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## Assessing adolescents' sport participation motives: psychometric evaluation of BRSQ

### Avaliação dos motivos de participação desportiva entre os jovens: Avaliação psicométrica do BRSQ

Efi Tsitskari<sup>1\*</sup>, Nickos Vernadakis<sup>1</sup>, Andromahi Foridou<sup>2</sup>, Evaggelos Bebetos<sup>1</sup>

ARTIGO ORIGINAL | ORIGINAL ARTICLE

#### ABSTRACT

The aim of the study was to examine the factorial structure and validity of *Behavioral Regulation in Sports Questionnaire* (BRSQ – Lonsdale Hodge & Rose, 2008). The proposed nine dimensional motivation model by Lonsdale et al. (2008) investigated: i) amotivation, ii) external regulation, iii) introjected regulation, iv) identified regulation, v) integrated regulation, vi) IM-general, vii) IM to know, viii) IM to experience stimulation and ix) IM to accomplish. One hundred and fifty-eight children aged 10 to 13 years old, all active members of private volleyball, football and basketball sport academies in a Greek city, completed the questionnaire. The age groups were chosen based on the early period of adolescence when a person seems to formulate his/her decision about whether to continue participating in a sport, choose another or abandon exercise in general. The scale was translated into Greek using the back-translation procedure. A confirmatory factor analysis (CFA) did not provide adequate support for the factorial validity of the motivational model. The data were then analyzed with an exploratory factor analysis and internal consistency through Cronbach alpha. Exploratory Factor Analysis revealed six out of the initial nine motivational factors. The theoretical and practical implications of these results are discussed.

*Key-words:* adolescents, self-determination theory, motivation, team sports

#### RESUMO

O objetivo deste estudo foi examinar a estrutura fatorial e validade do *Behavioral Regulation in Sports Questionnaire* (BRSQ). O modelo motivacional com 9 dimensões proposto por Lonsdale et al. (2008) investigou: i) amotivação; ii) regulação externa; iii) regulação introjetada; iv) regulação identificada; v) regulação integrada; vi) motivação intrínseca geral; vii) motivação intrínseca para saber; viii) motivação intrínseca para experimentar estímulos; ix) motivação intrínseca para a realização. Completaram o questionário 158 crianças, com idades compreendidas entre os 10 aos 13 anos de idade, membros ativos de equipas de voleibol, futebol e basquetebol, pertencentes a uma academia desportiva privada de uma cidade grega. Os grupos de idade foram escolhidos de acordo com a fase inicial da adolescência quando o indivíduo formula a sua decisão de continuar a sua participação, escolher outra modalidade ou abandonar a prática desportiva. A escala foi traduzida para grego usando o procedimento de tradução e retro-tradução. A análise fatorial confirmatória (AFC) não forneceu suporte adequado para a validade fatorial do modelo motivacional. Os dados foram então analisados com uma análise fatorial exploratória (AFE) e consistência interna através do Alfa de Cronbach. A AFE revelou 6 dos 9 fatores motivacionais. As implicações teóricas e práticas dos resultados são discutidas.

*Palavras-chave:* adolescentes, teoria da autodeterminação, motivação, desportos coletivos

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## INTRODUCTION

Physical activity and sport participation has a positive impact both on the physical and the psychic health of children and adolescents (Duda et al., 2013; Razakou, Tsapakidou, Beis, & Tsompanaki, 2003), either when it concerns their participation in organized and school sports (eg. sport academies or the course of physical education) or their participation in outdoor games and leisure activities (Koka & Hein, 2003; Tzetzis, Kakamoukas, Goudas, & Tsorbatzoudis, 2005). Youth participation in sport activities seems to be vital for their development since it contributes to the evolution of their kinesthetic, mental, social and sentimental abilities and qualities (Hassandra, Goudas, & Chroni, 2003) and, therefore, contributes to their full development (Razakou et al., 2003).

It is essential that exercise and physical activity should be included in a child's daily routine (Razakou et al., 2003). Following Kimiecik and Horn (2012), children that participate in any kind of physical activities on a regular basis appear to acquire many social (Brodersen, Steptoe, Williamson, & Wardle, 2005; Strauss, Rodzilsky, Burack, & Colin, 2001), psychological (Boyd & Hrycaiko, 1997), and physiological (Digelidis, Kamtsios, & Theodorakis, 2007) benefits, which may be maintained or even enhanced if children stay active as they move into adolescence and early adulthood (Taylor, Blair, Cummings, Wun, & Malina, 1999; Telama et al., 2005).

