

## **Children's Self - Efficacy and Attitudes towards Healthy Eating. An Application of the Theory of Planned Behavior**

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**Abstract:** *The purpose of this research was to study the attitudes and intentions of children in a sports camp with the use of an intervention program. Three questionnaires were used: Planned Behavior Theory, Self-Efficacy, and of eating habits, which were administered twice, within a 5-week period. The sample was consisted of 205 children aged 10-15 years, who attended a summer camp in Grammatiko, Athens, Greece. An intervention program was used. Results revealed differences among age groups, and among sexes. In conclusion, a combination of intervention techniques that included, ongoing information on healthy eating, discussions, and feedback, strengthened children's attitudes, behavior and self-efficacy.*

**Keywords:** *Eating habits, self-efficacy, role identity, perceived behavioral control.*

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### **1. INTRODUCTION**

Children's eating habits play an important role in their physical growth and development and are affected by specific factors and behaviors associated with health. Factors that may influence their choice and consumption are gender, age, body weight, the willingness and palatability of meals, nutrition and health knowledge, availability of food, family and its income, the opportunities for exercise and information about nutrition from the media and school programs (Blades, 2001; Richter et al., 2000; Wechsler et al., 2000; Keane & Willetts, 1994; Neale, Otte & Tilston, 1994). Additionally, obesity now a day has "epidemic" dimensions and for developed countries constitutes a serious public health problem (Christodoulos, Tokmakidis, Douda, Tousoulis, & Gika, 2009). On a survey of Douglas, Finkelstein, Douglas and Renaud (2005) on the public perceptions about child obesity, the defendants considered childhood obesity as serious problem as other important childhood health threats such as tobacco use and violence, but not as serious as drug abuse. The rates of overweight and obese children and adolescents have been constantly increasing worldwide (Wilborn et al., 2005). In the United States the percentage of overweight children aged 6-11 years, 15.3% were found in epidemiological surveys in 1999-2000 and 2001-2002 (Hedley et al., 2004).

With respect to childhood obesity is estimated that in European Union there are about 3 million. Overweight children and the number increases by 400,000 a year. The percentage of overweight children estimated total of 25% in the European Union, but in some countries more than 30% (James, Rigby, & Leach, 2004; Currie et al. 2004). In Greece childhood obesity is increasing in recent years. One in every three boys and one in every four girls have been rated as obese, and they rate higher than children of most Mediterranean countries (Digelidis, Kamtsios, & Theodorakis, 2007). In their study (Tzotzas et al., 2008) conducted on a sample of 14456 adolescents aged 13 to 19 years, indicated that rates of overweight and obese boys was 23.3% and 6.1% respectively, while overweight and obese girls were 14% and 2.7% respectively. These proportions were judged by these researchers as high, especially for boys, compared to corresponding figures in other European Mediterranean countries.

In the study of Georgiadis and Nassis (2007), using data collected from a representative sample of 6448 students, based on the calculation of the body mass index (BMI), the total percentage of overweight children and adolescents was 16.9% for boys and 17.6% for girls, while that of obese

children and adolescents was 3.8% and 3.3% for boys and girls respectively. Additionally, at ages over 10 years, it was observed an increase in the percentage of overweight boys and reduction in the percentage of overweight girls.

Literature states that flavor and taste of food are important factors affecting children's eating habits. A study by Douglas (1998) becomes apparent preference of children in foods with high fat and sugar, and non-preference in foods with fiber, vegetables, and milk. Moreover, consumption of soft drinks by children has increased, as a result of pleasure, satisfaction and experimentation that they (soft drinks) offer. Both, packaging and brand name of soft drinks, as well as their content, lead children to consumption (Duff, 1999).

There are differing views on the subjects of age and eating healthy foods. Study indicated that children between the ages 9-11 years consume healthier foods than older children, due to the greater influence of their parents and of nutrition education (Barker, Robinson, Wilman, & Barker, 2000). On the contrary, Berg, Jonsson and Conner (2000), believe that older children have more knowledge about healthy food than the younger ones, and furthermore tend to choose and adopt healthier attitudes and behaviors. Also, girls consume healthier foods and measure their weight more frequently than boys (Riddoch, Savage, Murphy, Cran, & Boreham, 1991). Additional results made it clear that children and adolescents who are well informed about healthy eating, their selections do not reflect on this knowledge, particularly within the school and their social living environment (Brown, McIlveen & Strugnell, 2000; Pizouznia, 2001; Burke et al., 1997; Hendricks et al., 2004). Therefore, a healthyway of life is determined not by individual behaviors, but from a larger set of factors that determine the overall behavior of individuals (Theodorakis, Papaioannou, & Karastigianidou, 2004).

