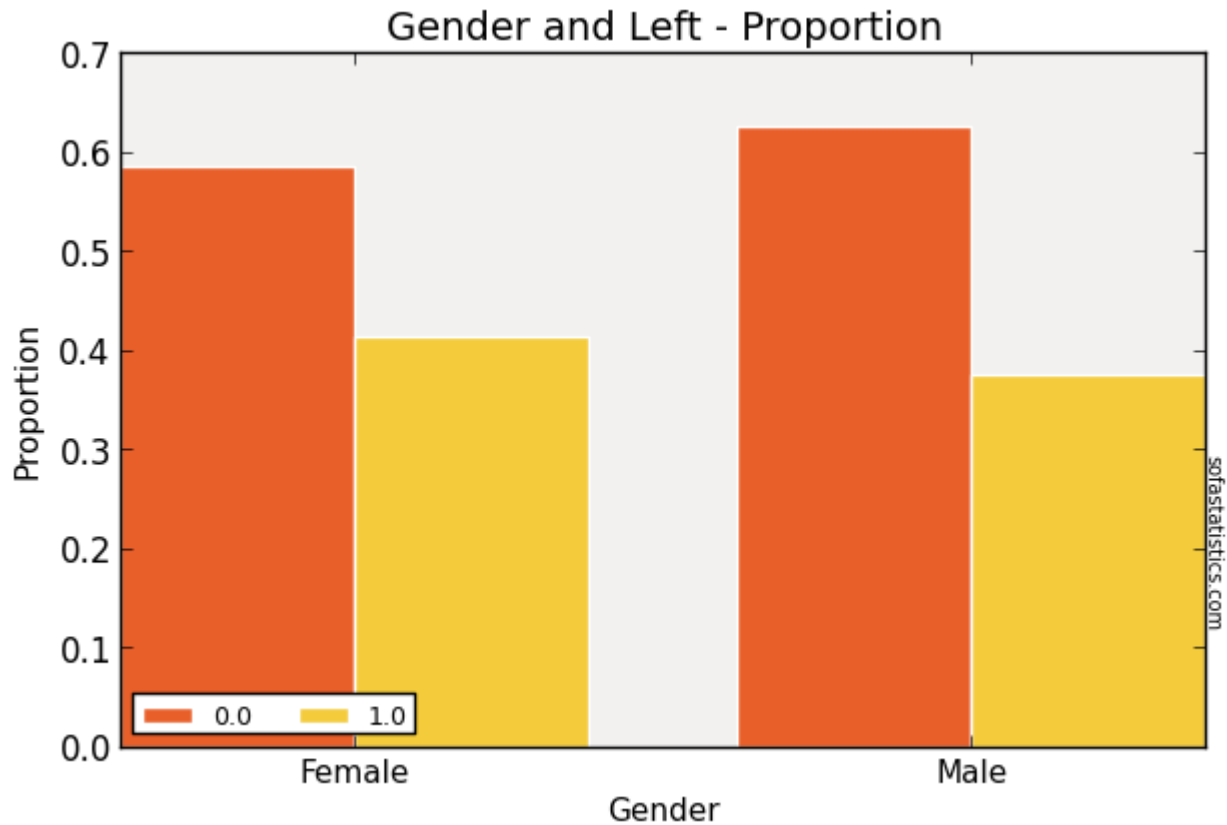
Degrees of Freedom (df): 1

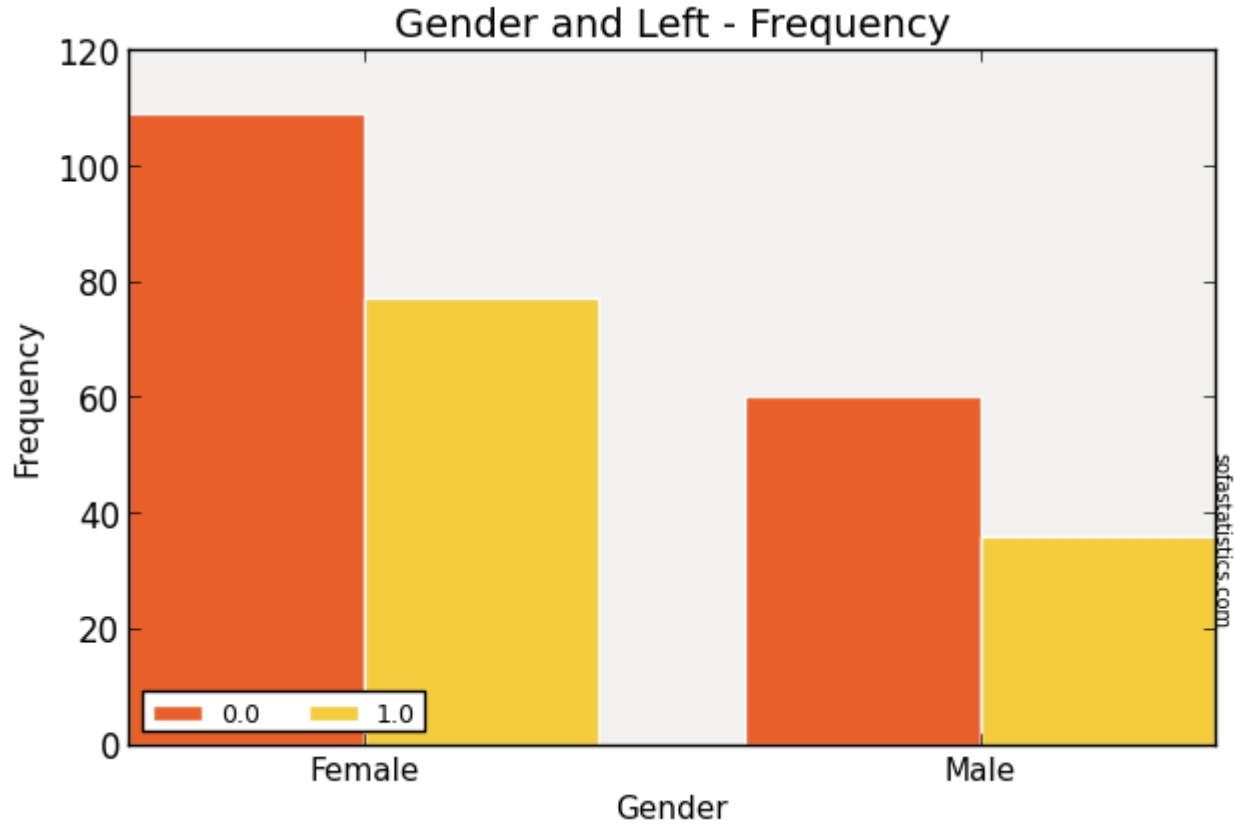
|        |        | Left |       |     |       |       |       |
|--------|--------|------|-------|-----|-------|-------|-------|
|        |        | 0.0  |       | 1.0 |       | TOTAL |       |
|        |        | Obs  | Exp   | Obs | Exp   | Obs   | Exp   |
| Gender | Female | 109  | 111.5 | 77  | 74.5  | 186   | 186.0 |
|        | Male   | 60   | 57.5  | 36  | 38.5  | 96    | 96.0  |
|        | TOTAL  | 169  | 169.0 | 113 | 113.0 | 282   | 282.0 |

Minimum expected cell count: 38.468

% cells with expected count < 5: 0.0

<sup>1</sup> If p is small, e.g. less than 0.01, or 0.001, you can assume the result is statistically significant i.e. there is a relationship.





Figures 1 and 2. Frequencies and Proportions of “Gender” and “Left”

The results demonstrate that we fail to reject the null hypothesis that gender is related to right or left-brained orientation in students currently matriculating in business courses.

Finally we examine if the right or left-brained orientation is related to whether the students are MBA or undergraduate students. Again we will use a chi-square test of independence. The results of this analysis are shown below:

Table 3. Results of Pearson's Chi Square Test of Association Between "Class" and "Left"

