

**PHYSICAL EXERCISE IN GYMS: PERSPECTIVES OF THE SELF-DETERMINATION THEORY****Carla Maria de Liz, Maick da Silveira Viana, Fábio Hech Dominski e Alexandro Andrade****Universidade do Estado de Santa Catarina, Brasil**

**ABSTRACT:** Reasons for the practice and the motivational regulations of men and women engaged in weight training were investigated. Descriptive cross-sectional study with 252 adherents of weight training (133 men and 119 women). Questionnaires were used to collect data. Men and women are self-determined to practice weight training. The weight loss was positively associated with the introjected regulation and the increase in muscle mass in women and in men to the reason "health and wellness". The increase in muscle mass was associated with intrinsic motivation and the self-determination index of women. The reasons "health and wellness" and "leisure and socialization" were related to each other and to the identified regulation, the intrinsic motivation, and to self-determination index. Older women presented higher introjected regulation, the same occurred with the ones practicing bodybuilding for over a year. Women practicing weight training for over five years presented higher identified regulation.

**KEYWORDS:** Self-determination theory, Physical exercise, Motivational regulations, Motivation.

**EXERCÍCIOS FÍSICOS EM ACADEMIAS: PERSPECTIVAS DA TEORIA DA AUTODETERMINAÇÃO**

**RESUMO:** Foram investigados os motivos de prática e as regulações motivacionais de homens e mulheres praticantes de musculação. Estudo transversal descritivo com 252 aderentes da musculação (133 homens e 119 mulheres). Foram utilizados questionários para a coleta de dados. Homens e mulheres são autodeterminados para praticar musculação. O emagrecimento se associou positivamente à regulação introjetada e ao aumento da massa muscular nas mulheres e nos homens ao motivo saúde e bem-estar. O aumento da massa muscular se associou à motivação intrínseca e ao índice de autodeterminação das mulheres. Os motivos "saúde e bem-estar" e "lazer e socialização" estiveram relacionados entre si e à regulação identificada, motivação intrínseca e ao índice de autodeterminação. Mulheres mais velhas apresentaram maior regulação introjetada, o mesmo ocorreu com as que praticam musculação há mais de um ano. Apresentaram maior regulação identificada as mulheres que praticam musculação há mais de cinco anos.

**PALAVRAS-CHAVE:** Teoria da autodeterminação; Exercícios físicos; Regulações motivacionais; Motivação.

**EJERCICIOS FÍSICOS EN ACADEMIAS: PERSPECTIVAS DE LA TEORÍA DE LA AUTODETERMINACIÓN**

**RESUMEN:** Se investigaron los motivos de reglamentos prácticos y de motivación de los hombres y mujeres que ejercen peso. Estudio descriptivo transversal con 252 adherentes de peso (133 hombres y 119 mujeres). Se utilizaron cuestionarios para la recolección de datos. Hombres y mujeres son auto-determinado para practicar el culturismo. La pérdida de peso se asoció positivamente con la regulación introjetada y el aumento de la masa muscular en las mujeres y los hombres a razones de salud y bienestar. El aumento de la masa muscular se asocia con la motivación intrínseca y la libre determinación del índice de mujeres. Las razones de "salud y bienestar" y "ocio y socialización" se relacionan entre sí y se identificó la regulación, la motivación intrínseca y el índice de autodeterminación. Las mujeres mayores tenían mayor regulación interiorizada, lo hicieron el culturismo practicando durante más de un año. Mostraron mujeres regulación identificada mayores que practican culturismo durante más de cinco años.

