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Chapter 15

WILL RIGHT-BRAINERS RULE THE FUTURE?

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ABSTRACT

During the 20th century as the technological age developed, there was high demand for logical, left-brained thinkers such as engineers and scientists. This was the golden era of IQ testing, where IQ scores were excellent predictors of performance on the job. However, the trend in the West since the downsizings of the 90s has been to outsource expensive cognitive left-brain tasks, like electronic engineering and computer programming, to low-cost countries like China and India. However, by moving these activities offshore, the question arises as to what will constitute viable career options in future in the West. This study explores Pink's (2005) claim that individuals that have right-brain hemisphericity will be better adapted to the future work environment in the West. The participants in this study were 145 psychology students and their family (mean age 33.5, *SD* = 14.5) who completed a test battery which included hemisphericity, emotional intelligence, verbal reasoning and big five factor personality questionnaires. It was found that older participants were less right-brain oriented than the younger participants. The general characteristics of right-hemisphericity participants included lower conscientiousness, and higher openness, neuroticism and attention to emotion scores. These results have implications for organisational psychology in the future.

Keywords: Big Five, Emotional intelligence, Hemisphericity, Left-brain, Right-brain

INTRODUCTION

Hemisphericity, especially right-brained thinking preference, has been proposed as a major success factor for individuals for future careers (Pink, 2005). Pink argues that the

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period from the industrial era through the information age required left-brained thinkers who specialised in logical and linear thought processes. These logical thinkers who made major contributions during the last century were employed in a diverse range of positions such as engineers, computer programmers, accountants, auditors, actuaries and so on. The left-brained or logical thinking period reached its zenith with the introduction of the personal computer and the internet and the myriad of applications that they both spawned. Computer applications that previously required an expensive mainframe could now be developed in the home on a low cost personal computer. This enabled third world communities to become part of the information age. During the same period, the World Wide Web allowed information to be sent simply and cheaply to any point in the globe.

With the corporate downsizings and cost reductions in the West in the mid-90s, and the rising skill base in China and India, organisations sought to reduce costs by sending work offshore for processing in countries that paid employees lower wages. The range of jobs outsourced overseas in the early part of the 21st century include a diverse range of applications such as engineering, computer programming, auditing of company records, and processing tax returns for individuals and corporations. The countries accepting this work are mainly China and India with their vast resources of university-educated and skilled engineers, IT specialists, and accountants (Pink, 2005). This trend has continued to the point where the local industries perform very little engineering design or application development for computers. In addition, intellectually-intensive tasks such as auditing and tax return preparation can be performed cheaper in India.

The thrust of Pink's thesis (2005) is to draw attention to the trend of sending work overseas thereby reducing the range of work-options available in Western countries, such as Australia and the USA. Having identified the problem inherent in outsourcing complex work offshore, Pink developed a rationale for future jobs and activities that are potentially resistant to being outsourced to lower-paid labour forces elsewhere. He proposes that activities that are not susceptible to being easily outsourced are right-brain skills that include: design, story-telling, complex pattern recognition, empathy, play, interpreting and providing meaning in today's world. He concludes by predicting that *right-brainers will rule the future.*

It is generally believed that the right-hemisphere provides a dominant and holistic focus on the task at hand, while the left-hemisphere deals with detail and logical processes after the right-hemisphere has holistically surveyed the big picture (Jackson, 2009; Martindale, 1999). These findings generally divide brain hemispherical functions into global, parallel and holistic processing in the right-hemisphere, with logical, verbal, numerical, sequential and analytical processing occurring in the left-hemisphere. Creativity as a right-brain activity including Pink's design and story telling skills finds considerable support in the literature (e.g., Morton, 2002; Martindale, 1999; Hermann, 1975, 1989).

Many hemisphericity researchers have used dichotic hearing preference as an indication of right versus left-brain preference (e.g., Jackson, Furnham, & Miller, 2001; Jackson, 2002, 2005, 2008; Morton, 2002, 2003; Williams, 1986). However, this study was designed to be delivered over the internet, and the dichotic listening test could not be controlled, so was therefore omitted. Further, we assumed that a hemisphericity test based on a questionnaire would be more suitable for organisational use; an area where we planned future studies.