p value: 0.332 <sup>1</sup>

Pearson's Chi Square statistic: 0.942

Degrees of Freedom (df): 1

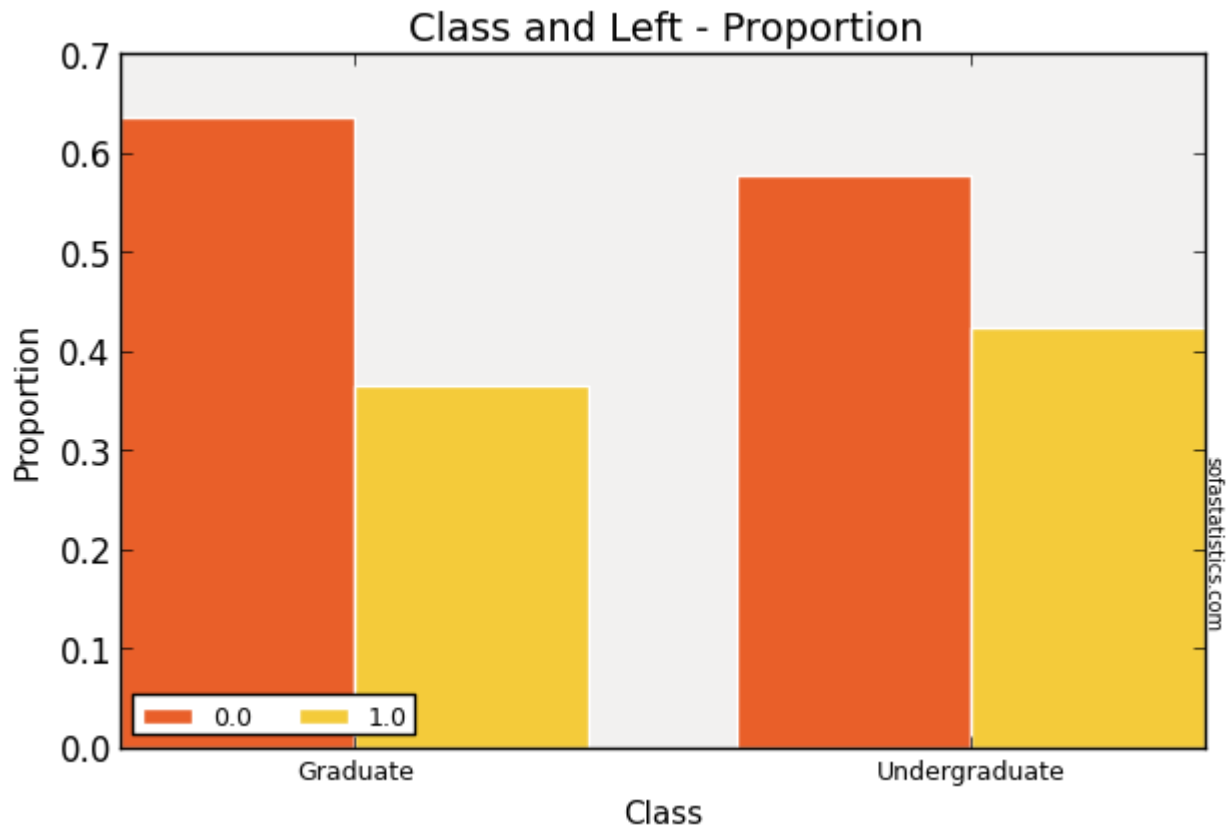
|       |               | Left |       |     |      |       |       |
|-------|---------------|------|-------|-----|------|-------|-------|
|       |               | 0.0  |       | 1.0 |      | TOTAL |       |
|       |               | Obs  | Exp   | Obs | Exp  | Obs   | Exp   |
| Class | Graduate      | 68   | 64.1  | 39  | 42.9 | 107   | 107.0 |
|       | Undergraduate | 101  | 104.9 | 74  | 70.1 | 175   | 175.0 |

|       |  | Left |       |     |       |       |       |
|-------|--|------|-------|-----|-------|-------|-------|
|       |  | 0.0  |       | 1.0 |       | TOTAL |       |
|       |  | Obs  | Exp   | Obs | Exp   | Obs   | Exp   |
| TOTAL |  | 169  | 169.0 | 113 | 113.0 | 282   | 282.0 |

Minimum expected cell count: 42.876

% cells with expected count < 5: 0.0

<sup>1</sup> If p is small, e.g. less than 0.01, or 0.001, you can assume the result is statistically significant i.e. there is a relationship.







Figures 3 and 4. Frequencies and Proportions of “Class” and “Left”

The results demonstrate again that we fail to reject the null hypothesis that class (undergraduate or MBA) is related to right or left-brained orientation in students currently matriculating in business courses.

### Conclusions

In this study we tested whether brain specialization was related to students self-selecting into business programs at colleges and universities. This research helps to develop an interesting line of thought around the type of people we attract to business programs and therefore the quality of the managers these programs educate. The results worked in the opposite way as expected and even held across gender and whether or not the students were enrolled in graduate or undergraduate courses as we found no significant interactions with these additional variables which would steer us to a different conclusion about the main effect. However, one can consider this to be a good outcome given the fact that many firms today having already focused on quantitative analysis as a competitive advantage are now looking at ways they can stimulate innovation within their organizations. This proves to be difficult especially in larger firms who don't have the history and culture in these types of activities. The information gleaned from this research should be useful for both

business school and industry leaders. We all have no doubt that quantitative skills are important to any business activity. However, are there skills we are missing? If so, what are they and how can we further attract this talent? Some futurists point to the fact that in a world when all firms have equal information and access to that information then qualitative or creative skills will rule. Of course there are limitations on the size and sampling frame used in this study which should be addressed with further research. One other area of interest for further research is how we attract talent which is more innovative and at the same time quantitative. In other words to not necessarily attract both types of individual talent. In summary, this is an important piece of research shedding light on the type of talent we are attracting to business schools today which has implications on how our future business leaders will behave.

