Global goal orientations: Prediction of sport and exercise involvement and smoking

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Running Head: Global goal orientations, exercise, smoking

Abstract

Objective: Two studies were conducted to investigate the assumption that a personal improvement goal in life is connected with adaptive self-regulatory strategies and high levels of self-efficacy that enable individuals to adopt regular physical activity and avoid smoking. On the other hand, it was hypothesized that health-related behaviours would have no connection with normative referenced goals such as ego-enhancing and ego-protection goals in life.

Method: Study 1 focused on exercise in adulthood. Women ($N = 381$) responded to instruments assessing stages and processes of change, self-efficacy, frequency of exercise and goal orientations in life. Study 2 was a two-year longitudinal investigation in adolescence. Students ($N = 1508$) responded twice on self-reports of sport and exercise involvement, smoking, truancy and goal orientations in life.

Results. A personal improvement goal in life was connected with frequent exercise, high levels of self-efficacy and ten processes of change in the exercise domain. Women in the maintenance stage of change had higher scores on personal improvement scale than women in the precontemplation stage of change. Controlling for responses in Time 1, a personal improvement goal in life was positive predictor of sport and exercise involvement and negative predictor of smoking and truancy two years later. Ego-enhancing goal in life had no association with sport and exercise involvement or smoking. Ego-protection goal in life was positive predictor of no exercise at all in adolescence. Invariance of factor loadings across the two age groups suggested that global goal orientation retain the same meaning across adolescents and adults.

Discussion. Life skills programs adopting self-regulation models to promote physical activity and to prevent from smoking should strengthen personal improvement goal in life.

Exercise promotion and smoking prevention are major aims of life skills programs (World Health Organization [WHO], 2003). Life skills are abilities for adaptive and positive behaviour that enable individuals to deal effectively with the demands and challenges of everyday life (WHO definition). They include interpersonal skills, decision making and critical thinking skills, and coping and self-management skills (WHO, 2003). Life skills development is determined by a self-regulation process in which goal pursuit has a vital role (Bandura, 1986; Carver & Scheier, 1998). Hence, life skills programs should target both self-regulatory strategies and goal pursuit.

According to Bandura (2004), life skills programs should also develop self-efficacy beliefs because they determine the adoption of concrete plans and strategies aimed at realizing health goals. In Carver and Scheier's (1998) theory both concrete and abstract goals have an important role in the self-regulatory process. Abstract goals are highly valued goals, such as the pursuit of the idealized self (Burke, 1991; Higgins 1996), the expected, hoped-for self or disliked possible self (Markus & Nurius, 1986) and the undesired self (Ogilvie, 1987). Like theorists of the hierarchical model of intrinsic-extrinsic motivation (Guay, Mageau & Vallerand, 2003; Vallerand, 1997), Carver and Scheier suggested that between abstract and concrete goals top-down and bottom-up effects takes place and, therefore, both abstract and concrete goals determine the self-regulation process.

Accordingly, life skills programs should facilitate the adoption of concrete plans and strategies as well as abstract, higher-order global goals such as personal development in life. A life skills program is a curriculum model whose major aim is to enable individuals to deal effectively with the challenges of everyday life. Curriculum models are not a mere selection of activities with concrete goals but they have a central aim and philosophy (Jewett, Bain & Ennis, 1995). An emphasis on personal development goal in life creates a coherent philosophy both in the design of the curriculum and the instruction of life skills programs. An emphasis on personal development in life is also a highly valued goal. It reminds students that pursuit of any concrete goal aimed at mastery and improvement is meaningful because (1) it is an expression of a coherent personal philosophy that directs them in life, and (2) through the learning process they develop metacognitive knowledge (Brown, 1987) and life skills that they can apply effectively across different life contexts. Increased levels of students' motivation are also expected, because

the adoption of a global personal improvement goal in life is associated with adaptive emotional, cognitive, self-regulative and behavioral patterns in school and physical activity contexts (Papaioannou, Simou, Kosmidou, Milosis & Tsigilis, 2009; Papaioannou, 2006).

Personal improvement goal is not the only global goal orientation that can be developed in sport. Indeed, life skills programs in sport could be considered as a vehicle to strengthen youngsters' desire to pursue positive evaluation from others and, eventually, to gain acknowledgement, high status and good careers. In a recent generalization of theoretical tenets of achievement goals theory (Elliot, 1999; Nicholls, 1989) across different life contexts, personal improvement goal in life is considered to differ from two other global goal orientations in terms of definition and valence (Papaioannou, 2001; 2006; Papaioannou, et al., 2009). Valence refers to the approach tendency resulting from evaluating progress towards attaining the expected, hoped-for self, or to the avoidance tendency resulting from evaluating progress towards moving away from the undesired, disliked possible self (Carver & Scheier, 1998). Definition refers to whether progress is defined based on intrapersonal standards or normative standards.

With regard to the approach motivational system, self-referenced or normative reference values correspond to two global goal orientations emphasizing the motivational importance of different meaning of expected self, progress towards the expected self, and success in life (Papaioannou, et al., 2009). A personal improvement goal is adopted when individuals use self-referenced criteria to construe the expected self, progress towards the expected self and success in life. These individuals envisage personal accomplishments as controllable, self-determined and intrinsically valued and they try to develop their qualities across different life sectors. When individuals adopt normative referenced values to define the expected self, progress towards the expected self and success in life, they envisage personal accomplishments as relatively uncontrollable and controlling and they try to establish superiority across life settings. Normative referenced values can have different valence indicating an approach or avoidance tendency . A global ego-enhancing goal in life defines pursuits to enhance self-worth by gaining positive evaluations from others and a global ego-protection goal defines concerns and attempts to protect self-worth by avoiding negative evaluation from others.[1]

The adoption of different global goal orientation has important connotations for life skills programs whose aim is to transfer adaptive self-regulatory strategies from one context to another. This is due to the pattern of association between global goals and self-regulatory processes that remains relatively consistent across life settings (Papaioannou, 2001; Papaioannou et al., 2009). Thus, life skill programs emphasizing a particular global goal orientation might facilitate or inhibit the transfer of particular self-regulatory strategies from one setting to another. Moreover, here we present evidence that global goal orientations remain relatively stable for long, which is also important for life skill programs that have a long-term perspective too. An influence on adaptive goal orientations might have long-lasting effects on health-related behaviors. Accordingly, in the following sections we firstly elaborate the pattern of associations between global goal orientations, self-regulatory processes and self-efficacy beliefs in the health behaviour domain. Next, we turn on the long-term stability of global goal orientations and their long-lasting implications for sport and exercise promotion and smoking prevention which are common targets of life skills programs.

