Children’s profile of healthy and unhealthy behaviors: Demographic characteristics and perceptions of social environment

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Running head: children’s healthy and unhealthy profiles

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Abstract

Objectives. In recent years health promotion is a matter of great interest among researchers in the field of social sciences. The aim of the present study was to identify the profile of children who exhibit healthy and unhealthy behaviors in relation to demographic characteristics and perceptions of social environment.

Method. Participants were 3640 Greek students from 10 to 16 years of age. They responded on self-report questionnaires assessing a number of behaviors (exercise, diet, smoking, and violence), as well as family structure, family income, perceived family and peer behavior and perceived family support.

Results. Cluster analysis identified four distinct profiles. One including children adopting healthy behaviors (exercising, healthy eating) and avoiding unhealthy ones (smoking, violence), a second including children avoiding unhealthy behaviors, but not adopting healthy ones, a third including children adopting healthy behaviors, but also taking part in violent incidents, and a fourth including children adopting smoking and avoiding healthy behaviors. Demographic characteristics seemed to better explain the adoption or not of healthy behaviors, whereas perceptions of social environment and age seemed to better explain the adoption or not of unhealthy behaviors.

Conclusion. The results of the present study indicate that health promotion programs should take into serious consideration both personal and social characteristics of the targeted population.

Key words: exercise, nutrition, smoking, violence, children profiles
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Introduction

In recent years the interest of health-related scientific and medical organizations on health promotion is progressively growing. However, despite the increasing focus on health prevention, results from relevant studies show that behavior patterns are quite worrying, especially among younger populations (Mota & Queiros, 1996; Pate et al., 1997; Steptoe et al., 2002). Since the early nineties, the adoption of unhealthy behaviors like smoking, use of alcohol and drugs, seems to spread rapidly (Torabi & Nakornhet, 1996). Furthermore, low levels of exercise and poor diet have been identified that are related to obesity and have been characterized as potentially risk-factors for individuals’ health (Muecke, Simons-Morton, Huang & Parcel, 1992).

Thus, the study of health-related behaviors becomes of great importance especially for younger children and adolescents, since it is at that age when health beliefs are established (Baranowski, 1997) and healthy/unhealthy habits are adopted (Taylor, 1999). The purpose of the present study was to identify whether patterns of healthy and/or unhealthy behaviors exist among young population and to examine likely personal and social factors that may be important in determining the adoption of healthy and unhealthy habits.

Considerable amount of research during the past and present years has been dealing with the healthy and unhealthy behaviors of children and the factors that influence and finally shape them. Researchers claim that healthy behaviors such as exercise and healthy eating habits are positively correlated (Liang, Shedia - Ritzkallan, Celantano & Rohde, 1999), and so are unhealthy behaviors, such as the
use of nicotine, drugs and violent behavior (Barnes, Welte, Hoffman & Dintcheff, 1999; Bauman & Phongsavan, 1999; Liang et al., 1999; Friedman, 1998; Griesler & Kandel, 1998). Of the amount of healthy and unhealthy behaviors the present study will focus on exercise, healthy eating, smoking, and violence.

There is a number of models which have been developed over the years to explain health-related behaviors and which recognize the importance of personal and social factors. According to Rosenstock (1991) the health belief model (Becker, 1974) has been the most influential and widely tested approach to health behaviors. According to the health belief model, among the forces that are recognized as important in shaping behavior are demographic characteristics such as age, gender education and ethnicity, and socio-psychological factors such as personality, social environment and social class. In a similar fashion Bandura’s (1986) social cognitive theory suggests that behavior is a product of relationships between personal factors (coming within the individual) and environmental factors (coming from the context in which the behavior occurs). Finally, Sallis and Hovell’s (1990) social learning model stresses that with regard to younger populations, personal factors (e.g. age, gender, personality) and social influences especially (e.g. family modeling, peer influences, social support) are significant determinants of health-related behaviors, in particularly physical activity. Therefore, it becomes evident that the important role of personal and social factors in shaping health behavior is widely recognized.

