2001

The Relationship Between Brain Dominance and Career Interests

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THE RELATIONSHIP BETWEEN BRAIN DOMINANCE AND CAREER INTERESTS

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APPROVAL PAGE

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Damon Cary

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CHAPTER I

INTRODUCTION

The researcher was preparing to attend the Herrmann Brain Dominance Instrument (HBDI) certification workshop in Boston, Massachusetts, as part of a certification series. The researcher had the privilege of participating in a cross-functional group discussion about the HBDI. Several of the individual participants were HBDI certified practitioners, and who discussed the brain being divided into two hemispheres (left brain and right brain). The participants stated that individual thinking preferences could be identified from casual conversation.

As the discussion progressed, the participants began discussing careers. From this discussion came the possibility that individuals who have a preferred method of thinking do not necessarily choose their careers because of that chosen preference.

STATEMENT OF THE PROBLEM

The problem of this study was to determine the relationship between brain dominance and career selection being guided by financial expectations or career interests.

HYPOTHESIS

The following hypothesis was developed to guide this study:

H_0: There is no relationship between left and right brain dominant individuals and their career selection being guided by financial expectations or career interests.

BACKGROUND AND SIGNIFICANCE

Ned Herrmann states (1995):

> Brain dominance was expressed in terms of how we prefer to learn, understand, and express something. First, dominance gives an automatic lead response to any situation and enhances our ability to respond quickly and effectively by eliminating a decision-making step. Second, dominance has given us higher skill levels than we could otherwise attain. Dominance is part of the normal human condition.

When applying the application to brain modality, Herrmann examined the context of preferences. He noted that the "left-brain approach to solving a problem would be fact-based, analytical and step-by-step, perhaps an engineering or law student. The right-brain strategy, by contrast, would seek out insight, images, concepts, with learning preferences to studying psychology, art, or music" (Hermann, 1995).

By analyzing the specific brain modality, conclusions were made about individual thinking preferences, making it possible to examine the context of individuals and their career interests. These conclusions can be used to prescribe a best-fit job situation based on work environment and those learning preferences (Herrmann, 1995). The preferences can lead to better job satisfaction for the individual and organization, and therefore creating and maintaining potential long-term employees.

LIMITATIONS

This study was limited in that the amount of brain dominance research available was non-verified and mostly opinionated. Brain dominance research continues to be in the developmental stage (Herrmann, 1995). This study was also limited in part to the Newport News Shipbuilding O-88 Implementation Team and the number of individuals that make up the team.

The participant's responses to the Job Satisfaction Survey also limited this study. The survey was interpreted to measure the financial expectations and the level of job satisfaction for each individual in the Newport News Shipbuilding O-88 Implementation Team.

ASSUMPTIONS

The study was based on the following major assumptions:

1. The Herrmann Brain Dominance Instrument would be used as an instrument to determine an individual's thinking preference.
2. The Job Satisfaction Survey would be used to determine individual's level of job satisfaction and financial expectations based on their responses.

PROCEDURES

Individuals were asked to complete the Herrmann Brain Dominance Instrument. They were then debriefed on their individual profile and were asked by the researcher to complete a Job Satisfaction Survey. Information could be gathered from the responses in the survey and compared to their level of job satisfaction and financial expectations. A chi-square was used to compare left-brain and right-brain dominance to financial expectations and job satisfaction with career interests. Recommendations were made to further the study of brain dominance and career selection.

DEFINITIONS OF TERMS

A few terms used in the readings needed to be defined in order to understand this study.

Brain dominance – the condition or fact that one hemisphere controls the processing of information involved in a particular mental task (Herrmann, 1995).

Career Interests – reference to career interest infers both job satisfaction and financial expectations.

Chi-square – A means of answering questions about data existing in the form of "frequencies", rather than as scores or measurements along some scale (Ritz, 1999).

Duality – used to discuss individuals with more than one dominant preference to their thinking.

Financial expectations – The expectations that equate to each individual definition of what they desire in a compensatory offer.

HBDI – The Herrmann Brain Dominance Instrument. It is used to measure thinking preferences in an individual's brain.

Job satisfaction - A feeling that the career choice of an individual fulfills the factors that they predetermine as satisfying. The descriptors that define job satisfaction are contingent rewards, operating conditions, coworkers, nature of work, and communication.

Job Satisfaction Survey – Questionnaire used to measure the job satisfaction levels and financial expectations of individuals.

Laterality – Refers to both sides of the brain, another name for hemisphere.

Left-brain dominant – Describes individuals who have thinking preferences on the upper and lower left-sides of their brain. These types of individuals tend to be more analytical, mathematical, and logical.

