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Predictors of young adults' movement capability in physical activity

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Abstract

Background and Study Aim: The purpose of the study is to identify the predictors of the movement capability of the individuals in physical activity.

Material and Methods: Quantitative descriptive predictive method was employed in identifying the significant relationship of the identified factors that can predict movement capability in physical activity. There were 263 participants in the study from one of the Higher Educational Institutions in Cebu City, Philippines which were randomly sampled using Raosoft Sample Size Calculator. Experts validated research instruments were used and data gathered were analyzed using descriptive (percentile, mean, standard deviation) and inferential statistics (multiple regression).

Results: Findings revealed that only three factors: blood type, attitude towards physical activity, and perceived action – scaled affordance were predictors of movement capability and five movement dimensions were influenced by blood type, attitude towards physical activity, and perceived action – scaled affordance. Thus, blood type is predictor to flexibility, accuracy, speed and endurance. On the other hand, attitude towards physical activity is predictor of endurance. While, perceived action – scaled affordance is predictor of strength, accuracy and endurance.

Conclusions: It was concluded that a person's capability to engage in physical activity is contributed by biological factors (blood type) and psychological factors (attitude and perceived action-scaled affordance). It is recommended that validation study be conducted to strengthen the claims of the identified factors to movement capability of an individual.

Keywords: attitude, blood type, movement capability, parents' inclination, physical activity

Introduction

Movement can be subjective and objective. It can boil down into the capability of a person to move based on his/her perceptions or on limits. Movement capability is sometimes referred to as physical ability [1], "motor skill competence" [2], or more commonly, "skill" [3, 4, 5]. Thus, movement capability can be acquired and developed when a person continuously engages in physical activity. However, the questions remain on how much the person can move and what constitutes movement capability? Expectations and hopes were placed on expanding movement capabilities through physical education lessons and activities [6, 7]. Thus, physical education teachers have this great responsibility to mold and enhance the capabilities of all the learners. In the personal observation of the researcher as physical education teacher/instructor in the different levels (secondary, senior high school, and tertiary) in educational system in the Philippines, movement capabilities of the students do differ in many ways and circumstances most dominantly visible during performance task on sports and dance. Sometimes, lingering on the huge delineation of their performances have ignited the mind of the researcher to look into the contributory factors on the translucent differences of their performances in physical activity.

However, in understanding movements, there are several reasons that underpin its natural course. Movement is everything but the capability to move is something to be identified by the movers. The Movement Continuum Theory specifies that each person has maximum, current, and preferred movement capabilities [8]. This implies that each individual has potential and capability as well as limitation in movements. Newton's Law of Motion talks about a certain outside force that acted upon to cause movement and cease movement. People often need to estimate what they are physically capable of accomplishing in a given situation and movement is not necessary to accurately perceive possibility [9]. Furthermore, optic flow is not sufficient to recalibrate the perception of action – scaled affordance. There are several factors that affect the movement capability of an individual but this study looked into which among the factors have significant contribution to human movement capability. Blood type may have something to do with the capabilities of an individual in terms of bodily movements. It has been proven that blood type has something to do with the personality of a person. Several studies have revealed that approximately 40% of the variation in personality can be explained by genes [9, 10].

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While, numerous studies proved that blood type/ groups have relationship on the IQ of a person [12]. Hence, blood type is a potential factor as predictor of movement capability in physical activity. On the other hand, parental encouragement leveraged the involvement of their children in engaging physical activity which in a way made their children healthier than usual [13]. In this context, parents' inclination to physical activity might be a potential attributor to movement capability in physical activity. Moreover, attitude plays an important role wherein it makes you decide either to engage in or not in physical activity. Inculcating enjoyment, appearance and feeling good in physical activity are some of the factors that very important for the group age 18 – 25 in participating physical activity [14]. Conversely, changing emotions and feelings might be good or bad potentially affect movement capability in physical activity. In the same vein, schools and colleges play an important part in the promotion of regular involvement of students through physical education activities that help in promoting healthy lifestyle in their life [15]. Physical activity and inactivity of the people is somehow attributed in neglecting physical environment as influences of physical activity [16]. Now, environment where the people live and build displays a potential barriers and opportunities to be physically active [17, 18]. Moreover, the design of neighbourhood and suburban sprawl have relationship to the physical health and bodyweight status of adults within the neighbourhood [19]. Thus, the presence of facilities and equipment matters in the development of movement capability in physical activity.

