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CORRELATION OF EIDETIC MEMORY AND ENTHUSIASM FOR SPORTS EXCELLENCE OF MALES AND FEMALES

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ABSTRACT

Eidetic memory is one kind of memory responsible for human image and visual information storage. It features the ability of a person to organize and perceive vast amounts of visual information. Little is known about it and this study has investigated how eidetic memory and enthusiasm on sports excellence correlate. Using a survey as a tool through a quantitative design, data were collected from college national athletes, students with sports-related occupation and without sports related occupation. Images that feature numerous details were used as test stimuli for respondents before answering a questionnaire regarding the images and their enthusiasm for excellence. Results showed a low r of 0.033 where relationship between eidetic memory and enthusiasm on sports excellence is not significant in 0.05 level of significance. However, the study revealed that relationship among males is close to its critical value 0.38, with r equal to 0.32. On contrary, females had a negative correlation of -0.12 with an r critical of -0.36. It also revealed that students/respondents without sports-related occupation have significantly lower enthusiasm in 0.05 significance level compared to the other two groups. Though not significant, it is perceivable that National Athletes have a generally higher eidetic memory scores compared to other groups.

Keywords: *Eidetic memory, visual information, motor learning, motivation.*

1. INTRODUCTION

Memory is considered as a variable and a vehicle for human learning. Learning is concerned with the capacities of the memory systems, like eidetic memory, for retaining information over short time intervals (Marteniuk, 1976). Eidetic memory is one kind of memory responsible for human image and visual information storage. It features the ability of a person to organize and perceive

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vast amounts of visual information. It is rich in children and is much less common in adults (Lahey, 1986). It is a special kind of memory that retains an accurate, detailed pattern, or sees an image that is an exact copy of the original sensory experience. It is considered as one of the individual differences in athletes' imagery ability. For visual information, the quality of one's eidetic memory limits its image learning and also kinematic knowledge retention.

Little is known about eidetic imagery. Haber and Haber (1969) found eidetic memory as rare. Vygotsky (1978) proposed that eidetic imagery is an elementary mental function, meaning that it is innate (Arnuado, 2000). Kosslyn (1988) says that there is a negative correlation between this memory and age, indicating that children are more image-perceptive than adults. Because of their under developed verbal skills, children interpret and understand pictures more than adults who are capable of encoding information using words. But there is no evidence showing that children normally use it as a form of memory.

According to the definition of Hamill and Knutzen (2003), kinematics concerns motion characteristics, including motion examination from spatial and temporal perspective. Without reference to the force causing the motion, it involves describing how far and how high the movement and position. In describing and perceiving these variables, image-use is an important aspect. Angles, lengths and other visible measurements are essential in athletes' kinematic storage and retention. Zheng, Nixon and Allen (2001) presented that through visualization, information in moving spine can be extracted. The researchers provided a moving 3D model for better understanding and diagnosis. Movement information, like in specific sports skills, can be collected as a moving picture, featuring various details that are relevant in analysis. Mononen, Viitasalo, Konttinen, and Era (2003) reported that a high frequency of kinematic knowledge of performance improved accuracy in rifle shooting. Change and improvement in the subjects' shooting performance propose that they undergone learning. Based on the report, it suggested that kinematic knowledge is relevant and a factor in learning motor skills.

Mental practice is a recognized and often effective method for influencing the proficiency of physical performance. It is suggested, however, that "mental practice" and "imagery" are general labels applied to a variety of procedures that have different goals and uses for influencing human physical performance (Rushall & Lippman, 1997). Adviento (2004), using Weinberg's definition of imagery, concluded that there is a significant improvement in subjects' performance after undergoing an imagery training program. Her study also gave assumptions that her subjects have the ability to retain pieces of information in the form of images. Her research also gave birth to the idea regarding how image recall improved athletes' execution of skills.

Imagery also increases athlete's self-efficacy. Athletes who are high in self-efficacy in competition situations tend to use more motivational imagery than their low self-efficacy counterparts (Mills, Munroe, & Hall, 2001). Bandura (1977) has proposed a model of self-efficacy that states that it is enhanced by successful performance, vicarious experience, verbal persuasion, and emotional arousal (Cox, 1985). Same as imagery, self-efficacy is also a factor and a variable in one's attachment to good performance and excellence. Feelings of self-efficacy lead to improved performance, while a lack of those feelings results in slackening performance.