An alternative potential method of determining hemisphericity was the rotating figure (Times, 2007). The rotating figure has appeared in popular psychology articles for some

years, and would be a quick and valuable test if it provided a reliable indicator of hemisphericity. The rotating figure test was therefore included in the internet survey.

EMOTIONAL INTELLIGENCE

Since the publication of Goleman's (1995) book on Emotional Intelligence (EI) there has been a growing recognition of the value of EI in the workplace (e.g., Caruso, Mayer & Salovey, 2002; Cherniss, 2001; Matthews, Zeidner & Roberts, 2004). There is a general assumption that EI is a right-brain holistic activity; this is supported by neurological evidence (e.g., Damasio, 1994; Lane, 2000; Springer & Deutsch, 1998). Jackson (2002) also found that the right hemisphere provided facilitation of emotional expression. This study provided an opportunity to test the assumption that right-brain orientation is related to emotions and EI; therefore, it included the necessary scales to examine whether hemisphericity and EI were convergent or divergent constructs. To this end the *Trait-Meta Mood Scale* (TMMS) EI scale (Salovey et al., 1995) was employed in the study.

FUTURE EMPLOYMENT ISSUES

Since the data was not available to determine employability of participants and thus include it in the statistical analysis it was decided that the study would focus on the personality differences between individuals categorised as having a right or left-brain preference. If Pink's hypothesis (2005) is correct that "right-brainers will rule the future," then it behoves organisational psychologists to seek an insight into the personality issues at play in the workplace of the future. In order to examine personality differences as a function of hemisphericity, a range of questionnaires including hemispheric preference, verbal and numerical skills, personality and emotional intelligence were included in a single battery delivered to participants over the internet.

STUDY OVERVIEW

The study first determined the hemispheric preference of participants using the Zenhausern preference questionnaire (Zenhausern, 1978). The hemisphericity score was then compared with personality, emotional intelligence and verbal/numerical cognitive markers to identify significant personality traits related to hemisphericity. The overall purpose of the study was to examine the relationships between hemisphericity and personality characteristics, with a view to understanding the psychological issues that may arise in the workplace of the future.

Hypotheses

Hypothesis 1: Participants with higher right hemispheric preference scores will have higher emotional intelligence scores.

Hypothesis 2: Participants with higher right hemispheric preference scores will have lower verbal and numerical reasoning scores.

Hypothesis 3: The rotating figure test will demonstrate convergent validity with the Zenhausern hemisphericity preference questionnaire.

Hypothesis 4: There will be notable differences between personality factors for right and left-brain oriented participants.

METHOD

Participants

The sample of 145 participants (mean age 33.5, *SD* = 14.5, 63% female) was made up of 55 students enrolled in an advanced 4th year research methods class, plus parents and friends recruited by the students. The participants provided their age, sex and country of birth and then proceeded to complete a web-based battery consisting of the following questionnaires.

Rotating Figure

This putative test of hemisphericity has been widely circulated on the internet (e.g., Times, 2007) and was included to determine its veracity. The figure is an animated graphics file (.gif) of a slowly rotating dancer. If the participant perceives it to be rotating in a clockwise direction they are assumed to use more of their right-brain, and alternatively, more of their left-brain if they perceive anti-clockwise rotation.

Zenhausern's Preference Questionnaire

This hemisphericity questionnaire consisted of 20-items scored on a 10-point Likert scale ranging from "1 = Very unlike me" to "10 = Very like me" (in Morton, 2002; Zenhausern, 1978). Examples of typical items are: *My decisions based upon objective facts rather than feelings* (left hemisphericity); *I am artistically or musically creative* (right); *My thinking consist of mental pictures or images* (right). Three questions that were directly related to verbal skills, such as *I am good at solving crossword puzzles*, were removed to reduce method variance with the verbal reasoning skills test.