In the intensive and extensive reading of the researcher, it has been observed that these literatures were only implied studies that cannot totally verify the relationship of the human movement capability to the identified factors. There was no study yet that explicitly explained which factors have significantly contributed to the human movement capability. With this, the study becomes exploratory for understanding and confirmatory of the scenarios known.

Purpose: The purpose of the study is to identify and predict the different factors that affect the movement capability in physical activity of an individual. Additionally, the contention of the researcher to give early intervention to improve human movement capability of the individuals. Likewise, it provides ways, in the vast possibilities and opportunities in understanding human movement capability in physical activity.

Materials and Methods

Participants

Using the sample size calculator, 385 Physical Education students were initially selected as the study participants. The stratified and simple random sampling was in the selection process. The sample population was identified through the Raosoft sample size calculator. The error tolerance used was 5%, a confidence level of 99% and a total population (N) of 915 based on the data presented by the Department Chair of Physical Education in the university. Physical Education students are believed to be the right participants of this research since they have active participation in physical activity in their PE classes.

However, from the targeted 385, only 263 (69%) were able to make it during the data cleaning, for the following reasons: (1) some participants submitted incomplete information needed in the study and were excluded; and (2) the distribution of variables such as variation in blood type was highly considered. The students were composed of 65 (24.7%) males and 198 (75.3%) females ranging from age 17 to 34 years old, all single. They were all enrolled in health allied courses and are enrolled in Physical Education course.

Research Design

This study utilized a quantitative descriptive predictive design. Descriptive was used to describe the students' characteristics in terms of their blood types, parents' inclination to physical activity, attitude towards physical activity, environment, and perceived action – scaled affordance. Further, it explained and described the level of movement capability of the students in terms of the flexibility, endurance, speed, accuracy, adaptability and strength. Furthermore, predictive research was employed to surface the potential factors in predicting the movement capability of the participants. Subsequently, providing the foundation to create the theory on movement capability of an individual. Thus, regression was used as the inferential statistics in identifying which of the five potential factors have greatly attributed to movement capability of the students.

Statistical Analysis

The data were analyzed using the SPSS data – based program to have an accurate presentation and computation of results. Descriptive statistics were used for students' profiles and regression to test the relationship between variables of the identified factors under investigation. Regression analysis is primarily used for prediction and forecasting and to infer causal relationship between independent variable and dependent variable [20]. Further, to use regression for prediction or to infer causal relationship must cautiously validate why prevailing relationship have predictive power for a new context or why a relationship between 2 or more variables has a causal interpretation. These premises of regression, this study have carefully emerged in all the literature to consider the factors

to be investigated.

Since most of the variable distribution are said to be non-normally distributed using the Shapiro-Wilk test, the data were normalized using Log Transformation Technique. Through this technique, the X variable was transformed into its LOG(X) form. To be more specific, scales such as continuous variables, were converted using the Log10 base such that the base (b) logarithm of X is equal to Y because X equals to the b to the power of Y, where log(X)=y and X=bY. Log Transformations was the technique implemented based on the current skewness and kurtotic nature of the data. Using this technique allowed the forced pushing effect of logarithms by making the rest of the data closer to the mean, thereby generating a more normally distributed data.

Results

This portion presents the results of the study, in which tables and figures are used to present the answers to the proposed problems.

Table 1 presents the characteristics of the participants in terms of sex and age. Most of the participants were between 18 to 19 years of age since they belonged to first year college students. This age belongs to young adulthood which some studies revealed that this stage is characterized by a steep decline in the level of physical activity [21]. Most of the respondents are females with 75.3%. Females are usually influence by their parents to engage in physical activity [22].

