

RESEARCH ARTICLE

Exercise Motivation and Social Physique Anxiety In Adolescents

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Based on self-determination theory (SDT), the goal of this study was to analyze the relation between satisfaction of basic psychological needs, types of motivation to exercise, and social physique anxiety (SPA). Participants in the study were 398 secondary education students, aged between 12 and 19 years, who completed questionnaires that measured the variables of interest. The results of multiple mediation analysis revealed that satisfaction of the need for competence negatively predicted SPA, both directly and indirectly through the mediation of integrated, identified, and external regulations. Introjected regulation also positively predicted SPA. Gender and body mass index (BMI) affected the relationships analyzed and were also shown to predict SPA. The results of this study further our understanding of the motivational process that explains SPA in adolescents within an exercise context, showing the positive influence of perceived competence and types of self-determined motivation to reduce SPA.

Keywords: self-determination theory; basic psychological needs; self-determined motivation; exercise; adolescence

Introduction

Although exercise has been acknowledged to provide many benefits, both physical (Pate et al., 1995) and psychological (Biddle, Fox, & Boutcher, 2000), it can also reflect important challenges to people's self-presentation and, consequently, to the development of a healthy self-image (Davis, Kennedy, Ralevski, & Dionne, 1994). Self-presentation or the way one presents oneself to others, also called impression management (Leary & Kowalsky, 1990), is the process by which people try to control the way they are perceived

and assessed by others (Leary, Tchividjian, & Kraxberger, 1994).

Adolescence is a period of rapid biological changes (Schulenberg, Maggs, & Hurrelmann, 1997) and adolescents are particularly sensitive about their image, especially about the way their bodies may be appraised by others (Hagger et al., 2010; Martin, Engels, Wirth, & Smith, 1997; Thompson & Chad, 2002). The accompanying changes in adolescents' bodily appearance, especially height and weight, can cause physical aspects to become a defining characteristic at these ages (Thompson & Chad, 2002). Adolescence has been pointed out as an essential stage for persisting in or dropping out of the practice of exercise (Armstrong & Welsman, 1997; Van Der Horst, Paw, Twisk, & Van Mechelen, 2007).

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Till now, research that has analyzed the relationship between participation in physical activity and body image concerns has emphasized the complexity of this relationship (see Hausenblas, Brewer, & Van Raalte, 2004). In Western societies, citizens, especially adolescents, are exposed to constant pressure to imitate certain models of the body (Fallon & Hausenblas, 2005). In fact, in our society, one of the reasons for exercising is to look like these body models (Conroy, Motl, & Hall, 2000; Markland & Hardy, 1993; McDonald & Thompson, 1992), and this has negative consequences for continued participation in exercise (Frederick & Ryan, 1993; Ingledew, Markland, & Medley 1998). Exercise is often performed in a social setting (e.g., sports team, fitness center), which involves a potential for future negative appraisals of the body (Sabiston, Crocker, & Munroe-Chandler, 2005). Therefore, exploring reasons for exercising that promote a healthy self-image seems crucial to improve people's experience of their physical activity. This study focuses on analyzing social physique anxiety in a sample of adolescents. Specifically, we attempted to verify how different motivational factors associated with exercise could contribute to social physique anxiety in adolescents.

Social Physique Anxiety

Within the domain of exercise, self-presentation has been studied predominantly in terms of social physique anxiety (Hausenblas et al., 2004). In line with self-presentation, social physique anxiety has been defined as an affective response that reflects concern about how one's body may be judged by others (Hart, Leary, & Rejeski, 1989; Leary, 1992). Although conceptually distinct, body image is related to the concept of social physique anxiety. In this respect, individuals may be concerned with how others view their physiques, either because their bodies are objectively unattractive or because they have an unrealistically negative perception of their physiques. Therefore, social physique anxiety is considered to be a type of social anxiety,

defined by Hart et al. as the anxiety felt by people in response to others' perceived appraisals of their physique (the structure and shape of their bodies—height, weight, muscle tone).

Social physique anxiety has been related to negative health-related behavioral and psychological consequences, such as low self-esteem and self-concept (Gargari, Khadem-Haghighian, Taklifi, Hamed-Behzad, & Shahraki, 2010; Hagger et al., 2010); appearance and body image dissatisfaction (Crawford & Eklund, 1994), smoking (Sabiston et al., 2007) and eating disorders (Haase & Prapavessis, 1998; Thompson & Chad, 2002). Furthermore, most research on the relationship between exercise adherence and social physique anxiety has indicated a negative relationship between both variables (Hausenblas et al., 2004). In fact, due to their body image, adolescents may avoid or stop exercising, especially if they think that others might consider them fat or uncoordinated (Eklund & Bianco, 2000; Sabiston et al., 2007).

In view of the possible negative consequences of social physique anxiety for a broad array of health-related behaviors, it is important to identify the motivational mechanisms associated with physical activity that can promote or reduce this kind of social anxiety. Motivation determines the initiation, maintenance, and termination of human beings' behavior (Deci & Ryan, 2000) and its analysis is therefore essential to understand social physique anxiety. The motives underlying physical activity have been described as key antecedents of social physique anxiety (Crawford & Eklund, 1994; Frederick & Morrison, 1996). Determining the factors associated with social physique anxiety can help us to understand the psychological mechanisms underlying this construct and allow us to implement preventive strategies within the field of physical activity. This study was therefore designed to analyze the relationship between different motivational variables associated with physical activity and social physique anxiety from the

viewpoint of the self-determination theory (SDT; Deci & Ryan, 2000; Ryan & Deci, 2007).