Global goal orientations, self-regulatory processes and self-efficacy in the health behaviour domain

Global goal orientations are associated with two global self-regulatory functions which were described by Kruglanski et al. (2000). Existing research implies that *locomotion,* which is concerned with movement from state to state and with committing the psychological resources that will initiate or maintain goal-related movement, corresponded moderately positively to personal improvement and weakly to ego-enhancing goals which are characterized for their proactive approach (Papaioannou et al., 2009). On the other hand, *assessment,* which is concerned with critically evaluating entities or states in relation to alternatives in order to judge relative quality, was positively associated with ego-enhancing and ego-protection goals but not with personal improvement goal. These associations at the global level of generality determine the pattern of self-regulatory processes across different actions, such as school achievement (Papaioannou et al., 2009) and exercise and smoking as is shown below.

Self-regulatory processes are defined as the specific self-initiated personal, behavioral and environmental processes designed to attain personal goals cyclically (Zimmerman & Kitsantas,

2005). Self-regulatory processes are effective strategies in health-related behaviour change (Karoly, Ruehlman, Okun, Lutz, Newton & Fairholme, 2005). The transtheoretical model of behaviour change (Prochaska, Norcross & DiClemente, 1994) suggests ten processes of change that enable individuals to change health-risks from less desirable stages such as precontemplation (not intending to make changes) and contemplation (considering a change), to more desirable stages like preparation (making small changes), action (actively engaging in a new behaviour), and maintenance (sustaining change over time). Results from meta-analyses across different health-risks (Rosen, 2000) revealed two processes with large effects on behaviour change: *counter-conditioning*, defined as substitution of alternative behaviors for the problem behavior, and *self-liberation*, defined as commitment to change the problem behavior, including the belief that one can change. Moderately large effects on behavior change of stage had four processes, specifically *self-reevaluation*, defined as emotional and cognitive reappraisal of values with respect to the problem behavior, *consciousness-raising*, defined as efforts to seek new information and to gain understanding and feedback about the problem behavior, *reinforcement management*, defined as changing the contingencies that control or maintain the problem behavior, and *stimulus control*, defined as control of situations and other causes which trigger the problem behavior. Medium-sized effects for change had the processes *helping relationships*, defined as trusting, accepting, and using the support of caring others during attempts to change the problem behavior, *environmental reevaluation*, defined as assessment of how the problem affects the physical and social environments, *social liberation*, defined as awareness, availability and acceptance of alternative problem-free lifestyles in society, and *dramatic relief*, defined as affective aspects of change, often involving intense emotional experiences related to the problem behavior.

An emphasis on personal improvement goal triggers proactive self-regulatory processes aiming at the reduction of one's weaknesses and substitution of problematic behaviours with alternative health-enhancing behaviors (counter-conditioning). Moreover, personal improvement goal bolsters up commitment for self-change and self-improvement (self-liberation). According to Prochaska, et al., (1994), reinforcement management includes self-monitoring followed by positive self-statements and self-rewards, which are the typical self-regulatory processes for

individuals adopting personal improvement goals. Moreover, self-reevaluation and dramatic relief involve cognitive and emotional appraisal of one's own values and problem behaviour, which are also typical self-regulatory processes for people focusing on personal improvement. Other processes of change, such as consciousness raising and environmental reevaluation require a proactive approach and respect for one's own and others' health. These self-regulatory processes primarily characterize people focusing on personal improvement goals.

Because assessment is the basic self-regulation function adopted by high ego-oriented individuals, processes of change involving assessment of one's behaviour in relation to alternatives (self-reevaluation and environmental reevaluation) should be also adopted by high ego-oriented people. Stimulus control requires a proactive approach with an external focus, which characterizes individuals pursuing high ego-enhancing goals. Because ego-protection goals do not instigate locomotion and proactive cognitive-behavioral responses, individuals adopting strong ego-protection goals are not expected to adopt effective self-regulation processes to change health-related behaviors.

Another impact of global goal orientations on self-regulation of behaviour is through their influence on self-efficacy which refer to people's appraisals of their capabilities to execute actions in designed settings (Bandura, 1977). A personal improvement goal adoption activates beliefs that high effort and good strategy will cause goal attainment (Ames & Archer, 1988) even in the face of setbacks, because obstacles are considered part of the progress process (Ames, 1992). In line with what was already said, individuals adopting strong personal improvement goals exert high effort and adaptive self-regulatory strategies, and therefore, they are likely to hold high self-appraisals for goal attainment. Findings from studies in the achievement domain are supportive of this prediction (Bell & Kozlowski, 2002; Button, Mathieu & Zajac, 1996; Potosky & Ramakrishna, 2002; Smith, Sinclair & Chapman, 2002; VandeWalle, et al., 2001; Vrugt, Oort & Zeeberg, 2002). Because the aforementioned adaptive beliefs about effort and strategy use are not shared by individuals adopting ego goals, the association of self-efficacy with ego goals is expected insignificant or even negative when ego-protection goals are adopted (VandeWalle, et al., 2001).

Research evidence supporting these assumptions has important connotations for life skills programs. A motivational climate emphasising personal improvement and deemphasising ego-protection goals creates the appropriate substratum for effective teaching of self-regulatory strategies determining healthy lifestyles. Moreover, life skill programs that amplify concurrently personal improvement goal, adaptive self-regulatory strategies, self-efficacy and particular health-related behaviours in youth physical activity settings strengthen the link between these cognitive-behavioural units of the person, which might remain relatively stable for long (Mischel & Shoda, 1998), with beneficial effects on healthy lifestyles in adulthood. That is, when these adolescents come of age, they might more spontaneously implement adaptive self-regulatory strategies, self-efficacy beliefs and particular health-related behaviours due to an input emphasizing personal improvement than other adults who had no similar training or relevant experiences before.

Two studies were conducted to initiate an investigation of the validity of these assumptions. In Study 1 the association of adults' global goal orientations, self-regulatory processes, self-efficacy beliefs and exercise behaviour was examined. In Study 2 the long-terms effects of global goal orientations on exercise and smoking in adolescence were investigated.

Study 1: Global Goal Orientations, Self-Efficacy and Self-Regulation in Exercise

The aforementioned hypotheses concerning global goal orientations, stages and processes of change and self-efficacy were investigated in the exercise domain with a group of adult women. Adults' exercise has been rarely considered in goal orientation research, which is unfortunate though given the importance of goal orientations in physical activity involvement (Duda & Hall, 2001; Papaioannou, Bebetsos, Theodorakis, Christodoulidis, & Kouli, 2006). The expected positive relationship of personal improvement goal with self-efficacy and with all processes of change and particularly with counter-conditioning and reinforcement management that are impeded in the stage of change process (Rosen, 2000) led us further assume that personal improvement goal would have positive association with exercise. On the other hand, it was deemed possible that the two ego goals would have no association with exercise because (1) exercise self-efficacy was expected to have no association with ego goals, and (2) exercise has

weak links with stimulus control, self-reevaluation and environmental reevaluation processes (Rosen, 2000) that were assumed to be connected with ego goals.