**PALABRAS CLAVE:** Teoría de la autodeterminación; Ejercicios físicos; Reglamentos de motivación; Motivación.

Manuscrito recibido: 24/10/2016  
Manuscrito aceptado: 14/11/2017

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Among the aspects that involve regular practice of Physical Exercise (PE), motivational aspects stand out, which are related to the initiation, permanence or withdrawal of the practice. The Self-Determination Theory (SDT) of Deci and Ryan (1985) is one of the theories that has influenced the most the study of motivation (Lindahl, Stenling, Lindwall, & Colliander, 2013), for it covers the degree to which the motivation is less or more self-determined by the individual (Vierling, Standage, & Treasure, 2007), considering that external regulations can manifest in different ways (Deci & Ryan, 2000), as follows: a) *External Regulation (EXR)* - behavior motivated by threats, rewards etc., such as playing a sport because of family pressure; b) *Intrajected Regulation (INR)* - internal pressure to perform an activity, such as feeling guilty for not practicing PE- which are not self-determined; c) *Identified Regulation (IDR)* - behavior perceived as personally important and useful, such as practicing PE expecting improvements in health; d) *Integrated Regulation (INTR)* - behavior understood as important and consistent with other personal aspects, conducted most likely by choice, such as practicing PE for a better quality of life, but without a specific purpose - presenting self-determined components (Boiché & Sarrazin, 2007).

In the extremes of the *continuum* of self-determination are found the amotivation (AMO) and the intrinsic motivation (IM). AMO is a state characterized by the lack of intention. In this case, the person does not realize the reasons for initiating or continuing the activity (Fernandes & Vasconcelos Raposo, 2005). On the other hand, IM is a process characterized by personal choice, satisfaction and pleasure (Brickell & Chatzisarantis, 2007), meaning that the motivational regulations are exclusively internal, having no aim beyond the practice itself.

According to Ryan, Frederick, Lepes, Rubio, and Sheldon (1997) with the identification of the motivational regulations it is possible to comprehend the motivation of individuals in the adhesion process to the practice of physical exercise. In this sense, research has found that people with higher self-determination present higher adhesion to physical sports practices, confirming the assumptions of SDT (Brickell & Chatzisarantis, 2007; Aspano, Lobato, Leyton, Batista, & Jimenez, 2016; Edmunds, Ntoumanis, & Duda, 2006; Granero & Baena, 2014; Ntoumanis, 2005; Silva, Matias, Viana, & Andrade, 2012; Teixeira, Carraça, Markland, Silva, & Ryan, 2012).

Studies have found that the quest for health, idealized appearance, socialization and improved physical fitness are the main reasons that drive people to practice PE in gyms (Balbinotti & Capozzoli, 2008; Klain, Rombaldi, Matos, Leitão, Cid, & Moutão, 2016; Liz, Crocetta, Viana, Brandt, & Andrade, 2010; Marcellino, 2003). It is known that these reasons are mediated by external regulations, however, there is no knowledge about self-determination of women and men with different goals of practice, to the point of not being able to find studies on the topic in main indexing services in the health area.

Studies only suggest that there are differences in motivational profile of men and women to practice PE, that women are more self-determined than men (Amorose & Anderson-Butcher, 2007; Carneiro, & Gomes, 2016; Chantal, Guay, Dobreva-Martinova, & Vallerand, 1996), not furthering in the subject (Markland &

Ingledeu, 2007; Moreno & González, 2006). The purpose of this study is to investigate the motives of the practice and the motivational regulations of men and women engaged in weight training.

## METHOD

This is a descriptive cross-sectional field study. The research procedures were approved by the Human Research Ethics Committee of the University in which the research was conducted, under the reference number 30/2010.

### Participants

The sample was selected in an intentional non-probabilistic manner. A total of 252 adherents in the modality of weight training at 11 gyms in Florianópolis, Santa Catarina State, Brazil participated in the study, with 133 men (52.8%) and 119 women (47.2%). The average age of participants was 34 ( $\pm 12$ ) (min.: 18, max.: 65) years old, same average for men (min.: 18, max.: 65) and women (min.: 18, max.: 65).

### Instruments

Four instruments were used for the collection of information, as follows:

*Questionnaire of characterization of the participant:* This instrument characterizes the participant regarding gender, age, marital status, educational level and health history.