There were several studies made regarding self-efficacy and attachment to sports. McAuley (1992) presented self-efficacy of previously sedentary middle-age adults, concerning the maintenance of their exercise participation. It reported that self-efficacy had a role in maintaining middle-age adults to participate on exercises. He also concluded that self-efficacy significantly predicted exercise behavior of his subjects. Self-efficacy is also hypothesized to be positively related to participation in physical education class, other school-related activities, and outside of school related activities. Allison, Dwyer, and Makin (1999) showed that self-efficacy, despite of external barriers, is predictive in participation in the hypothesized direction.

Generating new knowledge about this special kind of memory will provide researchers a launch pad in developing new mental and motor learning techniques for people who devote themselves in sports. Not only for researchers but coaches may also benefit regarding the advantages, athletes' capacities and individual differences in perceptual, encoding and retrieval mechanisms related to imagery. This study investigates how eidetic memory and enthusiasm for sports excellence correlate. It aims to know whether excellence enthusiasts are more image-perceptive compared with non-enthusiasts. It also explored the accuracy of different groups in recalling images and re-creation of the picture in mind along with their level of attraction and enthusiasm for extraordinary sports skills. Since imagery is related to sports performance, it showed how relative image-perception and external attention, and their devotion for achieving good performance, excellent execution and magnificent display of sports skills among males and among females.

2. METHODS AND MATERIALS

2.1 Research Design

The study used a cross-sectional, quantitative design. It used a survey in collecting descriptive data. Data were collected through the responses from

statements featuring the variables to be tested. These responses had equivalent numerical scores that will be good for mathematical analysis. Since intrinsic variables were evaluated, data collection was done anytime of the day.

2.2 Respondents

The researcher accumulated 45 respondents. They ranged from sports participants to non-participants. They were classified into groups: 11 National athletes; 18 from sports-related fields (from SR), which are CHK students and UP Varsity; and 16 from non-sports fields (from NS), which are PE and non-CHK students. They were from 15-25 years old college students, randomly selected within the area near the testing facility. They were allowed to use devices such as eyeglasses to meet their best visual acuity. They were as varied as possible.

Respondents from NS fields were collected through simple random sampling where every PE student had a non-zero chance of being included. However, convenience sampling was used in collecting National Athletes and respondents from SR fields for feasibility in accumulating excellent source of data that fits the research's criteria.

2.3 Instruments

The researcher prepared materials in conducting the survey: a questionnaire as a tool in collecting responses and sample images or pictures as stimuli in assessing subjects' photographic memory. Four sample images were presented first in a room with a controlled environment before proceeding to the first part of the questionnaire. Each of the images was attached on one face of the inside fold of a folder. The other face was remained blank, narrowing the subject's attention towards the image when he or she opened the folder up. Images used have no relation to sports and with numerous details as possible. This was to avoid motivational bias among sports enthusiasts.

The researcher used the College of Human Kinetics Exercise Science Laboratory in the University of the Philippines Diliman, as a testing facility. The room has plain features and environment. Subjects faced plain portions of the room, where visual and other stimuli are minimized. The four-page questionnaire had two parts: the eidetic memory evaluation and the sports excellence enthusiasm evaluation. Statements from the questionnaire were designed by the researcher and validated by a psychology specialist (Guzman, 2006). The first page contained the greeting and request letter for the subjects' consent, which includes an optional space for their e-mail address and another space for their

gender/sex. The last page contained a simple statement of appreciation for the subjects.

The first part evaluated their image recall. Subjects reported the details of the four sample images through statements regarding the visual display. They marked a check "✓" if the statement is correct according to the image, "x" if not. They were allowed not to put anything if they are undecided. Only marked statements were scored, each marked statement was scored 1. Respondents may score more than 32, where scores more than 25 are high and scores less than 10 are low. The second part evaluated their enthusiasm on sports excellence. Statements regarding attitudes on sports skills and participation were on it, encircling whether they do it always, often, sometimes or never as their response. Each had designated scores, from 0-3. The last question was scored either 0 or 3. Respondents may score up to 66, where below 25 are considered low and more than 50 are high. Scores in the first part were summed-up in parallel with the summed-up scores of the second part. Scores of each respondent in the first and second part were accessible separately and these two scores were used in the analysis.

