

# EUROPEAN PSYCHOMOTRICITY JOURNAL

<http://www.psychomotor.gr/en/european-psychomotricity-journal>

ISSN 1791-3837

*European Psychomotricity Journal* 2010; 3; 1,37-44

Published by: Athlotypo Sports Publishing

<http://www.athlotypo.gr/>

On behalf of:

[Scientific Psychomotor Association Hellas](#)

Additional services and information for *the European Psychomotricity Journal* can be found at:

## ORIGINAL ARTICLE

## The prediction of the degree of participation of Greek adult men in exercising through the magnitude of their motivation

Dimitrios Papadopoulos, Ioannis Athanailidis, Fotini Venetsanou, Dimitra Giannakidou, Elke Haberer, and Athanasios Laios

Correspondence: Dimitrios Papadopoulos, Democritus University of Thrace, Department of Physical Education & Sport Science, University Campus, 69100 Komotini, Greece, E-mail: [dimpap@teikav.edu.gr](mailto:dimpap@teikav.edu.gr)

### Introduction

During the last decades, the participation of adults in exercising programs have been received great importance, due to the fact that exercising is considered as a significant factor for the maintenance and promotion of both physical and psychological health (Fleck & Dean, 1987; Raglin & Morgan, 1985; Shephard, 1990). However the relevant research findings in Europe are conflicting. In a study that was carried out in 1998 in 12 selected countries of Europe, it was found that 50% of their population participated in at least one sport activity (Andreff, 2001). On the other hand, Martinez-Gonzalez et al. (2001) support that the majority of the citizens in the European Union are not committed to a sufficient level to a physical activity. Regarding Greece, Valanou, Bamia, Chloptsios, Koliva and Trichopoulou (2006) found that only the 36,9 % of the Greek male population deal with some physical activities.

Perhaps, the understanding of the significance of exercising for health is not the only factor for people's participation in it. As a result, although exercising is considered as the simpler way of re-storing patients' coronary illnesses, in most cases their staying in exercising programs is presented as problematic (Harlan et al., 1995), as it was found that almost 20-25% of the patients abandon the exercising program in the first three months (Song & Lee, 2001).

Several researches point out that motivation is connected to the insistence in the behavior of exercise (Pelletier et al., 2001; Sarrazin et al., 2002). According to Vallerand and Thill (1993) the aim of motivation is specified as the hypothetical structure that is used in order to describe the internal and the external forces causing the spark, the direction, the intensity and the insistence in a behavior. An important differentiation in motivation theory is that between intrinsic and extrinsic (Ryan, Vallerand & Deci, 1984), with the intrinsic being considered as a decisive anticipated factor of attendance in an activity. However, the self-determination theory of Deci and Ryan (1985a; 1990; 2000) supports that certain motives of exercising can be simultaneously intrinsic and extrinsic. According to the aforementioned authors every

### Abstract

The aim of this study was to determine (a) the motives predicting the participation of Greek adult men in exercising and (b) biographical and demographical factors affecting them. The participants were 843 men (n=843) some of which exercised and some others did not, aged between 18 and 73 years. The Exercise Motivation Inventory-2 (EMI 2 -Markland & Ingledew, 1997) adjusted for the Greek population was used for the assessment of the exercise motives. The degree of participation in exercising, as well as the biographical characteristics of the participants were also determined. A line of statistical analyses revealed that the regular participation in exercising was anticipated only by the "Psychological" and "Interpersonal" factors. The previous experience as an official athlete was positively related to "Psychological" as well as to "Interpersonal" factors. Moreover, both exercising under the direction of a coach and exercising with beloved ones were also positively related. The results support the parallel orientation of physical education so much to sports as well as to health, with respect to the autonomy of the individuals.

**Key words:** Motivation to exercise, self-determination theory, EMI-2, Greek adult men

situation can be interpreted as informative, controlled or non-motivational and this interpretation can influence the motivational results. When the situations are considered as informative, they affect the promotion of intrinsic motivation, through the support of autonomy and the benefit of information concerning their capability. On the contrary, the controlled situations promote the external motivation through the application of pressure, aiming in concrete results (Rose, Markland & Parfitt, 2001). However the interpretation of the situations is not common for all the individuals but lies on the personality and causality orientation.