Understanding and explaining people's eating and exercising behaviors appear to be a complicated problem. Several models have been proposed to the behavior. One of the models that have been considered in examining the relationships between attitude and behavior is the planned behavior model (Ajzen & Madden, 1986; Ajzen, 1988). According to this model, human behavior is a function of the individual's intention to perform the specific behavior. In turn, intention is determined by a combination of three independent factors: (a) attitude toward the specific behavior, (b) subjective norms, and (c) perceived behavioral control. Attitudes are defined as one's positive or negative predisposition towards a specific behavior and determined by one's behavioral beliefs toward that behavior. On the other hand, subjective norms express the social influence that is placed on one, for performing the behavior. Moreover, irrespectively of a person's intention, there may be some obstacles preventing one from executing that behavior. Perceived behavioral control has been introduced to enhance the prediction of the behavior in activities where volitional control may be incomplete and the concept expresses individual beliefs about the ease or difficulty in performing a specific behavior. The Planned behavior model indicates that perceived behavior control influences behavior directly, as well as indirectly through an independent effect on behavioral intention. The more one perceives that the behavior in question is not under control, the more it is expected between perceived behavioral control and behavior will not be mediated by intention (Ajzen, 1988).

Investigators have already used the "Theory of Planned Behaviour" in order to predict numerous behaviours: intention to participate in sports and physical activities (Godin & Shephard, 1986), intention of pregnant women to exercise after giving birth (Godin et al., 1989), participation in sports and physical activities (Theodorakis et al, 1995; Theodorakis, 1994; Hagger et al., 2002). Also, for healthy and unhealthy behaviors (Povey et al., 2000; Armitage & Conne, 2000; Sheeran et al., 2001), alcohol use (Rise & Wilhelmson, 1998), safer sex (Sheeran et al., 1999), smoking, exercising, and eating-habit domains (Sheeran & Orbell, 2000; Bebetzos et al., 2002; Bebetzos et al., 2014), moral judgment (Bebetzos & Konstantoulas, 2006), special education (Bebetzos et al., 2013), and distant education (Goulimaris et al., 2008).

Therefore, the study was conducted in an attempt:

- (i) To investigate whether the application of an intervention program and the use of the Theory of Planned Behavior can predict future intention(s) specifically on healthy eating habits among children, and furthermore if self-efficacy can improve.
- (ii) To identify the variables that might differentiate the sample.

## **2. METHODOLOGY**

### **2.1. Sample**

The sample consisted of 205 children, among the ages from 10 to 15 yrs. ( $M=13.15$ ,  $SD=1.26$ ), who participated in a summer camp, in Gramatiko, in Athens, Greece (Table 1). The questionnaire also included questions related to sex, and age. The method chosen to conduct the research was that of self-completed questionnaire. Researcher informed all subjects that their participation was completely voluntary and the individual responses would be held in strict confidence.

**Table1.** Demographic characteristics of the sample.

Sex		
Boys	Girls	
98	107	
Age Groups		
10-11	12-13	14-15
65	70	70

### **2.2. Questionnaires**

The children completed 2 questionnaires twice, with in a 5-week period.

#### *2.2.1. Health Behavior Questionnaire*

The Greek version (Bebetsos et al., 2002) of the “Health Behavior Questionnaire” that was originally developed by Parcel et al. (1995), in order to assess self-efficacy and healthy eating habits in children. The questionnaire consisted of 23 items adapted to the Greek cuisine (*Mediterranean Diet*), and examined participants’ self-efficacy on following a healthy diet. For example: “How sure you are that you can eat your food without salt for the next month?”; “How sure are you that can replace spaghetti with sauce and cheese with plain spaghetti, for the next month?”; “How sure are you that you can eat chicken after you have taken off the skin, for the next month?”; “How sure are you that you can eat a boiled egg instead of a fried one, for the next month?”. The answers were given on a 10-point Likert-type scale, ranging from “not sure at all” to “very sure”.