Numeric and Verbal Reasoning Markers

These brief cognitive tests (Stankov, 1997) were included to determine the relationship between IQ and hemisphericity scores. The numeric reasoning test consisted of spotting the odd-one-out in a set of numeric sequences, while the verbal reasoning consisted of items such as: *Horse is to Animal as Chair is to* _____.

Big Five Personality Inventory

A brief personality inventory (Saucier, 1994) was included to determine the relationships between the Big Five and hemisphericity.

Trait Meta-Mood Scale

This is a brief EI questionnaire (Salovey et al., 1995) used to determine the relationship between EI and the hemisphericity scores. It includes three subfactors: *Attention to Emotions*, *Clarity of Emotions*, and *Repair of Emotions*.

RESULTS

Descriptive statistics are presented in Table 1 below. Correlations between variables are shown in Table 2.

Table 1. Descriptive statistics for variables used in this study (N=145)

Variable	Minimum	Maximum	Mean	Std. Deviation
Zenhausern right-brain score	50.00	120.00	83.72	15.30
Numeric reasoning score	.20	1.00	.74	.16
Verbal reasoning score	.40	.95	.79	.12
TMMS Attention to emotions score	2.46	5.00	3.88	.52
TMMS Clarity of emotions score	2.27	5.00	3.56	.64
TMMS Repair of emotions score	2.00	5.00	3.74	.75
Age	18.00	71.00	33.46	14.46
Openness	18.00	40.00	30.39	4.65
Conscientiousness	17.00	40.00	29.93	5.62
Extraversion	15.00	40.00	27.01	5.89
Agreeableness	17.00	40.00	32.59	4.55
Neuroticism	7.00	33.00	19.55	5.55

Table 2. Correlations between the variables used in this study

Variable	1	2	3	4	5	6	7	8	9	10	11
1. Zenhausern Right-brain score	1										
2. Numeric Reasoning score	-.02	1									
3. Verbal Reasoning score	-.16	.14	1								
4. TMMS Attention	.42**	.00	.07	1							
5. TMMS Clarity	-.07	.07	.09	.14	1						
6. TMMS Repair	.03	.08	.06	.11	.32**	1					
7. Age	-.34**	-.05	.17*	-.13	.22**	-.07	1				
8. Openness	.31**	-.17*	.03	.21**	.07	.00	-.17*	1			
9. Conscientiousness	-.39**	-.03	.18*	.18*	.18*	.01	.25**	-.06	1		
10. Extraversion	.06	-.11	-.04	.14	.10	.30**	-.22**	.06	-.06	1	
11. Agreeableness	.10	.00	.24**	.40**	.23**	.30**	.06	.17*	.25**	.08	1
12.Neuroticism	.34**	-.01	-.17*	.22**	-.27**	-.36**	-.24**	.13	-.07	-.03	-.17*

Tests between Means

An independent samples *t*-test showed that there was a significant relationship between the perception of the direction of rotation of the dancer and the Zenhausern test of hemisphericity ($t(143)=2.27$, $p=.02$). Unfortunately, the significant difference was in the opposite direction to that expected (Times, 2007), with anti-clockwise rotation being associated with higher right-brain scores. An independent samples t-test did not indicate a significant positive relationship between EI (TMMS total score) and hemisphericity ($t(143)=1.24$, $p=.22$); however, the right-brain score was significantly related to the TMMS EI Attention to Emotions subfactor ($r(144)=.42$, $p<.01$).

DISCUSSION

It was proposed in hypothesis 1 that participants with higher right hemispheric preference scores would be significantly higher in total EI scores. This was not confirmed; however, participants did have significantly higher Attention to Emotion subfactor scores ($p<.01$). This hypothesis was therefore partially supported.

It appears that hemispheric preference is somewhat convergent with the Attention to Emotions EI subfactor (see Table 2). However, this translates into an overlap of only 18% of shared variance between the two variables, suggesting that the two constructs are different. Clearly, the Attention to Emotions scale assesses a different construct to the Zenhausern hemisphericity scale and could not be used as a proxy for hemisphericity. The implication of this finding is that there is a place for both hemisphericity and the EI concept, and the two can potentially contribute to a better understanding of human behaviour.