The blood types of students were categorized into four types, as shown in Table 2. Blood type O is the most dominant among the participants on this study with 36.88%. This is not surprising since in the Philippines O and B blood types are the most common for Filipinos. According to the Department of Health [23] Filipinos are likely to have type O as the common blood type, followed by A, then B. The least blood type in the Philippines is blood type AB, which is difficult and rare to find, especially during blood transfusion. Though, the disparity among the blood types is very clear and the result has shown that indeed blood type AB is the least represented with only 16.35% but still it is a good number to embody the study. Moreover, the importance of blood type in this study is to directly identify what blood type can predict movement capability in physical activity among the six dimensions of movement parameters.

The inclinations of the parents towards physical activities were grouped into four: dance - related,

Table 1. Participants' profile

Variable	Category	Frequency	Percentage
Age	17 years old	4	1.5
	18 years old	117	44.5
	19 years old	128	48.7
	20 years old	10	3.8
	21 years old	2	.8
	24 years old	1	.4
	34 years old	1	.4
Sex	Male	65	24.7
	Female	198	75.3

N=263

Table 2. Blood types and parents' inclination to physical activity

Variables	Category	Frequency	Percentage
Blood Types	A	46	17.49
	AB	43	16.35
	B	77	29.28
	O	97	36.88
Parents' Inclination	Dance – related	29	11.02
	Contact	3	1.14
	Non – contact	18	6.84
	Recreational	213	81.00

N=263

sports with body contacts like basketball and softball, sports without body contacts like volleyball and tennis, and recreational activities. Most parents involved themselves in recreational - related physical activity with 81%. The following activities that belong to recreational PA are biking, hiking, jogging, trekking, wall climbing, walking, weights, yoga, mountain climbing, swimming, and etc. Most of the activities do not necessarily require someone or company to execute or perform the said physical activity, so it more comfortable and self - time based activities. Hence, recreational activities or leisure activities can be associated with becoming healthier and well - being [24]. This implies that most of the participants' parents were physical active, especially on recreational activities, but it does not also mean that their children are physical engaged in physical activity. However, knowing that when parents are inclined in physical activity, they can somehow interpret how they can influence their children. Parents' encouragement can make a difference in the amount of physical activity engagement of their children [25]. Thus, to improve their children's movement capability, parents must continuously engage in physical activity.

Students' attitude was measured by a five-item questionnaire validated by experts, as shown in Table 3. Generally, the participants have good or positive attitude towards physical activity (mean=3.141) which implies that they like to participate or engage in physical activities. Although they find it important to engage in physical activities (mean=3.279), some were not so confident to do so (mean=2.954).

Students always show excitement in doing physical activity which could be translated to have positive attitude towards PA [26]. Some also believe that participating in physical activities can widen one's social environment and make new friends. Hence, letting, encouraging and giving opportunities for the students or individuals to engage in physical activity provides a good avenue to develop their positive feelings towards it which can strengthen their physical health.

Feeling confident to engage in physical activity makes a person do the activity without thinking of consequences. The scaled affordance profile of the students is presented in Table 4. Perceived action - scaled affordance of students is also high with the mean of 2.692. This implies that students are aware of the action and perception system of movement which means that they are ready every time they are asked to try or perform a task. In short, they are conscious of their intentions to move, especially if it requires climbing (M = 2.969) and walking long distance (M= 2.962).

