

GREEK STUDENTS' ATTITUDES TOWARD PHYSICAL ACTIVITY AND HEALTH-RELATED BEHAVIOR¹

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Summary.—A three-wave study over one year with 882 adolescents, aged 10 to 16 years at the initial testing, examined psychosocial variables regarding four health-related behaviors: exercise, eating fruit, smoking, and drug use. Analysis showed that during the stages of the study, high school students' exercise behavior decreased and their smoking behavior increased as well as their willingness to use drugs. It seems that study of physical education and health education during adolescence must take into account the possible differences in psychosocial variables associated with health-related behaviors as well as the different stages of adolescence.

Both healthy diet and physical activity are critical to adolescents' health, affecting both short- and long-term health. Healthy eating and physical activity patterns during adolescence promote optimal growth and development, can help in preventing immediate health problems, and may prevent long-term chronic diseases (Story & Neumark-Sztainer, 1999). Total nutrient needs are higher during adolescence than any other time in the life cycle (National Academy of Sciences, 1989). Regular physical activity among adolescents is also related to improved endurance and muscular strength, weight control, and optimal bone density (U.S. Department of Health and Human Services, 1996). Adolescents' physical activity is also consistently related to higher self-esteem and self-concept and lower anxiety and stress (Centers for Disease Control, 1992).

On the other hand, several personal behaviors in adolescence can contribute to morbidity and mortality such as smoking, heavy drinking, using illegal drugs, precocious and unprotected sexual activity, no regular participation in sports and exercise, traffic accidents, and violent, aggressive, and delinquent activities. These "indicate that the image of 'healthy adolescence' is inaccurate" (Hurrelman & Lösel, 1990, p. 2).

Adolescence is a time of transitions. In approaching most of life's transitions, people seek information about what is about to happen and strive to

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organize their understandings as events unfold (Ruble, 1994). The transitions of adolescence may be broadly similar for the majority of young people but the nature of the path followed through these transitions may vary widely according to a variety of psychosocial determinants and structural conditions (Hendry, Shucksmith, & Philip, 1995, p. 16). Young people's lifestyles can be clearly differentiated across a range of factors including health. These factors can be an interaction of self-perceptions, motivations, meanings, and salience, which adolescents put upon various social and leisure activities (Hendry, Shucksmith, Lovc, & Glendinning, 1993).

Research on health-related behaviors has examined a range of psychosocial variables in order to interpret these behaviors. These variables include intentions, attitudes, self-efficacy, values, expectations, beliefs, as well as the perception of others' attitudes (Jessor & Jessor, 1977; Ajzen & Fishbein, 1980; Bentler & Speckart, 1981; Godin, Cox, & Shephard, 1983; Bandura, 1986; Godin, Valois, Shephard, & Desharnais, 1987; Conrad, Flay, & Hill, 1992; Johanson, Thelle, Solvoll, Bjorneboe, & Drevon, 1999).

Some of the most common psychosocial variables used in the study of health-related behaviors are parts of the model of planned behavior which is a predictive model of behavior. The theory of planned behavior has been successful in predicting a number of health-related behaviors such as exercise (Theodorakis, 1994), smoking (De Vries, Backbier, Kok, & Dijkstra, 1995), and drug use (Lafin, Hirschl, Weis, & Haues, 1994). The key predictive variables of the theory are intention to engage in a specific behavior, attitudes toward the behavior, one's perception about others' approval or disapproval of engagement in a behavior (subjective norm), and one's perception whether one can control the behavior (perceived behavioral control) (Ajzen, 1991). According to the theory, intention toward a specific behavior is the main determinant of behavior. The attitude component is a function of a person's salient behavioral beliefs, which represent perceived consequences of the behavior. Subjective norm is a function of normative beliefs, which represent perceptions of specific significant others' preferences about whether one should engage in a behavior. Perceived behavioral control is formed by beliefs concerning whether one has access to the necessary resources and opportunities to perform the behavior successfully, weighted by the perceived power of each factor (Ajzen, 1988).