Self-determination Theory

SDT establishes different types of motivation according to whether the origin is internal or external to the individual. This classification facilitates understanding the reasons that lead people to exercise, reasons that can decrease social physique anxiety. Applying this theory to exercise, amotivation is the least self-determined motivation, characterized by a lack of interest and by not seeing any reason to exercise. At the opposite pole of the continuum, intrinsic motivation is the most self-determined form, reflecting that exercise is carried out for its own sake, for the fun and pleasure it produces. Extrinsic motivation, by which exercise is carried out as a means to achieve a goal, falls between these two types of motivation. Depending on the degree to which an external cause is internalized by the subject, extrinsic motivation presents different levels of self-determination: (a) external regulation: individuals exercise to obtain an external incentive, such as others' acknowledgement (e.g., people may exercise so others will say that they are fit or have a good body); (b) introjected regulation: a minimal degree of internalization begins to emerge. People are motivated by the desire to avoid feelings of guilt or shame. Individuals need to exercise to feel good and improve their self-esteem; (c) identified regulation: people begin to value the benefits of exercise and to perform it because they acknowledge that it is good for their physical, psychological, and social health; and (d) integrated regulation: this represents the most complete form of internalization of extrinsic motivation. Exercise is integrated into the person's lifestyle, in congruence with the rest of the values and needs that make up the individual's personality. According to SDT, intrinsic motivation and integrated and identified regulations represent self-determined forms of motivation, whereas introjected and external regulations and amotivation reflect non-self-determined forms of motivation.

Within SDT, self-determined motivation is considered to be facilitated by the satisfaction of three basic and universal psychological needs: autonomy, competence, and relatedness. Basic psychological needs are defined as essential nutrients for a person's growth, integrity, and well-being (Deci & Ryan, 2000). Within the exercise context, autonomy refers to the need to perform activities that are interesting, and being able to choose and to participate in the decision-making process. Competence refers to the need to feel capable and to see that the proposed goals are achieved over time. Relatedness refers to the need to maintain a good relationship with others and to feel accepted by them.

SDT considers that, in the different life settings (e.g., exercise), satisfaction of the basic psychological needs will affect the individual's type of motivation, which will lead to a series of consequences. In this motivational sequence, the hypothesis that motivation mediates in the relationship between the basic psychological needs and the consequences can be formulated. If people who exercise feel autonomous, competent, and related, this will facilitate an increase of self-determined motivation (i.e., intrinsic motivation and integrated and identified regulations). However, if people who exercise do not satisfy these needs, they are more likely to acquire a non-self-determined type of motivation (i.e., introjected and external regulations and amotivation). In fact, this hypothesis has found extensive support in the exercise setting (McDonough & Crocker, 2007; Vallerand, 2007).

SDT and Social Physique Anxiety

Prior studies that have examined the relationships between exercise motivation and social physique anxiety have suggested that extrinsic motives for exercise, such as improving muscle tone and physical attractiveness, are associated with social physique anxiety (Crawford & Eklund, 1994; Frederick & Morrison, 1996). Furthermore, based on SDT, previous studies have showed that social physique anxiety is negatively associated

with more self-determined forms of motivation and with less subsequent exercise behavior (Gillison, Standage, & Skevington, 2006). More recently, Brunet and Sabiston (2009) have expanded Gillison et al.'s study confirming that psychological needs mediate the relationship between social physique anxiety and motivation. However, to date, only two studies (Thøgersen-Ntoumani & Ntoumanis, 2006, 2007) have examined social physique anxiety as an outcome according to the continuum established by SDT. Using a sample of 375 fitness center users, Thøgersen-Ntoumani and Ntoumanis (2006) found that social physique anxiety was positively predicted by introjected regulation and negatively predicted by intrinsic motivation. In a second study carried out with 149 fitness center instructors, these authors (Thøgersen-Ntoumani & Ntoumanis, 2007) analyzed separately the types of motivation for exercise and satisfaction of the basic psychological needs in the prediction of social physique anxiety. The results indicated that introjected regulation for exercise positively predicted social physique anxiety, whereas satisfaction of the needs for autonomy and competence predicted it negatively. In contrast to the authors' hypothesis, in this second study, intrinsic motivation did not predict social physique anxiety. The authors had suggested that self-determined motivation could increase enjoyment during exercise and decrease social comparison, thereby relieving concern about one's physical appearance. However, based on their results, the authors interpreted that, in very specific populations such as aerobic instructors where the body is constantly exposed, self-determined motivation may not be sufficient to relieve concern about one's body. Moreover, intrinsic motivation is probably reported more frequently by fitness center users than by the instructors. In fact, it is logical to assume that the users who spend free time in a fitness center enjoy themselves more and have more fun during their physical activity than the instructors, for whom exercise in the center is part of their job.

Although these prior studies have provided useful information about the relationships between motivation and social physique anxiety from the perspective of SDT, they also present some limitations. First, in the two studies of Thøgersen-Ntoumani and Ntoumanis (2006, 2007), the instrument used to measure motivation for exercise did not contemplate integrated regulation. This type of motivation does not only imply identifying with the importance of certain behaviors (e.g., exercise) but also integrating these behaviors harmoniously and coherently with other aspects of oneself (e.g., values, identity) (Deci & Ryan, 2000) that may have a clear association with body image. Second, the types of motivation for exercise were not integrated with the basic psychological needs in this setting in connection with their relationship with social physique anxiety. In the 2006 study, the basic psychological needs were not contemplated. In the second study, the needs were measured in the global life domain and were therefore not integrated with the types of motivation for exercise in order to determine the predictive value of both variables (needs and motivations) for social physique anxiety. As established by SDT, people will become more interested and engage in an activity (e.g., exercise) to the extent to which they perceive that it satisfies their basic needs (Deci & Ryan, 2000).