In sports, the concept of "affordance perception" can mean detecting an op¬po¬nent's next move, which has implica¬tions not just for performance but also for reducing injury risk. Hence, understanding of concept in a way also can progress the efficacy of program and provide a better strategy in performing and/or executing physical activity in its best. Further,

Table 3. Students' attitude towards physical activities

Indicators	Mean	SD	Description
I love to participate in any physical activity.	3.183	0.701	Good
I am confident to engage in physical activity.	2.954	0.759	Good
I make sure that I can participate in any physical activity.	3.084	0.725	Good
I find it important to engage in physical activity.	3.279	0.695	Very good
I can make friends in participating in physical activity.	3.206	0.712	Good
Average	3.141	0.568	Good

Ranges for Weighted Mean: 3.26-4.00=Very Good, 2.51-3.25=Good; 1.76-2.50=Fair; 1.00-1.75=Poor

Table 4. Perceived Ascaled affordance measures of students

Indicators	Mean	SD	Description
A forceful ball approach you. Are you going to catch it?	2.726	0.886	Good
You are given a task to run1K within 1 minute. Are you going to run?	2.076	0.811	Fair
You are asked to climb a 250 stair steps. Are you going to do it?	2.969	0.810	Good
The elevator door is about to close and you are 5 meters away. Are you going to run for it?	2.722	0.904	Good
You are challenge to walk for 3K distance. Are you going to take the challenge?	2.962	0.901	Good
Average	2.692	0.563	Good

Ranges for Weighted Mean: 3.26-4.00=Very Good, 2.51-3.25=Good; 1.76-2.50=Fair; 1.00-1.75=Poor

perceived action – scaled affordance provides the opportunity to assess and evaluate the given movement task for the individuals to commune with the environment and perceptual system capability on what and how action can be taken or performed. This is enough reason to look into that indeed perceived action – scaled affordance can be a predictor in movement capability in physical.

One's environment during a physical activity may influence the degree of action or movement. Table 5 shows the students' usual environment when doing the physical activities. In terms of environment, students' response it quite low (mean=1.527), which indicate that good and conducive venue and equipment are not observed in their respective places or community. Providing the community with enough sports and fitness facilitates has shown a higher possibility of elevating physical activity participation [27]. Thus, this study supports those venues for physical activity somehow indicate the augmentation of physical activity engagement. However, even with the presence of physical activity venues does not warrant the increase in physical activity engagement [28]. Therefore, it lies on the decision of the person either to take advantage of the facilities provided or not in increasing his/her participation in physical activity. Furthermore, it gives the tendencies that it might be an environmental factor can be a predictor or not in movement capability in physical activity.

Table 6 presents the level of movement capability of the participants. Generally, at a glance, the results suggest that the participants are in the 50 – 50 scenario which means at the verge of capable and not capable. The participants are identified in the "poor level" in the three dimensions of movement: endurance, speed and accuracy level, while they are much more capable in the other three dimensions: adaptability, strength, and flexibility. Though, a lot of factors must be considered on these results in terms of their capabilities in movement. The result implies that participants are adaptable, strong and flexible but most of them are not persistent, fast and precise in their movement capability in physical activity. Moreover, the mean and standard deviation, the descriptive measures of movement capability indicators are determined and presented below.

First is the level of endurance of the participants was found to be poor (*M=1476.99, SD=358.45)*. This may indicate that the participants' ability to persist may not be consistent; hence, they may flag along with the challenges. Further, this may imply that they may not be able to continue or complete displacement tasks and may choose not to exert more effort. Consequently, it can be interpreted from the lens of persistence and perseverance to accomplish a physical activity task that requires patience from time and effort - consuming displacements. Second, the level of movement capability of participants in speed is at a poor level (M=7.51, Sd=2.01). It can be mean that their velocity to ascent at movement is not highly observable and may not be able to extract

Table 5. Students' environment for physical activity

Indicators	Mean	SD	Description
Is your place/neighbourhood a good venue for physical activity?	1.450	0.498	Fair
Is your place /neighbourhood located near a sports facility?	1.464	0.499	Fair
Are the people in your place/neighbourhood engaged in any physical activity?	1.513	0.500	Fair
Is your place/neighbourhood safe for any physical activity engagement?	1.608	0.488	Fair
Is your barangay/community supportive in promoting physical activity?	1.597	0.491	Fair
Average	1.527	0.307	Fair