In the literature, it has been reported that there are numerous factors influencing the adoption of behaviors like exercising or smoking, however family and friends are two of the most important factors proposed to account for such behaviors (e.g. Friedman & Glassman, 2000; Herrenkohl et al., 2000; Blackson, et al., 1999; Brook, Mendelberg, Galili, Priel, & Bujanover, 1999; Duncan, Duncan, Biglan, & Ary,
1998). Broadly speaking children's physical activity and their opinion about it as well has been found to be in accordance to their parents' (Babkes & Weiss, 1999; Trost, Pate, Ward, Saunders & Riner, 1999; Kimiecic, Horn & Shurin, 1996; Stucky-Ropp & DiLorenzo, 1993; Anderssen & Wold, 1992). Parents are said to influence their children either as models or motivationally (Stucky-Ropp & DiLorenzo, 1993; Anderssen & Wold, 1992). Vilhjalmssson and Thorlindsson (1998) also claimed that father's, friends' and older siblings' involvement in exercise is significantly correlated to children's behavior. Meta-analysis about the effects of social influences on individuals’ attitudes, intention and behavior, revealed that the influence of important others is stronger than that of family (Carron, Hausenblas & Mack, 1996). However, relevant study that dealt with parental influence concluded that children who grow up with one or no parents adopt unhealthier lifestyle behaviors than children who grow up with both parents (Theodorakis, Papaioannou & Karastogianidou, submitted). Thus, regarding exercise, the influence of both family and peers is clearly evident.

As far as healthy eating is concerned parental modeling is considered the major factor in shaping children's behavior (Lau, Quadrel & Hartman, 1990). Parental influence is evident in the work of Hooper, Gruber, Munoz and MacConnie (1996) who studied family and school influence in the modulation of healthy nutritional habits and concluded that parental and school cooperation was the most effective. It has been also noticed that financial and social status of the family influence children's nutritional habits (Neumark-Sztainer, Story, Perry & Casey, 1999; Hupkens, Knibbe, Otterloo & Drop, 1998). Children who lived with one of their parents, single and unemployed people were characterized as at-risk groups (Roux, Le Couedic, Durand-Gasselin & Luquet, 1999). Finally, nutritional habits are said to be affected by appearance, weight and peer influence (McLellan, Rissel, Donnelly & Bauman, 1999;
Shisslak, et al., 1998), whereas family and peer influence as models has been also found to be related to bulimic symptoms of teenagers (Stice, 1998).

Regarding smoking, it has been reported that peer influence is the most influential factor, and that the closer the friends are the more likely it is for children to adopt similar beliefs and behaviors (Roosmalen & McDaniel, 1989). Family influence is also recognized as important (Zhu, Liu, Shelton, Liu & Giovino, 1996; Dusenbury, et al., 1992), with mothers having the most significant influence (Griesler & Kandel, 1998). In a study by Brook, Mendelberg, Galili, Priel and Bujanover (1999), young children whose parents were smokers were found to be more tolerant towards smoking compared to the ones whose parents did not smoke, although they knew its consequences. Children whose parents and siblings were smokers were also found to start smoking at an earlier age (Unger & Chen, 1999; Roosmalen & McDaniel, 1989). Peer influence though is claimed to be stronger than parental (Friedman & Glassman, 2000; Dusenbury et al., 1992) and so is sibling influence (Sugathan, Moody, Bustan & Elgerges, 1998).

Furthermore, it has been supported that parental monitoring (Barnes et al, 1999; Duncan et al., 1998) and frequent conflicts between parents and children (Duncan et al., 1998) are related to increased use of nicotine by children, whereas parental supportive behavior leads to its decrease (Griesler & Kandel, 1998). According to Sobeck, Abbey, Agius, Clinton and Harrison (2000) it is more possible for children who smoke to come from families that face problems and know less about smoking compared to non-smokers of the same age. Finally, smoking has been found related to low socioeconomic family condition, poor academic performance and ignorance (Zhu et al., 1996).
The last behavior that this study deals with is violent behavior. Paetsch and Bertrand (1997) reported that the most important factor predicting violent behavior was peer deviant behavior. Sport activities and in a large degree involvement in amusement activities were positively correlated to such behaviors, whereas Herrenkohl, et al. (2000) reported violence to be related to poor academic performance. Blackson, et al. (1999) also supported that peers and family condition instill deviant behaviors when the environment is tolerable towards such behaviors. Other factors that violent behavior is likely to depend on during adolescence are modeling, family malfunctioning, and family separation (Dahlberg, 1998). Family and peer influences were also supported by Ary, Duncan, Duncan and Hops (1999) who claimed that family conflicts, congruous family relationship and inadequate children monitoring by parents play a major role in the adoption of violent behavior.