Objectives and Hypotheses of this Study

Drawing from SDT, the objective of this study was to examine the relationship of the basic psychological needs and types of motivation established by SDT—including integrated regulation—with social physique anxiety. For this purpose, the mediation hypothesis derived from SDT was analyzed. Specifically, we studied how motivation mediates the relationship between the basic psychological needs and social physique anxiety. In the analysis, we controlled for the influence of gender and body mass index (BMI), as prior research has shown that girls tend to

display higher levels of social physique anxiety (Eklund, Kelley, & Wilson, 1997; Hagger et al., 2010; Kruisselbrink, Dodge, Swanburg, & MacLeod, 2004; Mülazimoğlu-Balli, Koca, & Aşçi, 2010), and other studies have shown that BMI is positively related to social physique anxiety (Hausenblas & Fallon, 2002; Thompson & Chad, 2000).

Prior studies have analyzed the relationship between self-determination in the exercise context and social physique anxiety, and the positive relationship between dissatisfaction of basic psychological needs, non-self-determined motivation, and maladaptive behaviors (Vallerand, 2007). We therefore hypothesized that satisfaction of the basic psychological needs and the forms of self-determined motivation would have a significant and negative relationship with social physique anxiety, whereas the forms of non-self-determined motivation would have a significant and positive relationship with social physique anxiety. Moreover, we hypothesized that motivation would mediate the relationship between psychological needs in exercise and social physique anxiety.

Method

Participants

Participants in this study were 398 secondary education students (220 boys and 178 girls), aged between 12 and 19 years ($M = 15.08$, $SD = 1.94$), from a Spanish city. The participants' BMI ranged between 12.76 and 30.74 ($M = 20.84$, $SD = 3.09$), although 15 of the students did not indicate their height or weight and were therefore excluded from the analyses that considered this variable. Only 19 students (4.8 %) stated that, outside of the Physical Education classes, they had not exercised for at least 20 minutes during the past two weeks. With regard to the frequency of exercise, 82 students (20.60 %) admitted they exercised only occasionally (less than once a week), 154 students (38.7 %) stated they exercised between once and three times per week, whereas 143 (35.9 %) reported exercising more than three times per week.

Measures

Body Mass Index (BMI). Although weight and height can be obtained by means of direct measurement following anthropometric protocols, recent investigations have shown that there are no important differences between directly obtained data and data from self-reports (Gay, Monsma, & Torres-McGehee, 2009). Thus, as self-reported weight and height are usually sufficient to calculate BMI, thus saving time and money, we asked the participants to report their weight and height, and BMI was calculated by means of the formula: $BMI = \text{weight (kg)} / \text{height}^2 \text{ (m)}$.

Basic Psychological Needs in Exercise Scale (BPNES; Vlachopoulos & Michailidou, 2006). We used the Spanish version adapted by Sánchez and Núñez (2007) to measure basic psychological need satisfaction. This instrument has a total of 12 items, 4 for each one of the basic psychological needs: autonomy (e.g., "The exercise or sport I practice is closely related to my choices and interests"), competence (e.g., "I feel I have been making huge progress with respect to the end result I am pursuing"), and relatedness (e.g., "I feel extremely comfortable when I am with other exercise participants"). The stem for each item is "When I do exercise..." and the responses are rated on a Likert scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). In this study, we obtained Cronbach alpha coefficients of .79 for autonomy, .85 for competence, and .89 for relatedness.

Behavioral Regulation in Exercise Questionnaire (BREQ-3; Wilson, Rodgers, Loitz, & Scime, 2006). We used the Spanish version by Moreno, Cervelló, and Martínez Camacho (2007) of the BREQ-2 (Markland & Tobin, 2004), adding the new items created by Wilson et al. to measure integrated regulation. This new version (BREQ-3) has shown adequate psychometric properties in the Spanish context (González-Cutre, Sicilia, & Fernández, 2010). The instrument, headed with the statement, "Why do you engage in exercise?", consisted of a total of 23 items: 4 for intrinsic motivation (e.g., "I exercise because it's fun"), 4 for integrated regulation

(e.g., “I exercise because it is consistent with my life goals”), 3 for identified regulation (e.g., “I value the benefits of exercise”), 4 for introjected regulation (e.g., “I feel guilty when I don’t exercise”), 4 for external regulation (e.g., “I exercise because other people say I should”), and 4 for amotivation (e.g., “I don’t see why I should have to exercise”). Responses were scored on a Likert scale ranging from 0 (*not true for me*) to 4 (*very true for me*). This study obtained alpha values of .83 for intrinsic motivation, .89 for integrated regulation, .77 for identified regulation, .71 for introjected regulation, .77 for external regulation, and .74 for amotivation.

Social Physique Anxiety Scale (SPAS; Motl & Conroy, 2000, 2001). We used the Spanish version (Sáenz-Alvarez, Sicilia, González-Cutre, & Ferriz, 2013) of the original one-dimensional model. This instrument has seven items (e.g., “I am sometimes annoyed because I think that others are judging my weight or physical fitness negatively”). The participants had to rate their responses on a Likert scale ranging from 1 (*never*) to 5 (*always*). The Cronbach alpha value obtained in this study was .87.