Deci and Ryan (1985; 2000) divide the extrinsic prompted behaviors in four types of behavioral regulations. The extrinsic regulation represents behaviors regulated through external meanings, as rewarding or avoiding punishment. The introjected regulation refers to partially internalized, but not self-determined behaviors. Such behaviors are expressed in order to gain social acclamation and self-value or to avoid external pressures and negative sentiments. The identified regulation represents a relatively more self-determined regulation, because the results of the behavior are considered important (e.g. exercising for the promotion of the physical condition). This behavior is expressed without pressure, even though it is not particularly enjoyable. Finally, the integrated regulation represents a self-determination type of process internally and it refers to behaviors that are expressed without choice, on order to bring different parts of an individual in harmony and cohesion.

In the Dacey's study (2004) in which the EMI-2 (Markland & Ingledew, 1997) was used for the measurement of participants' motivation the intrinsic motivation (enjoyment), the self determined extrinsic motivation (health, physical condition, social and sentimental benefits, the management of stress and not self-determined extrinsic motives (management of weight, appearance) were separated. However it appears that the motives are not always susceptible to identical categorization, since they are additionally influenced both by the local cultural conditions (Triandis & Gelfand, 1998) and the social environment (Vallerand & Losier, 1999).

The aim of this research is to (a) study the motives of Greek adult men towards exercise and (b) determine the demographic and biographical features that influence the motives predicting the attendance in the exercise.

## **Method**

### *Participants*

The participants were 843 Greek adults (N=843), a number considered as representative for the total Greek population with margin of error at 0.05 (Saunders, Lewis & Thornhill, 2000). The medium age of the participants was 35.65 years (SD=+/-11.295). Among them, 267 used to exercise regularly and systematically, 249 interrupted their exercise for a small period and continued again, 114 interrupted their exercise for a long period and continued again, 143 exercised rarely and occasionally and 70 did never exercise.

### *Procedure*

For the measurement of motivation of Greek adult men in exercising the EMI-2 (Markland & Ingledew, 1997) was used. The above instrument had been adjusted in Greek population, through both reliability analysis and confirmatory factor analysis (Papadopoulos Athanailidis, Kapsakolis, & Proios, 2007). By that process, a revised

instrument had been resulted constituted of 45 variables attributing 14 first order factors and 5 second order factors (Table 1)

**Table 1.** First and Second order factors of the adjusted in Greek population EMI-2.

	Factors of 1 <sup>st</sup> order	Factors of 2 <sup>nd</sup> order
1	Stress management	I. Psychological factors
2	Revitalization	
3	Enjoyment	
4	Challenge	
5	Social recognition	II. Interpersonal factors
6	Affiliation	
7	Competition	
8	Health pressure	III. Health factors
9	Ill health avoidance	
10	Positive Health	
11	Weight management	IV. Body related motives
12	Appearance	
13	Strength and Endurance	V. Fitness
14	Nimbleness	

The degree of motivation in each of the 45 variables was measured on a 6-point Likert scale (0 = total lack of motivation and 5 = the highest degree of motivation). The degree of participation in the exercise was measured by the distinguishable five- leveled variable "Participation in the exercise during the last three years". The levels of the aforementioned variable were the following:

1. «Never exercise».
2. «Occasionally or rarely exercise».
3. «Interrupting exercising for long periods of time and then continuing again».
4. «Interrupting exercising for a short periods of time and then continuing again».
5. «Exercising regularly and systematically».

The demographic and biographical elements of the sample were also determined.

### *Statistical analyses*

In order the second order factors of motivation that can predict the regular attendance in exercise to be determined, a Discriminant analysis was conducted. The five - level variable "Attendance in the exercise for the last three years" was the dependent variable, while the five second order factors of motivation ("Psychological", "Interpersonal", "Health", "Body Related Motives" and "Fitness") were the independent ones. More over, Independent Samples t-tests were carried out, so as the possibility that the "Psychological" and "Interpersonal Factors" were influenced by (a) having been an official athlete in the past, (b) certain problems of health imposing exercising or (c) exercising under the guidance of a coach (1=Yes, 2=No) to be investigated.

With the purpose of determining if certain biographical characteristics of the participants affect the prediction of the participation in exercise, two Multiple Regression Analyses were carried out by using the Enter method. The "Psychological" and "Interpersonal Factors" were received as depended variables while the age, the number of beloved persons that took place, the years of exercising and the number of sports in which somebody participated as an athlete were used as independed ones. Finally, in order to establish if the type of sports (individual, team, individual and team), with which the participants dealt with in the past, were related with the "Psychological"

and "Interpersonal Factors" of motivation two analyses of variance (One way ANOVA) were carried out.