*Questionnaire of socioeconomic classification - ABEP (2013):* Standard Criterion of Economic Classification Brazil/2013 was used, according to the criteria of the Brazilian Association of Research Companies - ABEP (2012) to verify the socioeconomic levels of participants. For analysis, the socioeconomic levels were grouped in three socioeconomic groups: high (A1 and A2), medium (B1 and B2) and low (C1, C2).

*Questionnaire of assessment of the reasons for adhesion to weight training:* This instrument, built for this study based on the review of specific literature and on the results of the pilot study of the Master's Degree dissertation that originated this research, evaluates the reasons attributed to the practice of weight training in gyms. The instrument consists of 10 Likert scales of five levels, which assess the degree of importance of each reason of adhesion to weight training (1 - Health-related weight loss; 2 - Weight loss related to aesthetics; 3 - Health / Wellness / Health promotion and maintenance; 4 - Health / Fitness / Physical Conditioning; 5 - Aesthetics (Related to an increase in muscle mass); 6 - Muscle and bone strengthening; 7 - Medical orders; 8 - Meeting people / Socialization; 9 - Leisure / Pleasure of practicing weight training; 10 - Willingness to handle daily activities).

In order to group the reasons in different dimensions, a factorial analysis was conducted using the extraction method of analysis of the main components. The minimum charge established was 0.5 so that the question became part of the factor (eigenvalues > 1). Sphericity tests of Barlett and Kaiser-Meyer-Olkin were performed, which indicated that the data matrix was suitable to conduct the factorial analysis. From this analysis, the analyzed constructs were divided as follows: Weight loss (questions 1 and 2); Health and Wellness (questions 3, 4, 6, 7, 10); Leisure and Socialization (questions 8 and 9); Increase in

Body Mass (question 5). The constructs were represented by the means of the questions that were framed to them.

**Behavioral Regulation in Exercise Questionnaire (BREQ - 2):** The motivation of weight training practitioners was investigated using the *Behavioral Regulation in Exercise Questionnaire-2* (BREQ - 2) (Markland & Tobin, 2004). The questionnaire consists of 19 Likert scales, with five response options (0 = not true for me, 4 = Often true for me), separated in five different constructs: AMO (eg: I think exercise is a waste of time), EXR (eg: I exercise because other people say I should), INR (eg: I feel guilty when I don't exercise), IDR (eg: I value the benefits/advantages of the exercises) and IM (eg: I like my exercise sessions). The self-determination index (SDI) was used. Which is the score obtained by the following formula:  $(-3 \times \text{AMO}) + (-2 \times \text{EXR}) + (-1 \times \text{INR}) + (2 \times \text{IDR}) + (3 \times \text{IM})$ . The index can range from -24 (lower self-determination) to 20 (higher Self-determination). BREQ - 2 was translated and validated to the Portuguese language by Palmeira, Teixeira, Silva, & Markland (2007) in Portugal. The Brazilian version was adapted by Viana (2009), which achieved good rates of internal consistency (Cronbach's  $\alpha$  ranging from .65 to .80) and clarity.

### Procedures

Initially, it was requested the formal authorization of those responsible for the gyms to carry out the study in their respective establishments. After the consent of the owners, the subjects practicing weight training for at least six months were verbally invited to participate in the research. The ones that agreed received the Consent Form, which explained the voluntary nature of the research and its procedures, and the questionnaire used for the research.

During two months, the data collection instruments were applied in a reserved location, inside the gyms, so that the participants could fill them with the least possible interference. Two properly trained researchers were present at the time of data collection. The average time to fill the instrument was 10 minutes, at which time the researchers were present to clarify any possible questions.

### Statistical Analysis

The data was analyzed in the program "*Statistic Package for the Social Sciences*" – SPSS version 20.0. Data normality was tested using the Kolmogorov-Smirnov test. Results are presented as mean (*M*) and standard deviation (*SD*).