Procedure

The directors of the schools where the participants studied were contacted to request their support, and they informed the Physical Education Department, and the teachers who taught there agreed to collaborate. As the students were minors, they were required to present their parents’ authorization to participate in the investigation.

The scales were administered during Physical Education class. Before administering the questionnaire, the researcher briefly explained the relevance of the study and how to complete the instrument. The questionnaires were handed in individually to detect errors and verify that no item was left unanswered.

Data Analysis

First, we conducted analysis of the descriptive statistics and bivariate correlations among all the variables. Next, stepwise linear regression

analysis was performed to analyze the motivational variables that predicted social physique anxiety. In this analysis, we introduced the variables gender and BMI in Step 1. Boys were coded as value 1, and girls were coded as value 2. Gender and BMI were introduced to control for their effects, as the literature has shown a relationship between these variables and social physique anxiety (Eklund et al., 1997; Hagger et al., 2010; Hausenblas & Fallon, 2002; Kruisselbrink et al., 2004; Thompson & Chad, 2000). Following the sequence proposed by SDT (basic psychological needs → types of motivation → consequences), we entered the needs for autonomy, competence and relatedness in Step 2, and in the last step, we introduced the different forms of motivation: intrinsic motivation, integrated, identified, introjected, and external regulations, and amotivation.

Results

Descriptive Statistics and Bivariate Correlations

Table 1 presents the means and standard deviations of the variables of this study. The scores in satisfaction of the three basic psychological needs were very similar; the mean score for competence was slightly lower than the means for autonomy and relatedness. Regarding the different types of motivation, the highest scores were obtained in two of the self-determined forms of motivation— intrinsic motivation ($M = 3.07$) and identified regulation ($M = 3.18$)—, whereas the lowest scores were obtained in the less self-determined forms of motivation (external regulation and amotivation). The participants’ mean score ($M = 2.60$) in social physique anxiety was lower than the midpoint of the scale.

Using Pearson’s coefficient, the bivariate correlational analysis (Table 1) revealed that, except for identified regulation, all the variables in this study correlated with social physique anxiety. Specifically, the correlation of social physique anxiety with the three basic psychological needs and with two of the self-determined forms of motivation (intrinsic motivation and integrated regulation) was

	Range	M	SD	1	2	3	4	5	6	7	8	9	10	11	12
1. Gender	1-2	-	-	-	-.07	-.26**	-.25**	-.17**	-.30**	-.36**	-.24**	-.07	-.05	-.03	.20**
2. BMI	-	20.84	3.09	-	-	-.04	-.11*	-.08	.01	-.04	.04	.05	.08	.09	.18**
3. Autonomy	1-5	4.10	.87	-	-	-	.82**	.71**	.65**	.60**	.60**	.08	-.07	-.28**	-.22**
4. Competence	1-5	3.91	.94	-	-	-	-	.70**	.61**	.61**	.57**	.09	-.09	-.24**	-.27**
5. Relatedness	1-5	4.16	.95	-	-	-	-	-	.58**	.49**	.55**	.00	-.09	-.27**	-.22**
6. Intrinsic motivation	0-4	3.07	.95	-	-	-	-	-	-	.69**	.64**	.18**	-.02	-.28**	-.12*
7. Integrated regulation	0-4	2.62	1.17	-	-	-	-	-	-	-	.65**	.30**	.05	-.24**	-.19**
8. Identified regulation	0-4	3.18	.91	-	-	-	-	-	-	-	-	.26**	.01	-.34**	-.03
9. Introjected regulation	0-4	1.22	1.02	-	-	-	-	-	-	-	-	-	.57**	.24**	.32**
10. External regulation	0-4	0.80	.93	-	-	-	-	-	-	-	-	-	-	.37**	.33**
11. Amotivation	0-4	0.65	.88	-	-	-	-	-	-	-	-	-	-	-	.12*
12. Anxiety	1-5	2.60	1.04	-	-	-	-	-	-	-	-	-	-	-	-

* $p < .05$. ** $p < .01$.

Table 1: Means, Standard Deviations, and Correlations among all Variables

	<i>B</i>	<i>SEB</i>	β	<i>t</i>	Tolerance	VIF	Adj. <i>R</i> ²
Step 1	.62	.39					.07**
Gender	.41	.10	.20***	3.96	.99	1.01	
BMI	.07	.02	.20***	4.01	.99	1.01	
Step 2	1.94	.39					.10***
Gender	.30	.10	.15**	2.90	.92	1.08	
BMI	.06	.02	.17**	3.45	.97	1.03	
Autonomy	.05	.11	.04	.48	.28	3.56	
Competence	-.21	.10	-.19**	-2.13	.29	3.43	
Relatedness	-.09	.08	.08	-1.11	.45	2.22	
Step 3	.37	.27					.28***
Gender	.27	.10	.13**	2.71	.83	1.20	
BMI	.04	.01	.12**	2.79	.94	1.06	
Autonomy	-.02	.10	-.02	-.19	.26	3.83	
Competence	-.19	.09	-.17*	-2.04	.27	3.71	
Relatedness	-.09	.07	-.08	-1.17	.41	2.42	
Intrinsic motivation	.12	.07	.11	1.67	.41	2.44	
Integrated regulation	-.24	.06	-.27***	-3.93	.39	2.57	
Identified regulation	.19	.08	.17*	2.57	.42	2.37	
Introjected regulation	.26	.06	.25***	4.32	.55	1.83	
External regulation	.25	.06	.22***	2.66	.59	1.70	
Amotivation	-.09	.06	-.08	-1.50	.67	1.48	

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

Table 2: Linear Regression Analysis Predicting Social Physique Anxiety from Gender, BMI, Basic Psychological Needs, and Types of Motivation for Exercise

negative, whereas its correlation with three of the non-self-determined forms of motivation (introjected regulation, external regulation and amotivation) was positive.