#### *2.2.2. Theory of Planned Behavior Questionnaire*

The revised questionnaire of the planned behavior model (Ajzen& Madden, 1986), was used. The questionnaire was modified for the Greek language by the odorakis (1994). The questionnaire assessed participants’ intention and attitudes towards adopting a healthy eating style.

*More specifically the variables of this questionnaire were:*

- a) *Attitude towards eating healthy.* Attitude towards eating healthy was assessed with one item: “For me to eat healthy is...”. Responses were given on a 7-point Likert-type scale, using 4 different bipolar adjectives as answers (i.e., good-bad, foolish-smart, healthy-unhealthy, pleasant-unpleasant). Answers were ranged from 1 for the negative adjective, 4 as neutral up to 7 for the positive adjective.
- b) *Intention.* The mean score of three items estimated participants’ intention to exhibit the behavior of eating healthy. Example: “I intend to eat healthy next month.” Responses were given on a 7-point Likert-type scale, with endpoints labeled ‘likely’ and ‘unlikely.’
- c) *Role identity.* This variable was also added to the model by the odorakis (1994). Role Identity can be defined as a particular social object that represents a dimension of the self. Four items were used to measure role identity. Examples: “It’s in myself to eat healthy next month”. Responses were given on a 7-point Likert-type scale, ranging from ‘strongly agree’ to ‘strongly disagree’.
- d) *Perceived behavioral control.* The total score of three items was used to estimate participants’ perception of control on the specific behavior. Examples: “If I wanted to, I could eat healthy for the next month”, “How much control do you exert over eating healthy for the next month?” Participants’ responded on 7-point scales, ranging from ‘likely’ to ‘unlikely’ and ‘complete control’ to ‘no control’, respectively.
- e) 5-week Intervention(Continuous children’s updating):
- f) Every other afternoon, in the camp’ auditorium the researcher talked and discussed with the children numerous topics on health eating and on adopting healthy eating habits. Additionally, the

researcher also informed the children with the use of different aid materials (i.e. brochures, newspaper and magazine articles, internet) and answered possible questions.

### 3. RESULTS

#### 3.1. Reliability Analyses

The analysis showed that  $\alpha$ Cronbach coefficient was .71 for “Self-efficacy”, .77 for “Attitudes”, .79 for “Intention”, .73 for “Role Identity”, and .70 for “Perceived Behavioral Control” for the initial measure. And, .75 for “Self-efficacy”, .89 for “Attitudes”, .86 for “Intention”, .83 for “Role Identity”, and .81 for “Perceived Behavioral Control” for the final. The results indicated that the questions in both questionnaires had a satisfying internal cohesion.

#### 3.2. Anova Repeated Measures (3 Groups X 2 Measurements)

##### 3.2.1. Age (Table 2)

- 1) ANOVA repeated measures (3 groups X 2 measurements) was applied to establish whether there were any differences between age groups on self-efficacy. The results indicated that there was a statistically significant main effect on “self-efficacy” ( $F_{2, 198}=4.998$ ;  $p < 0.05$ ). More specifically, the Bonferroni multiple comparison test showed that self-efficacy increased in the final measurement ( $M=8.53$ ,  $SD=.44$ ), in comparison to the initial one ( $M=7.39$ ,  $SD=.29$ ).
- 2) ANOVA repeated measures (3 groups X 2 measurements) was applied to establish whether there were any differences between age groups on role identity. The results indicated that there was a statistically significant main effect on “role identity” ( $F_{2, 192}=4.185$ ;  $p < 0.05$ ). More specifically, the Bonferroni multiple comparison test showed that self-efficacy increased in the final measurement ( $M=6.05$ ,  $SD=.32$ ) in comparison to the initial one ( $M=5.03$ ,  $SD=.12$ ).
- 3) ANOVA repeated measures (3 groups X 2 measurements) was applied to establish whether there were any differences between age groups on perceived behavioral control. The results indicated that there was a statistically significant main effect on “perceived behavioral control” ( $F_{2, 192}=4.955$ ;  $p < 0.05$ ). More specifically, the Bonferroni multiple comparison test showed that self-efficacy increased in the final measurement ( $M=6.34$ ,  $SD=.18$ ) in comparison to the initial one ( $M=5.22$ ,  $SD=.21$ ).