Method

Participants

Three hundred eighty one women participated in Study 1. Their age varied from 18 to 70 ($M = 37.4$, $SD = 14.6$). Most of these women were full-time employees (56%), some had part-time employment (13%), 52% were married and 27% were mothers of young children. From them, 44% were university graduates, 39% junior or high school graduates and 17% elementary school graduates. Most participants completed the following questionnaires in their homes and some of them in work and fitness settings, always in the presence of a researcher who provided explanations where needed.

Measures

Global goal orientations. The 3-factor questionnaire assessing personal improvement, ego-enhancing and ego-protection goal orientations includes 5 items per factor and all 15 items are rated in a 5-point Likert scale (5 = *Strongly Agree*, 1 = *Strongly Disagree*) (Papaioannou et al., 2009). These authors supported the factorial validity for this measure across three samples of adolescents. Based on the responses of the present adult women and the adolescents in Study 2, evidence for the invariance of the three goal orientations in life model across adults and adolescents is provided in Study 2.

Stages and process of change. Two measures developed by Marcus, Rossi, Selby, Niaura and Abrams (1992) were used to investigate stages of change and processes of change in the exercise domain respectively. The stages of change scale consisted of the statements "this period I am doing exercise", "I plan to do exercise in the next 6 months", "for the time being I am doing regular exercise", "I have done regular exercise in the past 6 months", "In the past, I have done regular exercise for a period of 3 months". The response format was *YES-NO*. Respondents were informed that regular exercise is defined as follows: (1) for intensive physical activity, 3 times per week for more than 20 minutes each time, (2) for moderate physical activity, 5 times per week for more than 20 minutes each time. Based on participants' responses and followed

Marcus et al.'s, (1992) suggestions, they were classified in the stages of maintenance (37.3%), action (6.3%), preparation (4.7%), contemplation (20.5%) and precontemplation (31.2%).

The process of change questionnaire (Marcus et al., 1992) consists of 40 items, 4 items for each of the following process: (1) consciousness raising, defined as efforts to seek new information and to gain understanding and feedback about the problem behavior, (2) dramatic relief, defined as affective aspects of change, often involving intense emotional experiences related to the problem behavior, (3) environmental reevaluation, defined as assessment of how the problem affects the physical and social environments, (4) self-reevaluation, defined as emotional and cognitive reappraisal of values with respect to the problem behavior, (5) social liberation, defined as awareness, availability and acceptance of alternative problem-free lifestyles in society, (6) counter-conditioning, defined as substitution of alternative behaviors for the problem behavior, (7) helping relationships, defined as trusting, accepting, and using the support of caring others during attempts to change the problem behavior, (8) reinforcement management, defined as changing the contingencies that control or maintain the problem behavior, (9) self-liberation, defined as commitment to change the problem behavior, including the belief that one can change, and (10) stimulus control, defined as control of situations and other causes which trigger the problem behavior. Women were asked to recall the past month and rate the frequency of occurrence of each of 40 items on a five-point Likert scale (1 = *never*, 5 = *repeatedly*). This questionnaire had been adapted in Greek by Bebetsos and Papaioannou (in press). In the present study exploratory factor analysis revealed a nine-factor structure which was in line with the structure of the original questionnaire. The items of the social liberation factor did not load on a separate factor. We decided to include this social liberation subscale in this study, although the results about it as well as the stimulus control subscale should be treated with caution. All other subscales had acceptable internal consistency (Table 2).

Self-efficacy. This scale was constructed based on Bandura's (1986) recommendations. Women were asked how confident they were that they could do exercise in each of the five conditions: when they are tired, when they are in bad mood, when they feel that they do not have time, when they are in holidays, and when it is raining or snowing. Responses were indicated on

a 5-point scale (1 = *absolutely confident, 5 = not confident at all*). The alpha reliability for this scale was good (Table 1).

Exercise Behaviour. Recent exercise behaviour was assessed with four items, asking women how many times they did intensive exercise for more than 20 minutes each time, and how many times they did moderate exercise for more than 30 minutes each time, in the past month (1= *never,* 6 = *more than 20)* and in the past two months (1= *never,* 6 = *more than 40).* The alpha reliability coefficient for this scale was very high (Table 1).

Statistical Analyses

Pearson product moment correlations were computed to investigate the associations of goal orientations with exercise behaviour and self-efficacy. Multiple Analysis of Variance (MANOVA) was conducted to examine differences in goal orientations in life between stages of change. Finally, each self-regulatory process was regressed on the three goal orientations to investigate the contribution of global goals adoption in the explanation of self-regulatory processes adoption.

<p style="text-align:center;">Results</p>

The findings shown in Table 1 indicate that frequency of exercise behaviour was positively associated with personal improvement goal orientation. Pearson correlations indicate very low positive relationship of exercise behaviour with ego-enhancing and ego-protection goals. As was expected self-efficacy was positively linked with personal improvement goals and very weakly related with ego-enhancing and ego-protection goals.

Results from MANOVA revealed a multivariate effect (Wilks' Lamda = .92, $F = 2.63$, $p = .002$). Follow-up univariate analyses of variance revealed significant difference of moderate size in personal improvement goal adoption ($F = 5.54$, $p < .001$, $\eta^2 = .06$). A Bonferroni test adjusted for multiple comparisons ($p < .001$) revealed that women in the maintenance stage of change scored higher in personal improvement goal scale ($M = 4.29$, $SD = .61$) than women in the stage of precontemplation ($M = 3.89$, $SD = .82$).   No significant difference emerged in ego-enhancing or ego-protection goal adoption.

Results from regression analyses revealed that personal improvement goal contributed significantly in the explanation of all self-regulatory processes (Table 2). Specifically, personal

improvement goal adoption explained a significant amount of variance of counter-conditioning, self-liberation and reinforcement management. On the other hand, the two ego goals made no contribution in the explanation of variance of these self-regulatory processes. Likewise, a significant amount of variance of consciousness was explained by personal improvement goal but not by the two ego goals.

All goal orientations contributed in the explanation of variance of environmental reevaluation and self-reevaluation processes. An exception was the ego-enhancing goal that did not explained significant variance of self-reevaluation. A significant amount of variance of dramatic relief was explained by ego-protection but also by personal improvement goal adoption. Helping relationships and stimulus control had significant beta weights in connection with ego-enhancing goal but also with personal improvement goals. Social liberation had a low beta weight in connection with personal improvement goal and was not related with the ego goals.