Children's health habits are multidimensional. Certain interrelations vary at different developmental levels (Terre, Drabman, & Meydrech, 1990). Younger adolescents are most likely to be involved in physical activities and sport (Hendry, *et al.*, 1993). Furthermore, adolescents, in contrast to pre-adolescents, reported less social support for exercise and fewer exercise role models (Garcia, Broda, Frenn, Coviak, Pender, & Ronis, 1995). Similarly, older adolescents are likely to smoke more than younger adolescents (Mac-

Intyre, Annadale, Ecob, Ford, Hunt, Jamieson, MacIver, West, & Wyke, 1989).

The present study evaluated, in a sample of Greek students, the variables of planned behavior theory by age group. Four different health-related behaviors were examined at the three phases, exercise, eating fruit, smoking, and drug use. The aim of the study was to see if there are any differences between the research phases, between the different grades of students, and the possible interactions.

METHOD

Sample and Procedure

The sample consisted of 882 students (329 boys and 553 girls). They had a mean age of 13.9 yr. ($SD=2.14$) and were in three age groups represented by three grades: elementary school ($n=187$), high school ($n=398$), and senior high school ($n=297$). In classroom settings, students completed scales assessing attitudes, intention, perceived control, and behavior, for each of the four behaviors of the study. Students were contacted at three consecutive times in October 1998, April 1999, and November 1999. Differences in scores at different times and age groups, and the interaction between phases and age groups were examined using analysis of variance with repeated measures.

Measures

Intention.—Intention was estimated as the mean score of the responses to three different items: "I intend/I will/I am determined to exercise, eat fruit, smoke, use drugs during the next two months." Responses to the first item were rated on a 7-point scale with anchors of 1: likely and 7: unlikely. A scale with endpoints labeled 1: yes, sure and 7: not at all was used for the other two items. Cronbach alphas at the three phases were for exercise .82, .89, .92; eating fruit .82, .90, .87; smoking .90, .94, .95; and drug use .89, .89, .87, respectively.

Attitude.—Attitude toward the behavior assessed by the mean rating on three bipolar adjectives, e.g., good–bad, healthy–unhealthy, useful–of no use. Again, 7-point scales were used. "I think that exercising, eating fruit, smoking, using drugs during the next two months is . . ." Responses were rated on the three bipolar adjectives. Cronbach alphas at the three phases were for exercise .50, .69, and .83, respectively; for eating fruit .85, .95, .87; for smoking .79, .85, .89; and for drug use .80, .87, .90.

Perceived behavioral control.—Perceived behavioral control was assessed by two questions. (a) "I can [exercise/eat fruits/smoke/use drugs] during the next two months." Responses were rated on a scale with anchors of 1: likely and 7: unlikely. (b) "For me to exercise, eat fruits, smoke, use drugs, during

the next two months is . . ." Responses were rated with anchors of 1: easy and 7: difficult. Cronbach alphas at the three phases were for exercise .82, .90, and .94, respectively; for eating fruit .88, .92, .91; for smoking .86, .93, .93; and for drug use .71, .91, .92.

Behavior.—The examined behaviors were four and were assessed by self-reported measures. Students were asked to indicate frequency of the examined behaviors on 6-point scales. For exercising, "How many times you exercised intensively during the last month" (0: none, 1: 1 to 5 times, 2: 6 to 10 times, 3: 11 to 15 times, 4: 16 to 20 times, 5: more than 20 times). For smoking and eating fruits, "How many [cigarettes/fruits you smoked/ate during the last week]" (0: none, 1: 1 to 5, 2: 6 to 10, 3: 11 to 15, 4: 16 to 20, 5: more than 20). For using drugs, "How many times you used drugs in the past" (0: none, 1: 1 to 5, 2: 6 to 10, 3: 11 to 15, 4: 16 to 20, 5: more than 20).

RESULTS

Regarding exercise, there was a significant decrease from (1) elementary school to (3) senior high school on intention to exercise and on exercise behavior (Table 1). Interactions (Phase \times Grade) confirmed what means show (Table 2): that only students from senior high school reported a decrease in intention, in perceived behavioral control, and in exercise behavior, while only the students in senior high school said that they exercised significantly less in senior high school.