Table 1

*Descriptive analyzes and correlations among the motivational regulations, self-determination index, and reasons for the practice of weight training of men (lower diagonal) and women (upper diagonal).*

	<i>M</i> ♂	<i>SD</i> ♂	<i>M</i> ♀	<i>SD</i> ♀	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
(1) Weight loss†	1.83	1.28	2.71	1.28	-	.114	.089	.182*	.039	.161	.202*	.098	.050	-.034
(2) Health and wellness	2.82	0.60	2.93	0.60	.182*	-	.465**	.145	-.093	.043	.086	.200*	.281**	.248**
(3) Leisure and socialization	1.87	1.04	1.92	1.10	.122	.209*	-	.093	.091	.066	.101	.182*	.460**	.295**
(4) Muscle Mass†	3.12	1.12	3.45	0.90	.109	-.012	.331**	-	-.085	-.046	.062	.164	.183*	.196*
(5) Amotivation†	0.06	0.24	0.15	0.33	-.132	-.073	-.038	-.057	-	.301**	.143	.076	-.134	-.443**
(6) External Regulation†	0.09	0.22	0.18	0.37	-.204*	-.050	-.041	.066	.251**	-	.293**	-.019	-.241**	-.542**
(7) Introjected Regulation	1.27	1.03	1.44	1.03	.169	.065	.160	.219*	-.199*	.018	-	.473**	.122	-.132
(8) Identified Regulation	3.10	0.63	3.07	0.68	.100	.359**	.205*	.094	-.283**	-.068	.410**	-	.392**	.478**
(9) Intrinsic Motivation	2.94	0.74	2.94	0.76	.054	.205*	.468**	.093	-.265**	-.190*	.146	.401**	-	.844**
(10) SDI	13.38	3.25	12.69	3.58	.080	.283**	.364**	.034	-.486**	-.357**	-.016	.605**	.879**	-

Note: Self-determination Index (SDI); \*Correlation significant at level  $p < .05$ , \*\* $p < .01$ . †Significant difference between sexes at  $p < .05$

The T test was used for independent samples to compare the goals of practice and the motivational regulations of two groups and Analysis of Variance (One Way ANOVA) with Post-Hoc of Scheffé to compare three or more groups. For correlation analysis between the goals of practice and the motivational regulations, Pearson's *r* test was used. The level of statistical significance was defined as  $p < .05$ .

### RESULTS

Motivational regulations of men and women were positively related to the nearest constructs, and negatively with the farthest. Highlighting two points in particular: the negative correlation of AMO with other regulations, except the external, located closer to the continuum; and the most significant correlations between IM and introjected and identified regulations. AMO and EXR had a negative correlation with the self-determination index, while IM and IDR had positive correlations with it (Table 1).

With respect to comparative analysis between the goals of weight training practice of men and women, it was found that weight loss and the increase in muscle mass are more important for women than for men. As for motivational regulations, women had higher AMO and EXR to the practice of weight training when compared to men (Table 1).

The AMO and the EXR have little influence in the practice of weight training. On the other hand, the indexes of IDR and IM were high, resulting in a high SDI both for men and for women (Table 1).

With regard to the reasons for weight training practice and motivational regulations, it was found that "weight loss" was positively related to INR for women, and negatively related to EXR in men. Highlighting that "weight loss" was positively related with "increase in muscle mass" for women and "health and wellness" for men (Table 1).

For men and women, the reasons "health and wellness" and "leisure and socialization" were positively related to each other, as well as with identified regulation, intrinsic motivation, and to the self-determination index. For men, the reason "leisure and socialization" was positively related to "increase in muscle mass" and this to INR. For women, "increase in muscle mass" was positively related to IM and to the SDI (Table 1).

It was observed that women with age between 31 and 50 years old were more amotivated to practice weight training than those of other age groups (18-30 and 51-65 years old). On the other hand, women aged 31-50 years old presented greater IDR than women between 51-65 years old. Older women (51-65 years old) presented lower INR than younger women (18-30 and 31-50 years old). Men belonging to different age groups did not differ significantly regarding motivational regulations (Table 2).