In hypothesis 2 it was proposed that participants with higher right hemispheric preference scores would have significantly lower verbal and numerical reasoning scores. While the right-brain score negatively correlated with both the verbal and numerical reasoning scores, verbal reasoning scores just missed out on reaching significance ($p = .054$), while the numeric reasoning relationship was nowhere near significant ($p = .79$).

The general assumption that left-brained individuals perform better in numeric and verbal reasoning was apparent in the results, and verbal reasoning came close to reaching significance, and would have reached significance if the sample size had been larger. It can therefore be assumed that logical verbal operations are related to left-brain preference, with the caveat that statistical significance was just missed. Numeric reasoning was not found to be significantly correlated to hemisphericity ($p = .79$). This finding supports those by Szirony et al. (2007), where mathematical ability was found to be not significantly related to left brain function.

The overall conclusion was that hypothesis 2 was partially supported, and there was some evidence that verbal reasoning was a left-brain function, but there was little support for numeric reasoning being a left-brain function. Perhaps a broader battery of verbal and numeric reasoning items could be used in a future study to confirm their putative left-brain association.

In hypothesis 3 the effectiveness of the rotating figure as a measure of hemisphericity was examined. Although there was a weak ($r = .21$) but significant relationship between the rotating figure and the Zenhausern preference questionnaire, the direction of rotation was in

the opposite direction to that expected. Using binary logistic regression it was found that the rotating figure would only correctly predict hemisphericity in 59% of the cases, even with the rotation reversed. Therefore, since the rotating figure predicted at only slightly above chance, and in the wrong direction, this pop psychology indicator of hemisphericity must be rejected as a scientifically useful tool.

With regard to Hypothesis 4, it was proposed that there would be notable differences between personality factors for right and left-brain oriented participants. This study found that Openness and Neuroticism were positively related, and Conscientiousness negatively related with right-brain oriented participants ($p < .01$, see Table 2). Further, the age of participants was negatively related to the right-brain score. This indicated that younger participants were significantly more right-brained than the older participants (Table 2).

These findings are quite robust with all correlations being significant at the $p < .01$ level. One implication is that if you want to hire right-brain oriented individuals then the younger the better. However, if the hiring preference was biased towards hiring younger employees, then an organisation would need to ensure that they did not transgress any age discrimination laws.

CONCLUSION

Considering the personality factors, it would appear that if you hire more right-brained individuals, they would be more open to experience, which hopefully would translate into them being more creative than an average group. On the other hand, our results suggest that these right-brain individuals would be less mentally stable, and less conscientious than average. Overall this appears to be a somewhat mixed blessing attendant with right-brainers.

Based on Pink's (2005) assumption that future job opportunities in the West will favour right-brain thinkers, one implication for organisations arising from this study is that future workers will score higher on Neuroticism. This may lead to more conflict in the workplace, increased absenteeism, and more need for Employee Assistance Programs (EAP). Organisations will need to plan and adjust to these anticipated changes.

Another finding was that right-brained individuals showed increased Openness to Experience; this would be valuable in enhancing the creativity of an organisation. However, on the downside there is a concern that the reduced Conscientiousness of right-brained individuals could reduce the productivity of an organisation and contribute to absenteeism.

A final caution should be added noting that using age as a hiring indicator, with youth as a predictor of right-brain candidates, could be found to contravene age discrimination laws. Hiring based on handedness—with left handedness indicating more right-brain activation—could also fall foul of anti discrimination laws.

It would appear that right-brainers provide a mixed blessing for an organisation with increased openness and creativity, but with the dark side of increased neuroticism and lower conscientiousness. Further studies in this area, especially employment success versus hemisphericity, would be valuable in confirming or disproving Pink's thesis. The confirmation of a general shift to right-brained employees could have significant implications for organisations and organisational psychology.

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