

The Attribution Roles and Self-Efficacy in Determining Individual Exercise Behavior

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Abstract

The main purpose of this study was to determine the relationship between exercise self-efficacy and attributions with exercise behavior and to what extent the two independent variables that can determine the individual exercise behavior. Respondents are consists of 274 students (86 men, 188 women) aged between 20 and 24 years ($M = 21.31$, $SD = 1.27$). They were undergraduate students in various fields of specialization at the Institute of Teacher Education, Islamic Education Campus, Ministry of Education Malaysia. The Godin Leisure Time Exercise Questionnaire (GLTEQ; Godin & Shephard, 1985) is used to determine the level of their involvement in physical activity within a week. While the independent variables of exercise self-efficacy is measured using the Marcus' Self-efficacy for Exercise Questionnaire (Marcus, Selby, Niaura, & Rossi, 1992) and the revised Causal Dimension Scale (CDSII; McAuley, Duncan, & Russell, 1992) was used for measuring their attributions towards success and failure in physical activity. The findings showed there was a weak relationship between exercise self-efficacy and exercise behavior, and exercise self-efficacy also contributed significantly to the behavior of exercise. However, the four dimensions of attribution does not show a significant relationship with exercise behavior. The study is expected to enhance the understanding of motivational factors that contribute to the individual exercise behavior.

Key Words: Attributions, Exercise self-efficacy, Student-teachers, Individual exercise behavior

1. Introduction

Ministry of Health Malaysia statistics in 2010 showed 30 percent of Malaysians are overweight and 30 percent worse yet categorized as obese due to unhealthy lifestyle practices, including lack of exercise (Lai, 2010). Earlier, surveys by the National Fitness Council in 2008 found that only 49 percent of the youths in Malaysia exercise more than three hours a week and there are also 20 percent of youth who do not exercise at all (www.nfc.net.my). Lack of exercise among youths in Malaysia is consistent with the fact Spence et.al. (2010) state that there are many youths exercise less than the recommended 60 minutes a day, five days a week as proposed by Troiano et al., (2008).

The phenomenon of lack of exercise are not only among youth in Malaysia, but also in other countries, including developed countries because according to Dishman, Washburn, and Heath (2004), 30 percent of youth in the United States not to engage in physical activity and only 15 percent exercise for 30 minutes or

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more for three days or more in a week. This is supported by Basch (2011) who state that nearly two-thirds of high school students in the United States is not doing physical activity at recommended rates. Similar situation also occurred in Canada where Statistics Canada (2005) showed 55 percent of Canada's population is inactive, while 75 percent are not active enough to increase the benefits to their health. The statement also indicated that participation in physical activity and exercise is actually able to provide benefits to human health if done at the proposed rate (Corbin, Corbin, Welk, 2008).

Many studies found that participation in physical activity bring good impact on health such as reducing the risk of coronary heart disease (Manson, Hu, Rich-Edwards, Colditz, Stampfer, & Willet, 1999), preventing cardiovascular disease and obesity (Dietz, 2004), and reduce the symptoms of depression and the risk of osteoporosis (Kohl, Fulton, & Casperson, 2000). Recognising the importance of physical activity to promote health, World Health Organization (WHO) (2006), has encouraged people worldwide to engage in physical activity by encouraging member countries to develop policies and programs to promote healthy lifestyles through nutrition and physical activity. However, all efforts made by WHO to promote communities around the world to physically active will not help if the individual is still less desire to exercise. Therefore it is important for us to identify ways to motivate individuals to be more likely to engage in physical activity (Gao, Xiang, Lee, & Harrison Jr., (2008) because, according to Roberts (2001) motivation is a generator to direct and regulate individuals behavior.