## Results

The average scores of the 5 second order factors of motivation concerning the level of participation in the exercise are presented in Table 2.

**Table 2.** Means and standard deviations of the 2<sup>nd</sup> order motivational factors in every level of exercising attendance of Greek men.

MOTIVATIONAL FACTORS 2 <sup>ND</sup> ORDER	LEVELS OF EXERCISE PARTICIPATION				
	Total lack of exercise	Occasionally or rarely exercise	Interrupting exercising for long periods of time	Interrupting exercising for a short periods of time	Exercising regularly and systematically
Psychological Factors	M=2.756 SD=1.130	M=2.835 SD=1.011	M=3.069 SD=.985	M=3.303 SD=.920	M=3.621 SD=.856
Interpersonal Factors	M=1.852 SD=1.182	M=1.831 SD=1.151	M=1.756 SD=1.075	M=2.113 SD=1.085	M=2.461 SD=1.111
Health Factors	M=2.910 SD=1.125	M=2.849 SD=1.023	M=2.912 SD=1.030	M=3.060 SD=.881	M=3.147 SD=.942
Body Related Motives	M=2.647 SD=1.194	M=2.751 SD=1.122	M=2.906 SD=1.229	M=3.067 SD=1.137	M=3.008 SD=1.139
Fitness	M=3.131 SD=1.142	M=3.050 SD=1.115	M=3.235 SD=.987	M=3.346 SD=1.086	M=3.5303 SD=1.227

The results of the Discriminant analysis conducted in order the second order factors of motivation that can predict the regular attendance in exercise to be determined are presented in Table 3.

**Table 3.** Interrelations of the discriminant analysis for the prediction of Greek adult men's participation in exercising by the 5 2<sup>nd</sup> order motivational factors.

Function	Eigenvalue	% of Variance	Canonical correlation	Wilks' <i>λ</i>	$\chi^2$	df	Sig.
1	.116	82.6	.322	.875	110.37	20	.000
2	.020	14.0	.183	.976	19.96	12	.068
3	.004	2.6	.061	.995	3.96	6	.682
4	.001	.8	.033	.999	.92	2	.632

As it appears in Table 3, four functions with a combination  $\chi^2_{20} = 110.37$ , Sig = .000 were calculated. After the removal of the first function there was no correlation between the frequency of exercising and the independent variables ( $\chi^2_{12} = 19.96$ , Sig = .068). The 1<sup>st</sup> function explained the 82.6% of the total variance. From the structure matrix it arises that both the "Psychological Factors" (.981), and the "Interpersonal Factors" (.677) could predict the degree of exercise attendance. High scores in these factors mean more regular exercise attendance. On the other hand, the rest three factors ["Fitness" (.449), "Health Factors" (.337) and "Body Related Motives" (.298)] could not predict the regular participation in exercise. From the total sample, only 28.3%, was categorized correctly, a percentage slightly higher than the 20% that would have been

classified accidentally as correct. Relatively high probabilities of right classification had both the men who used to exercise regularly and systematically (52.5%) and those that did not exercise at all (31.4%).

The results of the Independent Samples T-tests showed that the previous experience as an official athlete was related positively both with "Psychological Factors" ( $t_{412.7} = 4.881$ , Sig.  $t = .00$ ) and the "Interpersonal Factors" ( $t_{831} = 5.055$ , Sig.  $t = .00$ ). Exercising under the guidance of a coach appeared to be positively related with the extent of motivation to "Psychological Factors" ( $t_{718} = 2.135$ , Sig.  $t = .033$ ) and to the "Interpersonal Factors" ( $t_{718} = 2.850$ , Sig.  $t = .004$ ). On the contrary, the existence of health problems that impose exercising appeared to negatively relate, in a statistically significant degree with the "Psychological Factors" ( $t_{822} = -3.193$ , Sig.  $t = .001$ ), but marginally with the "Interpersonal Factors" ( $t_{822} = -1.948$ , Sig.  $t = .052$ ).

Finally, the results of the Regression analyses conducted so as the influence of certain biographical characteristics of the participants on the prediction of the participation in exercise are presented in Table 5. In the 1<sup>st</sup> regression the extent of "Psychological Factors" could be predicted by the years that someone was an official athlete (Sig.  $t < .01$ ) and in a marginal degree of significance by the number of beloved persons trained (Sig.  $t = .057$ ). In the 2<sup>nd</sup> regression the extent of "Interpersonal Factors" could be predicted both by the years that someone was an athlete (Sig.  $t < .01$ ), as well as by the number of beloved persons trained (Sig.  $t < .05$ ). Something else that also arose that the "Interpersonal Factors" are related negatively with the age ( $\beta = -.079$ ,  $t = -2.004$ , Sig.  $t < .05$ ), that is to say, the higher the age is the smaller the presented height of the "Interpersonal Factors" of motivation. It should also pointed out however that the rate of indicator  $R^2$  shows that only a small percentage of the total variance of the dependent variable is explained by the variance of the independent variables.