Summarizing the above-mentioned, it is well documented that family and peer influence and support are important determinants of children’s behavior. The aim of the study was first to examine how the behaviors of interest, i.e. exercising, smoking, healthy eating and participating in violent acts, cluster, that is how certain behaviors relate to each other, and second to identify the profile of children in these clusters of behaviors, in relation to demographic characteristics and social influences. Given the exploratory character of the study, no specific hypotheses were formed regarding how behaviors would cluster. Nevertheless, we expected that age, gender and social influences (family support and perceived family and peer behavior) would be the most crucial factors in determining the adoption of healthy and unhealthy behaviors.
Method

Participants and procedures

Participants in this study were 3640 Greek students. Their age ranged from 10 to 16 years. The sample was selected with a random stratified sampling method from 85 classes of 30 elementary schools, grade 6, from 87 classes of 33 junior high schools, grades 2 and 3, and from 86 classes of 28 high schools, grades 5 and 6. These schools were elected from 6 urban areas of Greece varying in population from four millions to seventy-five thousands residents.

The study was conducted with the permission of the ministry of education. Ten trained research assistants were employed in the data collection process. Participants were informed that questionnaires were anonymous and signed consent forms. In their class environment, they responded on questionnaires assessing the examined behaviors, family and peer influence, perceived family support, family structure and family income. After completing the forms children were asked to place it in a poll.

Measures

Self-report past behaviors. The examined behaviors were four and were assessed by self-reported measures. The scales were adopted from Kimiecik (1992) and Steptoe, et al. (2002) and complied with Ajzen’s (2002) guidelines for measurement of behavior. In particular, students were asked to indicate frequency of the examined behaviors on six-point scales. For exercising, ‘how many times you exercised intensively during the last month’ (none to more than twenty times). Participants were instructed that intensive exercise meant taking part in physical activities, which cause increased heart rate and sweating for more than 30 minutes (e.g. football, basketball, aerobic). For smoking and eating fruits, ‘how many cigarettes/fruits you smoked/ate during the last week’ (none to more than twenty). For
participating in violent acts, ‘how many times you got involved in violent acts during the last month’ (none to more than ten times).

*Perceived family and peer behavior.* Family and peer influence was estimated in terms of modeling. The questionnaire used was based on prior work by Wang, Fitzhugh, Westerfield and Eddy (1995). Students answered 16 items regarding perceived parents' and peer's behavior towards the examined behaviors. Four items for each behavior were used. More specifically students were asked what they believed about their parents, siblings and best friends: ‘How often do you think your mother/father/ siblings/best friend exercised/smoked/ate fruits/ participated in violent action during the previous month. Responses on these items were rated on a 7-point scale (never to all the time).

*Perceived family support.* Perceived parental support was estimated by a questionnaire based on prior work by Wickrama, Lorenz and Conger (1997). It consisted of 10 items assessing students' perception of their parents' behavior towards them. For example, students were asked how often during the previous month their parents illustrated their real interest for them, expressed their love and affection to them, were angry with them and so on. Responses on these items were rated on a 6-point scale (never to all the time). Cronbach’s alpha was .86.

*Family structure.* To assess family structure, participants were asked to indicate whether they live with both parents, with their mother only, with their father only, with their grandparents, or alone. They also had the choice to state other.

*Perceived family income.* Finally, regarding family income, participants were asked to indicate on a five-point scale whether they perceived their family income to be significantly above average, a little above average, on average, a little below average or significantly below average. They could also state that they did not know.
Data analysis

Cluster analysis was chosen to answer the main research question, that is whether identifiable subgroups or profiles of children would emerge based on variations regarding the behaviors of exercising, smoking, eating fruits and participating in violent acts. A nonhierarchical clustering method was employed (SPSS Quick Cluster) with the squared Euclidean distance used as the similarity measure. Before submitting the data to the cluster procedures, all variables were converted to \( z \) scores in order to standardize the measurement scales and to allow the easier interpretation of the results. A \( z \) score value of +/- .50 was used as a criterion for interpreting whether individuals scored relatively higher or lower compared to their peers on each of the four variables.