Preferences – This is the preferred choice of thinking style that was identified on the HBDI.

Quadrants – A model of the brain that is divided in four equal parts.

Right-brain dominant – Describes individuals who have thinking preferences on the upper and lower right sides of their brain. These types of individuals tend to be more emotional, spatial, and aesthetic.

Thinking preference – Any of the four quadrants (upper/lower left and upper/lower right side) of the brain that is plotted or identified through HBDI. Upper left (A) quadrant is the analyzing side. Lower left (B) quadrant is the organizing side. Lower right (C) quadrant is the personalizing side. Upper right (D) quadrant is the visualizing side.

OVERVIEW OF CHAPTERS

The problem of this study was to determine the relationship between left and right brain dominant individuals in the Newport News Shipbuilding O-88 Implementation Team and whether these individuals selected their careers guided by financial expectations or career interests. The HBDI measures brain dominance and thinking preferences. The purpose of Chapter I was to provide a detailed introduction of the study.

In Chapter II, a review of literature supporting brain dominance, the Herrmann Brain Dominance Instrument, financial expectations, and job satisfaction with career interests were examined. In Chapter III, the methods and procedures used for conducting this study were described. In Chapter IV, the findings from the study were presented. Chapter V contains the summary, conclusions, and future recommendations of the study for other research usage.

CHAPTER II

REVIEW OF LITERATURE

Chapter II is the review of literature. It is a review of brain dominance, Hermann Brain Dominance Instrument, Job Satisfaction with career interests, and Financial expectations.

Brain Dominance

Brain dominance is expressed in terms of how we prefer to learn, understand, and express something. The term brain dominance is used to describe the thinking modes of the brain. The brain is divided into two halves, left and right. The halves are often referred to as hemispheres.

The term brain dominance focuses on word usage complementing a general or specific context. Use of the popular term dominance, however, may warrant additional consideration regardless of context. Another relatively universal deduction related to the study of human laterality (in general) is that despite the specializations of each hemisphere, the sides of the brain communicate with each other (interplay via the corpus callosum) to some degree, depending on the complexity of the task. Although a function may depend more on one hemisphere than on the other (e.g., language, motor control), the notion that one hemisphere is "dominant" and the other "non-dominant" is possibly too simplistic for describing most tasks (Gabbard, 1997).

Hemispheric Differences

Certain individuals possess qualities that make them double dominant. Their preferred mode of thinking allows them to use both hemispheres equally. Individuals that display a double dominance are able to use both sides of the brain to logically process

thoughts and create intrinsic values and decisions. The average individual processes thoughts from the left hemisphere.

The left hemisphere of the brain, having been described as analytic in orientation, focuses on individual elements within a field and analyzes them sequentially (McCluskey and Parish, 1993). The left hemisphere also supports speech in the vast majority of people, and there is growing evidence that the left brain is superior when it comes to analyzing fine details in vision, audition, and touch (Haseltine, 1999). That is, the left hemisphere processes verbal and nonverbal sequential information.

In contrast, the right hemisphere of the brain is thought to be more creative and relational in nature, and is predisposed to see wholes simultaneously (McCluskey and Parish, 1993). The right cerebral hemisphere, by contrast, does a better job than the left in reading facial expressions, decoding tone of voice in speech, and comprehending the big picture in visual, auditory, and tactile stimuli. The function of the right hemisphere is single-stage, parallel processing of many elements of information as a single whole.

Most people favor their right hands and feet. The left halves of their brains control the right sides of their bodies and are better suited for fine movements (Haseltine, 1999). The right side of the brain controls the emotions and conceptual thought (Herrmann, 1995). Thus right-handed/right-eyed individuals are generally more analytic in orientation because they are left-brain dominant, while left-handed/left-eyed individuals are thought to be more holistic and creative in nature because they are right-brain dominant (McCluskey and Parrish, 1993).

The Right Hemisphere and the Limbic System

The discovery of the correlation between the right hemisphere and the limbic portions of the brain added another dynamic to the study of the brain. The function of the right hemisphere and the limbic system are closely associated with the processing of emotions. Evidence suggests that there is a greater interconnection between the limbic system and the right hemisphere than between the limbic system and the left hemisphere (Rotenberg and Weinberg, 1999).

Emotions are multidimensional experiences. They are conveyed using words but continuously transform themselves through personal experiences. Emotions are unique and complex in their interpretations. The right hemisphere performs the conceptualization and spatial processes for the brain. It allows individuals to see the big picture and understand relationships. The right hemisphere stores memory within the brain (spatial processes) by providing a stimulus for the memory of the emotion items. That stimulus is directly related to emotional arousal that is caused in the brain.