2.4 Procedure

Data were collected through answering the questionnaire and the test was done only once per subject. After their approval, the researcher settled them inside the room. Four images were exposed to them for 30 seconds (Haber & Haber, 1969), one at a time. They were labeled as IMAGE 1, IMAGE 2, IMAGE 3 and IMAGE 4. After the exposure to the four images, they were asked to turn to Page 2, the image retention test, to evaluate some details that they can remember regarding the labeled images. Each response was evaluated. Questions were ordered according to the order of image exposure.

After the image retention test, they were asked to turn the questionnaire to the next page, the sports excellence enthusiasm test. The numerical values corresponding to their response were collected. Responses from the first part, which were converted to numbers, and the second part were analyzed.

2.5 Analysis

The study analyzed the degree of relationship between the scores in eidetic memory and enthusiasm on sports excellence and the researcher used the Pearson Product-Moment Correlation Coefficient in treating the scores for the analysis of the two variables' relationship. It also used multiple comparisons using the ANOVA through the Statistical Program for Social Sciences (SPSS).

3. RESULTS

Figure 1: Scatter plot of eidetic memory versus enthusiasm for sports excellence among males and females

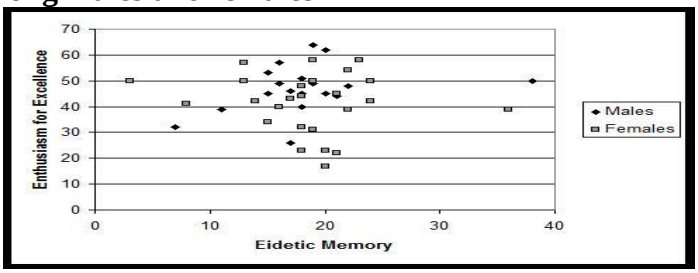

Figure 1 shows an accumulation between EM scores of 13 to 24 and between enthusiasm scores of 17 to 64. There were 6 outliers overall with national athletes have greater standard deviations. The computed rho is equal to 0.03, which indicates a positive correlation between the two variables with an r critical of 0.25.. Two male respondents had the highest score in EM and enthusiasm; both of them were national athletes. Two females, one from SR fields and one from NS fields, had the lowest score in EM and enthusiasm respectively.

Figure 2: Enthusiasm versus eidetic memory among males

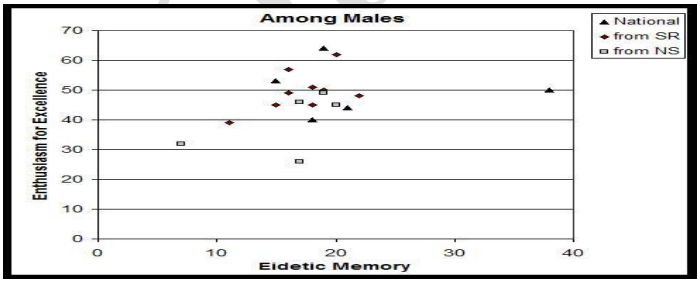

Figure 3: Enthusiasm versus eidetic memory among female

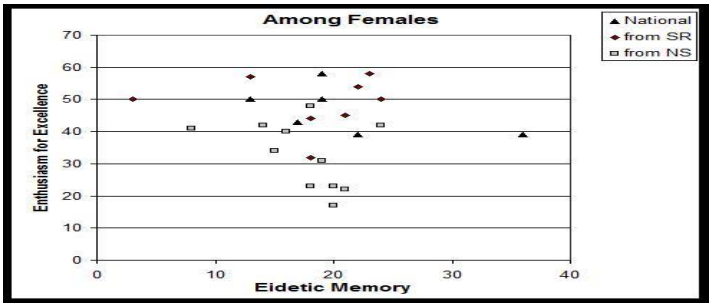

Figure 2 shows that there were 4 outliers: including a national athlete; a respondent from SR fields; and two respondents from NS fields. The computed rho of male respondents is equal to 0.32, which is positively correlated and close to its r critical of 0.38.

On the other hand, Figure 3 reveals a negative regression with 3 outliers, also including a national athlete, from SR and from NS. The respondent from SR is closer to the cluster compared to other two. The computed rho of female respondents -0.12, that is far from its r critical of -0.34.

National athletes dominated the highest scores in EM and enthusiasm among males and among females. Lowest scores for males in EM and enthusiasm came from two respondents from NS fields. For females, a respondent from SR got the lowest EM score and from NS got the lowest score in enthusiasm. It can also be seen that the cluster location of males is higher, indicating higher values of eidetic memory.