Discussion

The present findings imply that the adoption of a personal improvement goal orientation corresponds positively to frequent exercise in adulthood. Importantly, a personal improvement goal orientation in life was positively connected with all processes of change and self-efficacy in the exercise domain. These findings accord with the assumption that the adoption of these self-regulatory processes and the high levels of self-efficacy result to frequent exercise and assist individuals to adopt exercise permanently (Prochaska, et al., 1994). Indeed, women with high scores in personal development scale were more likely to be located in the maintenance stage of change than women with low scores in this scale who were more likely to be in the precontemplation stage of change.

Counter-conditioning, self-liberation and reinforcement management are the most effective processes for the adoption of health-promoting behaviours particularly exercise (Rosen, 2000). All these processes were connected with a personal improvement goal in life but not with ego goals. Individuals pursuing improvement in their life are proactive and committed to continuous self-change and self-improvement (self-liberation). They initiate actions aimed at reducing weaknesses and increasing strengths, such as the substitution of health-risks (e.g., inactivity) with health-enhancing behaviours (e.g., regular exercise). Reinforcement management

includes behavioural strategies such as self-monitoring, self-statements and self-regards (Prochaska et al., 1994). Self-monitoring is central to a self-regulatory process aiming at self-improvement. For example, through self-monitoring individuals realize how active they are and this helps them to set new goals for exercise involvement. Self-statements help individuals to stay focused on pursuing self-referenced goals while self-rewards increase individuals' satisfaction with self-improvement and reinforce them to continue pursuing personal goal attainment.

Conscious-raising is a cognitive-affective process characterising proactive individuals who are concerned with their health. Staying healthy is an inherent value for individuals who actively pursue self-improvement in life. The present findings are in line with the argument that individuals pursuing personal improvement goals in life are proactive in collecting information about how to sustain their health at good level. To sum up, the adoption of a personal improvement goal in life was connected with all processes of change, which accords with the argument that this is a highly valued goal which makes individuals proactive to find and adopt multiple behavioural and cognitive-emotional processes in order to promote their health and well-being (Papaioannou at al., 2009).

Global normative-referenced goals did not emerge helpful in the promotion of exercise. These goals were associated with some processes of change, which are not the most effective in promoting healthy lifestyles (Rosen, 2000). Both ego-enhancing and ego-protection goals are linked with the assessment of basic self-regulatory function (Papaioannou et al., 2009) which might facilitate the adoption of processes of change incorporating assessment, such as environmental reevaluation and self-reevaluation. Moreover, because both an approach tendency and an external locus of causality (Heider, 1958) characterizes ego-enhancing goal in life (Papaioannou et al., 2009) as well as stimulus control and helping relationships processes, a positive association between these two processes and the ego-enhancing goal is expectable. Ego-protection goal in life was positively linked with dramatic relief, a process that is characterised by an avoidance tendency like the ego-protection goal. Nevertheless, ego-protection goals did not help women to move to action or to maintenance stages of change, probably because they did not instigate self-regulation processes rooted on locomotion (Papaioannou et al., 2009, Study 3). In

sum, the present findings imply that the association of ego goals in life with the aforementioned process of change might not be enough to trigger exercise behaviour.

The positive association of global personal improvement goal orientation with self-efficacy in exercise is in line with hypotheses suggesting that this global goal adoption triggers high self-appraisals for goal attainment. For individuals adopting strong personal improvement goals in life, high expectations and self-appraisals are particularly evident when they pursue self-referenced goals, such as health-promotion and frequent exercise.

Study 2: Global Goal Orientations, Sport and Exercise Involvement and Smoking in Adolescence

Study 1 indicated that a personal improvement goal in life is positively connected with self-regulatory processes and self-efficacy beliefs that enable adults to exercise regularly. Calling health organizations' emphasis on the importance of youth programs for a long-lived healthy lifestyle from adolescence to early adulthood and beyond (WHO, 2003), one might wonder whether life skills programs targeting global personal improvement goal in adolescence could have lasting effects on health-related behaviours. A two-year study was conducted to investigate this issue in adolescence.

Firstly, multi-sample factor analysis of adults' (Study 1) and adolescents' (Study 2) responses on the global goal orientations questionnaire was conducted to examine whether this measure maintains its meaning across adults and adolescents. An invariant factor structure allows one to generalize findings based on this model across the two age groups, and to compare results stemming from adolescents' and adults' responses on the global goal orientations measure. This might be important for the implementation of this measure in youth programs which are designed to have lasting effects on the adoption of adaptive goals, self-regulatory strategies and health-enhancing behaviours. Instructors and parents can be assured that (1) the goal orientations that they try to cultivate will have the same meaning both in adolescence and adulthood, and (2) the development of adaptive goals in adolescence might have beneficial effects several years later. Indeed, an initial investigation of this assumption is described below.

We conducted a two-year longitudinal study to investigate the stability of goal orientations for a long period during adolescents' development which is characterized by many

and rapid changes in their lives. We also examined the long-term effects of global goal orientations on regular sport and exercise involvement which is an important health-enhancing behaviour in adolescence (Biddle, Sallis & Cavill, 1998; Bouchard, Shephard & Stephens, 1994). Establishing long-term stability for global goal orientations and for their effects on healthy lifestyles implies that promoting adaptive goals is a worthwhile target for life skills programs. Past findings suggested that goal orientations in sport remained relatively stable during adolescence and a personal improvement goal in sport had long-term effects on adolescents' sport and exercise involvement (Papaioannou, et al., 2006). A similar pattern of findings was expected for goal orientations at the global level of generality. The formation of goal orientations is determined by a variety of social factors such as parents, coaches, teachers, friends, culture and religion (Carr, Weigand & Jones, 2000; Harwood, & Swain, 2001; White, Kavussanu & Guest, 1998; Papaioannou, 2006; Papaioannou, Ampatzoglou, Kalogiannis, & Sagovits, 2008). Some social factors such as teachers and coaches change during adolescence, implying that global goal orientations are relatively unstable because their formation is partly determined by the motivational climate in school and sport (Papaioannou & Milosis, 2008), which is relatively unstable throughout adolescence. Yet, other social factors such as family, culture and religion (Papaioannou 2006) remain stable implying a relative stability for global goal orientations during adolescence. Hence, some stability was expected for global goal orientations, but for the two-year length of this study a moderate level of stability was predicted due to changes in motivational climate across several life-settings. This moderate level of stability implies that the long-term effect of personal improvement goal in life on adolescents' sport and exercise involvement would be small but still statistically significant.

In addition to frequent exercise which is a health-enhancing behaviour, we also examined the association of global goal orientations with abstain from health-risks which are also purposes of life-skills programs. *No exercise at all* is a health-risk suggesting complete avoidance of physical activity that might be generated by an avoidance tendency that is inherent in the global ego-protection goal. We expected that an ego-protection goal in life might be a positive predictor of no exercise at all in adolescence.

