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亞洲體康學報  
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The editorial mission of the *Asian Journal of Physical Education & Recreation* is to stimulate academic and professional development in Physical Education, Recreation, Leisure and Sports by publishing research papers and articles concerned with different aspects of this discipline. The refereed publication also aims to provide a forum for scholarly and creative thoughts about this multi-dimensional profession in Hong Kong and Asian countries.

亞洲體康學報編印之主要目的在於透過對研究之發表及評論，激勵有關體育、康樂、休閒及運動的學術和專業發展，並且在這個多次元的專業範疇上促進本港及亞洲地區學術和創意之交流。

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# Analysis of the Use of Exercise Imagery Functions by Exercisers in Nigeria

## 表象訓練對尼日利亞大學生運動行為的分析

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### Abstract

It is a general position that imagery plays a cognitive behavioral role in enhancing the performance of sport skills as noted in Short and Short (2005), the use of imagery is also more equally significant in exercise activities and can bring to fruition the performance of an individual exerciser because of its unique motivational function. Research studies has been conducted examining imagery use by different categories of participants related to sport and exercise in the developed world, there have been dearth of literature on imagery use on similar participants in the developing countries, hence the purpose of this study. Participants (482) male and female students were recruited from universities of Nigeria (mean age  $24.0 \pm SD4.7$ ; male,  $n=256$ ) and (mean age  $23.0 \pm SD5.2$ , female,  $n=226$ ). A demographic questionnaire and the Exercise Imagery Questionnaire (EIQ) Hausenblas et. al (1999) were used for data collection. Results indicated that no significant difference ( $p>0.5$ ) was found on the three imagery functions by sex. But significant difference ( $p<0.5$ ) was located on the appearance imagery function based on the criterion independent variables of three exercise activity groups of the exercise participants.

Keywords: Exercise, Imagery, Motivation.

### 摘要

本研究旨在探討表象訓練對尼日利亞大學生運動行為的改變，共邀請了482名大學生進行比較分析，結果顯示沒有明顯的運動行為改變。

### Introduction

Imagery has been operationalised as an experience that mimics real experience in which an individual can be aware of seeing an image, feeling movements as an image, or experiencing an image of smell, tastes or sound without actually experiencing the real thing (White &

Hardy, 1998). The pivotal research on exercise imagery conducted by Hausenblas et al. (1999) on the very nature of exercise imagery in which three factor structure of appearance, energy and technique were identified thus suggesting that exercise imagery is multidimensional in nature.

Several theories in the views of Martin, Moritz and Hall (1999) have been advanced to explain imagery's effect of various aspects of cognition, affect and behaviors. Some of these theories were developed to explain imagery's effect in general, whereas other theories were developed to explain imagery's effects within a particular domain. Paivio's (1985) analytic framework for imagery effects in sport does attempt to account for various imagery applications. Paivio was of the opinion that imagery influences motor behavior through its impact on both cognitive and motivational response strategy. Behavior can specifically be influenced by the imagery of motor skills components and general game or performance strategies. Added to these is that imagery of goals, the activities related to the achievement of goals, the physiological arousal and the affect that comes along with the imaged successes and failures can influence performance and as well as motivation (Martin & Hall, 1995; Vadocz, Hall & Moritz, 1997).

While it is generally understood that over the years imagery plays a cognitive behavioral role in enhancing the performance of sport skills as noted in Short and Short (2005), the use of imagery is equally important in exercise activities and can be very rewarding to an individual exerciser's performance because of its motivational function. This position was earlier shared by Hall (1995) in which he theorized that imagery serves similar motivational and cognitive functions for exercisers as it does for athletes.

It was found in Hausenblas et al. (1999) that over 75% of aerobics participants indicated using exercise imagery for three main functions namely appearance (which is the attainment of a fit looking body), for technique (which is performing skills and techniques correctly) and energy which is getting psyched up or feeling energized from the exercise bouts. This three factor suggest that exercise imagery is multidimensional in nature.

Explicitly, Gammage et al. (2000) described energy imagery as mental images associated with feelings of increased energy and relief from stress. The use of appearance imagery is related to imagining a leaner, fit and healthier appearance, while the technique imagery is associated with the execution of proper body positioning and form while engaging in exercise. They concluded that the energy and appearance imagery are associated with motivation, while technique imagery serves a cognitive function.

Also, the categorization of the effectiveness of imagery use in exercise into cognitive and behavioural outcomes was noted in Munroe-Chandler and Gammage (2005), in which supported behavioural outcomes includes the initiation and adherence to exercise programmes as well as the hypothesized outcomes of achievement and development of new skills or strategies, coupled with the improvement of form or technique.