Figure 4: Mean scores of eidetic memory and enthusiasm on sports excellence

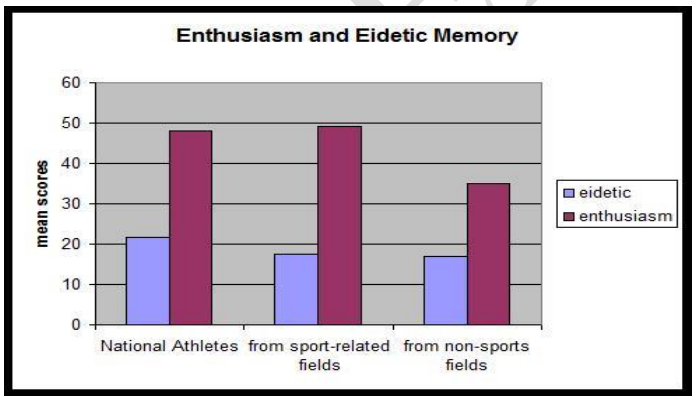

Figure 4 presents that eidetic memory values were 21.55, 17.56 and 17.06 for national athletes, from SR and from NS respectively. Scores for enthusiasm were 48.18, 49.22 and 35.06 for national athletes, from SR and from NS respectively.

The figure was perceived therefore that national athletes in general had the highest scores in eidetic memory. Interestingly, it shows that respondents from SR have minimally higher score in enthusiasm compared to national athletes, and eidetic memory compared to respondents from NS. It also appears that enthusiasm scores of from NS have a huge difference from the other two.

Table 1: Multiple comparison of the three categories using ANOVA

	Categories (Field)		Mean Difference	Std. Error	Sig.
Eidetic Memory	From non-sports	From sports-related	-0.49	1.95	0.966
		National	-4.48	2.23	0.123
	From sports-related	From non-sports	0.49	1.95	0.966
		National	-3.98	2.18	0.173
	National	From non-sports	4.48	2.23	0.123
		From sports-related	3.98	2.18	0.173
Enthusiasm	From non-sports	From sports-related	-14.15	2.98	0.000*
		National	-13.11	3.40	0.001*
	From sports-related	From non-sports	14.15	2.98	0.000*
		National	1.04	3.32	0.947
	National	From non-sports	13.11	3.40	0.001*
		From sports-related	-1.04	3.32	0.947

*Significant

Table 1 reveals that there is a significant difference between the enthusiasm of national athletes and from NS fields. But significant difference between the enthusiasm of respondents from SR and from NS fields is higher with significant level less than 0.001.

From Table 1, it could also be seen that national athletes have a mean difference of 4.48 from the EM mean score of the respondents from NS, and 3.99 from the mean score of respondents from SR. Though not significant, numbers show that national athletes had generally has the highest scores in EM.

Figure 5: Mean scores of eidetic memory (lighter bar) and enthusiasm on sports excellence (darker bar) among males

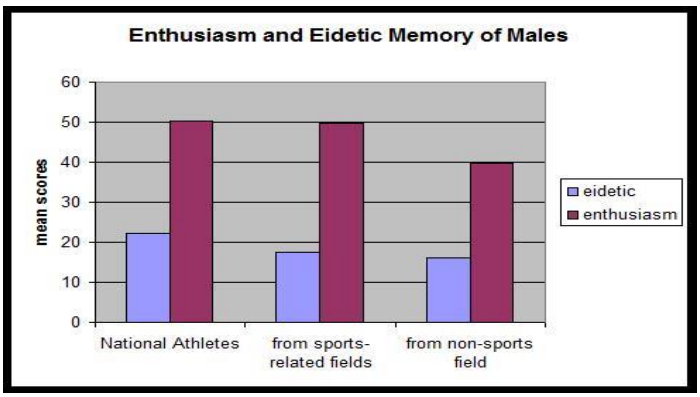

Figure 6: Mean scores of eidetic memory (lighter bar) and enthusiasm on sports excellence (darker bar) among female