On the other hand, the adaptive self-regulatory processes stemming from a strong personal improvement goal adoption might assist adolescents to abstain from other health risks such as smoking and truancy. The results of Study 1 coincide with previous findings suggesting that a personal improvement goal in life is positively associated with adaptive self-regulatory skills in school and with locomotion which is a global self-regulatory function determining the adoption of effective self-management and coping strategies across various actions (Papaioannou, et al., 2009). Together, the findings of these two studies confirm that individuals adopting a personal improvement goal in life are proactive, they pursue personally meaningful goals, they are committed to change and improvement (self-liberation) and they use particularly self-monitoring and self-instructions that are basic components of the reinforcement management process (Prochaska et. al., 1994) to achieve their goals. One can expect that these self-regulatory strategies have positive connotation for smoking prevention which is an important purpose of life skills programs in adolescence.

The present study was conducted in Greece. At the time of the study there was no available measure in Greek assessing self-regulatory processes with direct impact on smoking prevention. Based on problem behaviour theory we decided to investigate truancy which is a deviant behaviour determining the initiation of smoking in adolescence (Jessor, Donovan & Costa, 1992). We expected that adolescents with high scores on personal improvement goal would be well adjusted in schools (Papaioannou et al., 2009), and therefore, would be less susceptible to truancy. Taking into consideration the critical role of deviance in initiating smoking in adolescence, we expected that truancy would mediate some of the effects of personal improvement goal on smoking.

Study 2 was a longitudinal one lasting two years. During a two-year period many adolescents initiate smoking (Papaioannou, Karastogiannidou & Theodorakis, 2004; WHO, 2000). According to problem behaviour theory most adolescents have tried smoking at least once in their life (Jessor et al., 1992). However, not all of them are addicted to smoking. It takes some months of experimentation with smoking before the stage of addiction. During this period some adolescents quit smoking. We expected that most adolescents refusing to continue smoking are those with stronger personal improvement goals who monitor themselves and are committed to

change and self-improvement. Hence, we expected that in a 2-year period adolescents adopting high personal improvement goals would be less likely to start smoking.

Method

Participants

In February 2003 (T1), one thousand five hundred eight students ($n = 554$ males, $n = 949$ females), aged $12 \pm .06$ and $15 \pm .06$, responded to measures of goal orientations in life, exercise, smoking and truancy. These students responded to the same instruments again in March 2005 (T2). Because the questionnaires were completed in schools, 15.8% of the participants in the first measurement were not in school the day of the second measurement (due to change of school, or natural absence). The matching cases in the two measurements were 1270 students. Although the instruments were anonymous (by law of the Greek ministry of education) and after their completion they were put in a ballot box, students were asked to name a number of personal favorites (e.g., actors, sport teams, food, etc.) in order to match questionnaires of the same individuals based on class identification, sex, personal favorites and date of birth (the latter was not always provided). Students completed silently the questionnaires in their classrooms in the presence of a researcher who provided lowly explanations to those students who asked for it through hand rising. The study was conducted with the permission of the ministry of education and the school authorities and informed consent was provided by all students.

Measures

Global goal orientations. The same 15-item instrument that was used in Study 1 was employed (Papaioannou et al., 2009). Cross-validation across the samples of Study 1 and Study 2 was performed to investigate whether the global goal orientations in life questionnaire maintains its meaning across the two samples. Multi-sample factor analysis on the responses of participants in the two studies investigated the 3-factor form of the model containing the 15 global goals items. AMOS 5 statistical software (Arbuckle, 2003) was used employing maximum likelihood estimation. For each model the *chi-square,* the Comparative Fit Index (CFI), the Tucker-Lewis Index (TLI) and the Root Mean Square Error of Approximation (RMSEA) was considered. According to Hu and Bentler (1999), for the CFI and the TLI cut-off values of close to .95 and for the RMSEA values close to .06 reflect a good fit between the proposed model and the data.

Model comparison was made using Akaike's Information Criterion (AIC; 1987), Browne and Cudeck's (1989) Expected Cross-Validation Index (ECVI) along with a 90% confidence interval, and Cheung's and Rensvold's (2002) suggestion that a CFI difference smaller than or equal to -.010 should reject the null hypotheses of invariance.

Frequency of Sport and Exercise. A description of intensive sport and exercise involvement was firstly provided (i.e., when we sweat and our pulses are over 120, usually after basketball, football, or aerobic). Then students responded to two items capturing sessions of intensive sport and/or exercise involvement of at least one hour duration each. The first item referred to the last month while the second item referred to the mean of exercise sessions per month for the period covering the last three months. It was also clarified that participation in school physical education should be excluded. Responses were given to six-point scales for both items (*1 = not at all, 6 = more than 20 times*). Alpha reliabilities were .88 in T1 and .90 in T2 for exercise and school preparation respectively).

Based on students' responses to these items two new dichotomous variables were created. The first captured adolescents who were regularly involved in sport and exercise or not. For this variable the value 2 (high = frequent sport/exercise) was given for adolescents who scored 4 (sport/exercise at least 10 times per month) or higher to both items, and 1 (low = scarce sport/exercise) for all other participants. Percentages for scarce sport and exercise involvement were 62.4% in T1 and 65.3% in T2. The second dichotomous variable captured adolescents who did not make any sport/exercise at all in a month. For this variable the value 1 (no sport/exercise at all) was given for adolescents who scored 0 to both items, and 0 for all other participants. Percentages for no sport/exercise at all were 13.9% in T1 and 15.5% in T2.

Smoking and truancy. For the assessment of smoking and truancy, students were firstly asked if they ever did them. Then for each behavior they responded to two items. Firstly they were asked how many cigarettes they smoked in the last week and how many times they smoked in the last month. Responses to both items were indicated on a 6-point scale (*1 = none, 6 = more than 20*). Truancy was captured with items assessing how many times in their life they went somewhere else instead of school without informing their parents and how many times in the present academic year they went somewhere else instead of school without informing their

parents. Responses were indicated on 6-point scales ranging from *never* to *more than 20* for the first item, and from *never* to *more than 10* for the second item. Scale reliabilities for T1 and T2 respectively were as follows: smoking, $\alpha = .97$ and $\alpha = .98$; truancy, $\alpha = .92$ and $\alpha = .91$.

For each behaviour, based on students' responses to the three items two new dichotomous variables were created, with values 0 (*no*) for students who responded no/none/never to all three items concerning the particular behaviour and 1 (*yes*) for all other students (i.e, students who had given a score different than zero to any of the three items). For smoking, yes was given by 10.8% of the adolescents in T1 and by 22.2% in T2. For truancy, yes was given by 35.1% of the adolescents in T1 and by 45.6% in T2.