The conceptual framework of imagery use in exercise proposed by Munroe-Chandler and Gammage (2005) identified some limitations in previous research and further proposed hypothesized antecedents which determines the functions of imagery that will be employed in the exercise environment, the amount of exercise experience of the individual, the outcome goals expected from the exercise programme and the self-presentation, or the image that the individual desires to portray to other people. Studies such as Gammage et al. (2000, 2004) have examined the exercise imagery functions by gender, exercise frequency of high and low participation and exercise activity types.

A significant main effect for both gender and exercise frequency was reported by Gammage et al. (2000), and the high exercise frequency exercisers were reported to use the imagery functions more than the low frequency exercisers. A multivariate test using only the exercise activity types as the independent variables and the imagery sub-scales as the dependent variables yielded a significant result while the follow up ANOVA indicated differences for both technique and appearance imagery function, and it was further noted that the pattern of imagery was consistent with activity type. Individuals who exercise more frequently are not only more motivated to have others see them as being in shape, but they also may be more likely to imagine themselves exercising as a strategy for attaining desired physical impressions (Gammage, Hall and Martin, 2004). Moreover that Regular exercise has been confirmed to be positively related to physical and psychological well-being (USDHHS, 1996; 2000).

### Purpose of the Study

A dearth of research in exercise imagery on participants from the developing countries necessitated this study. The present study examined differences in exercise imagery use between genders, and also further determined whether high and low frequency exercisers differ significantly on the use of each imagery functions and

lastly, the study examined the differences in frequency of imagery used based on three different categories of activity such as ball games, racquet games, and jogging, swimming, and gymnasium activities. Based on previous research on exercise imagery it was therefore hypothesized that, there will not be a significant difference in the use of the exercise imagery functions between genders, that the high and low frequency exercisers will not significantly differ in the use of the exercise imagery functions and lastly that there will not be a significant difference in the use of the three imagery functions among the three different categories of exercise group.

## Methods

### Participants

Participants were 482 male and female university students with a mean age of 24.0 years, SD = 4.7 for male (n=256); and a mean age of 23.0 years, SD = 5.2 for female (n=226). The participants were from the three old generation universities in western part of Nigeria. They are involved in exercise activities such as jogging, walking, gymnastic activities which include weight training, exercising on the treadmill and cycling on the bicycle ergo meter, and recreational sports such as swimming (247), tennis, badminton, squash, table tennis (150), volleyball and basketball (85), for the purpose of exercise.

### Instrument

The participants completed two sets of questionnaires. The first was a demographic questionnaire which indicated the participants' demographic characteristics such as sex, age, exercise activity or activities and the frequency of exercise. Participants were classified as high or low frequency exercisers based on their response to frequency of exercise. Participants who exercised three times or more per week were classified as high frequency exercisers, and those who exercised two or fewer times per week were classified as low frequency exercisers (Gammage et al., 2000).

The second questionnaire is the Exercise Imagery Questionnaire originally developed by (Hausenblas, et al 1999). However, the revised version of (EIQ) as used by Gammage et al. (2000) was used for the study because of its generalisation for other forms of exercise. In this study, the Cronbach alpha coefficient of determination

for the (EIQ) is 0.85 appearance; 0.89 energy; and 0.88 technique. The 9 item measure of the (EIQ) ask the participants to rate their use of the three imagery functions on a 9 point scale ranging from 1(never) to 9 (always). Each of the sub-scale is made up of three items and according to Gammage et al. (2000), the appearance sub-scale is thought to serve a motivational function for the attainment of a fit-looking body. An example of an item is "I imagine a fitter me from exercising".

The energy sub-scale is thought to serve a motivational function and relates to getting psyched up or feeling energized from exercise. An example of an item under this subscale is "To take my mind off work, I imagine exercising".

The technique sub-scale serves a cognitive function of imagery and focuses on performing skills and techniques correctly with good form. An example of item under the technique sub-scale is "When I think about exercising, I imagine my form and body position".

### Procedures

The consent of the participants was sought at their different exercise stations before the administrations of the questionnaire. The researcher with the assistance of eight other researchers explained the content of the questionnaire for clarity and understandings, especially the preamble on the revised EIQ which relates to the concept of imagery in relation to exercise. The participants were assured of the confidentiality of all information given. The participants later completed the questionnaire and returned them to the researcher and the assistants.

### Data Analysis

The SPSS statistical package was used for analysis of data. The internal consistency for the EIQ subscales was done using the Cronbach alpha coefficient. The descriptive statistics of percentage mean and standard deviation was also utilized, while the multivariate analysis and test of between subjects effects was also used for the purpose of group comparison on the use of the three imagery functions.