Although benefits of sport participation are thoroughly discussed and established, studies mention that physical activity seems to decrease significantly as children move to adolescence (Strauss et al., 2001) and young adulthood (Gordon-Larsen, Nelson, & Popkin, 2004). Such an attitude is highly observed during puberty (10-13 years old) since during this period a passive lifestyle is chosen (Digelidis et al., 2007) while, simultaneously, the attitude of children towards exercise is formulated, with slight differentiations in the next few years (Kalogiannis, 2006).

Certainly, a matrix of social, psychological, cultural and environmental factors is crucial to the development and maintenance of children's physical activity levels (Lee, Sallis, & Biddle, 2010a), which appears to be of extremely importance for their psychological and physical health. Having said that, many researchers and scholars have directed their research toward a better understanding of the social and motivational factors that may underlie children's and adolescents' choices for physical activity. In Greece, most such research is concentrated in understanding children's intrinsic motivation parameters (K. Alexandris, Kouthouris, Funk, & Giovanni, 2009; Digelidis et al., 2007; Hassandra et al., 2003; Kalogiannis, 2006; Tsitskari & Kouli, 2010) and not extrinsic motivation or amotivation. Due to the development of the Behavioral Regulation in Sport Questionnaire (BRSQ – Lonsdale, Hodge, & Rose, 2008) it has become possible to examine the parameters of both autonomous and controlled regulations, as well as amotivation. The aim of the study was the examination of the factorial structure and validity of BRSQ. The researchers long to initialize and foster thorough research of what motivates adolescents in maintaining their participation in sports.

## Motivational factors and sport participation

Motivation has for a long time been a central topic in general psychology and, more recently, in sport and exercise literature (Ommundsen, Lemyre, Abrahamsen, & Roberts, 2010; Spray, John Wang, Biddle, & Chatzisarantis, 2006). Great attention has also been given in the literature dealing with youth physical activity and sport participation (Goudas, Biddle, & Fox, 1994; Lee, Sallis, & Biddle, 2010b; Sallis, Prochaska, & Taylor, 2000). In order for a child to decide to get involved in some kind of sport, numerous elements are important to be energized in order for this activation to be fulfilled. Instincts, needs, drives, intentions, internal desires, attitudes in addition to external causes,

such as rewards and appraisals, can lead children to the decision of exercise participation (R. Ryan & Deci, 2007).

According to Iso-Ahola (1989), motivation refers to the forces that initiate, direct, and sustain human behavior. People have different kinds of motivation, meaning that they vary not only in level (i.e. how much) but also in orientation of motivation (i.e. the underlying attitudes or intentions). Self-Determination Theory (SDT- Deci & Ryan, 1985) has been prominent in conceptualizing all types of sport motivation in terms of a qualitative continuum. It emphasizes to the degree to which motivation regulations of a specific behavior are self-determined (autonomous), controlled, or lack motivation. So, the most basic distinction that the researchers proposed was that of intrinsic, extrinsic motivation and amotivation (Deci & Ryan, 1985).

Intrinsic motivation refers to doing an activity for the pleasure and satisfaction deriving from participating in it, in which case behavior is performed in the absence of external rewards (Deci & Ryan, 1985). Hence, intrinsic motives refer to a personal desire of reaching a certain point of development as well as an inborn tendency and internal satisfaction that stems from the achievement of an individual's goal. Deci and Ryan (1985) viewed intrinsic motivation as a unitary construct, while Vallerand (1997) distinguished it in three equally autonomous forms: (1) *Intrinsic motivation to know* was defined as participating in an activity for the pleasure that one experiences while learning, (2) *Intrinsic motivation toward accomplishments* refers to the satisfaction gained while someone attempts to accomplish something, and (3) *intrinsic motivation to experience stimulation* occurs when the choice to participate in an action offers pleasurable sensations to the participant (Lonsdale et al., 2008). Intrinsic motivation has been studied in a variety of leisure and exercise related settings (Alexandris et al., 2009; Alexandris, 2012; Funk, Beaton, & Alexandris, 2012; Hassandra et al., 2003; Kim & Trail, 2010;

Palen, Caldwell, Smith, Gleeson, & Patrick, 2011; Tsitskari & Kouli, 2010).

Consequently, all choices taken when a person is intrinsically motivated involve a great sense of freedom. However, this may not be claimed for behaviors that are extrinsically motivated. Extrinsic motivation refers to taking part in an activity for external rewards (Deci & Ryan, 1985) and separable outcomes, to avoid punishment or satisfy an external demand (Lonsdale et al., 2008). Extrinsic motivation is characterized by four types of regulation: *external* and *introjected regulations* are considered controlled regulatory styles, whereas *identified* and *integrated regulations* are considered autonomous regulatory styles. Deci and Ryan (1985) conceptualized integrated regulation as the most self-determined of all extrinsic regulation. Integrated regulation describes a sport participant's behavior caused by personally endorsed needs, values and goals. Identified regulation, derives from a sport/exercise participant's full acceptance and endorsement of the reasons to perform a behavior –independently of whether someone actually enjoys his/her participation in it.