Results

Cases with missing values on the variables of main interest (behavioral variables) were deleted. This resulted in a sample of 3307 children. Descriptive statistics for all variables are presented in Table 1. Mean scores indicate that children scored moderately on exercising and eating fruits and low in smoking and participating in violent incidents. Furthermore, they scored moderately high on perceived family support and perceived family and peer exercise behavior, moderately low on perceived family and peer smoking behavior, moderately high on perceived family and peer eating fruits behavior, and low on perceived family and peer violent behavior.

Exercise was negatively, but lowly correlated with smoking (\( r = -.11 \)), and positively but again lowly correlated with eating fruits (.20) and participating in violent acts (.11). Furthermore, smoking correlated moderately (\( r = .36 \)) with
participating in violent acts. Family support correlated negatively with smoking ($r = -0.32$) and participating in violent acts ($r = -0.29$). Finally, children’s behavior correlated with perceived family and peer behavior for all corresponding behaviors ($0.23 < r < 0.46$). All correlations were significant at $p < 0.001$ level.

Cluster analysis

Results from the cluster analysis revealed four distinct children profiles. Three and five-cluster analyses were also examined, however the four-cluster solution was the most meaningful. $Z$ scores, unstandardized means and standard deviations for each of the key variables on which participants were classified into subgroups are presented in Table 2.

Cluster one comprised 221 children. The unique characteristic of this cluster was high scores on participating in violent acts. Children in this cluster scored high on exercising and eating fruits, and low on smoking. Cluster 2 comprised 1272 children. The main characteristic of this cluster was the low scores on exercising. Children in this cluster also scored near-zero on smoking and participating in violent acts, and moderately low on eating fruits. Cluster three comprised 382 children. The unique characteristic of this cluster was the high scores on smoking. Children in this cluster also scored low on exercising, and participating in violent acts, and moderately on eating fruits. Finally, cluster four comprised 1432 children. The main characteristic of this cluster was the high scores on exercising in combination with near-zero scores on smoking and participating in violent acts. Children in this cluster also scored moderately high on eating fruits.

In relative terms, children in cluster one were those participating in violent acts, who however maintain a satisfactory level of exercise, comparable to that of children in cluster four who were characterised by the adoption of healthy behaviors, and
absence of unhealthy ones. Children in cluster two, like those in cluster four were characterised by absence of unhealthy behaviors, however their level of exercise was very low, and they also had the lowest scores on eating fruits. Finally, children in cluster three were those who were smokers, who also had comparatively moderate levels of participating in violent acts and low levels of exercising.

*Cluster profiles in relation to demographic characteristics*

Statistics regarding demographic characteristics of participants falling into each cluster are presented in Table 3. Regarding within gender differences, the first cluster (high violence, high exercise) included higher percentage of boys than girls. In particular, 11.6% of the boys and 2.3% of the girls fall in this cluster. The opposite was evident for cluster two (low exercise, low smoking, low violence), which included 29.6% of the boys and 46.2% of the girls. Gender representation in clusters three and four was comparable.

Regarding family structure, because the vast majority of children were living with both parents, children were regrouped to form two groups, one including children living with both parents (n=2835) and one including children living with one or no parents (n=409). Representation in clusters one and two was similar for children living with both parents and children living with one or no parent. In cluster three (high smoking) there was a higher percentage of children living with one or no parent. In particular, cluster three included 22.7% of children living with one or no parents and 9% of children living with both parents. Finally, cluster four (high exercise, low smoking, low violence) included 44.8% of children living with both parents and 33.5% of children living with one or no parent.

In relation to grade, in cluster one there was no specific pattern regarding representation of different grades. In contrast, obvious patterns could be observed in
cluster two, three and four. In particular, in cluster two (low exercise, low smoking, low violence) and cluster three (high smoking) percentage of membership increased in direct relation with grade. In cluster four (high exercise, low smoking, low violence) the pattern was opposite with membership decreasing as grade increased.

Finally, in relation to family income, observable differences were revealed in cluster three (high smoking), where the percentage of children coming from families with the lowest income was high (26.5%) compared to the total (12.4%), and cluster four (high exercise, low smoking, low violence) where the percentage of children coming from families with the lowest income was low (26.5%) compared to the total (42.6%).