**Results**

**Table 1. Frequency and Percentage Distribution of Participants According to Exercise Frequency Category.**

Category	Gender	Frequency	Percentage
High	Male	138	28.63
	Female	112	23.24
Low	Male	118	24.48
	Female	114	23.65
Total		482	100%

Note High \*\* Participants who exercise 3 times and above in a week  
 Low \*\* Participants who exercise 2 times and below in a week

The descriptive statistics were calculated for all the independent and dependent variables for the entire samples. Table 1, shows the participants' division into exercise frequency category of high and low by gender.

**Table 2. Cronbach Alpha for the EIQ subscales.**

Subscales	Hausenblas, et al (1999)	Gammage, et al (2000)	Present study
Appearance	.84	.87	.85
Energy	.90	.85	.89
Technique	.86	.86	.88

Table 2 revealed the cronbach alpha coefficient of determination for this study on the three exercise imagery functions in comparison with Hausenblas et al. (1999) and Gammage et al. (2000). The cronbach alpha coefficients indicate that the EIQ is internally consistent.

**Table 3. Descriptive Statistics of the Exercise Imagery Functions by Gender.**

Subscales	Gender	N	Mean	SD
Appearance	Male	256	16.53	4.99
	Female	226	16.60	5.30
Energy	Male	256	17.08	4.83
	Female	226	16.40	5.49
Technique	Male	256	19.31	5.15
	Female	226	18.69	5.49

Mean scores for each of the three exercise imagery subscales for the total sample by gender are shown in Table 3. The female exercise participants were found to use the technique imagery function most frequently and the energy imagery function least frequently. While the male exercise participants were found to use the technique imagery function most frequently and the appearance imagery function least frequently. MANOVA was conducted using the three EIQ subscales as dependent variables, and gender, exercise frequency categories of high and low and exercise activity groups as independent variables. There was no significant multivariate main effect for gender (Wilks Lambda =.63; F(3,479) =0.719; P>.05; eta squared =.14).

**Table 4. Describe Statistics for the High and Low Exercise Frequency Groups on the Exercise Imagery Functions by Gender.**

Subscales	Category	Gender	Mean	SD	N
Technique	High	Male	19.23	4.91	138
		Female	18.58	5.90	112
	Low	Male	19.39	5.45	118
		Female	18.80	5.09	114
Appearance	High	Male	16.44	5.13	138
		Female	16.73	5.26	112
	Low	Male	16.63	4.84	118
		Female	16.48	5.35	114
Energy	High	Male	17.11	4.47	138
		Female	16.91	5.45	112
	Low	Male	17.05	5.25	118
		Female	15.90	5.51	114

Also, the MANOVA results for the exercise frequency categories of high and low by gender did not reveal any significant multivariate effect (Wilks Lamda =.99;  $F(3,479) = 1.923$ ;  $P > .05$ ;  $\eta^2 = .21$ ).

An examination of the mean as shown on Table 4, indicated that both male and female exercisers in the high and low exercise frequency categories use the technique imagery function most frequently when compared with the energy and appearance imagery functions.

**Table 5. Descriptive Statistics for the Exercise Imagery Questionnaire subscale by Exercise Activity Type.**

Exercise Activity Groups	Energy		Appearance			Technique	
	N	Mean	SD	Mean	SD	Mean	SD
Ball games	85	17.89	4.72	17.72	4.92	19.60	5.27
Racquet and stick games	150	16.46	4.99	15.68	5.29	18.46	5.38
Jogging, gym swimming	247	16.55	5.37	16.70	5.03	19.16	5.29

Meanwhile, MANOVA results for the exercise activity groups indicated a significant multivariate main effect. (Wilks Lamda =0.98;  $F(3,479)=3.376$ ;  $P < .05$ ;  $\eta^2 = .28$ ). However, the results did not indicate a significant effect for the Test of between subjects for all the exercise imagery functions; Technique,  $F(2,481)=.549$ ;  $P > .05$   $\eta^2 = .06$ ; Energy,  $F(2,481)=.083$ ;  $P > .05$ ;  $\eta^2 = .02$ ; Appearance (2,481)= .737;  $P > .05$ ;  $\eta^2 = .04$ . The results further shows on Table 5, that exercise participants in the ball games exercise activity group used the three imagery functions most frequently than the racquet and stick games and the jogging, gymnastics and swimming exercise activity group when the mean values are considered.