Various theories have been used to understand the process of motivation in exercise behavior, and the most frequently used is the Self-Efficacy Theory of Bandura (Gao et. al., 2008). Self-efficacy refers to the level to which extent the individual believes he can do things at set level (Bandura, 1986). Thus, this theory suggests self-efficacy could serve as a determinant of individual behavior. Self-efficacy is among the focus of researchers in determining individuals' involvement in physical activity (e.g., Nigg, Geller, Motl, Horwarth, Wertin, & Dishman, 2011; Buckley, & Cameron, 2011; Murru, & Ginis, 2011). Results previous studies have also identified self-efficacy as the most important determinant of individual participation in physical activity (e.g., Bandura, 1997; McAuley, Courneya, & Lettunich 1991; Rudolph, & McAuley, 1996). Individuals with high self-efficacy will tend to put more effort in implementing it despite the obstacles or constraints such as time, health and environment factors (Bandura, 1997). The findings of the study by Spence et. al. (2010) coincided with the statement where the study found that male respondents who have higher exercise self-efficacy leads to greater participation in physical activity than female respondents.

In general, many studies found that Self-Efficacy Theory shows consistent role in predicting exercise behavior (McAuley, & Jacobson, 1991), but it does not mean it is the only factor that determines the individual exercise behavior (Sallis, & Hovell, 1990). This is because Weiner (1985), has developed a model to assess the extent of how individual attribute their success and failure play role in determining future behaviors. The theory describes the process of how individuals describe and understand why a thing, behavior or emotional effects occur in their lives (Weiner, 1985 & 1986). Lewis and Daltroy (1990) was added that attribution is an individual's perception of the causes of success or failure of the experiences and perceptions are seen as a predictor of future behavior.

Based on the Weiner's (1985) model, McAuley, Duncan, and Russell (1992) have carried out as study to determine the causes of success and failure in the competitive task ergometer cycling, gymnastics activities and one on one basketball game. Each respondent is required to identify things that cause their success or failure. Each of the causes mentioned by the participants will be included in one of the four dimensions of the causes of success and failure. Figure 1 shows the four dimensions which is locus of control, stability, personal control and external control. The study concluded that to achieve the goals related to physical activity behavior, stable causes (e.g., individual capacity) and the locus of control (e.g., caused by me) have a relationship with the actual behavior. This is consistent with the statements by Lewis and Daltroy (1990) which states that individual who attribute the success or failure caused by themselves, tend to engage in activities related to health even if facing barriers, constraints or failure.

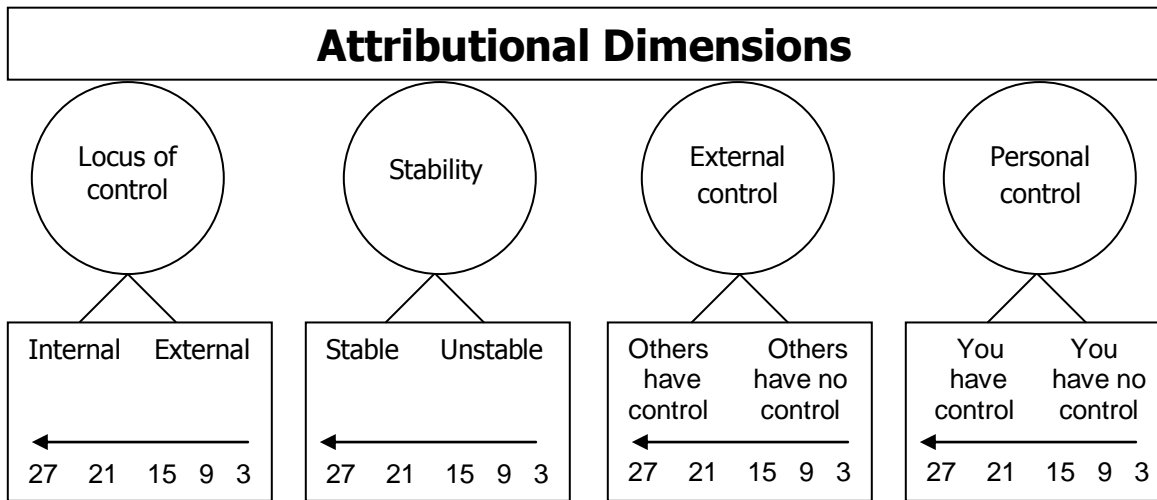


Figure 1. The illustration shows the four dimensions used to measure the causality in revised Causal Dimension Scale (CDS II; McAuley, Duncan, & Russell, 1992).