TABLE 1
F RATIOS AND POWER ESTIMATES FOR CHANGES IN RATINGS BETWEEN PHASES IN ALL THE BEHAVIORS FOR WHOLE SAMPLE

Behavior	Phases		Phase \times Grade	
	F	η^2	F	η^2
Exercise				
Attitude	6.65‡	.008	4.60‡	.011
Intention	21.39‡	.024	10.39‡	.023
Perceived Control	10.74‡	.013	9.83‡	.023
Behavior	22.17‡	.026	10.04‡	.024
Eating Fruit				
Attitude	5.99‡	.007	3.69†	.009
Intention	10.65‡	.012	1.47	.003
Perceived Control	5.46‡	.006	.99	.002
Behavior	15.19‡	.019	4.63‡	.012
Smoking				
Attitude	3.20	.004	2.11	.005
Intention	16.51‡	.019	10.03‡	.023
Perceived Control	14.80‡	.017	10.00‡	.023
Behavior	15.72‡	.018	9.54‡	.022

(continued on next page)

* $p < .01$. † $p < .005$. ‡ $p < .001$.

TABLE 1 (Cont'd)
F RATIOS AND POWER ESTIMATES FOR CHANGES IN RATINGS BETWEEN PHASES IN ALL THE BEHAVIORS FOR WHOLE SAMPLE

Behavior	Phases		Phase \times Grade	
	F	η^2	F	η^2
Drug Use				
Attitude	.87	.001	3.19	.005
Intention	14.99‡	.689	5.09‡	.007
Perceived Control	22.78‡	.770	2.52	.004
Behavior	4.69*	.007	1.39	.002

* $p < .01$. † $p < .005$. ‡ $p < .001$.

Regarding eating fruit behavior, while there were no changes in psychosocial variables, self-reported behavior increased significantly from the first to third phases of the study (Table 1). No significant interactions between phases and grades, at any variable concerning eating fruit behavior were observed.

TABLE 2
MEANS AND STANDARD DEVIATIONS FOR EXERCISE BEHAVIOR BY PHASES IN PLANNED BEHAVIOR THEORY VARIABLES FOR THREE EDUCATIONAL LEVELS

	Elementary School		High School		Senior High School	
	M	SD	M	SD	M	SD
Attitude						
Phase 1	6.59	.04	6.55	.03	6.55	.03
Phase 2	6.68	.05	6.59	.03	6.44	.04
Phase 3	6.73	.05	6.70	.04	6.50	.04
Intention						
Phase 1	5.98	.10	5.85	.07	5.18	.08
Phase 2	6.09	.11	5.91	.07	4.94	.08
Phase 3	6.02	.12	5.68	.08	4.33	.09
Perceived Control						
Phase 1	5.95	.10	5.64	.07	4.76	.08
Phase 2	6.15	.11	5.75	.07	4.55	.08
Phase 3	6.11	.12	5.54	.08	4.06	.09
Behavior						
Phase 1	11.22	.60	11.66	.39	8.57	.46
Phase 2	14.63	.55	12.22	.36	8.29	.41
Phase 3	12.48	.56	11.41	.36	5.36	.42

Regarding smoking behavior, there were significant increases in intention, perceived control, and behavior from the first (elementary school) to the third phase (senior high school) (Table 2). Interactions (Phase \times Grade) showed that high school and senior high school students increased their intention to smoke, their perceived behavioral control, and smoking behavior from the first to the third phase, while this did not happen in elementary school's students (Table 3).