The Left Hemisphere and the Cerebral Cortex

The left hemisphere and the cerebral cortex help process the logical memory. The left hemisphere tends to be more involved in the process of formal learning and the process of semantic memories, or memories that are related to signs and their interpretation. Semantic memories are encoded in the left hemisphere. They are signs or symbols that have a special meaning to the individuals. When the learner experiences a particular emotion (either positive or negative) during learning, a context that centers on that emotion is created. The context may be a verbal or visual stimulus.

Consequently, when that emotion is aroused again, the context becomes more available and recall improves. That ability to store emotions and reference back to them is contained in the left hemisphere of the brain. An example might be the ability to relate a match to fire and the potential danger that the situation could be from its misuse. That context is monosemantic, singular symbol related to a memory, and may be maintained by the left hemisphere.

Thus, the influence of emotions on semantic memory is attributable to emotional fit between retrieval and encoding contexts. Those contexts may be formed on the basis of either positive or negative emotions. However, emotional valence, ability to react and interact with emotion, does not affect semantic memories. Emotions serve simply as a context for semantic memories (Rotenberg and Weinberg, 1999). Whether in their symbol or contextual form, emotions serve as a catalyst for long-term or short-term memory in the brain.

The Herrmann Brain Dominance Instrument

In 1976, while a manager at General Electric, Ned Herrmann created and developed the Herrmann Brain Dominance Instrument (HBDI). Hermann conducted his research with large groups. For over 20 years, through tens of thousands of surveys, the data have been validated with prominent brain research institutions, including the Educational Testing Service. The HBDI measures a person's preference both for right-brained or left-brained thinking and for conceptual or experiential thinking. These preferences attract people of particular brain dominance profiles. Herrmann referred to the most common or average profile for certain occupations as occupational norms (Herrmann, 1995).

Herrmann used the brain hypothesis, which established the brain as the center of mankind's experience, emotions, and desires. The hypothesis was used as the foundation of neuropsychology that reflected centuries of theoretical investigations, experimental research, and debate (Herrmann, 1995). Herrmann took the studies of past brain research one step farther. He examined the interconnectedness of the brain and all its specialized functions. When other research, the triune brain theory, which says the brain is in reality three brains, and the left brain/right brain theories were combined with his findings, the concept of quadrality was created (Herrmann, 1995).

Herrmann divided the cerebral and limbic portions of the brain into four hemispheres or quadrants. He labeled each quadrant with a letter and color-coded each quadrant for identification.

The upper left quadrant was labeled A and colored blue. The A-quadrant means that individuals favor activities that involve analyzing, dissecting, figuring out, solving problems logically, and getting facts (Herrmann, 1995).

The lower left quadrant was labeled B and colored green. The B-quadrant is similar to the A-quadrant in that they are both verbal. They both have a linear approach to thinking and reject ambiguity. The B-quadrant individual prefers to keep things safe and predictable (Herrmann, 1995).

The lower right quadrant was labeled C and colored red. The C-quadrant might be looked upon as the most sensitive and receptive. The C-quadrant sops up experience like a sponge – about mood, and atmosphere, attitudes, and energy levels. The primary modes are emotional and spiritual (Herrmann, 1995).

The upper right quadrant was labeled D and colored yellow. The D-quadrant is where individuals thrive on excitement of new ideas, possibilities, variety, oddities, incongruities, and questions that sound obvious but actually go to the heart of a matter. The D-quadrant is where individuals fear structure because it hinders ideas and energy (Herrmann, 1995). The left side of the brain and right side of the brain in their wholeness is the topic on this study.

Left-Brain

The left-brain controls the logical sequential processes. There is also some suggestion that this specialization, like that for language, is more pronounced for production than for the perception of sequence. It is of course suggested that language, in its oral form, is fundamentally sequentialized, which has origins in the left-hemisphere specialization (Corballis, 1983). The left hemisphere includes dominance of language, specialization of the tongue and other articulation, and more advanced motor skills (Corballis, 1983). The left brain is where the more analytical, logical, and social individual finds comfort.

Right-Brain

The right hemisphere is generally dominant in the expression of facial emotion (Corballis, 1983). The right hemisphere controls the ability to smile, frown, and look puzzled and any other of the facial expressions that reflect emotions. In addition, the right hemisphere controls functions that are not encountered with language or specialized involvement of the left hemisphere in sequencing or rhythm. The right hemisphere specialization is relative rather than absolute (Corballis, 1983). The relative cell refers to emotions that are not concrete but almost abstract. The right brain individual is strong in

the perception of certain situations. These individuals have strong convictions in the conceptual realm. The representation of spatial sense is the comfort area for these individuals.

