

## **THE EMERGENT BEHAVIOR IN THE ENGAGEMENT OF PHYSICAL ACTIVITY IN FITNESS CENTERS**

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### **ABSTRACT**

*The study explained the relationship between the increase of fitness centers in urban areas warrant the increase of the physical activity engagement of the Filipino people in different walks of life. Using the Complex Adaptive Systems (CAS) as the tool of creating an artificial world wherein participation rate served as the aggregating agent to look into the social interaction of the atoms either to participate, uncertain or will not participate. Along the process, there are six interactions: (H – M); (H – N); (H – H); (M – N); (M – M); & (N – N) which allows the different atoms to interact. It was found out that the more interaction with those individuals who participated in physical activity in the fitness center would likely influence those individuals who will not participate in physical activity but in most cases they are not. Furthermore, those who are moderately interested in physical activity in the fitness center are mostly sustained their participation in the fitness center. It has been concluded that the presence of fitness centers does not postulate increase of participation in physical activity of the Filipino people but on the other hand changes their behavior towards physical activity.*

**Keywords:** Emergent behavior, fitness centers, physical activity, engagement, complex adaptive system.

### **1. INTRODUCTION**

It has been observed that the fitness centers in the urban areas are sprouting like mushrooms. With this increase, the study claims that the reciprocal action of the increase accessibility and availability of fitness centers will produce high participation rate of the people to engage in physical activity when interacted or influenced by individuals who engaged in fitness center - based exercises that warrant the physical activity participation.

Studies conducted by Eime, Harvey, Charity, Casey, Westerbeek, and Payne, (2017), Higgerson, Halliday, Ortiz-Nunez, Brown, and Barr, (2018), Huang and Hung (2016), Stace (2009) proved that provision of sports and fitness facilities was positively associated with the increase in participation rate in the community. The quality of facilities enhances the interest of the participants to stay longer in the gym and fitness centers. Indeed, it is true that the sprouting of fitness centers in the urban areas are giving opportunities for the people to engage in physical activity but so far there are no studies that directly proves that it equates increase participation rate and interest of the people. The importance of comprehending on how to increase participation in physical activity is necessary to secure health and wellness of the people.

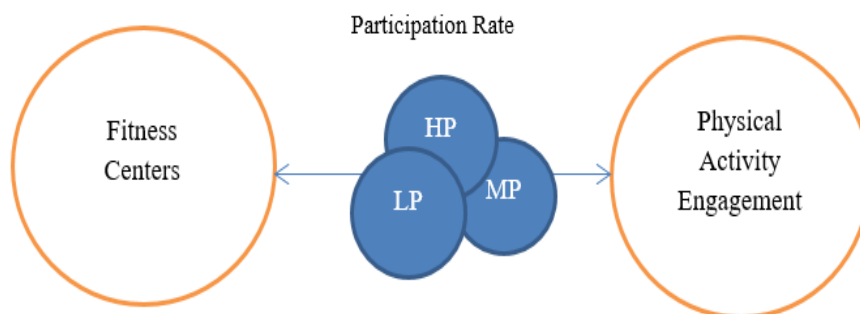
In this study, an artificial world has been created to look for the interactions of the atoms with regard to the participation rate as the aggregating agent to stimulate influences and decisions

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to be persuaded and change their attitudes toward the engagement of physical activity in the fitness centers.

## 2. METHODS AND MATERIALS

### 2.1 Conceptual Framework



This framework explains the relationship between the presence of fitness centers vis-a-vis the physical activity engagement of the people in different walks of life. Furthermore, within the relationship there is interaction between the atoms from those who actively participate in physical activity, those who are likely to participate and those who are not willing to participate. With this, it gives a clear understanding on the interest, persuasion and attitude of the people who will engage in physical activity in the fitness centers.

### 2.2 Research Design and Method

The study utilized complex adaptive systems as a design in creating an artificial world to identify the interactions of the atoms to see if the increase of fitness centers postulates the increases of participation rate among individual who are highly to engage, likely to engage and not willing to engage. Thus, it will provide a better understanding on how to persuade people to engage in physical activity and to improve their wellness.

### 2.3 Aggregate Agent

We looked into the **participation rate** of the people in the community vis-a-vis to the accessibility and availability of fitness centers.

### 2.4 Social Atom

Fitness center participants

Characteristic is on interest and participation level of participants are- ***Highly Interested, Moderately Interested, and Not Interested.***

### 2.5 Action of Social Atom

If highly interested, **will participate;**

If moderately interested, **either to participate or not** (uncertain);