TABLE 3
MEANS AND STANDARD DEVIATIONS FOR REPORTED SMOKING BEHAVIOR BY PHASES IN
PLANNED BEHAVIOR THEORY VARIABLES FOR THREE EDUCATIONAL LEVELS

	Elementary School		High School		Senior High School	
	M	SD	M	SD	M	SD
Attitude						
Phase 1	1.22	.06	1.27	.04	1.45	.05
Phase 2	1.11	.07	1.29	.05	1.50	.05
Phase 3	1.15	.08	1.37	.06	1.62	.06
Intention						
Phase 1	1.22	.09	1.29	.06	1.82	.07
Phase 2	1.08	.10	1.30	.07	2.18	.08
Phase 3	1.12	.12	1.49	.08	2.46	.09
Perceived Control						
Phase 1	1.30	.10	1.41	.07	2.07	.08
Phase 2	1.17	.10	1.37	.07	2.37	.08
Phase 3	1.17	.12	1.61	.08	2.68	.10
Behavior						
Phase 1	.00	.31	.42	.21	2.17	.24
Phase 2	.00	.34	.60	.23	2.95	.27
Phase 3	.00	.42	.93	.28	4.17	.33

Regarding drug use, intention and perceived behavioral control were rated significantly higher in the high school and senior high school than in elementary school, and these differences were large ($\eta^2 = .69$, $\eta^2 = .77$, respectively; see Table 1). There were no significant interactions between phases or times of testing and grades in school.

DISCUSSION

The decrease in intention to exercise shows a lack of motivation in senior high school students to engage in exercise. The decrease in perceived behavioral control in senior high school students (Table 2) could likely mean, according to theory (Ajzen, 1991), a gradual increase in the perception of obstacles to exercise behavior. Similarly, there was a decrease in exercise behavior from the first to the third phase for senior high school students. Hendry, *et al.* (1993) also found a drop-off in involvement in the last few years of secondary schooling and particularly when people make the transition from school towards work, training or higher education. In our study, it could be argued that the decrease in exercise involvement could be due to an exclusive focus of students on academic objectives.

The reported increase in consumption of fruit between phases for the total sample, even though it is rather small ($\eta^2 = .019$), could be attributed to reasons related to maturation. Among the three evaluation phases children came in contact with various sources of information and so became more aware of the importance of fruit in nutrition.

Regarding smoking, the gradual increase of intention, perceived control, and actual behavior among phases could reflect developmental and cognitive changes in students, as they experiment with some risky behaviors. Adolescence is the first period in life where persons become more aware of their volitional and self-evaluative powers, recognizing that they can exert control over their own behavior and thinking (Broughton, 1978). The interactions between testing phases and grades of school show that the differences are restricted to high school and senior high school students. Davies and Coggans (1991), who examined the distribution of smoking in an adolescent sample, reported that older adolescents smoke more than younger ones. The increase in perceived control for smoking behavior by high school and senior high school students, according to theory (Ajzen, 1991), could reflect a decrease in perception of obstacles to smoking behavior.

As for using drugs, it is noteworthy that there are marked differences in intention and perceived behavioral control between the first phase and the two other phases. The increase in intention and perceived control in high school and senior high school students for using drugs (this behavior was not examined for elementary school students) could reflect both an increased impulse in students to use drugs together with a decrease in the perception of the existence of obstacles for experimenting with this behavior. This may result from the transitions in adolescence related to risk-taking behaviors. Igra and Irwin (1996) have argued that risk-taking behaviors serve different functions and have different meanings at various developmental stages during adolescence.

Certain limitations of this study should be taken into account. One limitation regards the estimation of the behaviors with a single item, *i.e.*, the eating fruit question for healthy behavior. With regard to the results, it is also necessary to point out the small effect sizes we generally observed, despite the large subject pool we had in the study.

In conclusion, in this sample of Greek students, the variables of planned behavior theory changed over a period of one year, depending on the grade of students and the specific behavior. It seems that there are some possible factors affecting psychosocial processes in adolescence within the limited period of one year. Such factors are possibly related to environmental aspects underlying an increase in perception of obstacles for participation in leisure activities, *e.g.*, exercise, or factors related to adolescent development which may account for the increase in risk-taking behaviors, *e.g.*, smoking, drug use, and evolving needs for autonomy, mastery, and intimacy (Irwin & Millstein, 1986). It also seems that application of variables of planned behavior theory could be useful in implementation of health education programs, taking into account the extent of change at each particular one. Lon-

itudinal studies are required to examine the contribution of each separate variable to the prediction of each specific behavior.

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