Job Satisfaction or Better Career Selection

Job satisfaction has many factors. The values have to be examined to the extent of what causes employees to experience job satisfaction.

> Job satisfaction is clearly related to levels of intrinsic empowerment. Job satisfaction refers to individuals' affective relations to their work role and function of the perceived relationship between what one wants from one's job and what one perceives it is offering. The strength of an individual's "desires, or his/her level of aspirations in a particular area" are an important factor in job satisfaction. Those with the strongest desires or highest aspirations are least happy with their job if the environment does not facilitate satisfaction of their needs (Davis, 2000).

Though the level of job satisfaction is an intrinsic measure, the level of financial expectations may not be directly related. The perceived notion of job satisfaction varied among individuals. This research examined job satisfaction through a survey. The survey measured needs and characteristics in order to assess an individuals level of job satisfaction.

Personal Satisfaction needs

In examining personal job satisfaction, according to Ellis,

> Job satisfaction is directly tied to job performance and success. If you enjoy what you are doing, believe in it and know why you chose to do it, you will tend to be more committed to it, better at it, and you'll work harder to do it well. This commitment to a strong work ethic is what helps us achieve greatness. If we are happy, we look toward the future with ambitions, goals and dreams. If we are just getting by in our jobs, we could care less about whether or not we got the job done or showed up for work at all. We do more looking back at what could have been or should have been and can only see the future as more of the same dissatisfaction. Success means taking an active role in the growth and development of our personal and professional life (Ellis, 1998).

Personal satisfaction can be linked to job performance. Regardless of the financial expectations if individuals are often satisfied with what they do that outweighs other aspects of their position. If an individual is committed to the job performance, then both the individual and organization prosper.

Job Satisfaction Survey

In order to interpret the meaning of job satisfaction, the researcher is using a survey to measure the level of job satisfaction. Job satisfaction for this study is measured using the following variables: the amount of contingent rewards, an individuals operating procedures, coworkers, the nature of the work they perform, and communication preferences for that individual.

Job satisfaction was measured using Paul Spector's Job Satisfaction Survey (JSS), adapted with permission for this research. The JSS, in its original format, assesses nine facets of job satisfaction, as well as overall satisfaction (Spector, 1985).

The JSS can be scored using a sub-scale that produces a facet score. The JSS was computed to yield an accurate score based on the way the respondents answered the question that corresponds to the area that measures job satisfaction. It was a Likert scale type measurement that provided the feedback for the level of job satisfaction. The survey rearranged the questions to allow for a dispersion of the information. An individual can score from one to six, which allowed for the researcher to apply that score to a pre-determined sub-scale in order to analyze the level of job satisfaction.

Employer Needs

In order to understand levels of job satisfaction in individuals, a critical element was to look at employer needs. The researcher intended for the employer to understand that there is an important connection in job satisfaction and the employees needs. Individuals measure their level of job satisfaction based on the job that they do. In a recent article from American Society of Training and Development, Stacey Wagner writes:

> The cost of losing workers notwithstanding, and engendering employee loyalty is good for business. Loyal employees provide a return-on-investment that's recognized and rewarded by the stock market. "Companies with highly committed employees tend to post sharply higher shareholder returns". Wagner also found a correlation between organizational investment in training (employee development) and higher stock market returns to those organizations (2000).

By examining a trend for American workers who received employer-sponsored training it was discovered that the more individuals are satisfied with their jobs, the more likely they are to stay with their employer than those who do not receive any training. Employees know their worth in the marketplace, and they are doing something about it. They are taking responsibility for their development and demanding that employers help (Wagner, 2000).

Employers need to take a problematic approach to examining the job satisfaction of their employees. Employers should want the best-fit situation to exist to ensure company profitability and organizational productivity.

According to the ASTD-SHRM study these actions are most important for recruiting and retaining workers (Wagner, 2000):

Value your workers.

- Tie workforce initiatives to organizational strategies.
- Understand your identity and culture.
- Hire right.
- Understand the importance of employee growth and career development.
- Link training to HR and operations.
- Provide training and development for everyone.
- Use competencies.
- Track, measure, evaluates initiatives.

The value of the employees' level of job satisfaction can be used to retain the workforce that is currently in place. The level of commitment involved is well worth the help to the employee and employer.