Introjected regulation represents a controlled form of extrinsic regulation, as it stems from a need to avoid undesirable psychological consequences, such as guilt or shame, or because of experiencing desirable outcomes, such as self-worth. The least autonomous form of extrinsic motivation is a category that Deci and Ryan (2000, p. 2) labeled “external regulation” and described as the behaviors that “... *are performed to satisfy an external demand or obtain externally imposed award*”, in order to gain praise or avoid punishment. According to Deci and Ryan (1985) in some cases, behaviors that may not have been intrinsically motivated at the beginning may in the future be internalized to become more autonomous. For example, a child may initially take part in a sport activity because of his/her parents' pressure, but in time he/she may come to appreciate the value of the activity and want to take part in it (Spray et al., 2006).

Finally, *amotivation*, according to Ryan and Deci (Ryan & Deci, 2007; Ryan & Deci, 2000), is the state of lacking an intention to act. Amotivation results when someone does not value an activity (Ryan, 1995), does not feel competent to participate in it (Deci, 1975), does not believe that he/she will come to a desired outcome (Seligman, 1975), or had negative past experiences (Ryan & Deci, 2007). In the sporting context, amotivated athletes are likely to question the continuation of their participation (Lonsdale et al., 2008).

In order to examine intrinsic motivation, extrinsic motivation and amotivation, following the principles of SDT in a sport context, a conceptually and psychometrically sound measure of behavioral regulation is essential. Sport Motivation Scale (SMS - Pelletier, Fortier, Valletand, Tuson, & Blais, 1995) is one of the most popular such tools. However, some researchers raised concerns about the internal consistency (eg. Martin & Cutler, 2002; Vlachopoulos, Karageorghis, & Terry, 2000) and factorial validity (Mallett, Kawabata, Newcombe, Otero-Forero, & Jackson, 2007; Shaw, Ostrow, & Beckstead, 2005) of SMS's subscales, especially of the extrinsic motivation ones. In contrast to Mallet et al. (2007) choice to modify SMS items based on statistical evidence, Lonsdale and his cooperates (2008) decided to start the development of a scale progress from scratch. Therefore, they created a new measure of 36 items evaluating amotivation, intrinsic and extrinsic motivation through nine types/factors of motivation: i) One for amotivation, ii) four for intrinsic motivation (IM-General, IM to know, IM to experience stimulation and IM towards accomplishments) and iii) four for extrinsic motivation (Integrated, Identified, Introjected and External regulation). Each factor was evaluated through four items. The researchers named the tool "Behavioral Regulation in Sport Questionnaire (BRSQ)". The evidence that Lonsdale and his cooperates (2008) presented was supportive of the reliability and validity of the BRSQ scores. Moreover, the tool was designed specifically for use with competitive sport participants. For all

the above, we decided to use BRSQ in a sample of young sport participants.

The factorial structure and validity of BRSQ was examined. The hypothesis that drove the researchers was that the nine-factor structure of the scale would be validated using a Greek sample.

## METHOD

### Participants

The questionnaire was completed by 158 children, 121 boys and 37 girls aged 10-13 years old, who participated in academies of team sports (basketball, volleyball and soccer-football) in a city of Northern Greece. The age groups were chosen based on the early period of adolescence when a person seems to formulate his/her decision about whether to continue participating in a sport, choose another or abandon exercise in general (Patrick et al., 1999).

### Measures

Data were collected through the *Behavioral Regulation in Sport Questionnaire* (BRSQ) (Lonsdale et al., 2008), which was constructed in order to measure intrinsic motivation, extrinsic motivation and amotivation, following the principles of self-determination theory (Deci & Ryan, 1985). The questionnaire selection was based on its factorial and nomological validity evidence as long as the test-retest reliability scores. When Lonsdale and his cooperates (2008) directly compared the scores that derived from the Sport Motivation Scale (Pelletier et al., 1995) and its revised version (the SMS-6; Mallett et al., 2007), the BRSQ scores demonstrated equal or superior reliability and factorial validity as well as better nomological validity. Moreover, BRSQ was specifically designed for use with competitive sport participants and the results of Lonsdale et al. (2008) and Lonsdale, Hodge, and Rose (2009) seem to be promising for the research in areas where previous SDT-based studies gave conflicting results.