## Discussion

The purpose of this study was to examine exercise imagery use between the gender, whether they differed significantly in the use of these imagery functions. The same was also done with the classification of these exercisers into high and low exercise frequency categories. The examination of the three imagery functions on three different exercise activity groups was also carried out in this study.

The null hypothesis formulated on the exercise imagery functions by gender was accepted, and this is at variance with the findings in Gammage et al. (2000), in which the MANOVA result revealed a significant main effect of the three imagery functions between genders.

Though the results did not indicate a significant main effect for both gender on the imagery functions, the insignificant result recorded in this study may be connected with the fact that the gender groups may have similar perceptual motive of the imagery functions as they participate in exercise, and further examination of the findings indicated that the male exercisers used the technique imagery function more than the female did, while it was the opposite with the appearance imagery function.

The male exercisers were also reported to use the energy imagery functions more frequently than the female. Meanwhile the finding on the appearance imagery is expected because ideally the female exercisers tend to exercise more for appearance related motive given the pressure placed on women generally to maintain a physically fit and ideal body weight (McCauley and Burman, 1993). Also, men have been reported as argued in Gammage et al. (2000) to use technique imagery more frequently than women because they always image themselves perfecting their form and technique as they exercise.

The classification of the exercise participants in this study into either high or low exercise frequency groups is consistent with the studies of Gammage et al. (2004), Hausenblas, et al.(1999), and Rodgers and Gauvin, (1998), even though it is expected that the high frequency exercise group should use all the three imagery functions more often than the low frequency exercisers as found in the studies above, the present findings in this study varies because further classification with the gender group which was done in Gammage et al. (2000) was also done along with the high and low frequency exercise groups on the three imagery functions.

Though, there were no significant multivariate main effect for both gender groups and the exercise frequency categories on the three imagery functions, which by implication mean that the null hypothesis formulated is accepted but results also shows that the male exercisers in both high and low exercise frequency group utilized the technique imagery more than their female counterparts, while the males and females, regardless of high or low frequency of exercise seem to use about the same amount of appearance imagery. Also, both male exercisers in the high and low exercise frequency groups utilized the energy imagery functions more than their female counterparts. The frequency of exercise (high and low) are very important variables which influences imagery use and the study of Rodgers and Gauvin(1998) has demonstrated that these groups of exercisers differ on both the motivational and cognitive functions of imagery use in exercise.

This study also revealed a significant multivariate main effect in exercise imagery by exercise activity types. This implied that the null hypothesis formulated is rejected. The significant result is in congruence with Gammage et, al. (2000), in which activity type was used as the independent variable and the three imagery functions as dependent variable. The significant result recorded with the activity types may be as a result of the preference of the activity type coupled with the motive for the involvement in the exercise programme. The different activity types in this study refers to the ball games, racquet and stick games, and the jogging, gymnastics exercise activities in the gymnasium i.e. weight training, exercising using the treadmill and cycling on the bicycle-ergo meter and swimming for recreation.

Exercisers in the ball games exercise activity group utilized all the three exercise imagery functions most frequently when compared with the other exercise activity groups. This could be as a result of the influence the exercisers in the ball games being a group have on each other, and exercising together more frequently as a team can promote cohesion and this could unify their motive for participation in these exercise activity types, while the jogging, gymnastics activities and the swimming exercise group used the three imagery functions more than the racquet and stick games group.

The classification of the exercisers into exercise activity groups was necessary for ease in analysis and it is worthy to note that some participants listed more than a single exercise engagement. For example, some participants whose primary exercise engagement is jogging also listed riding on the bicycle ergometer, the use of the treadmill and even weight training as part of their exercise routine. While in the racquet and sticks games some participants are engaged in both squash as well as table tennis. Exercise behaviour is a well developed norm in the developed world when compared with the developing countries, because most ingredients that facilitate the participation in exercise activities are readily available. Barriers such as socioeconomic, culture and religious factors are challenges that hinder participation in exercise in terms of frequency, female participation when one considers religion or culture that disallowed female involvement, and also variety in exercise activity type. The dichotomization of the exercise frequency (i.e. high and low) is replete with concern and this is regarded as a limitation in this study.

In conclusion, a relevant cognition that may be associated with exercise is imagery and since every individual has an inherent imagery ability, further studies on the use of other imagery approaches in relation to some psychological constructs such as ego, task and goal orientation to enhance exercise behavior among different groups are encouraged especially in the developing countries where there are dearth of literature on imagery research, this is because of its significant motivational and cognitive roles according to Milne et al (2006) in exercise, and its usefulness in enhancing exercise adherence, which furthermore reflect the motive people have for enjoying exercise.

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