Ranges for Mean: 1.00-1.33=No/Poor; 1.34-1.66=Yes/No/Fair; 1.67-2.00=Yes/Good

Table 6. Level of movement capability of the participants

Movement Dimension	Mean	Std.	Interpretation
Endurance	1476.99	358.56	Poor
Speed	7.51	2.01	Poor
Accuracy	36.45	7.316	Poor
Adaptability	16.49	11.17	Average
Strength	36.22	14.61	Average
Flexibility	73.68	15.09	Very Good

the maximum speed at a required course. Accuracy, on the other hand, has also been found also to be poor, M=36.45 SD=7.32. This suggests that the participants exhibit inefficient ability to direct and time their placement coordination. The participants are likewise not capable of exhibiting sequencing, fractionating, and isolating their movements in the selective capacity. While, the level of adaptability is considered to be average (*M=16.49, SD=11.17)*. This can be interpreted that participants' ability to respond to changes in activity course is average which implies that the participants can maximize their sensorimotor interaction of accommodating changing environmental cues for movement adjustments. In terms of strength, participants exhibited a level of average at *M=36.22, SD=14.61*. This means that their level of exhibiting a certain level of force to propel and withstand against it is somehow observable. This further indicates that there are efficiencies in their ability to apply force against confronting displacement and generate force to create tension and movement within a spectrum or continuum.

Lastly, the level of flexibility of the participants was rated at very good at *M=73.68, SD=15.09*. This indicates that the extent to which there is ease in movement along the joints to perform reaching actions has been more than the average population. This also means that there are high amounts of appropriate muscle stiffness, tone, and length and ligament integrity to reach different range of motions.

The results of the movement capability of the participants only provide its current capability in physical activity and do not mean and warrant that they will not improve their movement capability.

Correlation Between Factors and Movement Capability

Table 7 presents that only blood type is attributed to movement capability in flexibility dimension among the identified factors. Further, the table revealed that Blood Type has significantly predicted flexibility, *b=-7.282, beta=-.179, t(262)=-2.937, p<.01*. Specifically, it has been found that Blood Type AB has a negative likelihood for flexibility which means that more Blood Type AB may have a decreased level of -.7.282 units of flexibility or -.179 standard deviations compared to other blood types. Further, blood Type has also explained a significant proportion of the variance of flexibility, r^2*=.032, F(1,266)=8.624, p<.01*. Hence, the regression equation is expressed, *flexibility = 74.871 – 7.282(AB)*.

Table 8 presents the regression analysis among blood type, attitude, perceived action – scaled affordance, parents' inclination to physical activity and environment factors in predicting movement

Table 7. Regression estimation procedures of the factors towards students' flexibility

Regression Estimate	Model 1 (Blood Type AB)
r (correlation coefficient)	.179
r^2 (effect size)	.032
Computed F	8.624
p-value	.004
B (unstandardized estimate)	-7.282
Beta (standardized estimate)	-.179
t	-2.937
p-value	.004
Constant	74.871

Table 8. Regression estimation procedures of the factors towards students' strength

Regression Estimate	Model 1 (Perceived Action Affordance)
r (correlation coefficient)	.211
r^2 (effect size)	.044
Computed F	12.112
p-value	.001
B (unstandardized estimate)	5.453
Beta (standardized estimate)	.211
t	3.480
p-value	.001
Constant	21.538

capability in strength dimension. It was revealed that among the only perceived action – scaled affordance is attributed to strength which has significantly predicted strength, *b=5.453, beta=.211, t(262)=3.480, p<.01*. This suggests that a unit increase in perceived action affordance increases the strength of the students inasmuch as 5.453 units or .211 standard deviations. Also, perceived action affordance has significantly explained 4.4% of the variability of strength, r^2*=.044, F(1,262)=12.112, p<.01*. Hence the regression equation states, Strength = 21.538 + 5.453(Perceived Action Affordance).