Statistical Analyses

Cross-validation across the two samples for the 3-factor model of global goal orientations in life was performed. Then, using the longitudinal data with the two-year interval, three structural equation models corresponding to each global goal respectively were developed to examine stability coefficients of goal orientations in life.   Finally, to investigate the prediction of sport and exercise involvement, smoking and truancy from global goal orientations, sequential logistic regression analyses were conducted.

<div align="center">

Results

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Cross-Validation across Studies 1 and 2

In the cross-validation across the two samples for the 3-factor model of global goal orientations, five models were constructed. Model 1 was the least restrictive implying that only the form of the model was invariant and all other parameters were non-constrained. This model was used as criterion for subsequent model comparisons. For Model 2 factor loadings were invariant across the two groups. For Model 3 both the intercepts and the factor loadings were constrained. For Model 4, factor loading, intercepts, variances and covariances across groups were constrained. To this model the invariance of error uniqueness (errors) was added, with factor loadings, intercepts, covariances and variances still constrained (Model 5).

Model comparison supported the invariance of factor loadings across the two samples (Model 2; Table 3). These findings suggest acceptable goodness-of-fit indices for Model 2. All

factor loadings were statistically significant ($p < .001$) and standardized beta values varied from .49 to .86 ($M = .74$, SD = .08) suggesting high magnitude for the majority of standardized beta values. The difference in CFI (Cheung & Rensvold, 2002) between the invariant form model (Model 1) and Models 3, 4 and 5 was larger than .01. These findings do not support the invariance of covariance, variances and uniqueness for the 3-factor model.

For the sample of adolescents the unconstrained correlations imply that personal improvement goal was not associated with ego-protection goal ($r = -.05$, $p > .05$) or with ego-enhancing goal ($r = .08$, $p > .01$). A positive relationship of low magnitude emerged between the two ego goals ($r = .28$, $p < .001$). For the sample of adult women, the unconstrained correlations suggest that personal improvement goal had low positive correlation with both ego-protection goal ($r = .26$, $p < .002$) and ego-enhancing goal ($r = .22$, $p < .001$). The magnitude for the relationship between the two ego goals was moderate ($r = .53$, $p < .001$).

Alpha reliabilities were computed for the three scales for T1 and T2. Alpha for personal development was .76 in T1 and 81 in T2, alpha for ego-enhancing was .87 in T1 and .89 in T2 and alpha for ego-protection was .76 in T1 and .89 in T2. Based on these findings scale scores were computed for the three global goal orientation variables in T1. Then the three scale scores were modified to three dichotomous variables (high-low) using the median of each variable to split each of them. The median in T1 was 4.33 for personal improvement, 2.83 for ego-enhancing and 3.33 for ego-protection.

Stability of goal orientations

AMOS 5 software was used for the construction of three models corresponding to each global goal orientation respectively. Each model consisted of two latent variables. The first latent variable was constructed by the five observed variables that were assessed in T1 and the second latent variable was composed by the five observed variables that were measured in T2. Stability coefficient was represented by the path leading from latent variable in T1 to the latent variable in T2. In all models the appropriate paired uniquenesses or errors were allowed to covary (Duncan & Stoolmiller, 1993; Marsh, 1989). Stability coefficients (standardized beta weights) for the two-year period were as follows: (1) for personal improvement goal, $\beta = .57$ (chi-square = 220.62, df=

29, TLI = .92, CFI = .96, RMSEA = .06), (2) for ego-strengthening goal, β = .54 (chi-square =

90.61, df= 29, TLI = .98, CFI = .99, RMSEA = .04), and (3) for ego-protection goal, β = .54

(chi-square = 199.05, df= 29, TLI = .95, CFI = .98, RMSEA = .06). Hence, goal orientations in

life remain relatively stable for quite a long time.

Prediction of sport and exercise involvement, smoking and truancy

Four sequential logistic regression analyses were conducted using as dependent variables

the following dichotomous variables that were assessed in T2: sport/exercise 10 times per month

or more, no sport/exercise at all in a month, smoking, and truancy. For each analysis, at the first

step predictor was the dependent variable in T1 which was used as control variable. At the

second step, the three dichotomous global goal orientations in T1 were entered. In all analyses the

addition of global goals in step 2 was statistically significant (*p* < .01*). The results (*Table* 4) are

shown as a series of odds ratios (OR).

After adjusting for frequent sport and exercise involvement in T1, personal improvement goal

in T1 increased the odds of regular sport and exercise involvement (10 times/month or more) in T2.

No other goal contributed in the prediction of frequent sport and exercise involvement. Results

from the second logistic regression analysis imply that while personal improvement goal in T1

was negative predictor of no sport/exercise at all in T2, ego-protection goal in T1 significantly

increased the odds of no sport/exercise at all in T2.

After adjusting for smoking in T1, being high in personal improvement goal decreased the

odds of smoking in T2 by 2.7 times (1 divided by .37). No other global goal orientation in T1 was a

significant predictor of smoking in T2. Finally, results from the fourth analysis imply that after

adjusting for truancy in T1, adolescents with high scores on personal improvement goal in T1 were

2.38 times (1/.42) less likely to adopt truancy in T2.

In order to investigate whether truancy was mediator between personal improvement goals

and smoking, another logistic regression was computed using smoking in T2 as dependent variable

and smoking in T1 (step 1), truancy in T1 (step 2), truancy in T2 (step 3) and the three dichotomous

global goal orientations in T1 (step 4) as predictors. As shown in Table 5, the addition of truancy

in T1 in step 2 increased significantly the predicted variance. Specifically, after adjusting for

smoking in T1, adolescents who adopted truancy in T1 were almost 5 times more likely to become

smokers in T2. In step 3, adjusted for smoking in T1, truancy both in T1 and T2 made significant contribution in the prediction of smoking in T2. As was expected, the effect of truancy in T2 was much larger than the effect of truancy in T1. In step 4, controlling for smoking in T1 and truancy in T1 and T2, a personal improvement goal in life contributed significantly in the prediction of smoking in T2. A comparison of the Odds ratio in Tables 4 and 5 indicates that truancy might mediate some of the effects of personal improvement goal on smoking. However, even after adjusting for truancy both in T1 and T2, being high in personal improvement goal significantly decreased the odds of smoking in T2 by 1.82 times (1 divided by .55).

Discussion

Study 2 results imply that goal orientations in life are predictors of sport and exercise involvement and smoking in adolescence. Specifically, a personal improvement goal orientation in life was positive predictor of frequent sport and exercise involvement and on the other hand, it was negative predictor of no sport or exercise at all. The adoption of a personal improvement goal orientation in life facilitates locomotion and assists adolescents to initiate actions and to be physically active. Theoretical analyses and past findings (Study 1; Papaioannou et al. 2009), imply that a personal improvement goal orientation in life is connected with adaptive self-regulatory strategies such as commitment to self-change, self-monitoring, self-rewards and self-instruction, planning and task-related strategies, as well as with positive affect and high self-efficacy beliefs that determine exercise involvement in adults and adolescents. On the other hand, an ego-protection goal in life was positive predictor of no exercise at all two years later. An ego-protection goal in life is connected with an avoidance tendency and it might hinder the initiation of actions and make adolescents passive.