**Table 5.** The prediction of Psychological and Interpersonal Factors through demographic characteristics, influence of social environment and past athletic participation.

Depended Variable	In depended Variables	<i>B</i>	<i>T</i>	<i>Sig. t</i>
Psychological Factors $R^2 = .052$ , $F = 5.817$ , Sig. $F = .000$ .	Age	-.079	-1.704	.089
	Number of beloved persons	.083	1.905	.057
	Years as an official athlete	.201	4.405	.000
	Number of sports	.037	.856	.392
Interpersonal Factors $R^2 = .029$ , $F = 3.176$ , Sig. $F = .008$ .	Age	-.094	-2.004	.046
	Number of beloved persons	.087	1.988	.047
	Years as an official athlete	.143	3.099	.002
	Number of sports	.010	.222	.824

Finally, according to the results of the analyses of variance that were conducted, there was not found a statistically significant difference between the type of sport and both the "Psychological Factors" ( $F_{2, 570} = 1.480$ , Sig.  $F = .228$ ) and "Interpersonal Factors" ( $F_{2, 570} = .166$ , Sig.  $F = .847$ ). However, the individuals that had dealt only with individual sports in the past presented a higher degree of motivation in the "Psychological Factors" ( $M = 3.447$ ,  $SD = 1.009$ ), than did the individuals having dealt with team sports ( $M = 3.293$ ,  $SD = .902$ ) and those having dealt with individual and team sports ( $M = 3.422$ ,  $SD = .948$ ). On the contrary, in the "Interpersonal Factors" of

motivation individuals having dealt with individual and team sports ( $M=2.265$ ,  $SD=1.102$ ) showed a higher degree of motivation, been followed by the individuals having dealt with team sports ( $M=2.242$ ,  $SD= 1.115$ ) and those having dealt with individual sports ( $M=2.184$ ,  $SD= 1.178$ ).

## Discussion

The aim of this study was to determine the motives of Greek adult men that led them in attending exercise programs and the determination of factors influencing the decisive motives of attendance. The degree of exercise attendance of Greek adult was found to be influenced positively by the extent of motivation both in the "Psychological Factors" and the "Interpersonal Factors". The "Psychological Factors", reflecting mainly intrinsic motivation (enjoyment, invigoration, ability) are related more than any other to the exercise attendance and in the minimization of its being interrupted (Biddle, 1999; Eix, 2001; Thøgersen-Ntoumani & Ntoumanis, 2006). The "Interpersonal Factors", the extent of which also influence positively the attendance of Greek men in exercising, are considered to reflect self determined extrinsic motivation (Dacey, 2004). According to the theory of self determination, cases that are considered to reflect extrinsic motivation can be internalized totally or partially by the individuals (Deci & Ryan, 2000). Various researches have shown that the internalized extrinsic motivation led to more powerful engagement to the task (Chatzisarantis, Biddle & Meek, 1997; Connell & Wellborn, 1991) and lower frequency of abandonment (Vallerand & Bissonnette, 1992). Thus, it can be considered that the "Interpersonal Factors" of motivation constitute for the Greek adult men internalized extrinsic motivation. Thøgersen-Ntoumani (2009) supports that, in the collective cultures, such as Greek, the social elements is exceptionally important for participating in the physical activity.

On the contrary, it appears that the motivational stimulus that is related with the health and the fitness which is also considered as extrinsic motivation (Dacey, 2004), it does not appear to be internalized in an efficient degree by the adult Greeks, so that they lead to their more regular participation in exercising. The body related motives, which are considered to reflect extrinsic motivation (Ryan et al., 1997), do not contribute in the increase of the degree of participation.

From the biographical elements of the sample what influenced positively the "Psychological" and "Interpersonal Factors", is the previous experience as an official athlete and its duration. It appears that the experience gained from the period of being an official athlete can also influence the future participation in the exercise. This finding appears to be contrary to the ascertainments of Thøgersen-Ntoumani, Ntoumanis and Nikitaras (2008), who found that the Greek adults, who did not have previous experience of exercising, had more positive opinion about it, than those who had experience. However, according to Lee (2005), the previous athletic experience constitutes an important factor of prediction of the future behavior of exercising.