Although there was nothing to suggest that the BRSQ model would not fit the gathered data in Greece, cultural, sport and age differences

were a concern for the researchers. In line with Vallerand (1989), the back translation technique was used to translate the BRSQ scale. Two of the authors translated the original BRSQ into Greek and afterwards compared the two versions. 22 out of the 36 items were translated in an almost identical way. For the remaining 14, a discussion between the authors was conducted and its meaning was judged to be quite identical, despite the use of different words. In each case, the translators came to an agreement to keep one of the two statements, which seemed to be the more appropriate one according to the vocabulary used, the meaning, the grammar and syntax. The Greek version was then given to two other bilingual researchers in the field of sport marketing and psychology who agreed to translate the items back into English. Neither of the two researchers had ever used nor read the BRSQ. After the translation was accomplished, the four researchers evaluated the back-translated versions with the original Questionnaire. While half of the statements (19 out of 36) were slightly not identical to those of the original scale, the researchers agreed that their meaning was the same. For this reason they resulted in the retention of the translated Greek scale.

In order to check the content validity of the translated scale, a pilot study was conducted in 50 children, aged 10-13 years old who were athletes in basketball and football academies (other than the ones approached for the survey). Most of the children reported difficulties in understanding two of the translated *Intrinsic Motivation to Accomplish* variables (“...because I enjoy the feeling of achievement when trying to reach long-term goals” and “...because I get a sense of accomplishment when I strive to achieve my goals”). Help from a school teacher was asked, in order for the two items to be better understood by 10-13 years old adolescents. The new version was distributed to 30 other pupils. None of the respondents reported any difficulty in understanding and completing the questionnaire.

The questionnaire distributed to the young athletes consisted of 4 items for each of the nine factors evaluating Intrinsic and Extrinsic Motivation and Amotivation; that is a total of 36 items (all factors and its items appear in Table 1). As Lonsdale and his co-authors (2008, p. 348) pointed out, their scope was to “...develop a measure, not to advocate one theoretical position over another... (they) decided to create items that reflected both the multidimensional.. and unitary .. conceptualizations” of motivation. As Lonsdale et al. (2008) referred to the evidence that supported the internal consistency and factorial validity of all subscales, the authors of the present study decided to include all the items and sub-scales in the distributed questionnaire. All answers were given through a seven point Likert type scale (1: *not at all true*, 4: *Somewhat true*, 7: *Very true*)

### Procedure

Data were collected from January to May 2013. Prior contact with coaches or managers of team sports academies operating in the city of Komotini was made in order first to obtain permission by both the coaches and the parents and secondly to acquire the training program. The questionnaires were given to the children by one of the investigators before the beginning of the training in order to avoid fatigue or even sentimental responses (eg. after a good or bad day on the court). A total of 205 questionnaires were distributed, 160 were returned, of which eventually 158 were used in the study (return rate: 77.07%).

### Analysis

Procedures in the EQS (Bentler, 1995) and the Statistical Package for Social Sciences (SPSS 16.0) were utilized to analyze the data.

*Factor Structure and Reliability:* To examine the factorial validity of the translated into Greek BRSQ, a Confirmatory Factor Analysis was performed (Bentler, 1995). The purpose of the CFA was to confirm the factor structure of the nine-factor 36-item scale. Because the item results

were only slightly skewed, the maximum likelihood (ML) estimation was used in conducting the CFA (Lam, Zhang, & Jensen, 2005). Extensive research on the robustness of the ML method indicates that this method is almost always acceptable, even when data are not normally distributed (Lam et al., 2005; Tanaka & Bentler, 1985). Model fit was examined based on several indices, including the Non-normed Fit Index (NNFI), the Comparative Fit Index (CFI), the Standardized Root Mean Residual (SRMR) and the Root Mean Squared Error of Approximation (RMSEA) accompanied by the confidence interval (90% CI). NNFI and CFI values less than 0.90 do not indicate a good fit of the model to the data, while values greater than 0.95 show an excellent fit (Hu & Bentler, 1999). Values of the RMSEA less than .05 indicate a very good fit, and values up to .08 indicate reasonable errors of approximation in the population (Byrne, 2000; Lam et al., 2005; Steiger, 1990). McCallum, Browne & Sugawara (1996) also declared that the values of the RMSEA between .08 and .10 indicate a mediocre fit and those greater than .10 indicate poor fit. On the other hand, the SRMR values which are close to 0.08 show a rather good fit of the model to the gathered data (Hu & Bentler, 1999). Finally, the scale and its subscales reliability was measured with Cronbach's alpha.