**Cluster profiles in relation to perceptions of social environment**

Analysis of variance was subsequently calculated in order to examine differences in family support and perceived family and peer behavior among participants falling into each cluster. The results of the analysis and mean scores for these variables in each cluster are presented in Table 4. One-way ANOVA was calculated to test for differences in family support. The analysis revealed significant univariate effect ($F_{3,2118} = 88.16$, $p < .001$). The highest scores on family support were reported from participants in cluster four (high exercise, low smoking, low violence), followed by participants in cluster two (low exercise, low smoking, low violence), followed by participants in cluster one (high violence, high exercise), whereas the lowest scores were reported from participants in cluster three (high smoking). Post-hoc test revealed that there were significant differences between all clusters. However, given the large cell sizes this was expected. Examination of effect sizes indicated that differences between cluster two and four were small and so were differences between clusters one and three (ES = .14 and .31 respectively). In
contrast, differences between clusters two/four and clusters one/three were larger (ES ranging from .45 to 1.01).

One-way MANOVA was calculated to examine differences between participants in each cluster in perceived family and peer behavior. The analysis revealed significant multivariate effect ($F_{12,5604} = 52.18, p < .001$). Univariate analysis indicated that differences between the clusters existed in all dependent variables. Post-hoc test indicated that regarding perceived family and peer exercising behavior children in cluster one and four (moderately high and high in exercise behavior respectively) scored higher than children in clusters two and three (low and moderately low in exercise behavior respectively). Furthermore, it was indicated that children in cluster two scored higher than those in cluster three. Post-hoc tests regarding perceived family and peer smoking behavior revealed that children in clusters two and four (non smoking behavior) scored lower than children in clusters one and three (low and high smoking behavior respectively). Furthermore, children in cluster three scored higher than children in cluster one. Post-hoc tests regarding perceived family and peer eating fruits behavior revealed that children in cluster four (high eating fruits behavior) scored higher than all other clusters. Furthermore, children in cluster three (moderate low eating fruits behavior) scored lower than children in cluster two (low eating fruits behavior). Finally, post-hoc tests regarding perceived family and peer violent behavior revealed that children in cluster one (high violent behavior) scored higher than children in all other clusters. Furthermore, children in cluster three (low violent behavior) scored higher than children in clusters two and four (no violent behavior).
Discussion

The adoption of healthy and unhealthy behaviors is a matter of great importance in the study of contemporary lifestyle. Children and adolescents are a population of particular interest, since health beliefs adopted in early years are indicative of later behavioral patterns. The present study explored patterns of behavior among adolescent Greek population and examined personal and social factors as likely determinants of such behavioral patterns.

Cluster profiles in relation to demographic characteristics

The first aim of this study was to identify profiles of the Greek student population regarding healthy and unhealthy behaviors, according to demographic characteristics. The cluster profile results indicate considerable variability among children as far as the examined behaviors are concerned. These differences were associated, at least partly, with age, gender, family structure and income. In relation to gender, the results of the present study give some interesting information regarding the adoption of healthy and unhealthy habits. Comparing cluster two to cluster four it becomes evident that among children that avoid unhealthy behaviors, boys are more involved in exercising than girls. Similar findings have been reported by Anderssen and Wold (1992) and Mota and Queiros, (1996) who found that girls are significantly less active than boys. Comparison of clusters one and four reveals that among children that exercise regularly, there is a greater number of boys getting involved in violent acts. This result incorporates findings from Paetsch and Bertrand (1997) who found involvement in sport activities being associated to violent behavior and findings from Herrenkohl et al. (2000) who reported male gender to be a significant predictor of violence. Regarding smoking and eating behavior there were no differences.
between boys and girls, in contrast to Lau et al. (1990) who reported that girls adopt healthier eating habits than boys.

In relation to age, the patterns that were identified are quite worrying. It seems that as children grow older they abandon healthy behaviors and adopt unhealthy ones. Similar results regarding smoking and alcohol use have been reported by Johnston, O’Malley and Backman (2000), who found that during high school rates of smoking and alcohol use increase rapidly with age, whereas similar conclusions have been drawn by Botvin and Kantor (2000).

Family structure was another factor that seemed to influence the adoption of healthy and unhealthy behaviors, especially smoking and exercising. A relatively large percentage of children living with one or no parents are smokers and non-exercisers, and respectively a relatively small percentage of those children are regular exercisers. Similar patterns emerged for family income. However, overall, family income did not seem to be a very crucial factor.