Also, exercising under the instruction of a coach appeared to be positively related to the "Psychological" and "Interpersonal Factors", mainly in the second factor. Probably an organized exercise promotes the social recognition, the contracting of relations (components of "Interpersonal Factors") much more than the unorganized one. A directed environment of beloved persons in exercise appears to affect positively concerning the "Interpersonal Factors" of motivation and the expanding of the

participation in exercising. This result aligns with previous ones (Dishman, 1984; Grouzet et al., 2004).

The individuals that had health problems imposing the participation to exercise were found to record smaller motivation in the decisive participation in exercising "Psychological" and "Interpersonal Factors". Perhaps the "Pressures of health", constitutive element of "Health Factors", imposing the behavior of exercise, opposing the autonomy of the individuals and render the behavior externally or introjected regulated (Deci & Ryan, 1985; 2000).

The results of the present study indicate certain directions in which the interventions that intend in increasing the participation of Greek adult men towards exercising should be directed. The incentive and support towards young people to participate in sports (irrelevant if it is a team or an individual sport) should be considered as the most important intervention, since it can contribute in the future participation in exercising. The promotion relative to health motivation for exercising is also considered essential, provided that it will be done with respect in the autonomy of the individual, so that the behavior of exercising would not be considered as an external imposition.

## References

- Andreff, W. (2001). Los intentos europeos y franceses de elaborar una contabilidad nacional de la economía del deporte (European and French attempts to set up a National Accounts of the Economy of Sports). In J.M. Otero (Eds.) *Incidencia economica del deporte*. Malaga: Instituto Andaluz del Deporte, 23-53.
- Biddle, S.J.H. (1999). Motivation and perceptions of control: Tracing its development and plotting its future in exercise and sport psychology, *Journal of Sport and Exercise Psychology*, 21, 1-23.
- Chatzisarantis, N.L.D., Biddle, S.J.H., & Meek, G.A. (1997). A self-determination theory approach to the study of intentions and the intention-behaviour relationship in children's physical activity, *British Journal of Health Psychology*, 2, 343-360.
- Connell, J.P., & Wellborn, J.G. (1991). Competence, autonomy and relatedness: A motivational analysis of self-system processes. In M.R. Gunnar & L.A. Sroufe (Eds.), *Minnesota Symposium on Child Psychology* (Vol. 22, pp. 43-77). Hillsdale, NJ: Erlbaum.
- Dacey, M. (2004). *Exercise Motivation Inventory-Revised (EMI-2) Applied to Older Adults: Exploratory Factor Analysis*. Available in: [http://aahperd.confex.com/aahperd/2004/finalprogram/paper\\_5695.htm](http://aahperd.confex.com/aahperd/2004/finalprogram/paper_5695.htm) (Accessed: 23-03-2007).
- Deci, E.L. & Ryan, R.M. (1985a). *Intrinsic motivation and self-determination in human behavior*. New York: Plenum Press.
- Deci, E.L. & Ryan, R.M. (1985b). The General Causality Orientations Scale: Self-determination in personality. *Journal of Research in Personality*, 19, 109-134.
- Deci, E.L. & Ryan, R.M. (1990). A motivational approach to self: Integration in personality. In R. A. Dienstbier (Ed.), *Nebraska Symposium of Motivation: Vol. 38, Perspectives on Motivation* (pp. 237-288). Lincoln: University of Nevada Press.
- Deci, E.L. & Ryan, R.M. (2000). The "What" and "Why" of Goal Pursuits: Human Needs and the Self-Determination of Behavior. *Psychological Inquiry*, 11(4), 227-268.
- Dishman, R.K. (1984). Motivation and Exercise Adherence. In J.M. Silva & R.S. Weinberg (Eds.), *Psychological foundation of sport* (p.p. 420-434). Champaign, IL: Human Kinetics.
- Eix, T. (2001). *Intrinsic and extrinsic motivation in sport: An analysis of gender differences*, Unpublished Doctoral Dissertation, Department of Psychology, Carleton University.
- Fleck S.J., & Dean L.S. (1987). Resistance training experience and the pressure response during resistance exercise. *Journal of Applied Physiology*, 63, 116 - 120.
- Grouzet, F., Vallerand, R.J., Thill, E.E. & Provencher J.P. (2004). From Environmental Factors to Outcomes: A Test of an Integrated Motivational Sequence. *Motivation and Emotion*, 4 (28), 231-246.