*Correlation analysis:* was conducted in order to test the relations of the intrinsic, extrinsic and amotivation factors that emerged according to SDT.

## RESULTS

### Factor Structure

Confirmatory factor analysis was first used to examine the hypothesized nine factor structure of the initial BRSQ. Each of the 36 items was allowed to load only on its hypothesized factor (according to Lonsdale et al., 2008) and

all of the cross-loadings were set to zero. Factor variances were fixed to unity and error terms were not permitted to correlate. The BRSQ items that were skewed ranged from -3.26 to 11.66, while the kurtosis values ranged from -.58 to 106 (Table 1). Mardia's (1970) coefficient of multivariate kurtosis was 804.26, indicating multivariate normality as it was lower than the cutoff point of 1368 (1368 results from the rule  $p(p+2)$ , where  $p$  is the number of the observed variables). The value of the normalized index of multivariate kurtosis (Normalized estimate = 90.64) showed deviation from the normal distribution (when greater than 5 indicates non-normal distribution).

The model fit indices showed an unsatisfactory adaptation of the data collected from the young Greek athletes. More specifically, it emerged that:  $\chi^2 = 6519.16$   $df = 630$ ,  $p < .001$ , NNFI = .559, CFI = .583, SRMR = 1.804 and RMSEA 90% CI = .254 - .265. These results, combined with the very low to zero loadings of some of the items to the initial BRSQ factors, led to the rejection of the first research hypothesis (Table 1). Consequently, an Exploratory Factor Analysis through SPSS 16.0 was performed to unearth underlying dimensions.

The oblimin rotation method was first used to allow for factor inter-correlations. As two of the factors that emerged showed low correlation, the Varimax rotation was then used (Streiner, 1994). The decision making process in the determination of the extraction and rotation methods, the number of factors, etc., is a rather complicating procedure in EFA. However, a very common practice by researchers is to follow the default procedures on a statistical package (i.e. the utilization of the principal component extraction and the varimax rotation methods) (Lam et al., 2005). Cattell's (1966) eigenvalue larger than 1.00 was also selected.

Table 1

*Descriptive statistics and confirmatory factor analysis results of translated BRSQ items*

<b>"I participate in my sport....."</b>								
Item		M	SD	Skew- ness	Kurtosis	Factor loading	Error term	Item va- riance explained (%)
						IM-General		
<b>IM-gen 21</b>	...because I enjoy it	6.5	1.36	-3.17	9.41	.66	.75	43.6
<b>IM-gen 22</b>	...because I like it	6.7	0.98	-4.14	19.65	.85	.81	34.2
<b>IM-gen 23</b>	...because it's fun	6.6	1.19	-3.34	11.45	.68	.73	46.7
<b>IM-gen 24</b>	...because I find it pleas- urable	6.6	1.03	-3.38	12.51	.62	.78	38.6
						IM to Know		
<b>IM-Know 25</b>	...for the pleasure it gives me to know more about my sport	6.6	1.01	-3.28	12.79	.58	.81	33.5
<b>IM-Know 26</b>	...because I like learning how to apply new tech- niques	6.5	1.01	-3.27	12.55	.61	.79	37.3
<b>IM-Know 27</b>	...because I enjoy learn- ing new techniques	6.4	1.29	-3.04	9.31	.66	.75	44
<b>IM-Know 28</b>	...I enjoy learning some- thing new about my sport	6.5	1.07	-2.73	8.84	.62	.78	38.6
						IM to Experi- ence Stimula- tion		
<b>IM-Stim 29</b>	...because I love the ex- treme highs that I feel during sport	6.1	1.51	-2.03	3.56	.70	.71	49.5
<b>IM-Stim 30</b>	...because of the excite- ment I feel when I'm re- ally involved in the ac- tivity	.8	.91	1.79	.86	.83	.55	8.9
<b>IM-Stim 31</b>	...because of the pleas- ure I experience when I feel completely ab- sorbed in my sport	.0	.41	2.03	.43	.75	.66	6.5
<b>IM-Stim 32</b>	...because of the posi- tive feelings that I expe- rience while playing my sport	.9	.61	1.98	.28	.80	.59	4.4
						IM to Accom- plish		
<b>IM-Acc 33</b>	...because I enjoy the feeling of achievement when trying to reach long-term goals	.14	.58	2.33	.53	.76	.64	8.5
<b>IM-Acc 34</b>	...because I enjoy the feeling of success when I am working toward something important	.2	.09	2.08	.13	.63	.77	9.8
<b>IM-Acc 35</b>	...because I enjoy doing something to the best of my ability	.18	.29	2.37	.09	.72	.69	1.3
<b>IM-Acc 36</b>	...because I get a sense of accomplishment when I strive to achieve my goal	.1	.45	2.08	.08	.76	.65	8
						Integrated Re- gulation		
<b>Integrat 17</b>	...because it's an oppor- tunity to just be who I am	.77	.94	1.49	.81	.87	.49	5.5
<b>Integrat 18</b>	...because it's part of who I am	.57	.88	1.21	.28	.85	.52	3
<b>Integrat 19</b>	...because what I do in sport is an expression of who I am	.54	.9	1.34	.61	.86	.50	4
<b>Integrat 20</b>	...because it allows me to live in a way that is true to my values	.36	.88	1.18	.36	.62	.78	8.5
						Identified Re- gulation		