Regarding aspects of family structure and its relation to children’s behavior, the findings of this study are in accordance with the existing literature suggesting that children living in single-parent families are at high risk as far as unhealthy behaviors are concerned (Roux et al., 1999). Shisslak et al. (1998) reported that girls having separated or divorced parents show at risk-levels of weight control behaviors, whereas Sobeck et al. (2000) found that it is more possible for smokers to come from families that are not congruous. Similar results have been reported regarding drug use (Friedman & Glassman, 2000). Finally, in relation to the present findings, Dahleberg (1998) reports that among the factors that increase the possibility of violent behavior are family malfunctioning and family disruption. Similar views have been expressed
by Herrenkohl et al. (2000) and Blackson et al. (1999) who claim that family conflicts lead to violent behavior.

Overall, the demographic results of the present study indicate that regarding healthy behaviors, older children, children from disrupted families, and mainly girls can be characterized as at greater risk groups, whereas regarding unhealthy behaviors older children, children from disrupted families, and mainly boys can be characterized as at greater risk groups. However, it is also notable that younger children, irrespective of other variables, exhibited healthier profiles. To our view, this finding stresses the need to direct our attention to earlier ages where healthy habits are still dominant and try to improve maintenance of healthier life-style.

Cluster profiles in relation to perceptions of social environment

Researchers claim that the effect of social factors on the adoption of healthy and unhealthy behaviors are of particular importance. More specifically, it has been supported that children’s behavior regarding exercise, healthy eating, smoking, and violent behavior can be predicted by social factors, mainly family and peer influences (Friedman & Glassman, 2000; Herrenkohl et al., 2000; Blackson et al., 1999; Brook et al., 1999; Duncan et al., 1998). The second aim of the present study, was to identify profiles of the Greek student population regarding healthy and unhealthy behaviors, in relation to perceived family support and perceived family and peer behavior.

According to the results of the present study, the role of family support seems to be influential in shaping behavior. A more careful examination reveals that family support looks more crucial in relation to the adoption of unhealthy, rather than healthy, behaviors. In particular, children who scored higher on family support were those who do not smoke and do not take part in violent acts (cluster four and cluster two). However, children in cluster two had the lowest scores on exercising and eating
fruits. Moreover, children who scored lower on family support were those who engage in unhealthy behaviors, such as smoking and violent acts (cluster one and cluster three), even though they scored higher in exercising and eating fruits compared to children in cluster two.

Similar patterns of relationships were revealed regarding perceived family and peer behavior. Thus, it seems that perceptions of social environment are more influential in relation to the adoption or not of unhealthy, rather than healthy, behaviors. In relation to these results, in the literature, there are evidence that parental monitoring (Barnes et al., 1999; Duncan et al., 1998) as well as frequent conflicts between parents and children (Duncan et al., 1998) relate to increased smoking among children. Moreover, Grisler and Kandel (1998) suggested that supportive parental behavior invokes reduction of smoking. Finally, Blackson et al. (1999) claim that negatively perceived parental control and psychological dominance are responsible for violent behavior, while Ary et al. (1999) reported loose parental control to be also related to deviant behavior.

Overall, what seems of great importance to us is some of the patterns that emerged. In particular, even though clear connections between smoking and non-exercising were detected, the opposite was not evident, that is, no clear pattern between non-smoking and exercising were revealed. This lead us to believe that avoidance of unhealthy behaviors is not necessarily connected to adoption of healthy behaviors. Furthermore, the relationship between exercising and violence indicates in addition, that adoption of healthy behaviors is not necessarily connected to avoidance of unhealthy behaviors.

Considering the evidence regarding prevailing lifestyles around the world (e.g. Johnston et al. 2000, for the USA; Steptoe et al. 2002, for Europe, Leslie et al. 1999,
for Australia) the need to develop health promotion programs is universally recognized. In accordance to health behavior theories personal and social characteristics are amongst the important determinants of health-behavior. The results of the present study can prove helpful in developing more efficient health promotion programs. Demographic characteristics and descriptions of social environment can help identify intervention targets. Furthermore, the way behaviors cluster can help schedule more specific intervention programs in relation to specific groups. For example, a program with emphasis on the importance of exercising in maintaining healthy life style would be more appropriate for individuals who are not smokers but are not physically active, whereas a program emphasizing long-term consequences of unhealthy life-style and benefits of healthy habits would be more appropriate for inactive individuals who also smoke and a program designed to promote fair-play, respect for team-mates and opponents and avoidance of violence would be more appropriate for exercisers with violent behavior. Finally, with regard to social environment, this should also become part of the intervention programs with educational programs for parents about personal behavior and parental guidance.
References


Table 1.