Women who practice bodybuilding for more than one or five years presented higher INR than women who practice weight training for less than a year. Those who practice weight training for over five years presented a higher IDR than women who practice weight training for less than one year (Table 2).

The marital status, education and socioeconomic level of men and women were not associated with the motivational regulations (Table 2).

Table 2  
Motivational regulations of women and men in terms of sociodemographic characteristics (M/SD).

Female	AMO	EXR	INR	IDR	IM	SDI
	M ± SD	M ± SD	M ± SD	M ± SD	M ± SD	M ± SD
<i>Age groups</i>	*		*	*		
18 - 30 years old	0.06±0.20 <sup>a</sup>	0.19±0.37	1.58±1.00 <sup>a</sup>	3.02±0.67	2.84±0.73	12.42±3.49
31 - 50 years old	0.31±0.44 <sup>ab</sup>	0.20±0.43	1.52±1.07 <sup>b</sup>	3.25±0.61 <sup>a</sup>	3.07±0.77	12.84±3.71
51 - 65 years old	0.00±0.00 <sup>b</sup>	0.07±0.15	0.61±0.62 <sup>ab</sup>	2.69±0.77 <sup>a</sup>	2.89±0.86	13.30±3.72
<i>Marital status</i>						
With partner	0.18±3.75	0.17±0.39	1.30±1.03	3.11±0.65	2.97±0.80	12.96±3.91
Not live with partner	0.13±0.31	0.19±0.37	1.52±1.03	3.04±0.70	2.92±0.75	12.54±3.41
<i>Education</i>						
Basic Education	0.19±0.38	0.16±0.37	1.35±1.04	3.10±0.65	2.99±0.72	12.91±3.48
Under graduate	0.13±0.31	0.22±0.40	1.47±1.01	3.04±0.68	2.85±0.79	12.33±3.72
Postgraduate	0.10±0.31	0.00±0.00	1.56±1.20	3.17±0.80	3.37±0.55	14.60±2.23
<i>Socioeconomic level</i>						
High level	0.12±0.29	0.11±0.24	1.73±1.00	3.25±0.70	2.99±0.77	13.15±3.10
Medium level	0.15±0.34	0.23±0.43	1.36±1.02	3.02±0.67	2.92±0.78	12.54±3.88
Low level	0.19±0.39	0.05±0.14	1.38±1.11	3.00±0.67	2.92±0.71	12.70±2.64
<i>Time of weight training practice</i>			*	*		
6 to 11 months	0.12±0.28	0.19±0.34	1.06±0.84 <sup>ab</sup>	2.83±0.64 <sup>a</sup>	2.89±0.80	12.54±3.44
1 to 5 years	0.13±0.31	0.19±0.42	1.65±1.02 <sup>a</sup>	3.14±0.68	2.95±0.81	12.71±3.63
More than 5 years	0.21±0.42	0.16±0.37	1.69±1.15 <sup>b</sup>	3.30±0.66 <sup>a</sup>	2.97±0.66	12.88±3.82
<b>Male</b>						
	M ± SD	M ± SD	M ± SD	M ± SD	M ± SD	M ± SD
<i>Age groups</i>						
18 - 30 years old	0.06±2.51	0.11±0.22	1.42±1.11	3.01±0.68	2.90±0.83	12.89±3.52
31 - 50 years old	0.04±0.18	0.08±0.25	1.14±0.86	3.23±0.56	2.96±0.58	13.92±2.61
51 - 65 years old	0.14±0.34	0.01±0.06	0.92±1.09	3.10±0.53	3.03±0.79	13.92±3.74
<i>Marital status</i>						
With partner	0.07±0.25	0.06±0.21	1.23±0.97	3.19±0.59	2.96±0.70	13.69±3.06
Not live with partner	0.05±0.23	0.11±0.22	1.29±1.07	3.05±0.65	2.92±0.76	13.19±3.37
<i>Education</i>						
Basic Education	0.03±0.14	0.14±0.29	1.40±1.05	3.19±0.74	2.97±0.65	13.51±2.97
Under graduate	0.07±0.25	0.07±0.19	1.18±1.01	3.04±0.61	2.90±0.79	13.23±3.37
Postgraduate	0.08±0.32	0.10±0.22	1.46±1.08	3.31±0.43	3.08±0.63	13.96±3.29
<i>Socioeconomic level</i>						
High level	0.12±0.30	0.10±0.24	1.39±1.13	3.25±0.62	2.90±0.73	13.22±3.21
Medium level	0.04±0.21	0.10±0.22	1.23±1.01	3.03±0.63	2.94±0.76	13.34±3.30
Low level	0.00±0.00	0.02±0.08	1.11±0.78	3.25±0.53	3.05±0.67	14.50±3.16
<i>Time of weight training practice</i>						
6 to 11 months	0.13±0.35	0.16±0.28	1.17±0.93	3.07±0.56	2.77±0.83	12.55±3.73
1 to 5 years	0.03±0.12	0.09±0.19	1.29±1.04	2.99±0.60	2.89±0.66	13.10±2.88
More than 5 years	0.06±0.26	0.05±0.21	1.28±1.09	3.27±0.67	3.09±0.75	14.25±3.27