Linear Regression Analysis

Table 2 shows the linear regression analysis that predicts social physique anxiety from satisfaction of the basic psychological

needs and the different types of motivation. Variance inflation factor (VIF) values for all variables included in the model were much less than 10, while the corresponding tolerance values were considerably larger than .10, indicating the nonexistence of a serious multicollinearity among the variables (Neter, Kutner, Nachtsheim, & Wasserman, 1996). In the last step, the analysis shows that gender

		Bootstrapping					
		Percentile 95% CI		BC 95% CI		BCa 95% CI	
	Estimate	Lower	Upper	Lower	Upper	Lower	Upper
	Indirect Effects						
Intrinsic motivation	.0622	-.0185	.1446	-.0219	.1466	-.0268	.1354
Integrated regulation	-.1636	-.2514	-.0782	-.2501	-.0803	-.2534	-.0830
Identified regulation	.0953	.0140	.1809	.0149	.1789	.0266	.1881
Introjected regulation	.0244	-.0063	.0592	-.0031	.0627	-.0062	.0613
External regulation	-.0288	-.0631	-.0029	-.0673	-.0054	-.0673	-.0067
Amotivation	.0217	-.0066	.0560	-.0039	.0600	-.0080	.0546
TOTAL	.0111	-.0869	.1191	-.0870	.1164	-.0925	.1136
	Contrasts						
Integrated vs. Identified	-.2589	-.4005	-.1221	-.3945	-.1245	-.4107	-.1439
Integrated vs. External	-.1348	-.2252	-.0450	-.2273	-.0470	-.2247	-.0457
Identified vs. External	.1241	.0368	.2162	.0406	.2161	.0487	.2178

Note. BC, bias corrected; BCa, bias corrected and accelerated; 5.000 bootstrap samples

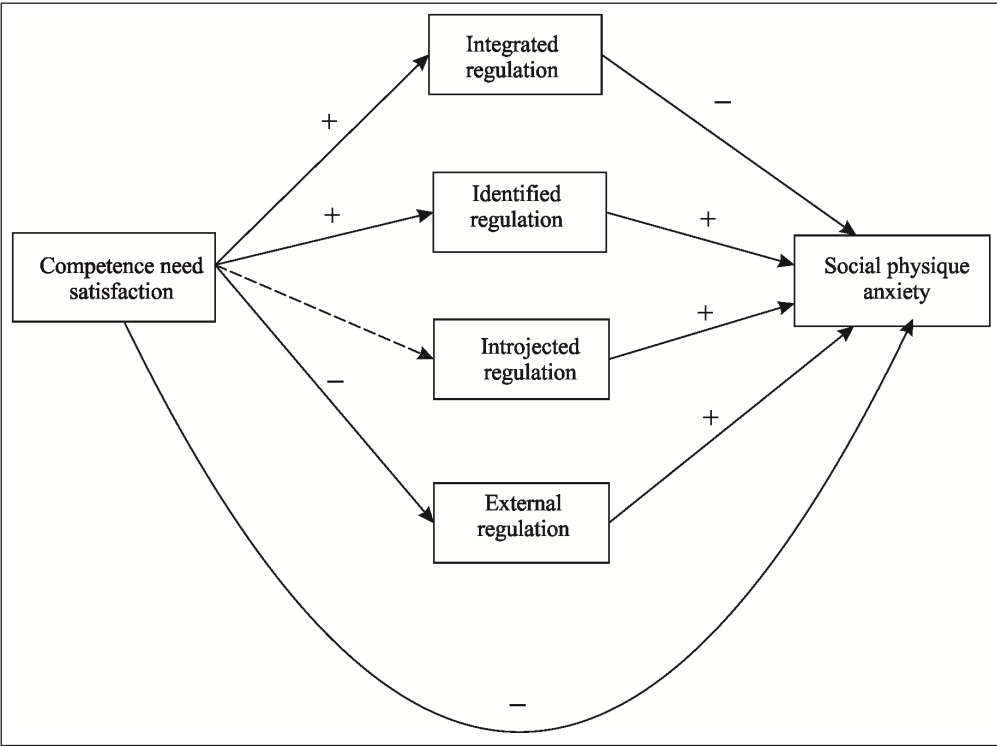
Table 3: Mediation of the Effect of Satisfaction of the Need for Competence on Social Physique Anxiety through Types of Motivation

($\beta = .13$), BMI ($\beta = .12$), identified regulation ($\beta = .17$), introjected regulation ($\beta = .25$), and external regulation ($\beta = .22$) significantly and positively predicted social physique anxiety, whereas satisfaction of the need for competence ($\beta = -.17$) and integrated regulation ($\beta = -.27$) predicted it negatively, conjointly explaining 28% of the total variance.