Financial Expectations

The level of financial expectations was measured on the amount of money that satisfied an individuals' physiological needs. Based on Maslow's hierarchy of needs, the financial aspect is when individuals' needs are self-actualized. Financial expectations, for the purpose of this study, are considered but not limited to: a 401K plan, the number of promotions, salary increases, bonus packages and any other fringe benefits packages. The level of financial expectations was measured in the Job Satisfaction Survey. The factors listed are examples and are not intended to be an all exclusive list of factors for financial expectations.

Summary

A review of literature that pertains to Brain Dominance, the Herrmann Brain Dominance Instrument, Job Satisfaction, and Financial Gains has focused on some unique points. The different brain hemispheric differences and their effect on the behavior of those individuals were examined in Chapter II. The Hermann Brain Dominance Instrument and the individuals thinking preferences and how they were

applied to job opportunities were reviewed. Job satisfaction and financial expectations were individual preferences that were measured using the Job Satisfaction Survey.

In Chapter III, a review of methods and procedures was conducted. This section will include how the research was conducted and an explanation of the instrument design.

CHAPTER III

METHODS AND PROCEDURES

This chapter contains a description of the methods and procedures used to conduct a study to determine the relationship between left-brain and right-brain dominant individuals and whether individuals select their careers guided by financial expectations or career interests. This chapter includes a description of the population, Herrmann Brain Dominance Instrument, Job Satisfaction Survey instrumentation design, data collection and data analysis. The chapter concludes with the procedures that were used to for analysis of the problem.

POPULATION

The population sampled was the Newport News Shipbuilding O-88 Implementation Team that consisted of twenty individuals. The team consisted of trainers and administrative and clerical staff responsible for implementing Integrated Processes and Product Development (IPPD) as stated by contract requirements from the Navy.

INSTRUMENT DESIGN

Information was gathered from individuals using the Herrmann Brain Dominant Instrument assessment. The assessment used 120 questions that were generated from Hermann International to measure individual thinking preferences. The assessment plotted a picture of the thinking preferences on a graph and identified whether individuals were left brain or right brain dominant.

Additional data was obtained from the Job Satisfaction Survey. The survey measured the job satisfaction level of individuals based on their individual responses. A sample of the instrument was included in Appendix A.

METHODS OF DATA COLLECTION

The Job Satisfaction Survey was delivered to the respondents in a sealed envelope that included a return envelope to the researcher. The respondents completed the Herrmann Brain Dominance Instrument online. To protect their privacy, the HBDI was debriefed by a certified practitioner at the respondent's choice of location.

The Job Satisfaction Survey was kept confidential from everyone except the researcher to protect the privacy of the respondents. Names were not asked to be included on the survey. The respondents were surveyed during the week of April 6th, 2001. The respondents were asked to share their brain dominance from their HBDI, on the first question on the Job Satisfaction Survey.

STATISTICAL ANALYSIS

The purpose of the study was to discover if there was a relationship between left brain and right brain individuals and why they chose their careers. The statistical method used was the chi-square. Information was discerned to find if there was a relationship between left brain and right brain individuals and financial expectations and job satisfaction.

SUMMARY

The purpose of Chapter III was to provide a description of how the relationship was to be examined and identify the methods and procedures used. The chapter included instrumentation design and the variables from the research goals that were compared.

Chapter IV represents the findings of the study using the chi-square to determine the result of the hypothesis.

CHAPTER IV

FINDINGS

The problem of this study was to determine the relationship between left and right brain dominant individuals in the Newport News Shipbuilding O-88 Implementation Team and whether they selected their careers guided by financial expectations or career interests. This chapter contains a detailed analysis of data collected to answer the hypothesis and a summary of the research findings. There were twenty respondents contacted to participate in the Job Satisfaction Survey. Of the twenty respondents, the researcher received a 100% response rate.

Brain Dominance

Table 1 shows the number left-brained and right-brained dominant individuals. The total number of left-brain respondents was 11. The expected number of left-brain respondents was 10. There was one more left brain respondent than the expected number; therefore a residual of 1.0 was calculated. The total number of right-brain respondents was 9. There was one less right brain respondent than the expected number, therefore a residual of –1.0 was calculated.

Brain Dominance – Table 1

	# of Actual Respondents	Expected # of Respondents	Residual ($\leq$ or $\geq$ the expected # of Respondents)
Left-Brain	11	10	1.0
Right-Brain	9	10	-1.0
Total	20	20	0.0

Career Interests

The career interests were determined on two categories and their sub-scale contents in the Job Satisfaction Surveys (JSS). The two categories of career interests were financial expectations and job satisfaction. The sub-scales for the financial expectation category were pay, contingent rewards, promotion, and financial expectations. The sub-scales for job satisfaction were operating conditions, supervision, co-workers, and communication.