Note: Amotivation (AMO); External Regulation (EXR); Introjected Regulation (INR); Identified Regulation (IDR); Intrinsic Motivation (IM); Self-determination Index (SDI).

Same letters represent significant differences between groups (<sup>ab</sup>). \* Significant difference at  $p < .05$

Women in the superior age groups (31-50 and 51-65 years old) attribute greater importance to the benefits to health and wellness resulting from weight training than younger women. Furthermore, women aged 31 to 50 years old practice weight training more for leisure and socialization than women aged 18 to 30 years old. Among women, marital status, education,

socioeconomic level and amount of time practicing weight training were not related to reason to for the practice of weight training (Table 3).

Among men, the younger (18-30 and 31-50 years old) practice weight training more to increase muscle mass than those with a superior age (51 - 65 years old). Those who do not have a partner,

give more importance to practice of weight training to increase muscle mass than men that have a partner. Those with a under

graduate value weight training more for weight loss than those that only completed basic education.

Table 3

Reasons attributed to the practice of weight training depending on the sociodemographic characteristics of women and men.

	Weight Loss	Health and Wellness	Leisure and Socialization	Muscle Mass
Female				
	<i>M</i> ± <i>SD</i>	<i>M</i> ± <i>SD</i>	<i>M</i> ± <i>SD</i>	<i>M</i> ± <i>SD</i>
<i>Age groups</i>		*	*	
18 - 30 years old	2.64±1.30	2.70±0.52 <sup>ab</sup>	1.68±1.03 <sup>a</sup>	3.47±0.87
31 -50 years old	2.91±1.13	3.13±0.62 <sup>a</sup>	2.20±1.13 <sup>a</sup>	3.47±0.86
51 - 65 years old	2.32±1.62	3.25±0.45 <sup>b</sup>	2.00±1.17	3.28±1.20
<i>Marital status</i>				
With partner	2.90±1.29	3.01±0.66	1.92±1.19	3.42±0.96
Not live with partner	2.60±1.27	2.89±0.56	1.92±1.06	3.46±0.88
<i>Education</i>				
Basic Education	2.45±1.20	2.84±0.74	2.00±1.21	3.28±1.20
Under graduate	2.84±1.27	2.98±0.52	1.90±1.04	3.50±0.76
Postgraduate	2.60±1.59	2.92±0.65	1.80±1.27	3.70±0.67
<i>Socioeconomic level</i>				
High level	2.75±1.27	2.91±0.62	1.88±0.99	3.40±0.93
Medium level	2.67±1.33	2.98±0.57	1.96±1.12	3.52±0.84
Low nivel	2.78±1.12	2.70±0.72	1.75±1.26	3.14±1.16
<i>Time of weight training practice</i>				
6 to 11 months	2.63±1.29	286±0.67	1.72±1.10	3.55±0.75
1 to 5 years	2.77±1.06	3.01±0.55	2.14±1.13	3.40±0.93
More than 5 years	2.73±1.55	2.93±0.55	1.92±1.05	3.37±1.07
Male				
	<i>M</i> ± <i>SD</i>	<i>M</i> ± <i>SD</i>	<i>M</i> ± <i>SD</i>	<i>M</i> ± <i>SD</i>
<i>Age groups</i>				*
18 - 30 years old	1.77±1.37	2.71±0.60	1.96±1.05	3.49±0.79 <sup>ab</sup>
31 -50 years old	1.89±1.20	2.94±0.61	1.91±1.05	2.92±1.27 <sup>ac</sup>