We used the multiple mediation technique with bootstrapping methods to analyze the mediating effects of the types of motivation in the relationship between satisfaction of the basic psychological needs and social physique anxiety (Hayes, 2009; Preacher & Hayes, 2008). Specifically, we examined how the different types of motivation could mediate the relationship between the need for competence and social physique anxiety. To control for the effects of the variables gender and BMI, they were introduced as covariates in the analysis. The results showed that satisfaction of the need for competence positively predicted integrated regulation ($\beta = .68, p < .001$) and identified regulation ($\beta = .54, p < .001$), and that, in turn, integrated regulation

negatively predicted social physique anxiety ($\beta = -.23, p < .001$), whereas identified regulation predicted it positively ($\beta = .17, p < .05$). Satisfaction of the need for competence negatively predicted external regulation ($\beta = -.11, p < .05$), and external regulation, in turn, positively predicted social physique anxiety ($\beta = .24, p < .001$). Thus, the total effect of satisfaction of the need for competence ($\beta = -.34, p < .001$) on social physique anxiety was comprised of direct effects ($\beta = -.24, p < .001$) and indirect effects ($\beta = -.10, p < .05$, total indirect effects; $\beta = -.16, p < .05$, through integrated regulation; $\beta = .09, p < .05$, through identified regulation; and $\beta = -.03, p < .05$, through external regulation).

Table 3 shows the direction and size of the indirect effects (estimates and 95% CIs). An examination of the indirect effects indicates that integrated, identified, and external regulation were the only mediators between satisfaction of the need for competence and social physique anxiety, as their 95% CIs do not contain zero. Furthermore, examination of the pairwise contrasts of the indirect effects among these three mediators shows



Note. Dashed arrows indicate statistically nonsignificant paths.

Figure 1: Motivational processes explaining social physique anxiety.

that the specific indirect effect through integrated regulation was larger than the rest of indirect effects.

The partial effects of the controlled variables on social physique anxiety were: $\beta = .26, p < .01$, in the case of gender, and $\beta = .04, p < .01$, in the case of BMI. On the basis of these results, we can state (see **Figure 1**) that three types of motivation (integrated, identified, and external regulations) mediated the effect of the need for competence on social physique anxiety. Nevertheless, the direct effect of the need for competence on social physique anxiety was stronger than the indirect effects through the types of motivation.

Discussion

The objective of this study was to analyze the relationships between social physique anxiety and satisfaction of the basic psychological needs and exercise motivation,

taking into account the mediation hypotheses proposed by SDT and controlling for the effects of gender and BMI. This study is an advancement compared to other studies that have addressed the analysis of social physique anxiety as an outcome from the perspective of SDT (Thøgersen-Ntoumani & Ntoumanis, 2006, 2007) because it includes the measure of some variables that were not considered till now, such as satisfaction of the basic psychological needs in exercise and integrated regulation. Moreover, the multiple mediation analysis allowed more precise identification of the motivational process that may be related to social physique anxiety. The proposed hypotheses were partially confirmed, and we found some unexpected relationships between identified regulation, external regulation, and social physique anxiety. Specifically, the results revealed that the need for competence was the only

basic psychological need that negatively predicted social physique anxiety, both directly and mediated by integrated, identified, and external regulations. Gender and BMI were also shown to predict social physique anxiety.

Thøgersen-Ntoumani and Ntoumanis (2007) found that satisfaction of the psychological needs for autonomy and competence negatively predicted social physique anxiety, although autonomy was shown to be a more important predictor of certain indicators of body image concern, among which social physique anxiety was prevalent. Our results are only partially in line with the findings of the study of Thøgersen-Ntoumani and Ntoumanis because only the need for competence was found to be a negative predictor of social physique anxiety. However, our study considered satisfaction of the basic psychological needs in exercise, whereas the study of the former authors considered satisfaction of the three needs in the global life sphere. Cross-sectional studies within exercise contexts have pointed out that the need for competence, more so than the other two basic psychological needs, presents the strongest associations with more self-determined motivation for exercise and health-related behaviors (Edmunds, Ntoumanis, & Duda, 2006; Wilson, Rodgers, Blanchard, & Gessell, 2003). This could explain the differences between the two studies, as research in exercise settings has also found a strong association between perceived competence and lower levels of body dissatisfaction and social physique anxiety (Crocker, Snyder, Kowalski, & Hoar, 2000; Frederick & Morrison, 1996). These results could indicate that, within an exercise setting, the perception of improvement in skill development or in physical condition may be more important to reduce concern about one's body being negatively assessed than feeling integrated in a group or feeling capable of participating in decision-making. Thus, for example, if adolescents notice that by exercising, their body form approaches the desired body form and they feel that their bodies are more

competent than other people's bodies, they are more likely to reduce their levels of social physique anxiety.

However, SDT postulates an important role of the basic psychological needs in people's development and, in this vein, the results of this study are inconsistent with Deci and Ryan's (1985, 2000) contentions. In fact, Deci and Ryan (2000) argued that concern about controlling one's body image may be the result of a lack of autonomy. Thus, the fact that only satisfaction of the need for competence has shown prediction effects on social physique anxiety in adolescents could be explained by the high interfactor correlation between the need for competence and the other psychological needs, especially the need for autonomy, which could have suppressed the magnitude of the relationship between these variables and social physique anxiety in the linear regression analysis. This explanation, which has been indicated in previous exercise-based studies (Wilson & Rogers, 2008), is partially supported by the magnitude of the bivariate correlations shown in Table 1. Nevertheless, an alternative explanation involves the design used in this study. As mentioned, cross-sectional studies within exercise contexts have revealed the chief role of the need for competence in the prediction of behaviors related to image and health. However, this type of design may provide a restricted view of the relationships among the variables of interest by offering no insight into the direction of change over time. In the same vein, longitudinal studies have indicated that the fulfillment of basic psychological needs varies with time in exercise contexts and therefore, in the explanation of behaviors related to health and body image, satisfaction of the need for competence is usually complemented with satisfaction of the need for autonomy (Edmunds, Ntoumanis, & Duda, 2007; Wilson et al., 2003; Wilson & Rogers, 2008). As suggested by SDT, perception of autonomy would lead to internalizing the social value of exercise, which is critical for its integration and