**Table2.** Age differences

Variable	Initial Measurement		Final Measurement	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Self-Efficacy	7.39	.29	<b>8.53</b>	<b>.44</b>
Role Identity	5.03	.12	<b>6.05</b>	<b>.32</b>
Perceived Beh. Control	5.22	.21	<b>6.34</b>	<b>.18</b>

#### 3.3. Anova Repeated Measures (2 Groups X 2 Measurements)

##### 3.3.1. Sex (Table 3)

- 1) ANOVA repeated measures (2 groups X 2 measurements) was applied to establish whether there were any differences between sex on *attitudes*. The results indicated that there was a statistically significant main effect on “sex” ( $F_{1, 199}=6.483$ ;  $p < 0.05$ ). More specifically, the Bonferroni multiple comparison test showed that girls’ attitudes were increased greater ( $M=8.74$ ,  $SD=.38$ ) than boys ( $M=7.63$ ,  $SD=.30$ ), on the final measurement.
- 2) ANOVA repeated measures (2 groups X 2 measurements) was applied to establish whether there were any differences between sex on *intention*. The results indicated that there was a statistically significant main effect on “sex” ( $F_{1, 194}=4$ ;  $p < 0.05$ ). More specifically, the Bonferroni multiple comparison test showed that girls’ intention was increased greater ( $M=5.34$ ,  $SD=1.37$ ) than boys ( $M=4.96$ ,  $SD=1.47$ ), on the final measurement.

**Table3.** Sex differences

Variable	Boys		Girls	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Attitudes	7.63	.30	<b>8.74</b>	<b>.38</b>
Intention	4.96	1.47	<b>5.34</b>	<b>1.37</b>

#### **4. DISCUSSION**

The purpose of this research was to investigate whether attitudes, intentions, and self-efficacy of the dietary habits of children can be affected through an intervention program. The higher reliability coefficients of measuring instruments showed that the formation of scales was in the right direction. All variables showed high rate of reliability in all measurements.

More specifically, with regard to age groups differences were presented in the variables of self-efficacy, self-identity and perceived behavioral control. These results are consistent with results of previous surveys where the use of an intervention program and the support that was provided for orientation on healthier eating habits, helped the subjects change their behaviors into a healthier life (Boutelle et al., 2000; Bebetos et al., 2002).

In addition, surveys specifically regarding self-efficacy has been shown that there is a direct relation on maintaining positive attitudes towards healthy eating (Bebetos et al., 2002; Noar, Chabot, & Zimmerman, 2008), and that the greater the self-efficacy towards healthy eating, the greater the intention to adopt healthier eating habits.

Thereafter, differences were also presented on the sample's attitudes. To begin with, the children indicated positive change towards healthy eating attitudes, which is translated to an increase of consumption of healthier foods and to a decrease of consumption of unhealthy ones? This result agrees with previous research results where it was mentioned that providing information and discussing topics on healthy eating, were the key factors of predicting healthier dietary habits and even key factors on changing unhealthy ones (Bagozzi & Yi, 1989).

Finally, as regards to gender, girls had more positive "intentions" about adopting healthier eating habits in the near future. The literature underpins that consumption of unhealthy foods from boys may be due to their greater need on energy prevention (Hunt & Rigley, 1995). Let us not forget that self-esteem in overweight children and adolescents vary according to gender, with women being at greater risk of developing low self-esteem than men (Zametkin, et al., 2004; Nowicka et al., 2009; Latzer & Stein, 2013). As a result, girls are more interested in their appearance and try harder to keep their weight at "low" levels (Cornette, 2008; Riddoch, et al., 1991; Tsamita, Kontogianni, & Karteroliotis, 2007), even from the age of 9 years old (Hill, Oliver, & Rogers, 1992).

In conclusion, while the generalization of the results should be made with caution, the results of this study provide the incentive for future researchers to consider not only the relationship of body indicator with the mentioned factors as well as other personal and psychological factors in children from Greece. Moreover, it would be important to carry out relevant studies not only in children but also in adolescents because some habits and attitudes are adopted from earliest age and tend to retain into adulthood (Kelder, Perry, Klepp, & Lytle, 1994). Let's not forget that body indicators do not change from childhood to adolescence (Clavien, Theintz, Rizzoli, & Bonjour, 1996), although adolescence is a period of important changes with different demands and claims. It is therefore an urgent need for intervention programs in health, not only on an early age, to enable children to acquire such behavior in lifestyle and healthy eating habits, which positively affects their health in the long term. And also as Pate and Ross (1987) stated, childhood is the best period for the aim of promoting healthy eating habits as obesity begins between the ages of 6 and 9 years old.

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