This statement is also supported by study conducted by Beacham et. al. (2011) who found that individuals who feel that their success or failure in physical activity due to stable internal factors and within their control, seemed tend to continue exercise at recommended frequencies. But there are also studies that deny the relationship, such as finding Kendzierski and Sheffield, (2000) found that differences in attributions of university students is not the cause of the decline in physical activity participation.

Based on the literature reviews, self-efficacy and attribution able to predict the behavior of individuals to exercise (e.g., Beacham et al., (2011); Fauzee & Ali, 2004; Spence et. al., (2010), but there are also studies that denies it, especially the relationship between attributions and exercise behavior (Kendzierski et al. al., 2000). Because of that, William, Anderson, and Winnet (2005), stressed that a key factor in predicting individuals' involvement in physical activity continues to be sustainable but still no assurance clearly related, and the perfect model about it yet to be determined. It is also supported by Beacham et al. al., (2011) by stating that many studies have been conducted to determine the main factors that motivate individuals to exercise regularly, but factors yet to be identified clearly. Because of the confusion, the current study was conducted to enhance understanding of the motivational factors that determine the behavior of individual in exercise self-efficacy and attributions aspect, particularly for populations in Southeast Asia especially in Malaysia. This is in line with the recommendations of Kok, Omar-Fauzee, and Rosli (2010) who state that a variety of factors need to be examined in determining participation in physical activity, including the level of individual self-efficacy.

To achieve this goal, the current study will determine the relationship between exercise self-efficacy and attribution with respondents exercise behavior. This study also will determine to what extent exercise self-efficacy and attribution contribute to predict the respondents exercise behavior.

2. Methodology

Respondents

Respondents for this study consists of 274 students (86 male; 188 female) who is pursuing a Bachelor of Teaching at the Institute of Teacher Education, Islamic Education Campus, Bangi, Selangor (IPG KPI). Those aged between 20 and 24 years ($M = 21.31$, $SD = 1.27$) was in first to the final year study in the various areas of expertise related to teaching.

Procedures

Researcher apply for permission from the Rector of the Institute of Teacher Education, Ministry of Education Malaysia to conduct a study on students in the IPG KPIs. With permission, the researcher met the Director of the IPG KPI to explain the background study that will be conducted. Then, the student enrollment in the IPG KPIs will be obtained from the Student Affairs Unit to determine the sample to be taken. Researcher using stratified random sampling technique to obtain the number of male and female respondents and the number of respondents according to years of study. After that, simple random sampling is used to determine the students who will be selected as respondents. After the respondent is identified, the researcher met with the respondents in small groups to distribute the questionnaire. Researcher will select respondents randomly for replacement if the original respondent could not be found during distributing the questionnaires. Before answering, the researcher briefly describes the study and how to answer a questionnaire. Then, respondents are given 20 to 30 minutes to complete the questionnaire and handed it to the researcher after completed. The researchers also stressed to respondents that all information provided by them is confidential, for that purpose the respondent is required to sign a letter of consent to involved in this study. Respondents were also given the option to withdraw from this study within one month from the date of the questionnaire is answered and if this happens, withdrawn respondent data will not be used.

Instrumentation

Exercise Behavior

The Godin Leisure Time Exercise Questionnaire (GLTEQ; Godin & Shephard, 1985) were used. It consists of two questions and is used to measure the frequency of individual participation in strenuous, moderate and light exercise in a week. In the first question, respondents are required to state the total number of times per week they engaged in physical activity at three different levels which is strenuous exercise (heart beats rapidly), moderate exercise (not exhausting) and exercise (minimal efforts). While the second question required respondents to state whether they are often, sometimes or rarely do physical activity long enough to cause sweating. For the first question the reliability of this questionnaire was .94 (strenuous exercise), .46 (moderate exercise) and .48 (light exercise), while the .80 is for the second question. These reliability values obtained from test-retest results (Godin, & Shephard, 1985).