Two factors have been identified to have influenced Accuracy. It has been revealed in Table 9 that there are two possible models that could potentially influence the level of accuracy among the students. The first model suggests that Blood Type AB significantly predicts accuracy, *b=-3.588, beta=-.182, t(262)=2.985, p<.01*. This implies that the likelihood of being more accurate is when a student belongs to blood type AB. In this regard, it has also been established that Blood Type AB was able to significantly predict as much as 3.3% of the variability of Accuracy, r^2*=.033, F(1,262)=8.910, p<.01*. Hence model 1 regression equation is presented as, Accuracy = 35.860 + 3.588(Blood Type AB).

An alternative model may increase the level of significance towards accuracy. This can happen when an additional factor Perceived Action - scaled Affordance is added to the model. It has been reported that combining the effects of Blood Type and Perceived Action Affordance increases the variability prediction by 2%, r^2*=.053, F(2,261)=7.332, p<.01*. Specifically, both blood type AB and PASA significantly predicts accuracy, such that, $b_{bloodtype}$*=3.362, beta=.170, t(261)=2.985, p<.01* and b_{PASA}*=-1.859, beta=-.143, t(261)=-2.368, p<.05*. However, PASA negatively predicts accuracy which may yield to as much as 1.859 units decrease in accuracy or .143 standard deviations. As such, Model 2 can be stated, Accuracy = 40.903 + 3.362(Blood Type AB) – 1.859(PASA).

Table 10 shows that among the identified potential factors, only blood type is associated with speed. In terms of measuring the factor of speed, Blood Type B has significant levels of prediction, *b=.721, beta=.164, t(262)=-2.686, p<.01*. Specifically, it has been found that Blood Type B has a positive likelihood for speed which means that more Blood Type B members may have an increased level of .721 units of speed or .164 standard deviations compared to other blood types. Further, blood Type has also explained a significant proportion of the variance of speed, r^2*=.027, F(1,266)=7.214, p<.01*. Hence, the regression equation is expressed, *speed = 7.295 + .721(Blood Type B)*.

To determine the significant factors of adaptability, regression analysis was also employed.

Table 9. Regression estimation procedures of the factors towards participants' accuracy

Regression Estimate	Model 1 (Blood Type AB)	Model 2 (Blood Type AB[a]+ PASA[b])
r (correlation coefficient)	.182	.231
r^2 (effect size)	.033	.053
Computed F	8.910	7.332
p-value	.003	.001
B (unstandardized estimate)	3.588	3.362[a] + (-1.859[b])
Beta (standardized estimate)	.182	.170[a] + (-.143[b])
t	2.985	2.812[a]/-2.368[b]
p-value	.001	.005[a]/.019[b]
Constant	35.860	40.903

Table 10. Regression estimation procedures of the factors towards students' speed

Regression Estimate	Model 1 (Blood Type B)
r (correlation coefficient)	.164
r^2 (effect size)	.027
Computed F	7.214
p-value	.008
B (unstandardized estimate)	.721
Beta (standardized estimate)	.164
t	2.686
p-value	.008
Constant	7.295

However, no model and identification of factors were made, r^2=.051, F(263)=1.234, p=.264. This implies that performing physical activity that requires adaptability could not be influenced from the factors being identified. Conversely, the physical activity being tested might not able to capture the measures of adaptability. Thus, further emersion of different physical activity on adaptability must be done as a recommendation.

Table 12 presents that among the identified potential factors only perceived action – scaled affordance, attitude towards physical activity and blood type are accounted for endurance. Further, it revealed that there are three models that can predict endurance. The first model demonstrates that perceived action – scaled affordance significantly predicts endurance, b=184.445, beta=.290, t(262)=2.985, p<.01. This suggests that a unit increase in perceived action - scaled affordance increases the level of endurance in as much as 184.445 units or .290 standard deviation. Perceived Action- scaled Affordance also significantly explained the level of endurance by 8.4%, r^2=.084, F(1,262)=24.016, p<.01. Model 1 regression equation states, endurance=980.397 + 184.445 (perceived action affordance).