For every sub-scale there was a minimum of two questions, one with a positive response and one with a negative response. The positive response was added to the sum of the category. The negative question was scored using the sum of the highest and lowest number for the response, then subtracting the respondent's choice to yield a score for that question. An example for scoring a negative question utilizes a range from 1 (lowest) to 6 (highest), thus the sum was 7. Then, subtract the response given, and use that figure in the overall sum of the category.

The financial expectations had a scale ranging from 8-48, and job satisfaction had a scale ranging from 11-66. The range for the financial expectation category was 40. The range for the job satisfaction category was 55. After calculating the scores for each survey category, they were divided by the range of each category. The highest percentage between both categories indicated the career interests of the respondents.

Table 2, analyzes the relationship between job satisfaction and financial expectations. The table shows the frequency of the respondents career interests, which are financial expectations and job satisfaction. The observed N of respondents who chose their career for financial expectations was 2. The expected N was 10, thus yielding a

residual of –8.0. There were 8.0 less respondents expected for the frequency of individuals who chose their careers for financial expectations. The observed N for individuals who chose their career for job satisfaction was 18. The expected N was 10, thus yielding a residual of 8.0. There were 8.0 more respondents expected for the frequency of individuals who chose their careers for job satisfaction.

Career Interests – Table 2

	# of Actual Respondents	Expected # of Respondents	Residual (≤ or ≥ the expected # of Respondents)
Financial Expectations	2	10	-8.0
Job Satisfaction	18	10	8.0
Total	20	20	0.0

Chi-Square

Table 3 shows a chi-square matrix that examined the relationship between brain dominance and career interests. The matrix identified that 10 respondents who selected job satisfaction were left-brained compared to 8 who were right-brained. The matrix identified that 1 left-brained individual selected their career based on financial expectations compared to 1 right-brained individual. The calculated chi-square (x^2) was 4.615.

Chi-Square – Table 3

	Left Brain	Right Brain
Job Satisfaction	10	8
Financial Expectations	1	1

SUMMARY

This chapter included the findings and a summary of the data collected for the research to determine whether to accept or reject the hypothesis. The identification of the respondents' brain dominance and career interests were included in the chapter. The findings included a description how the Job Satisfaction Survey was scored in order to identify the career interests. Chapter V includes the summary, conclusions, and recommendations to the research.

CHAPTER V

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

This chapter contains a summary of the research conducted. It contains the conclusions for the research and the recommendations to further the study.

SUMMARY

The problem of this study was to determine the relationship between brain dominance and career selection being guided by financial expectations or career interests. The following hypothesis was developed to guide this study, H_o: There is no relationship between left and right brain dominant individuals and their career selection being guided by financial expectations or career interests.

To test the hypothesis, information was gathered using a Job Satisfaction Survey (JSS) and the Herrmann Brain Dominance Instrument (HBDI). The significance of the study was to determine if individuals who are predominantly left or right brained chose their careers to meet their financial expectations or for job satisfaction. The research study was limited to individuals in the O-88 Implementation Team at Newport News Shipbuilding. The team consisted of twenty Integrated Product Team (IPT) Trainers responsible for implementing Integrated Products and Process Development or IPPD at Newport News Shipbuilding.

The HBDI was the instrument utilized to determine the individual's brain dominance. Each participant was asked to review, in confidentiality, his or her HBDI profile to find his or her brain dominance. The Job Satisfaction Survey was used to determine if the participants selected their career based on career interests of financial expectations or job satisfaction. The data from the survey were collected, analyzed and

the findings placed into a matrix to examine the frequencies. A chi-square was used to show the relationship between left-brained and right-brained individuals and their career interests between financial expectations or job satisfaction.

CONCLUSIONS

The following hypothesis was developed to guide this study:

H_0: There is no relationship between left and right brain dominant individuals and their career selection being guided by financial expectations or job satisfaction.

Based on the findings of the Job Satisfaction Survey, Herrmann Brain Dominance Instrument, and the chi-square, it was the concluded that the hypothesis should be rejected.

Since the chi-square value of 4.615 exceeds 3.840 at the .05 level and falls below 6.640 at the .01 level required for significance, the hypothesis is rejected. In other words, the researcher may conclude that there is a relationship between left-brained and right-brained dominant individuals and their career selection being guided by financial expectations or job satisfaction. More specifically left-brained and right-brained individuals prefer to choose their careers guided by job satisfaction and not their financial expectations.