Exercise self-efficacy

The Marcus' Self-efficacy for Exercise Questionnaire (Marcus, Selby, & Niaura, Rossi, 1992) was used to measure respondents' level of exercise self-efficacy in different situations. Respondents are required to determine how they perceive their own ability to perform physical activity when confronted with various situations of barriers (*I am tired, I am in a bad mood, I feel I don't have time, I am on vacation, and it is raining*). For each situation described, respondents are required to provide their perceptions on a scale from 1 (*Not at all sure*) to 7 (*Very sure*). Marcus et. al. (1992) reported internal consistency of this questionnaire was .82.

Causal Attribution

The Revised Causal Dimension Scale (CDSII; McAuley, Duncan, & Russell, 1992) was used to measure the causes of success and failure that are specific to exercise. The respondents state the reason why they are successful or unsuccessful meeting their exercise goals. Respondents rate causes for being successful / unsuccessful on 9-point bipolar scale reflecting four attributional dimensions. This questionnaire consists of 12 items from the four dimensions of attributions (1) locus of control (*reflects an aspect of yourself – reflects an aspect of the situation, inside you – outside of you, something about you – something about others*), (2) stability (*permanent – temporary, stable over time – variable over time, unchangeable - changeable*), (3) personal control (*manageable by you – not manageable by you, you can regulate – you cannot regulate, over which you have power – over which you have no power*), and (4) external control (*over which other have control – over which other have no control, under the power of other people – not under the power of other people, other people can regulate – other people cannot regulate*). Based on the

Cronbach-alpha, the reliability of this instrument is .67 (locus of control), .67 (stability), .79 (personal control), and .82 (external control) (McAuley, Duncan, & Russell, 1992).

Statistical Analyses

All statistical analysis carried out using SPSS version 19 for Windows. Demographic data of respondents will be determined using descriptive statistics and frequency. Data relating exercise behavior, exercise self- efficacy, and attribution would spread in the form of descriptive as well. Onwards, Pearson Product-Moment correlations coefficient will be used to determine the relationship between exercise self- efficacy and dimensions of attributions with exercise behavior. End of, the standard multiple regression analysis was also carried out to determine to what extent the predictors able to predict the respondents exercise behavior.

3. Results

Demographic Data

Descriptive analysis showed that 31.4 percent of respondents were males while 68.6 percent are female. All respondents aged between 20 to 24 years ($M = 21.31$, $SD = 1.27$). While the frequency and percentage distribution of respondents according to field and year of study are shown in table 1 below.

Table 1. Distribution of respondents based on age, gender, year and field of study.

		<i>Frequency</i>	<i>Mean</i>	<i>SD</i>	<i>Percent</i>
Age			21.31	1.27	
Gender	Male	86			31.4
	Female	188			68.6
Year of Study	First	117			42.7
	Second	54			19.7
	Third	36			13.1
	Final	67			24.5
Field of Study	Islamic Studies	83			30.3
	Arabic	25			9.1
	English	18			6.6
	Mathmatics	39			14.2
	Social Studies	29			10.6
	Pre-school	21			7.7
	Physical Education	28			10.2
	Special Education	33			11.3

Descriptive Statistics

Exercise behavior measured by weekly physical activity score. To determine this, the total frequency of light exercise per week will be multiplied by 3, moderate exercise is multiplied by 5, and strenuous exercise multiplied by 9. All the sum will be added together to determine the exercise behavior of respondents. The higher the score values obtained, the more exercise performed by the respondents in the week. Therefore, based on descriptive statistics obtained, rates of physical activity performed by the whole of the respondents in the week was moderate ($M = 30.06$, $SD = 13.34$). The respondents exercise self-efficacy scores also showed the moderate level ($M = 3.40$, $SD = 1.10$) based on a scale of 1 to 7. Meanwhile, for the four attributional dimensions also showed respondents had a moderate score based on a minimum three and maximum of 27 values, where the dimensions of locus of control ($M = 13.74$, $SD = 4.35$), stability ($M = 15.51$, $SD = 3.45$), external control ($M = 15.18$, $SD = 3.31$) and ($M = 13.97$, $SD = 4.08$). The findings of the descriptive statistical analysis are summarized in table 2 below.