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## 8: The Measuring Instrument:

### Hemispheric Dominance Inventory Test

1. When you walk into a theatre, classroom, or auditorium (and assuming there are no other influential factors), which side do you prefer?  
 Right  
 Left
2. When taking a test, which style of questions do you prefer?  
 Objective (true/false, multiple choice, matching)  
 Subjective (discussion)
3. Do you often have hunches?  
 Yes  
 No
4. When you have hunches, do you follow them?  
 Yes  
 No
5. Do you have a place for everything and keep everything in its place?  
 Yes  
 No
6. When you are learning a dance step, is it easier to...  
 Learn by imitating the teacher and getting the feel of the music?  
 Learn the sequence of movements and talk your way through the steps?
7. Do you like to move your furniture several times a year, or do you prefer to keep the same arrangement?  
 Keep  
 Move
8. Can you tell approximately how much time passed without a watch?  
 Yes  
 No
9. Speaking in strictly relative terms, is it easier for you to understand...  
 Algebra  
 Geometry

10. Is it easier for you to remember people's names or to remember people's faces?

Names

Faces

11. When given the topic "school," would you prefer to express your feelings through drawing or writing?

Drawing

Writing

12. When someone is talking to you, do you respond to the word meaning, or do you respond to the person's word pitch and feelings?

Word meaning (what is said)

Word pitch and feeling (how it is said)

13. When speaking, do you use few gestures, or do you use many gestures (that is, do you use your hands when you talk)?

Few gestures (very seldom use hands when you talk)

Many gestures (often use hands when you talk)

14. Your desk or where you work is...

Neat and organized

Cluttered with stuff that you might need

15. Is it easier for you to read for main ideas or to read for specific details?

Main ideas

Specific details

16. Do you do your best thinking sitting erect or lying down?

Sitting erect

Lying down

17. Do you feel more comfortable saying/doing humorous things or saying/doing well-reasoned things?

Humorous things

Well-reasoned things

18. In math...

You can explain how you got the answer

You can get the answer but not explain how

## Answers below ...

1. When you walk into a theatre, classroom, or auditorium (and assuming there are no other influential factors), which side do you prefer?

**L** Right

**R** Left

2. When taking a test, which style of questions do you prefer?

**L** Objective (true/false, multiple choice, matching)

**R** Subjective (discussion)

3. Do you often have hunches?

**R** Yes

**L** No

4. When you have hunches, do you follow them?

**R** Yes

**L** No

5. Do you have a place for everything and keep everything in its place?

**L** Yes

**R** No

6. When you are learning a dance step, is it easier to...

**R** Learn by imitating the teacher and getting the feel of the music?

**L** Learn the sequence of movements and talk your way through the steps?

7. Do you like to move your furniture several times a year, or do you prefer to keep the same arrangement?

**L** Keep

**R** Move

8. Can you tell approximately how much time passed without a watch?

**R** Yes

**L** No

9. Speaking in strictly relative terms, is it easier for you to understand...

**L** Algebra

**R** Geometry

10. Is it easier for you to remember people's names or to remember people's faces?

**L** Names

**R** Faces

11. When given the topic "school," would you prefer to express your feelings through drawing or writing?

**R** Drawing

**L** Writing

12. When someone is talking to you, do you respond to the word meaning, or do you respond to the person's word pitch and feelings?

**L** Word meaning (what is said)

**R** Word pitch and feeling (how it is said)

13. When speaking, do you use few gestures, or do you use many gestures (that is, do you use your hands when you talk)?

**L** Few gestures (very seldom use hands when you talk)

**R** Many gestures (often use hands when you talk)

14. Your desk or where you work is...

**L** Neat and organized

**R** Cluttered with stuff that you might need

15. Is it easier for you to read for main ideas or to read for specific details?

**R** Main ideas

**L** Specific details

16. Do you do your best thinking sitting erect or lying down?

**L** Sitting erect

**R** Lying down

17. Do you feel more comfortable saying/doing humorous things or saying/doing well-reasoned things?

**R** Humorous things

**L** Well-reasoned things

18. In math...

**L** You can explain how you got the answer

**R** You can get the answer but not explain how