An increase in variability prediction can be observed when Attitude towards physical activity has been factored in the equation, r^2=.106, F(2,261)=15.453, p<.01. This suggests that both factors account for 10.6 percent of the variability of endurance. The model 2 equation states that, endurance = 788.406 + 129.915[a] + 107.863[b]. This suggests that there will be 129.915 units increase plus 107.863 units increase of endurance for every unit increase of perceived action - scaled affordance and attitude towards physical activity acting together.

A third model emerged combing the effects of perceived action - scaled affordance, attitude towards physical activity and Blood Type O. This suggest that endurance may be a three-factor model that constitutes that said factors as significant influences. Adding Blood Type O as a factor increases the variability prediction to 12.4%, such that, r^2=.124, F(3,260)=12.244, p<.01. The third model suggest that there will be 122.122[c] + 107.422[d] + 100.063[e] units increase in endurance for every unit

Table 11. Regression estimation procedures of the factors towards participants' adaptability

Regression Estimate	Model
r (correlation coefficient)	.227
r^2 (effect size)	.051
Computed F	1.234
p-value	.264
B (unstandardized estimate)	-
Beta (standardized estimate)	-
p-value	-
Constant	-

Table 12. Regression estimation procedures of the factors towards participants' endurance

Regression Estimate	Model 1 (Perceived Action Affordance)	Model 2 (Perceived Action Affordance[a] + Attitude[b])	Model 3 (Perceived Action Affordance[c] + Attitude[d] + Blood Type O[e])
r (correlation coefficient)	.290	.326	.352
r^2 (effect size)	.084	.106	.124
Computed F	24.016	15.453	12.244
p-value	.000	.000	.000
B (unstandardized estimate)	184.445	129.915[a] + 107.863[b]	122.122[c] + 107.422[d] + 100.063[e]
Beta (standardized estimate)	.290	.204[a] + .171[b]	.192[c] + .171[d] + .135[e]
t	4.901	3.018[a]/2.528[b]	2.852[c]/2.539[d]/2.305[e]
p-value	.000	.003[a]/.012[b]	.005[c]/.012[d]/.022[e]
Constant	980.397	788.406	774.252

increase of perceived action affordance, attitude towards physical activity and Blood Type O. Hence, the final regression equation states that Endurance = 774.252 + 122.122^{c} + 107.422^{d} + 100.063^{e}.

Discussions

Flexibility is the degree and ease of movement at joints to extent of the next step or range, and accuracy projects strong body coordination with time [29]. This dimension of movement capability provides a degree of linear or angular displacement in different range of motion. Table 7 presents that among the five identified factors, only blood type AB is attributed to flexibility movement dimension. Blood typing is usually considered part of a medical test to identify what kind of blood he/she may possess. Several times, parents have thought that the inclination of their children whether or not in education, lifestyle, and profession and even in sports, dance and any related physical activity is always associated from their genes or bloodline. As celebrities and sports champions have been idolized by many, these questions can be asked: what made them a celebrity and sports champions and what must be done to be like them? The usual answer to these questions is it runs in the blood or it is an innate talent. Consequently, there are several studies that shows the relationship of blood groups to personality [30], behavior [31], career development and organizational practices [32], cognitive impairment and dementia [33], and stress [34]. However, there is still a great gap in the studies about how blood type is related to movement capability of an individual. Thus, this study proven that blood type is related to the movement capability of the person more specifically to flexibility dimension. Furthermore, in the context of Physical Education or in choosing athletes that requires flexibility, one must consider looking into individual's blood type, especially on blood type AB, which is a rare type in the Philippines.