*Descriptive statistics for the examined behaviors, perceived family support and perceived family and peer behaviors.*

<table>
<thead>
<tr>
<th>Variables</th>
<th>N</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exercise behavior</td>
<td>3307</td>
<td>2.47</td>
<td>1.70</td>
</tr>
<tr>
<td>Smoking behavior</td>
<td>3307</td>
<td>.61</td>
<td>1.52</td>
</tr>
<tr>
<td>Eating behavior</td>
<td>3307</td>
<td>2.81</td>
<td>1.51</td>
</tr>
<tr>
<td>Violence behavior</td>
<td>3307</td>
<td>.46</td>
<td>1.23</td>
</tr>
<tr>
<td>Perceived family Support</td>
<td>2866</td>
<td>4.70</td>
<td>.95</td>
</tr>
<tr>
<td>Perceived family and peer exercise behavior</td>
<td>2532</td>
<td>3.26</td>
<td>1.18</td>
</tr>
<tr>
<td>Perceived family and peer smoking behavior</td>
<td>2567</td>
<td>2.51</td>
<td>1.29</td>
</tr>
<tr>
<td>Perceived family and peer eating behavior</td>
<td>2287</td>
<td>4.71</td>
<td>1.28</td>
</tr>
<tr>
<td>Perceived family and peer violence behavior</td>
<td>2560</td>
<td>1.63</td>
<td>1.13</td>
</tr>
</tbody>
</table>
Table 2.

Mean scores, standard deviations and z-scores for the four clusters.

<table>
<thead>
<tr>
<th></th>
<th>Cluster 1 (n= 221)</th>
<th>Cluster 2 (n= 1272)</th>
<th>Cluster 3 (n= 382)</th>
<th>Cluster 4 (n= 1432)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>mean</td>
<td>s.d.</td>
<td>z</td>
<td>mean</td>
</tr>
<tr>
<td>Exercising</td>
<td>3.38</td>
<td>1.57</td>
<td>.53</td>
<td>1.11</td>
</tr>
<tr>
<td></td>
<td>3.68</td>
<td>1.13</td>
<td>.71</td>
<td></td>
</tr>
<tr>
<td>Smoking</td>
<td>0.25</td>
<td>.70</td>
<td>-.24</td>
<td>0.01</td>
</tr>
<tr>
<td></td>
<td>0.01</td>
<td>.26</td>
<td>-.38</td>
<td></td>
</tr>
<tr>
<td>Eating fruits</td>
<td>3.15</td>
<td>1.64</td>
<td>.23</td>
<td>2.09</td>
</tr>
<tr>
<td></td>
<td>3.44</td>
<td>1.37</td>
<td>.42</td>
<td></td>
</tr>
<tr>
<td>Participating in violent incidents</td>
<td>3.53</td>
<td>1.25</td>
<td>2.43</td>
<td>0.01</td>
</tr>
<tr>
<td></td>
<td>0.01</td>
<td>.20</td>
<td>-.45</td>
<td></td>
</tr>
</tbody>
</table>
Table 3.

Cluster profiles in relation to demographic characteristics.