If not interested, **will not participate.**

## 2.6 Social Atom's Interaction

$$H \leftrightarrow M$$

$$H \leftrightarrow N$$

$$H \leftrightarrow H$$

$$M \leftrightarrow N$$

$$M \leftrightarrow M$$

$$N \leftrightarrow N$$

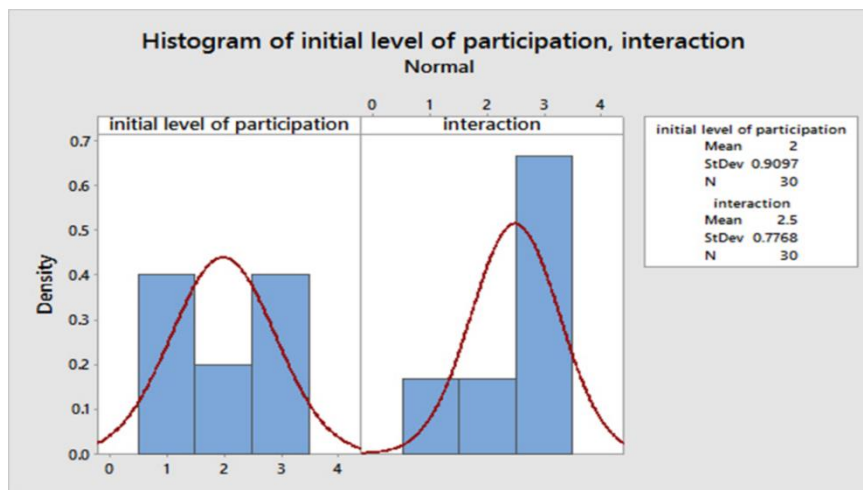
**Table 1: Initial interaction and decision of the atoms**

Response ms	level of particip initial	level of particip interpret ation	Interpret ation	Interpret ation after interactio	values_1	probability _1	acting agent_1
1	3	3	will participate	3	will participate	1	0.1 will not partip
2	3	1	will not participate	3	will participate	2	0.3 uncertain
3	1	3	will participate	1	will not participate	3	0.6 will partidpate
4	3	1	will not participate	1	will not participate		
5	1	3	will participate	2	uncertain		
6	1	3	will participate	3	will participate		
7	2	2	uncertain	3	will participate		
8	1	3	will participate	2	uncertain		
9	2	2	uncertain	2	uncertain		
10	3	1	will not participate	3	will participate		
11	2	2	uncertain	2	uncertain		
12	1	3	will participate	3	will participate		
13	3	1	will not participate	3	will participate		
14	2	2	uncertain	3	will participate		
15	2	2	uncertain	1	will not participate		
16	1	3	will participate	3	will participate		
17	1	3	will participate	3	will participate		
18	1	3	will participate	2	uncertain		
19	2	2	uncertain	1	will not participate		
20	1	3	will participate	2	uncertain		
21	1	3	will participate	2	uncertain		
22	1	3	will participate	3	will participate		
23	2	2	uncertain	2	uncertain		
24	1	1	will not participate	2	uncertain		
25	1	1	will not participate	3	will participate		
26	1	3	will participate	3	will participate		
27	2	2	uncertain	3	will participate		
28	3	1	will not partidpate	3	will participate		
29	1	1	will not partidpate	3	will participate		
30	2	2	uncertain	3	will participate		
			will participate	13	will participate	17	
			uncertain	9	uncertain	9	
			will not participate	8	will not participate	4	

The interactions between atoms were being run for more than 100 times to see to it that there is a constant interaction among the atoms. It can be observed in the table that the decision of the individual through the influences of the interaction of the atoms yielded different reactions.