- Harlan, W.R., Sandler, S.A., Lee, K.L., Lam, L.C. & Mark, D.B. (1995). Importance of baseline functional and socioeconomic factors for participation in cardiac rehabilitation. *American Journal of Cardiology*, 76, 36-39.
- Lee, Y.S. (2005). Gender differences in physical activity and walking among older adults. *Journal of Women and Aging*, 17, 55-70
- Markland, D. & Ingledew, D.K. (1997). The measurement of exercise motives: Factorial validity and invariance across gender of a revised Exercise Motivation Inventory. *British Journal of Health Psychology*, 2, 361–376.
- Martinez-Gonzalez, M.A., Varo, J.J., Santos, J.L., De Irala, J., Gibney, M., Kearney, J., & Martinez, J.A. (2001). Prevalence of physical activity during leisure time in the European Union. *Medicine Science of Sports Exercise*, 33, 1142–1146.
- Papadopoulos, D., Athanailidis, I., Kapsakolis, A., Proios, M. (2007). Motives for the adults to occupy themselves with physical activities in Greece. *Proceeding in 12<sup>th</sup> European Congress of Sport Psychology*, 1033-1037, Halkidiki, Greece.
- Pelletier, L., Fortier, M., Vallerand, R., & Brière, N. (2001). Associations among perceived autonomy support, forms of self-regulation, and persistence: A prospective study. *Motivation and Emotion*, 25, 279–306.
- Ryan, R.M., Vallerand, R.J. & Deci, E.L. (1984). Intrinsic motivation in sport: A cognitive evaluation theory interpretation. In W.F. Straub & J.M. Williams (Eds), *Cognitive Sport Psychology* (pp. 230-242). New York: Sport Science Associate.
- Raglin, J. & Morgan, W.P. (1985). Influence of vigorous exercise on mood state. *Behavior therapist*, 8, 179-183.
- Ryan, R., Frederick, C., Lepés, D., Rubio, N. & Sheldon, K. (1997). Intrinsic motivation and exercise adherence. *International Journal of Sport Psychology*, 28, 335-354.
- Sarrazin, P., Vallerand, R.J., Guillet, E., Pelletier, L., & Cury, F. (2002). Motivation and dropout in female handballers: A 21-month prospective study. *European Journal of Social Psychology*, 32, 395-418.
- Saunders, M., Lewis, Ph., & Thornhill, A. (2000). *Research Methods for Business Students*. Prentice Hill.
- Shephard, R.J. (1990). Physical activity and cancer. *International journal of Sports Medicine*, 11, 413-420.
- Song, R. & Lee, H. (2001). Effects on 12-week cardiac rehabilitation exercise program on motivation and health promoting lifestyle. *Heart and Lung*, 30(3), 200-209.
- Thógersen-Ntoumani, C. (2009). An ecological model of predictors of stages of change for physical activity in Greek older adults. *Scandinavian Journal of Medicine & Science in Sports*, 19(2), 286-296.
- Thógersen-Ntoumani, C. & Ntoumanis, N. (2006). The role of self-determined motivation in the understanding of exercise-related behaviours, cognitions and physical self-evaluations. *Journal of Sports Sciences*, 24(4), 393 – 404.
- Thógersen-Ntoumani, C., Ntoumanis, N. & Nikitaras, N. (2008). Typologies of Greek inactive older adults based on reasons for abstaining from exercise and conditions for change. *Journal of Sports Sciences*, 26(12), 1341-1350.
- Triandis, H. C., & Gelfand, M. (1998). Converging measurement of horizontal and vertical individualism and collectivism. *Journal of Personality and Social Psychology*, 74, 118–128.
- Valanou, E.M., Bamia, C., Chloptsios, G., Koliava, M., & Trichopoulou, A. (2006). Physical activity of 28,030 men and women of the Greek EPIC cohort. *Archives of Hellenic Medicine*, 23(2), 149–158.
- Vallerand, R.J. & Bissonnette, R. (1992). Intrinsic, extrinsic and amotivational styles as predictors of behavior: A prospective study. *Journal of Personality*, 60, 599-620.
- Vallerand, R.J. & Losier, G. (1999). An integrative analysis of Intrinsic and Extrinsic motivation. *Journal of Applied Sport Psychology*, 11, 142-169.
- Vallerand, R. & Thill, E. (Dir.) (1993). *Introduction à la psychologie de la motivation*. Paris: Vigot.