Strength is the ability of an individual to generate force to drive or resist forces to lift a mass. Thus, most strength exercises are considered challenging and sometimes have the tendency to be difficult at times. Table 8 presents that among the five (5) factors only perceived action – scaled affordance is attributed to speed movement dimension. In physical activity, specifically in sports, there are several instances wherein action and perception play the role for opportunity to move or the capacity to move. The action and perception scenarios are what we called affordances. It was first introduced by Gibson in 1979 and the concept is usually applied to psychology [35]. He stressed that animals visually control their behavior by perceiving what the environment offers or affords to them. This concept was used or applied in physical activity since opportunities of affordances can easily be observed. Affordances explained the relationship between the performer and the environment and underscored the specific coupling of perceptual and action systems required for goal - directed behavior [36]. This means that if one does a specific movement, he or she needs to perceive if it can be done before doing the action. There are several interpretations of the theory of affordances in physical activity. In boxing, it was revealed that distance between the attacker and the opponent is the metric distance parameter for attacker- opponent system [37], which others called it "action – scaled" [38]. The use of the action - scaled features (e.g., limb sizes) can be based in change of actions. The assumptions are that change of kinematic movement is likely due to the perceptual variables that serve as the information that would specify or constrain your action [39]. Thus, the study claimed that perceived action-scaled affordance is a predictor of movement capability of an individual, specifically on the strength dimension. Furthermore, the study implies that when the physical activity requires more strength the decision of an individual to perform the activity is high.

Accuracy is the achievement of target position on each succeeding step which timing, coordination and sequencing of movements are considered [29]. This kind of movement dimension requires high precision and exactness of movements. Table 9 presents that blood type AB and perceived action – scaled affordance were predictors of accuracy dimension of movement. This implies that when physical activity requires body coordination in respect to time, that individual who has AB as their blood type is more adaptable in performing the said activity. Further, the likelihood decision of an individual to perform physical activity that requires accuracy has an association as presented in the results. Moreover, in the context of physical education and sports, selecting individuals to perform physical activity that requires accuracy such as golf, polo, dart, billiards and etc. one must need to consider individual having AB blood type. Similarly, those individuals who have a strong conviction and are good decision maker have a better chance to excel in the identified physical activity. In the same manner, in enhancing affordance, one must be exposed to different movement capabilities that aid accuracy.

Speed is the ability of an individual to move or accelerate movement displacement in a short period of time [29]. Hence, distance and time are the requirements to measure speed which is mostly associated to running. Table 10 explains that among the 5 identified factors, only blood type B is attributed to speed. Thus, this result infers that individual with blood type B has the potential to perform better in physical activity that requires speed such as maybe track events, swimming,

basketball and among others. Further, in the context of track events, selecting athletes in this field must consider blood type of the individual.

Adaptability applies to movement when run into unforeseen challenges or when forthcoming the bounds of a person's capacity [29]. This signifies the capacity to adjust during displacement of movements and easily adapt to the environmental changes. Table 11 presents that the five factors identified such as blood type, attitude towards physical activity, parents' inclination towards physical activity, perceived action – scaled affordance, and environment were not predictors of adaptability dimension of movement. This implies that there are other factors that might be attributed to adaptability. Moreover, another validation must be conducted in different group of samples and environment to strengthen if these five factors are really not predictors of adaptability.

Endurance requires continuity by completing movement displacement and persistence in finishing the task [29]. Hence, cardiovascular and muscular endurance physical activity such as running a marathon, swimming, and among others are recommended in enhancing endurance in general. Table 12 presents that among the identified potential factors only perceived action – scaled affordance, attitude towards physical activity and blood type are accounted for endurance. This explains that an individual is highly likely to decide to perform physical activity that requires endurance. Further, it explains that likelihood for the individual to decide to perform in physical activity which requires endurance is high when the individual is also happy and feeling good towards the activity. Moreover, the study implies that the likelihood of an individual to perform the physical activity that requires endurance will be much higher when he/she is happy or feeling better about the activity and as well as if an individual has a blood type O.

Conclusions

Movement capability can be attributed to many factors in different levels and circumstances. Thus, the study concluded that movement capability to engage in physical activity posited to the biological factor (blood type) and psychological factor (attitude and perceived action – scaled affordance) of an individual. It is recommended that validation study be conducted to strengthen the claims of the identified factors to movement capability of an individual.

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