The adoption of a personal improvement goal in life seems promising for the prevention of adolescents from health-risks such as smoking. The odds for becoming a regular smoker in adolescence were almost three times higher for individuals adopting low personal improvement goals in life in comparison to individuals with high scores on this global goals scale. As was hypothesized, the adoption of a strong personal improvement goal in adolescence reduced significantly the likelihood of engaging in deviant behaviours that pave the way for the initiation of several health-risks such as smoking (Jessor et al., 1992). The present strong association

between truancy and smoking support this explanation and the tenets of problem behaviour theory. This explanation is also supported by the emerged slight decrease of the effects of personal improvement goal on smoking when truancy was entered as mediator variable.

Nevertheless, apart of decreasing the likelihood of engaging in deviant behaviour and correspondingly smoking, a strong personal improvement goal might have additional benefits contributing to smoking prevention. This study showed that after adjusting for truancy in T1 and T2, a global personal improvement goal in T1 had still significant negative effects on smoking in T2. In line with what preceded, a personal improvement goal might have positive effects on the adoption of self-regulatory processes such as self-monitoring and commitment to self-improvement. These coping strategies help adolescents who might have tried sometimes smoking to avoid permanent smoking. A personal improvement goal adoption might contribute to the development of other life skills, for example interpersonal skills such as assertiveness and refusal skills which also determine smoking prevention (WHO, 2003).

Goal orientations are assumed to be products of socialization across different motivational climates in family, sport, school, peer, religious, ethnic contexts, etc. (Carr, et al., 2000; Harwood, & Swain, 2001; White, et al., 1998; Papaioannou, 2006; Papaioannou, et al., 2008). Some social factors such as peers, teachers and coaches determining the motivational climate in these contexts change during adolescents' development. Still, other social factors such as parents remain stable for long. As a result, global goal orientations emerged to have moderate levels of stability in a two-year time. This moderate level of stability of goal orientations trimmed their effects on the adopted health-related behaviors two years after the initial assessment.

Multi-sample factor analysis supported the invariance of factor structure of the global goal orientations measure across adults and adolescents. These findings imply that adults' and adolescents' responses to this measure are comparable because the captured global goal orientations have the same meaning for both age groups. Instructors of life-skills programs can use this instrument to examine whether they are effective in increasing personal improvement and decreasing ego-protection goals in life, which seems to have beneficial effects on healthy lifestyles in adolescence and beyond. Despite some variability in global goal orientations due to different emphasis on goal orientations by different instructors, the present findings imply that

the positive effects of adaptive goal orientations on health-related behaviours sustain throughout adolescence. These positive effects might be even stronger if all teachers and coaches exert persistent emphasis on adaptive goal orientations throughout adolescents' development. A concurrent amplification of adaptive goals, self-regulatory strategies, self-efficacy beliefs and health-related behaviors in adolescence facilitates the development of a stable pattern of adaptive cognitive-behavioral units of a person that might sustain in adulthood (Mischel & Shoda, 1998), which might have important benefits for a healthy lifestyle throughout life.

An interesting finding was the lower association between goal orientations in adolescents than in adults. Adults were more likely to associate different goal orientations in life than adolescents. This should be attributed to experiences that accumulated during lifetime. Adults were less likely to dissociate personal improvement goals from ego-enhancing and ego-protection goals than adolescents, presumably because adults experienced several instances in life suggesting that the adoption of different goal orientations sometimes can go together. For example, some might argue that both personal improvement and ego-enhancing goals might contribute to career development. Unfortunately, for adults the association between ego-protection and ego-enhancing goals seems to be quite strong. This might make them prone to switch to ego-protection and adopt an avoidance tendency when they foresee difficulties in attaining normatively-referenced goals. This might be a hidden cost from adopting ego-enhancing goals in adulthood.

General Discussion

Life skill programs should target global personal improvement goal adoption as well as more specific self-regulatory strategies, positive affect and self-efficacy beliefs in physical activity, academic and peer contexts (Milosis & Papaioannou, 2007; Papaioannou & Milosis, 2009). Personal improvement goals in life were positively connected with an array of adaptive cognitions, emotions and behaviours across different life contexts that enable adolescents to be good students, responsible, physically active, capable to abstain from smoking and be more satisfied with their life (Papaioannou, 2006; Papaioannou, et al., 2009; Papaioannou & Milosis, 2009). A motivational climate emphasizing personal improvement goal in life creates the appropriate substratum to base more concrete strategies and plans aimed at assisting individuals

to develop life skills, behave adaptively across life contexts, deal effectively with the challenges of everyday life and be satisfied with their life.

The development of a personal improvement goal orientation in life should concern instructors and administrators in all contexts. Global goal orientations are strongly connected with contextual goal orientations in specific life settings such as sport and school (Papaioannou, 2006). Sport involvement is the major physical activity in adolescence. Accordingly, most of the positive effects of global personal improvement goal on adolescents' physical activity should be ascribed to task orientation in sport and physical education settings (Papaioannou et. al., 2009). Papaioannou (2006) argued that task orientation is sport is formatted by the adoption of a personal improvement goal orientation in life and by sport-specific input. The latter is provided by coaches, parents and friends emphasizing task-involvement in sport (Carr, et al., 2000; Harwood, & Swain, 2001; White, et al., 1998; Papaioannou, 2006; Papaioannou, et al., 2008) and by feedback from involvement in sport-related behaviours (Papaioannou, et al., 2006). Papaioannou, (2001; 2006) argued that newcomers in sport can more easily adopt a strong task orientation in sport if they already have a strong personal improvement goal in life that was developed by input from other life contexts.

On the other hand, sport-involvement covers very small percentage of physical activity of adults (United States Department of Health & Human Services, 2000). For women who exercise frequently in health and fitness centers (Study 1), sport involvement was entirely irrelevant to their exercise behaviour. Task-orientation in sport seems to have no important connotations in adulthood but a personal improvement goal in life is important for the promotion of adults' exercise. However, taking into consideration the strong association between global and contextual goals (Papaioannou, 2006), one might assume that a strong task-orientation in sport in adolescence might facilitate the adoption of a strong personal improvement goal orientation and correspondingly exercise involvement in adulthood. Certainly, longitudinal studies starting in adolescence and continuing to adulthood are needed to investigate this assumption. Studies across adults' life settings could also reveal how we can promote a strong personal improvement goal in adulthood. This information could be valuable for future interventions aiming at the promotion of exercise and healthy lifestyles.