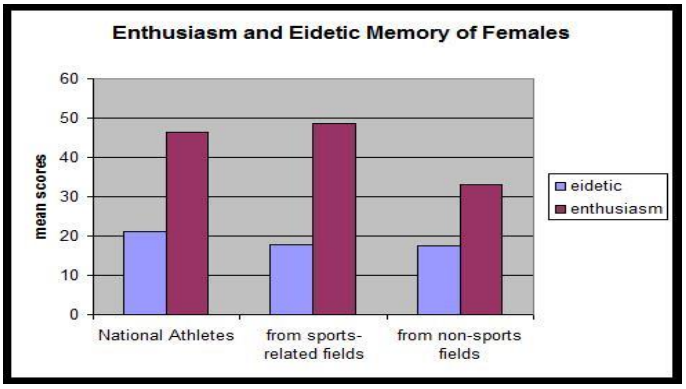

Figure 5 presents that eidetic memory values were 22.2, 17.4 and 16.0 for male national athletes, males from SR and from NS respectively. Scores for enthusiasm were 50.2, 49.6 and 39.6 for male national athletes, males from SR and from NS fields respectively. Results shows that mean scores are generally related to sports participation.

Figure 6 presents that eidetic memory values were 21.0, 17.75 and 17.55 for female national athletes, females from SR and from NS fields respectively. Scores for enthusiasm were 46.5, 48.75 and 33.0 for female national athletes, females from SR and from NS respectively. Enthusiasm (mean) score of respondents from NS was significantly different from National athletes at 0.022 and from sports-related respondents at 0.004, with a level of significance at 0.05.

4. DISCUSSION

It was noteworthy that there is an emergence of different results in correlation among males and among females. Sex differences in spatial ability are widely acknowledged. Linn and Peterson (1985) suggested that large differences are found on measures of mental rotation and smaller on measures of spatial perception, through the use of meta-analysis. Figure 2 and 3 emphasized these differences: the location of the clusters and the regression of points.

For males, EM scores along with enthusiasm scores are somehow related to sports participation. A study by Newcombe, Bandura, and Taylor (1983) in sex differences states that activities which are spatial in nature, were positively correlated with masculinity and with greater male participation than female. Participation in spatial activities, such as sports activities, was correlated with spatial ability. Occurrence of these sex-related differences in spatial ability

excavates the role of sex-differentiated experience of males and females in their development to adulthood. It also presented a large increase in spatial difference during adolescence.

Marks (1977) emphasized the role of individual differences in perceptual, encoding, and retrieval mechanisms related to imagery (Gill, 1986). Eidetic memory being a perceptual mechanism is essential in recalling bunch of stimuli (visual), retrieving them to effect a more successful and better motor experience. The way of organizing images and spatial ability reflects the quality of this memory.

National athletes exhibited high EM scores. One reason could be that the importance of organization in motor learning appears to relate in enabling an athlete more effectively and efficiently to acquire a complex movement skill as well as more effectively to produce the response required for a complex skill (Magill, 1980). The organizing ability of excellence enthusiasts, in chess for example, made them organize their moves without the presence of a chessboard. Also through this ability, soccer players demonstrate readiness in finding open player for a pass; quickly perceive the overall view of the field (Gill, 1986).

The visual system tends to be dominantly essential during skilled action because of its unique role in movement control (Schmidt, & Wrisberg, 2004). In the study of Hardy, and White (1995), kinematic feedback in performing pseudo-gymnastic skills were effective in learning motor and subsequent retention. It reported that both perspectives are involved before each trial through video recording in the learning and performing different motor skills.

Interestingly, respondents from sports-related fields had higher enthusiasm than national athletes. These respondents are primarily spectators, affected by good display of performance and have knowledge on sports-related activities. The competence theory of motivation, and Caroll and Loumidis (2001) supported this competence and participation link. It concluded that children of high-perceived competence participated in significantly more physical activity (quantity and intensity) outside school than those of low perceived competence. Competence motivates an individual to be part of any activity and can affect its participation and enthusiasm on it. Furthermore, some motivational factors may also affect enthusiasm on sports excellence of national athletes.

5. CONCLUSIONS

There is no significant relationship between eidetic memory and enthusiasm on sports excellence. However, relationship of the two variables among males is positive and close to a significant relationship. On the other hand, a negative correlation was found among females.

There is a significant difference between enthusiasm of national athletes and sports-related respondents, and respondents from non-sports fields.

Comparable to the overall sample, there is a significant difference between enthusiasm of female national athletes and respondents from sports-related fields, and female respondents from non-sports fields.

Though not significant, national athletes have generally higher eidetic memory compared to the other two categories. Sports excellence enthusiasts are more image-perceptive but the difference from non-enthusiasts is not significant.

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