regulation (Ryan & Deci, 2000). Thus, at an initial stage (as adolescence is assumed to be), one may feel competent and begin to exercise but, as time passes, one may begin to understand the meaning of exercise and integrate this meaning with one's other values and goals. Nevertheless, this stage will need a holistic process to allow one to choose without external pressure from others (e.g., the threat of a negative assessment of the body). It seems reasonable to examine the relationship between satisfaction of psychological needs in exercise and social physique anxiety in more detail through longitudinal studies to determine whether the principles proposed by SDT concerning social physique anxiety in exercise contexts can be supported. Therefore, more research with other samples, but also over a more extended period of time, is necessary before proposing definite conclusions about the association between the three basic psychological needs in exercise and social physique anxiety.

Apart from the direct effect of competence need satisfaction on social physique anxiety, the results of the mediation analysis showed that this relationship was partially mediated by integrated regulation and, to a lesser extent, by external and identified regulation. Moreover, although in this study, introjected regulation was not shown to be a mediator between the need for competence and social physique anxiety, it did, however, have a direct effect on the positive prediction of social physique anxiety.

Introjected and external regulations were the two types of non-self-determined motivation that positively predicted social physique anxiety. In fact, the results of bivariate correlations showed that social physique anxiety had a stronger relationship with the non-self-determined types of motivation (i.e., introjected and external regulations) than self-determined motivation (intrinsic motivation and integrated and identified regulations). Exercising to improve one's body appraisal according to certain standards (e.g., an ideal body) is likely associated with body image concern. These results are coherent

with the studies that have found a positive relationship between these types of non-self-determined motivation and body image concern. For example, research has found that the motives of appearance and weight control positively predict external and introjected regulation in exercise contexts (Ingledew & Markland, 2008; Ingledew, Markland, & Ferguson, 2009). Research has also found an association between body-related motives for exercising (e.g., weight control, improving attractiveness) and body dissatisfaction and the perception of a negative body image (McDonald & Thompson, 1992). In the same vein, some studies have indicated that people, especially women, who report engaging in exercise due to body image concerns present higher levels of social physique anxiety than those who report other motives such as socializing, health, or fun (Crawford & Eklund, 1994; Frederick & Morrison, 1996).

Our results partially support both our hypotheses and the studies of Thøgersen-Ntoumani and Ntoumanis (2006, 2007) because, although introjected regulation positively predicted social physique anxiety, in both of these studies, external regulation had no association with social physique anxiety. As these authors acknowledge, due to age and the specific characteristics of the sample used (i.e., fitness center users and instructors), the effects of external regulation may not be noticeable in people who exercise with some frequency. In other words, at first, the motive of exercising to improve one's physical appearance may be determined by others' appraisal and social recognition and, after some time, it may be internalized and turn into introjected regulation. In fact, the results of our study indicate that external regulation partially mediates the relationship between satisfaction of the need for competence and social physique anxiety. Thus, these results suggest that adolescents with low perceived competence could be seeking external reinforcements when exercising (e.g., others' recognition) and these reinforcements could increase their social physique anxiety. However, this

is only a hypothesis, which should be tested in future studies.

Regarding the types of self-determined motivation, integrated and identified regulation mediated the effect of satisfaction of the need for competence on social physique anxiety. It is not surprising that integrated regulation is a negative predictor of social physique anxiety, because feeling competent in an exercise setting usually leads to repeating the behavior (i.e., physical activity), which thereby becomes a part of the person's lifestyle. Thus, if exercise is integrated into people's lives, it is reasonable to conclude that they will become more accustomed to exposing their bodies to others in these situations. Nevertheless, these results differ from those found in the studies of Thøgersen-Ntoumani and Ntoumanis (2006, 2007) because, in their first study, only intrinsic motivation was a negative predictor of social physique anxiety. There could be two main reasons for these differences. First, we should consider the differences in the samples of the first and second study of Thøgersen-Ntoumani and Ntoumanis. Whereas fitness center users exercise in their free time, instructors do it as a part of their job. This could explain why intrinsic motivation was a negative predictor for fitness center users but not for instructors. Second, neither study measured the effect of integrated regulation. Perhaps if these studies had contemplated integrated regulation in their analyses, it would have been revealed as a negative predictor of social physique anxiety. In fact, it is logical to think that regular exercise in fitness centers would reduce the traits involved in social physique anxiety (Sicilia, Aguila, Orta, & Muyor, 2008; Thøgersen-Ntoumani & Ntoumanis, 2007).