The benefits from emphasizing task orientations in sport, school and home extend beyond these contexts. The adoption of a global personal improvement goal in adolescence increased three times the possibilities to abstain from smoking. An emphasis on personal improvement goals seems to facilitate the attainment of concrete self-referenced goals, such as frequent exercise and abstain from smoking, because goal attainment is perceived controllable, self-appraisals for goal attainment are high, and adaptive self-regulatory strategies are adopted. On the other hand, global normative referenced goals such as ego-enhancing and ego-protection goals have no implications for the attainment of self-referenced goals such as the adoption of health-promoting behaviours. Ego-protection goals might be even detrimental to the initiation of actions aimed at health-promotion.

Undoubtedly, the magnitude of the effects of global goal orientations on health-related behaviours was relatively small. This is a hardly surprising finding given the several mediating variables between goal orientations and behaviours. A personal development goal adoption will have minor impact on health-related behaviours if it is not accompanied by adaptive self-regulatory processes and strong self-efficacy beliefs which are determined by a variety of situational and dispositional factors (Bandura, 1986). Thus, life skills programs should target all determinants of health-related behaviours, including goal orientations as well as self-regulatory processes and self-efficacy beliefs. Future studies should examine additional mediating variables between goal orientations in life and health-related behaviours, such as affect and values which are important elements of the cognitive-affective network of a person (Mischel & Shoda, 1998).

To conclude, a strong personal improvement goal orientation seems to determine healthy lifestyles both in adolescence and adulthood. An emphasis on personal improvement goals in life seems critical for life skills programs because it facilitates the development of coping skills such as self-monitoring, planning, substitution of problematic behaviours with alternative health-enhancing behaviors and commitment to self-change. Moreover, a strong personal improvement goal adoption provides a coherent philosophy aiming at self-improvement across all life settings. Taking into consideration that global goal orientations are distinct constructs from contextual goal orientations (Papaioannou et al., 2009), curriculum planners, policy-makers, teachers and parents should promote both the adoption of a global personal improvement goal in life and task-

involvement in school, sport and home if they want to enable individuals to deal effectively with the demands of their contexts and with challenges of everyday life such as abstain from smoking.

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Footnote

1   The reasoning for the use of ego and personal improvement terms to define goal

orientations at the higher-order level of abstraction is provided elsewhere (Papaioannou et

al., 2009).

Table 1

Pearson correlations of goal orientations in life with exercise and self-efficacy

	Personal improvement	Ego- enhancing	Ego- protection	
	r	r	r	$.\alpha$
Exercise behavior	.24***	.14**	.13*	.95
Self-efficacy	.32***	.13*	.15**	.82

***p< .001, **p< .01, *p< .05.

Table 2

Standardized beta weights following10 regression analyses of processes of change on global goal orientations and alpha reliability in the last line

	Dependent variable									
Predictors at Time 1	Consciousness raising	Dramatic relief	Environmental reevaluation	Self-reevaluation	Social liberation	Counter-conditioning	Helping relationships	Reinforcement management	Self-liberation	Stimulus control
Personal Improvement	.22***	.23***	.17***	.27***	.16**	.34***	.16**	.38***	.25***	.17***
Ego-enhancing	.07	-.06	.19***	.07	.11	.06	.22***	.07	.12	.31***
Ego-protection	.07	.22***	.13*	.21***	-.08	.04	-.01	.04	.02	-.10
Alpha reliability	.78	.87	.79	.81	.61	.84	.78	.75	.73	.61

***p< .001, **p< .01, *p< .05.

Table 3

Multi-Sample Confirmatory Factor Analysis for global goal orientations in life

Model specification	NPar	Chsq	df	TLI	CFI	RMSEA	AIC	ECVI	ECVI LO90-	HI90
"Global goals in life": 3-factor model (15 variables)										
M1 Unconstrained	96	582.31	174	.949	.963	.035	774.4	.410	.374	.451
Constrained										
M2 Loadings	84	624.79	186	.949	.961	.035	792.8	.420	.382	.462
M3 Loadings, intercepts	69	787.81	201	.937	.947	.039	925.8	.491	.447	.538
M4 Loadings, intercepts, variances, covariances	63	884.78	207	.929	.939	.042	1010.9	.536	.489	.586
M5 All parameters	48	949.40	22	.929	.935	.042	1044.4	.553	.505	.606

Table 4 Prediction of Exercise, Smoking and Truancy two years later (Time 2) from global goals in Time 1 controlling for behaviours in Time 1

Predictors	Dependent Variable in Time 2							
	Exercise 10 times/month or more		No exercise at all		Smoking		Truancy	
	OR	CI	OR	CI	OR	CI	OR	CI
Step 1: Dependent Variable Time 1								
Behaviour in Time 1	6.86	5.25-8.97	7.75	5.4-11.3	31.62	17.2-58.2	50.8	33.3-77.4
Step 2: DV & global goals in Time 1								
Behaviour in Time 1	6.54	4.99-8.57	7.32	5.04-10.6	27.4	14.7-51.1	47.2	30.9-72.2
Personal improvement in Time 1	1.46	1.11-1.91	.71	.50-.98	.37	.27-.52	.42	.26-.68
Ego-enhancing in Time 1	1.05	.80-1.38	.89	.63-1.25	1.07	.77-1.49	.90	.61-1.35
Ego-protection in Time 1	.78	.59-1.02	1.53	1.08-2.19	.98	.71-1.37	1.28	.87-1.87

Note: OR_{adj} = Odds ratio, CI = 95% Confidence Interval for Odds Ratio; DV = Dependent Variable

Table 5

Prediction of smoking in T2 from smoking in T1 (step 1), truancy in T1 (step 2), truancy in T2 (step 3) and global goals in T1 (step 4)

Predictors	Dependent Variable	
	Truancy in Time 2	
	OR	CI
Step 1:		
Smoking in Time 1	43.3	23.5-79.9
Step 2		
Smoking in Time 1	22.2	11.7-42.1
Truancy in Time 1	4.82	3.28-7.07
Step 3		
Smoking in Time 1	22.2	11.5-43.1
Truancy in Time 1	1.86	1.16-2.97
Truancy in Time 2	4.84	2.98-7.87
Step 4		
Smoking in Time 1	20.6	10.7-38.6
Truancy in Time 1	1.74	1.08-2.08
Truancy in Time 2	4.44	2.71-7.26
Personal improvement in Time 1	.55	.37-.83
Ego-enhancing in Time 1	.93	.63-1.39
Ego-protection in Time 1	.90	.60-1.35

Note: OR_{adj} = Odds ratio, CI = 95% Confidence Interval for Odds Ratio.