<b>Identif 13</b>	...because the benefits of sport are important to me	.63	.25	0.27	13.69	1	.98	16	7.5
<b>Identif 14</b>	...because I value the benefits of my sport	.67	.0	1.42	.58	0	.32	94	0.5
<b>Identif 15</b>	...because it teaches me self-discipline	.26	.5	2.38	.99	4	.32	94	0.1
<b>Identif 16</b>	...because it's a good way to learn things which could be useful to me in my life	.85	.6	1.77	.62	2	.19	98	.8
Introjected Regulation									
<b>Introjec 9</b>	...because I would feel guilty if I quit	.04	.89	.61	.12	1	.81	58	5.5
<b>Introjec 10</b>	...because I would feel ashamed if I quit	.47	.33	.10	0.58	-	.89	44	0.1
<b>Introjec 11</b>	...because I feel obliged to continue	.85	.72	.75	.53	1	.81	58	5.9
<b>Introjec 12</b>	...because I would feel like a failure if I quit	.06	.95	.51	.69	0	.86	50	5
External Regulation									
<b>External 5</b>	...because I feel pressure from other people to play	.01	.16	1.66	34	1	.02	1	.1
<b>External 6</b>	...to satisfy people who want me to play	.05	.3	.62	5.61	6	.01	1	
<b>External 7</b>	...because people push me to play	.03	.18	.98	2.84	2	.02	1	
<b>External 8</b>	...because if I don't other people will not be pleased with me	.15	.65	.41	7.75	4	-.007	1	
Amotivation									
<b>Amotiv 1</b>	...but I question why I continue	.04	.36	0.04	05.99	1	.014	1	
<b>Amotiv 2</b>	...but I question why am I putting myself through this	.2	.69	.16	.74	8	-.03	1	.1
<b>Amotiv 3</b>	...but the reasons why are not clear to me anymore	.1	.36	.28	0.75	1	-.02	1	.1
<b>Amotiv 4</b>	...but I wonder what's the point	.1	.54	.09	8.31	3	.006	1	

Taking into consideration both CFA's and multiple EFAs' results it turned out that six of the BRSQ's items should be deleted. The items that were gradually removed from the initial scale were two *Amotivation* variables ("*...but I wonder what's the point*" and "*...but I question why I continue*"), two *Identified Regulation* variables ("*...because the benefits of sport are important to me*" and "*...because it teaches me self-discipline*"), one *External Regulation* item ("*...because I feel pressure from other people to play*") and one *Integrated Regulation* item ("*...because it allows me to live in a way that is true to my values*"). A six factor solution was extracted that accounted for the 78.5% of the total variance, which is relatively high considering Streiner (1994) who claimed that extracted factors emerging from an EFA should explain at

least 50% of the total variance. All items had quite strong factor loadings, as shown in Table 2 (>.60). According to Guadagnoli and Velicer (1988), when the factorial loadings are from 0.60 and above and the sample of respondents is more than 150, as in our case, the results of EFA are considered reliable. The rate of factor analysis was KMO = 0,796 while the Bartlett's Test of Sphericity was equal to 4831.445.

The factor structure of the translated into Greek BRSQ consisted of six dimensions, two for intrinsic motivation (instead of the initial four), three for extrinsic motivation (instead of the initial four) and one for amotivation. After the sequential deletion of the six above mentioned variables, the emerging factors were: i) *IM-General* (consisting of three IM-General items, three IM to Know, one IM to Experience

Stimulation and three of the initial IM to Accomplish), ii) *IM to Experience Stimulation* (consisting of three IM to Experience Stimulation items, one IM General, one IM to Know and one of the IM to Accomplish), iii) *Autonomous Regulation* (consisting of two of the initial Identified Regulation items and three of the initial Integrated Regulation ones), iv) *Introjected Regulation* (which emerged as identical with the initial factor), v) *External Regulation* (consisting of three out of the four initial items) and vi) *Amotivation* (consisting of two of the initial four Amotivation items).