<table>
<thead>
<tr>
<th></th>
<th>Cluster 1</th>
<th>Cluster 2</th>
<th>Cluster 3</th>
<th>Cluster 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender ( (n= 3212) )</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Males</td>
<td>172 (11.6%)</td>
<td>439 (29.6%)</td>
<td>190 (12.8%)</td>
<td>680 (45.9%)</td>
</tr>
<tr>
<td>Females</td>
<td>39 (2.3%)</td>
<td>800 (46.2%)</td>
<td>173 (10%)</td>
<td>719 (41.5%)</td>
</tr>
<tr>
<td>Family structure ( (n= 3244) )</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Both parents</td>
<td>180 (6.3%)</td>
<td>1105 (39%)</td>
<td>279 (9.8%)</td>
<td>1271 (44.8%)</td>
</tr>
<tr>
<td>One or no parents</td>
<td>32 (7.8%)</td>
<td>147 (35.9%)</td>
<td>93 (22.7%)</td>
<td>137 (33.5%)</td>
</tr>
<tr>
<td>Grade ( (n= 3303) )</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Elementary school 6(^{th}) grade</td>
<td>33 (5.3%)</td>
<td>177 (28.5%)</td>
<td>11 (1.8%)</td>
<td>400 (64.4%)</td>
</tr>
<tr>
<td>Junior high school 2(^{nd}) grade</td>
<td>57 (8.2%)</td>
<td>215 (39.8%)</td>
<td>39 (5.6%)</td>
<td>388 (55.6%)</td>
</tr>
<tr>
<td>Junior high school 3(^{rd}) grade</td>
<td>72 (9.7%)</td>
<td>279 (37.8%)</td>
<td>63 (8.5%)</td>
<td>325 (44%)</td>
</tr>
<tr>
<td>High school 2(^{nd}) grade</td>
<td>49 (6.7%)</td>
<td>339 (46.2%)</td>
<td>136 (18.5%)</td>
<td>210 (28.6%)</td>
</tr>
<tr>
<td>High school 3(^{rd}) grade</td>
<td>8 (1.6%)</td>
<td>261 (51.2%)</td>
<td>133 (26.1%)</td>
<td>108 (21.2%)</td>
</tr>
<tr>
<td>Family income ( (n= 2425) )</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Much below average</td>
<td>3 (8.8%)</td>
<td>13 (38.2%)</td>
<td>9 (26.5%)</td>
<td>9 (26.5%)</td>
</tr>
<tr>
<td>Below average</td>
<td>7 (5.8%)</td>
<td>50 (41.7%)</td>
<td>17 (14.2%)</td>
<td>46 (38.3)</td>
</tr>
<tr>
<td>On average</td>
<td>61 (5.8%)</td>
<td>478 (45.4%)</td>
<td>113 (10.7%)</td>
<td>402 (38.1%)</td>
</tr>
<tr>
<td>Above average</td>
<td>52 (6.3%)</td>
<td>297 (36%)</td>
<td>91 (11%)</td>
<td>385 (46.7%)</td>
</tr>
<tr>
<td>Much above average</td>
<td>36 (9.2%)</td>
<td>93 (23.7%)</td>
<td>71 (18.1%)</td>
<td>192 (49%)</td>
</tr>
</tbody>
</table>
Table 4.

Mean scores on family support and perceived family and peer behavior for the four clusters.

<table>
<thead>
<tr>
<th></th>
<th>Cluster 1</th>
<th>Cluster 2</th>
<th>Cluster 3</th>
<th>Cluster 4</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Family support (n=2866)</td>
<td>4.23</td>
<td>4.76</td>
<td>3.94</td>
<td>4.89</td>
<td>88.16**</td>
</tr>
<tr>
<td>Perceived family and peer behavior (n=1873)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Exercise</td>
<td>3.53</td>
<td>2.98</td>
<td>2.71</td>
<td>3.70</td>
<td>74.54**</td>
</tr>
<tr>
<td>Smoking</td>
<td>3.05</td>
<td>2.35</td>
<td>3.63</td>
<td>2.29</td>
<td>76.80**</td>
</tr>
<tr>
<td>Eating fruits</td>
<td>4.52</td>
<td>4.63</td>
<td>4.16</td>
<td>5.05</td>
<td>37.14**</td>
</tr>
<tr>
<td>Participating in violent incidents</td>
<td>2.76</td>
<td>1.36</td>
<td>2.26</td>
<td>1.43</td>
<td>100.66**</td>
</tr>
</tbody>
</table>

*\( p < .05 \), **\( p < .001 \)

1,2,3,4 upper cases indicate differences between clusters
Yannis Theodorakis  
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Department of Physical Education and Sport Science  
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E-mail ytheo@pe.uth.gr  
Fax +302431 47042  
Tel  +302431 470001,

Trikala, 05 December 2002

To:  Professor Stuart Biddle,  
Loughborough University,  
Department of PE, Sports Science & Recreation Management,  
Loughborough, Leics.,  
LE11 3TU,

Dear Stuart

Please find enclosed 4 copies of the paper titled "CHILDREN'S PROFILE OF HEALTHY AND UNHEALTHY BEHAVIORS: DEMOGRAPHIC CHARACTERISTICS AND PERCEPTIONS OF SOCIAL ENVIRONMENT" which I submit for publication into “Psychology of Sport and Exercise”. I am looking forward to hearing from you.

Sincerely yours,

Yannis Theodorakis,  
Professor