RECOMMENDATIONS

The chi-square shows the relationship between brain dominance and the career interests for the Newport News Shipbuilding O-88 Implementation Team. There are recommendations that need to be addressed.

1. A recommendation would be to utilize a more diverse sample of individuals to see if the results would change.

2. A recommendation would be to survey individuals in the medical, technical, educational, and entrepreneurial occupational fields to discover if the brain dominance of those individuals correlated to their career choice using the HBDI.
3. A final recommendation would be to determine if individuals would switch their career interests based on the results of their brain dominance.

BIBLIOGRAPHY

Corballis, M. (1983). Human laterality. New York: Academic Press.

Davis, J., and Wilson, S. (2000). Principals' Efforts to Empower Teachers: Effects on Teacher Motivation and Job Satisfaction and Stress. The ClearingHouse, v73 349.

Ellis, M. (1998). Self-assessment: knowing yourself and what you want to do! The Black Collegian, v29 36-39.

Gabbard, C. (1997). Coming to terms with laterality. The Journal of Psychology, v 31 561- 564.

Haseltine, E. (1999). Your Better Half. (determining brain lateralization). Discover, v20 112.

Herrmann, N. (1995). The Creative Brain. Kingsport Tennessee: Quebecor Printing Group.

McCluskey, J. and Parrish, T. (1993). Where Today is Tomorrow in Health Care. Education v113. 553 – 556.

Ritz, J. (2000). Course Guide. Old Dominion University, Occupation Technology Education 635.

Rotenberg, V., and Weinberg I. (1999). Human Memory, Cerebral Hemispheres, and the Limbic System: A New Approach. Social, and General Psychology Monographs, v1251 45 – 46.

Spector, P. (1985). Job Satisfaction: Application, Assessment, Causes, and Consequences. New York: Sage Publications.

Wagner, S. (2000). Retention: Finders, Keepers. Training & Development v54, 64.

APPENDICES

APPENDIX A – Job Satisfaction Survey

JOB SATISFACTION SURVEY

Adapted for educational use by Damon Cary – OTED636

Used with permission from author, Paul E. Spector

	Directions: Please circle the one number for each question that comes closest to reflecting your opinion about your job. To answer the first question refer back to your brain dominance profile.	Disagree Very Much	Disagree Moderately	Disagree Slightly	Agree Slightly	Agree Moderately	Agree Very Much
1	Based on the results of your HDBI are your left-brained or right brained?						
2	I feel I am being paid a fair amount for the work I do.	1	2	3	4	5	6
3	My supervisor is quite competent in doing his/her job.	1	2	3	4	5	6
4	I feel a sense of pride in doing my job.	1	2	3	4	5	6
5	When I do a good job, I receive the recognition for it that I should receive.	1	2	3	4	5	6
6	There are few rewards for those who work here.	1	2	3	4	5	6
7	I do not like my job duties, but my financial expectations are being met or exceeded.	1	2	3	4	5	6
8	I sometimes feel my job is meaningless.	1	2	3	4	5	6
9	Communications seem good within this organization.	1	2	3	4	5	6
10	Raises are too few and far between.	1	2	3	4	5	6
11	Those who do well on the job stand a fair chance of being promoted.	1	2	3	4	5	6
12	My supervisor is unfair to me.	1	2	3	4	5	6
13	I have too much paperwork.	1	2	3	4	5	6
14	There is really too little chance for promotion on my job.	1	2	3	4	5	6
15	My efforts to do a good job are seldom blocked by red tape.	1	2	3	4	5	6
16	I find I have to work harder at my job because of the incompetence of people I work with.	1	2	3	4	5	6
17	I like doing the things I do at work.	1	2	3	4	5	6
18	The goals of this organization are not clear to me.	1	2	3	4	5	6
19	I like the people I work with.	1	2	3	4	5	6
20	I choose my career because of my chances to meet my financial expectations.	1	2	3	4	5	6

Damon Cary – ODU – Master of Science – Spring 2001

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APPENDIX B – Scoring Scale

Subscale Contents for the Job Satisfaction Survey – OTED636

SubScale	**Item Number**
Pay	2, 10r
Promotion	11, 14r
Supervision	3, 12r
Contingent Rewards	5, 6r
Operating Conditions	13r, 15
Coworkers	16r, 19
Nature of Work	4, 8r, 17
Communication	9, 18r
Financial Expectations	7r, 20

Item	**Scale Score**
Pay	2 – 12
Promotion	2 – 12
Supervision	2 – 12
Contingent Rewards	2 – 12
Operating Conditions	2 – 12
Coworkers	2 – 12
Nature of Work	3 – 18
Communication	2 – 12
Financial Expectations	2 – 12
Total Scale Score	**19 – 114***

Category – Financial Expectations	
Pay	2 – 12
Contingent Rewards	2 – 12
Promotion	2 – 12
Financial Expectations	2 – 12
Total	**8 – 48**

Category – Job Satisfaction	
Supervision	2 – 12
Operating Conditions	2 – 12
Coworkers	2 – 12
Nature of Work	3 – 18
Communication	2 – 12
Total	**11 – 66**

*Sum lowest (1) to highest (6) – Respondents Choice

r – being negative values for scores.