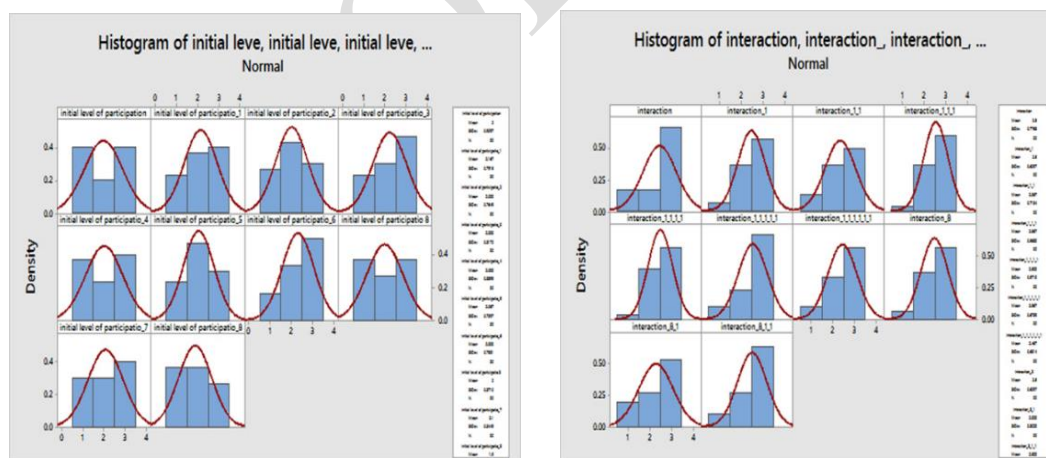
### 3. RESULTS

**Figure 1: Histogram of the initial level of participation and interaction of the 3 atoms**



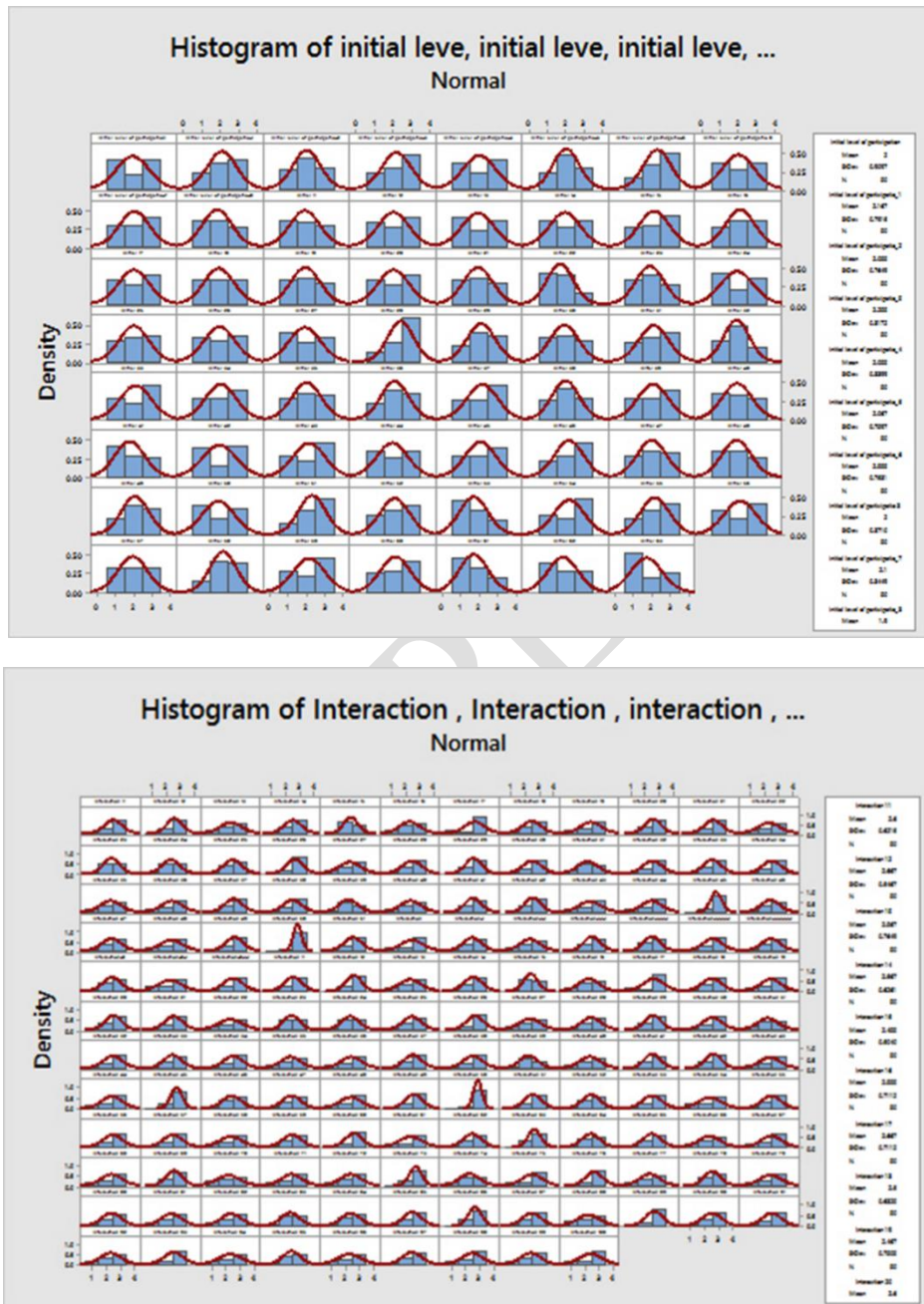
The figure explains that the change of decision whether to participate or not in physical activity will affect if there is interaction among the atoms.

**Figure 2: Histogram of the 10 sample runs of the level of participation and interaction of the atoms**



After the 10 runs of the data, the figures show that the more interaction you will have the more decisive you will become in the change of behavior and decision either to participate or not in physical activity in the fitness centers. The more change of decision is noticeable for the people who are undecided or likely to participate because the more interaction especially to those who are actively participating in physical activity they seem to participate.

**Figure 3: Numerous runs of the level of participation and interaction of the atoms**



The figures explain that after numerous runs of the interaction of the atoms have changed their attitude towards physical activity in fitness center. The more you will interact with the people who are highly active in physical activity somehow changes your attitude towards physical activity



however there are still instances wherein you remained unchanged even with so much interaction. It is believed that whether you participate or not in physical activity in the fitness center is someone's decision but could be persuaded when interacted.

#### **4. DISCUSSION**

The presence of fitness center in the urban areas does not warrant the engagement of the people in physical activity. However, if there are influences and interactions among the people whether they engaged in physical activity or not somehow creates ripples especially to those who are at the verge of deciding whether to participate or not in physical activity at the fitness centers.

#### **5. CONCLUSION**

Interactions among people will influence the decision of an individual most of the time especially in the engagement of physical activity. Furthermore, the people can be persuaded and change their attitudes if they can be assured of the results of the activity.

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