### Reliability analysis

The values of alpha were calculated (Cronbach, 1951) to assess the internal consistency reliabilities of the scale and the emerged sub-scales. Alpha coefficients were: i) 0.85 for “*IM-General (new)*” (with 10 items), ii) 0.92 for “*IM-Stimulation (new)*” (with 6 items), iii) 0.93 for “*Autonomous Regulation*” (with 5 items), iv) 0.86 for “*Introjected Regulation*” (with 4 items), v) 0.77 for “*External Regulation*” (with 3 items) and vi) 0.66 for “*Amotivation*” (with 2 items).

Table 2  
*Exploratory Factor Analysis of the BRSQ's items*

Items	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6	Communalities
IM-gen 22	.70						.81
IM-gen 23	.73						.84
IM-gen 24	.80						.83
IM-Know 25	.76						.75
IM-Know 26	.61						.72
IM-Know 28	.84						.88
IM-Stim 29	.76						.86
IM-Acc 34	.64						.73
IM-Acc 35	.66						.74
IM-Acc 36	.67						.80
IM-gen 21		.87					.86
IM-Know 27		.85					.79
IM-Stim 30		.68					.68
IM-Stim 31		.85					.84
IM-Stim 32		.78					.78
IM-Acc 33		.75					.75
Identif 14			.78				.82
Identif 16			.78				.70
Integrat 17			.83				.83
Integrat 18			.89				.91
Integrat 19			.91				.85
Introjec 9				.84			.76
Introjec 10				.89			.85
Introjec 11				.84			.81
Introjec 12				.78			.73
External 6					.88		.86
External 7					.74		.57
External 8					.89		.84
Amotiv 3						.82	.74
Amotiv 4						.81	.72
Eigenvalues	38.45	13.35	9.31	7.64	5.37	4.36	
% of variance	20.66	16.53	15.39	11.27	8.72	5.92	
Total variance							78.49%
a of subscales	.95	.92	.93	.86	.77	.66	
a of the whole scale							.91

### Correlation analysis

Spearman's correlation was conducted in order to explore the relations between the emerged factors. The results suggested that *IM-*

*General* and *IM to Experience Stimulation* positively influence each other ( $r=.692$ ,  $p<.001$ ). There is also a rather positive influence between *IM-General* and *IM to Experience Stimulation*

with *Autonomous Regulation* ( $r=.582$ ,  $p<.01$  and  $r=.466$ ,  $p<.01$ , respectively). As for the extrinsic motivation factors, *Autonomous Regulation* is lowly correlated with *Introjected* ( $r=.312$ ,  $p<.01$ ) and *External Regulation* ( $r=.237$ ,  $p<.01$ ). Finally, *Amotivation* is only lowly correlated with *External Regulation* ( $r=.329$ ,  $p<.01$ ).

## DISCUSSION

The main objective of the study was to contribute to the development and testing of the factorial structure and validity of the translated into Greek *Behavioral Regulation in Sport Questionnaire* (BRSQ) in a sample of young team sports participants (10-13 years old). The responses gathered from the translated scale did not support the hypothesized dimensionality of the original one. After confirmatory and exploratory factor analyses were conducted, a six factor solution resulted, that closely reproduced three of the motivational factors of the initial Australian version of BRSQ (Lonsdale et al., 2008). More specifically, the results of the CFA and the successive EFAs lead to the deletion of six of its initial items: two amotivational items (amotiv1 and amotiv 2), one of *External Regulation* (external 5) and *Integrated Regulation* (integrat 20) factors and two of the *Identified Regulation* factor (identif 13 and identif 15).

The results showed that the first factor was defined by ten items (three from the *IM-General* factor, two from the *IM to Know*, one from the *IM to Experience Stimulation* and three from *IM to Accomplishment*) and was labeled as "*IM-General (new)*" as it contained most of the items that constitute the IM subscales and reflected intrinsic motives in general. According to Filippou and Christou (2001)(2001), when someone is intrinsically motivated, he/she finds pleasure in aesthetic joy, the joy of success and mental achievement, regardless of any other reward. The factor retained the label *IM-General (new)* as most items represented this definition (eg. "*because I like it*", "*for the pleasure it gives me to learn more about my sport*") while showing a high internal consistency ( $\alpha = .95$ ).