Regarding identified regulation, the results show that this type of motivation had the weakest mediation effects between satisfaction of the need for competence and social physique anxiety. However, in contrast to our expectations, the results show a positive association between identified regulation and social physique anxiety. Initially, this association seems difficult to understand, because

identified regulation emerges when a person begins to appraise the benefits of exercising, and this identification has been related to a positive body image and higher self-esteem (Crawford & Eklund, 1994; McDonald & Thompson, 1992). However, it may be that, in the critical stage of adolescence, exercise is not only valued because of its health benefits, but also because of its benefits for beauty, according to the standard of the ideal body. Thus, valuing exercise because of its benefits for image more than for health may explain why this identification is positively associated with social physique anxiety. In fact, Markland and Ingledew (2007) found that the relationship between body image motives and types of motivation for exercise is complex because, although the motives of weight control and physical appearance have shown a strong positive association with introjected regulation, they have also shown a weak association with identified regulation. Nevertheless, future studies need to clarify the relationship between identified regulation in exercise and social physique anxiety.

In the regression analysis, we controlled for the effects of gender and BMI. The results showed that, for this sample, both gender and BMI were significant positive predictors of social physique anxiety. These results are in accordance with previous research that has shown that women and people with a higher BMI are more likely to report higher levels of social physique anxiety than men and groups classified as having a lower BMI (Gargari et al, 2010; Hagger et al., 2010; Mülazimoğlu-Balli et al., 2010; Storch et al., 2007).

Implications and Limitations of the Present Research

This study has shown that competence and motivation for exercise can play an important role in social physique anxiety. Satisfaction of the need for competence has shown direct and indirect effects (through integrated, identified and external regulations) on social physique anxiety. The results of this study suggest that increasing competence within an exercise context can

contribute to diminishing social physique anxiety in adolescents, both directly and indirectly by reducing external pressure to exercise and increasing the internalization process through which the value of exercise can be integrated with the person's own values and goals.

Some implications can be derived from the results of this study. Social agents, especially parents, teachers, and coaches, should encourage adolescents to be more physically active over time in view of the direct consequences that competence appears to have on body image and, consequently, on the reduction of social physique anxiety. In this line, research has reported that the increase of competence, as a consequence of exercising regularly, can achieve changes in the levels of people's body dissatisfaction, and this could lead to the decrease in their levels of social physique anxiety (Altan, & Gençöz, 2008; Fallon & Hausenblas, 2005; Hausenblas & Fallon, 2006). Nevertheless, this study suggests that the development of competence in exercise can also contribute to a reduction of social physique anxiety by helping adolescents to perceive the value of physical activity and to find more self-determined reasons to engage in exercise.

Adolescents who perceive that their physical competence improves will probably make more effort to continue exercising, in spite of the pressure exerted by the environment for the assessment of body image. Therefore, social agents should establish strategies aimed at creating high competence in physical activity settings, in view of the positive consequences this would have for body satisfaction and a reduction of social physique anxiety. During physical activity, adolescents should feel they are attaining the foreseen goals, developing and improving little by little, experiencing efficacy, and achieving the desired results. Making adolescents aware of the fact that physical activity can improve with practice and learning, along with the establishment of moderately difficult goals and tasks that are adapted to their levels seem to be key strategies for improving

perceived competence (Moreno, Cervelló, González-Cutre, Julián, & Del Villar, 2011).

Despite the results of this study, some limitations should be acknowledged. First, to our knowledge, this study is the first one to analyze the mediating effects of different types of motivation in the relationship between satisfaction of the basic psychological needs and social physique anxiety. However, this study did not consider social factors (e.g., perceived autonomy support) that might have helped to complete the analysis from the theoretical motivational sequence established by SDT. Therefore, researchers are encouraged to analyze how social factors may contribute to satisfaction of the basic psychological needs, thereby enhancing certain types of motivation for exercise that lead to a decrease in social physique anxiety in exercise settings. Second, the results of the study indicate that gender and BMI affect the relationship between the variables, so it would be interesting to analyze in larger samples the motivational factors that are precursors of social physique anxiety, differentiating by gender and different BMI levels. This study only represents an approach to the analysis of social physique anxiety in the exercise context, considering various motivational factors described by SDT. Third, future research should employ longitudinal designs to study social physique anxiety, with a view to confirming the results of this study over time and to determining whether these relationships are maintained at different life stages. Lastly, we underline the cross-sectional correlational nature of the study, which precludes establishing causal relations. Thus, when we refer to prediction and effects, we are describing statistical relations and not causal directions. However, causal directions are theoretically possible, but causal relations in the opposite direction are also probable (e.g., Brunet & Sabiston, 2009; Cox et al., 2011). As suggested by research, the relationship between social physique anxiety and exercise is probably bidirectional and with mutual feedback (Altan, & Gençöz, 2008; Hausenblas et al.,

2004). For example, adolescents with high levels of social physique anxiety will probably tend to avoid exercise settings where their bodies may be exposed to others' appraisal (e.g., sports facilities, gymnasiums, Physical Education classes). However, avoiding exercise will probably contribute to their being still more dissatisfied with their body image, which will lead to an increase in their social physique anxiety. In the same vein, satisfaction of the basic psychological needs or the type of motivation towards exercise will also probably be affected as a consequence of the degree of social physique anxiety produced by the environment in a person. Experimental research designs could study how environmental conditions can affect social physique anxiety and how such anxiety affects satisfaction of basic psychological needs and the motives to exercise.

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How to cite this article: Sicilia, A et al. (2014). Exercise Motivation and Social Physique Anxiety In Adolescents. *Psychologica Belgica* 54(1), 111-129, DOI: <http://dx.doi.org/10.5334/pb.ai>

Submitted: 5 June 2013 **Accepted:** 22 October 2013 **Published:** 21 January 2014

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