Table 2. Descriptive statistics for exercise behavior, exercise self-efficacy, and attributional dimensions scores based on gender and overall respondents.

<i>Variables</i>		<i>Male</i>	<i>Female</i>	<i>Total</i>
Exercise behavior	(M)	33.91	28.34	30.06
	(SD)	13.34	16.09	15.49
Exercise self-efficacy	(M)	3.60	3.32	3.40
	(SD)	1.15	1.09	1.10
Attributional Dimensions				
<i>Locus of control</i>	(M)	14.76	13.29	13.74
	(SD)	4.23	4.33	4.35
<i>Stability</i>	(M)	15.72	15.42	15.51
	(SD)	3.69	3.34	3.45
<i>External control</i>	(M)	15.45	15.06	15.18
	(SD)	3.26	3.33	3.31
<i>Personal control</i>	(M)	14.13	13.90	13.97
	(SD)	4.35	4.00	4.08

Correlation Analysis

The current study aims was to determine the relationship between exercise self-efficacy and four attributional dimensions with exercise behavior. Therefore, Pearson product-moment correlation coefficient is used. Preliminary analysis was conducted and found that there are no violation for both normality and linearity assumptions. Since, there are five (5) bivariate pairs, a modified Benferroni alpha level of 0.01 ($0.05 / 5$) was used to test the hypothesis for all pairs.

Table 3. The relationship between exercise self-efficacy and four attributional dimensions with respondents exercise behavior.

Dependent variables	Exercise behavior		
	Male (<i>p</i>)	Female (<i>p</i>)	Total (<i>p</i>)
Exercise self-efficacy (5)	.128 .265	.090 .237	.171** .002
Attributional dimensions			
<i>Locus of control</i> (3)	-.080 .484	-.025 .738	.015 .400
<i>Stability</i> (3)	-.129 .260	.023 .763	.065 .143
<i>External control</i> (3)	.060 .602	.079 .297	-.012 .422
<i>Personal control</i> (3)	-.127 .270	-.044 .564	-.061 .157

Notes : Numbers in captivity indicate the numbers of item that were measured for each construct.

A modified Benferroni alpha value = 0.01 (0.05/5)

** $p < .01$

Based on Table 3 above, the findings showed that only self-efficacy of the overall respondents have a significant relationship with exercise behavior and it was weak

($r = .17$, $p = .002$). Thus these findings suggest that the weak positive correlation coefficient of .17 showed the higher exercise self-efficacy of the respondents, the higher the level of their involvement in physical activity. In addition, there are no attributional dimensions showed significant relationship with exercise behavior.

Multiple Linear Regression Analysis

To determine the extent of exercise self-efficacy and attributional dimensions able to predict the respondents exercise behavior, standard multiple regression analysis has been carried out. Preliminary analysis of the data has been implemented in advance and showed that assumptions of normality, equality of variance and linearity are all met. Standard multiple regression analysis found that the exercise self-efficacy and attributional dimensions is a significant predictor of the respondents exercise behavior, $R^2 = .046$, $R^2_{adj} = .028$, $F(5, 268) = 2.569$, $p < .05$. Accordingly, the exercise self-efficacy-and four attributional dimensions explain 4.6 percents variance in exercise behavior scores. However, based on coefficient table only exercise self-efficacy contribute significantly to the exercise behavior ($\beta = .181$, $p < .05$), while all of the attributional dimensions does not contribute significantly in predicting the exercise behavior. Summary of standard multiple regression analysis of shown in table 4.

Table 4. Results of the standard multiple regression analysis.