The second factor consisted of one *IM-General* item, one *IM to know* item, three of the *IM to Experience Stimulation* items and one *IM to Accomplish* item, a total of six which also displayed a high internal consistency ( $\alpha = .92$ ). This new factor was labeled as "*IM to Experience Stimulation*", as all statements indicate the need of the child/adolescent to get stimulated when participating in his/her sport (eg. "*because of the excitement I feel when I am really involved in the activity*", "*because I enjoy learning new techniques*"). The results of the factor analyses for intrinsic motivation confirm its multi-dimensionality but without supporting the internal consistency and factorial validity of all IM subscales that Lonsdale and his cooperates (2008) suggested.

The third factor, now labeled "*Autonomous Regulation*", consisted of the items of the two distinct initial factors *Identified* and *Integrated Regulation* that remained untouched after the EFAs (eg. "*because I value the benefits of my sport*", "*because what I do in sport is an expression of who I am*"). The emerged factor presented a high internal consistency ( $\alpha = .93$ ) and was made up of items that represented an autonomous regulatory style. "*Introjected Regulation*" was the fourth emerging factor and it was the only one that remained intact as the one that Lonsdale and his co-authors (2008) suggested. Its internal consistency was quite high as well ( $\alpha = .86$ ). The fifth emerging factor "*External Regulation (new)*" consisted of three out of the four initial items while "*Amotivation (new)*" was the sixth emerging factor, with two out of four of the initial items, with moderate internal consistency ( $\alpha = .77$  and  $\alpha = .66$  respectively). This moderate internal consistency may be due to the sample characteristics (eg. heterogeneity, age) or maybe to a need of the variable/s refinement. Correlation analysis conducted verified that the new factors emerged following the principles of Self-Determination Theory. A strong relation emerged between the two intrinsic motivation factors, while moderate was the intrinsic motivation factor relationship with

*Autonomous Regulation*, verifying that Autonomous regulations are the most self-determined of all extrinsic regulation (Deci & Ryan, 1985, 2000). The least autonomous form of extrinsic motivation, according to Deci and Ryan (2000), is the one they labeled “*external regulation*”, which in our research seems to have a low relation with both of the two other extrinsic motivation factors (*Autonomous* and *Introjected regulation*) as well as with *Amotivation*.

The unification of some of the factors or the deletion of six of the initial items is probably the result of the different culture, especially of what young adolescents in Greece find important when motivated to participate in a sport. The BRSQ was created and tested by getting the opinions of youths though adults, while the respondents of this research were actually children aged 10-13 years old. In any case, only by testing the BRSQ scale in more cultural, sport and age contexts, will such issues be resolved. The development or purification of additional items that are culturally congruent to a Greek sample seems also quite important.

Coaches, parents, as well as marketing managers of sport academies and recreational sport activities should frequently evaluate what intrinsically and extrinsically motivate a child to participate, or what causes amotivation, as the way a person views the issue of exercise gradually differentiates while he/she grows up (Hassandra et al., 2003). Diggelidis and his cooperates (2007) mentioned that parents do play a crucial role in this decision and choice of life, since when there is no parental encouragement for exercise during childhood it is likely that the person will choose a passive or a limited exercise participation lifestyle during his/her adolescence and adulthood. Coaches and physical education teachers should also try to understand and offer adolescents more incentives that will enhance both their intrinsic and extrinsic motivation, by enjoying their participation and developing their sentiment of accomplishment respectively.

As a general conclusion it seems that cultural variations may play a significant role in the conceptualization of motivation. Comparing sport motivation between sport participants of different cultures or nationalities will give a more focused approach to define and segment international sport consumer markets.

#### LIMITATIONS AND FUTURE RESEARCH

Several limitations are acknowledged in the present study. The current investigation should be only considered a step in the development and testing of the translated into Greek BRSQ as additional research should be conducted to further test its construct validity. The sport motivation scale was developed primarily for adolescents participating in teams sports, in Greece. Further studies would be required to ascertain whether the proposed model is applicable in different settings and sports. Second, the psychometric properties of the measurement scale were partially verified with a specific sample (adolescents). Sport participants in the same and other demographic groups can also have very different psychographic profiles and combining demographic variables (e.g. demographic and/or geographic segmentation) with psychographic variables (e.g. psychographic and/or behavioral segmentation) provides a clearer insight into marketing and communication strategy formulation. Moreover, further tests of the psychometric properties of the scales using different samples in other event contexts would be desirable to increase confidence in the generalization of the results.

Future research should examine the extent to which BRSQ's factor structure is invariant across participants/adolescents who have different gender, participate in different sports or reside in different cities/countries. Furthermore, it should take into serious consideration other parameters such as the years of sport participation, the levels of involvement or even the role of the important others, that is parents, siblings, peers, team-mates, coaches or teachers.

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