APPENDIX C – Authorization Letter

NEWPORT NEWS
SHIPBUILDING

4101 Washington Avenue
Newport News, Virginia 23607-2770
Phone: 757-380-2000
http://www.nns.com

April 10, 2001

Stacie Raymer, Ph.D.
College of Education Human Subjects Committee Chair
Department of ESSE, Child Study Center
Old Dominion University
45th Street and Hampton Boulevard
Norfolk, Virginia 23529

Re: Permission to Survey Implementation Team

Dr. Raymer,

In the response to the graduate research that is to be conducted by Damon Cary, I granted him permission to survey the Integrated Product and Process Development Implementation (IPPD) section of the CVNX Program offices. He is a contributing member of the team and is a certified practitioner of HBDI. Damon's survey does not reflect a cooperate position and should not be interpreted as such. The Implementation section is an organizational development and oversight section within a much larger organizational structure of Newport New Shipbuilding responsible for implementing the process of IPPD.

Doug Stitzel
IPPD Implementation

APPENDIX D – Respondent Letter

11 April 2001

Dear Mr./Mrs. Respondent:

My name is Damon Cary and I am a graduate student in the Occupational and Technical Studies Department at Old Dominion University. I would like to thank you for participating in my graduate research. The topic of the research is "The Relationship Between Brain Dominance And Career Interests".

This research will be used for educational purposes and your individual responses will not be showed. The researcher will be the only individual viewing the results to compile a statistical relationship.

Please complete the survey in anonymity and return it in using the envelope provided by April 16, 2001.

After the results have been compiled, the survey will be destroyed to further protect the anonymity of the individuals.

Thank you for your time and cooperation.

Damon Cary
Educational Researcher
OTED636
Old Dominion University Spring 2001

APPENDIX E – Debriefing Process for HBDI

10 April, 2001

Stacie Raymer, Ph.D.
College of Education Human Subjects Committee Chair
Dept. of ESSE, Child Study Center
Old Dominion University
45th St. & Hampton Blvd
Norfolk, VA 23529-0136

Re: COE 01-04-06, Debriefing Process for HBDI

Dr. Raymer,

The debriefing process for the HBDI should include at the very least a short one-on-one session with each individual profiled. During that session, each individual will receive their profile, but after they've had a chance to react to it, the following questions (as well as any other specific questions around the needs of this particular individual and their application of the data) may be broached in a one-on-one coaching session.

The debriefing is a strategic learning process so that as much learning as possible can be gained from the use of the HBDI profile data. The questions below generate a general reaction to the data, and allow a practitioner to ask what new information the individuals learned, what behavior changes they might make, and investigates any results one hopes to achieve when behavior and attitude changes are made.

Reaction Data (Assess participant's attitudes towards the profile, the profile's validity, and perceived usefulness)

1. Does the data accurately reflect how you generally see yourself?
2. What do you see more clearly about yourself than you did before?
3. What surprises are there, if any, about the data?
4. How does it confine your basic beliefs about yourself?

Learning Data (Assess the changes in behavior that are planned as a result of the data)

1. What new perceptions about yourself have you gained from the use of this data that will be helpful to you?
2. How do you think your past and present experiences with work, education, etc...are reflected in this data?
3. What, if any, information form this data could alter the way you do your job at present?

Behavior Data (Assess the changes in behavior that are planned as a result of the data)

1. What ways will you change your communication strategy with others as a result of understanding your data?

2. Are there ways you could more effectively accomplish your job by better understanding your preferences around work?

Result Data (Assess which business and individual results one hopes to achieve from the use of the data)

1. What result, in your professional or personal life would you like to see achieved from a better understanding of your thinking/learning/working preferences?
2. What quadrant areas would you like to develop more preferences in to be more homogeneous or heterogeneous interactions with others?

Once these questions, and any others, are answered the certified practitioner has officially debriefed the individuals.

Please feel free to contact me with any further questions, 757-539-0919, or email dcary72@cs.com.

Thank you,

Damon Cary