<i>Predictors</i>	β	<i>t</i>	<i>p</i>
Exercise self-efficacy	.181**	2.99	.003
Attributional dimensions			
<i>Locus of control</i>	.127	1.52	.129
<i>Stability</i>	-.076	-1.08	.283
<i>External control</i>	-.015	-.228	.820
<i>Personal control</i>	-.127	-1.54	.125

R = .214; R² = .046; Adj. R² = .028

** *p* < .01

4. Discussion

The current study aims to investigate the relationship between exercise self-efficacy with exercise behavior. Based on previous studies, this study hypothesized that there is a relationship between these variables. In general, this study found that a weak positive relationship between exercise self-efficacy with exercise behavior. This finding to some extent support the findings of the study by Spence et. al. (2010) that individuals with high exercise self-efficacy are more likely to engage in physical activity. It is also consistent with the findings of Beacham et. al. (2011) who found that individuals who adopt a systematic exercise will show high in exercise self-efficacy which leads to a more positive attitude to exercise. Therefore, we can conclude that these findings suggest there a relationship between these variables and exercise self-efficacy showed the ability to predict the individual exercise behavior. For this reason, exercise self-efficacy should be enhanced to make individuals more engage in physical activity. To increase it, McAuley (1994) have suggested several potential strategies consisting of four sources of mastery experience, vicarious learning, verbal persuasion, and physiological states (more information see Omar-Fauzee, Lian, Loon, Nazaruddin, & Rashid, 2009). It is hoped that by implementing the strategies had the potential to enhance individual exercise self-efficacy as a catalyst to continue to engage in physical activity.

This study also aimed to determine the relationship between the four attributional dimensions with exercise behavior and to what extent these dimensions could predict exercise behavior. Based on available literatures, numerous studies confirming the relationship between these two variables as Beacham et. al. (2011) found that individuals who exercise regularly tend to associate their exercise behavior to personal, stable and control by themselves factors. Similarly Kendzierski et. al. (2002) found that individuals who do not exercise associated their behavior to a stable factor (e.g., barriers). Nonetheless, this study was not supported previous studies because finding showed there was no relationship between the four attributional dimensions with exercise behavior, it also meaning that all attributional dimensions cannot predict the exercise behavior. But there are studies supporting these findings as Kendzierski (2000) who found differences in attributions are not the cause of the decline in physical activity. This similarity may be due to both studies were conducted on respondents from the same background of undergraduate students.

From the perspective of researcher, there are several factors that contribute to these findings. First, the difference may be due to the background of the respondent, where current study was conducted on undergraduate students at the university between the ages of 21 to 24 years compared to a study by Beacham et. al. (2011) who conducted the study to respondents aged between 18 and 80 years, while Spence (2010) studied grade seven to 10 school children. The second factor of the difference is probably caused by the learning environment in IPG KPIs is relatively compact and exhausting. Therefore during leisure time, students would prefer to relax, review lessons or to complete assignments compared ti doing physical activity. Furthermore, this institute are more to islamic environment-based and more focus on aspects of islamic spirituality, but at the same time does not ignore the physical fitness aspects as the teachings of Islam

encourages physical activity, especially swimming, archery and horse riding. But these activities can not be provided by the administrator of the institute because of the relatively high cost. Perhaps other physical activities are provided as an alternative less attractive to engage their interest. Thus, the attribution factor in physical activity is not a determinant of their participation in physical activity and probably physical activity is not a significant factor to be a priority in their lives now.

Because of these findings failed to fully support the previous studies especially the relationship between attributional dimensions and exercise behavior, the researchers concluded the study of motivational factors that cause individuals engagement in physical activity still need to continue, especially in South-East Asia context. To improved this matter, the researchers suggest several other variables to consider in reviewing it. First, the barriers to exercise, as many researchers found that these factors play a significant role in predicting positive changes in health-related activity (Buckworth, & Dishman, 2002). The second factor is the outcome expectancy, because according to Gao et. al. (2008) this factor are more important compare to self-efficacy in predicting individual behavior. Third is to consider the self-determination, because this factor have a relationship with strenuous exercise activity during leisure time (Lutz, Karoly, & Okun, 2008). Temptation factor cannot be marginalized because Nigg et. al. (2009) stressed that the temptation also contributes to participation in physical activity. Finally, the researchers suggested to included three factors simultanously in one study, the factors are attribution / self-efficacy / intention, because according to Shields, Brawley and Lindover (2006) self-efficacy and intention are mediators of the relationship between attributions and exercise behavior.

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