51 - 65 years old	1.96±1.16	2.98±0.47	1.32±0.82	2.07±1.14 <sup>bc</sup>
<i>Marital status</i>				*
With partner	2.00±1.26	2.91±0.63	1.71±1.06	2.80±1.21
Not live with partner	1.73±1.29	2.77±0.58	1.97±1.01	3.32±1.01
<i>Education</i>	*			
Basic Education	1.29±1.06 <sup>a</sup>	2.77±0.65	2.14±1.19	3.51±0.72
Under graduate	2.02±1.31 <sup>a</sup>	2.81±0.62	1.81±1.00	3.03±1.16
Postgraduate	1.87±1.29	2.97±0.35	1.65±0.88	2.87±1.40
<i>Socioeconomic level</i>				
High level	1.98±1.32	2.92±0.58	1.66±1.10	2.79±1.30
Medium level	1.85±1.28	2.76±0.61	1.94±0.96	3.29±1.04
Low level	1.05±0.88	2.97±0.66	2.11±1.43	3.00±0.70
<i>Time of weight training practice</i>				
6 to 11 months	1.76±1.32	2.95±0.59	1.67±1.01	3.03±0.99
1 to 5 years	1.81±1.27	2.75±0.56	1.75±1.07	3.08±1.21
More than 5 years	1.90±1.30	2.83±0.65	2.14±0.98	3.23±1.08

Note: Same letters represent significant differences between groups (<sup>ab</sup>). \* Significant difference  $p < .05$

## DISCUSSION

This is an innovative study because there is an establishment of relations between the reasons for practice of strength training and the motivational regulations, since there is no this type of analysis in the literature. Most of these studies focuses on only one of these variables. In analyzing these relationships, it is possible to understand the process of adhesion to the practice of strength training of men and women and contribute to the field of Sport and Exercise Psychology through one of the most used theories for the study of motivation, the SDT.

The correlations that were verified between the motivational regulations in this study confirm the assumptions of SDT that indicate a continuum of self-determination (Ryan & Deci, 2000). Motivational regulations were positively related to the nearest levels and negatively with the farthest ones, showing that, in

general, when external demands to practice weight training are high, the pleasure for the practice tends to be lower. These results, combined with the assumptions of SDT, point to the tendency that weight training practitioners with higher external regulations are less intrinsically motivated.

Regarding the motivation to practice weight training, the results show that participants are self-determined, with high index of IM and low index for AMO and external regulation. IM is a process characterized by personal choice, satisfaction and pleasure (Brickell & Chatzisarantis, 2007). On the other hand, according to Ryan et al. (1997), extrinsic motivations predict short-term adhesion, while a longer involvement needs more intrinsic motivations. The more intrinsic motivations, according to the assumptions of SDT, are the regulations that influence the

most the process of adhesion to the practice of PE (Ryan & Deci, 2000).

SDT suggests that it is possible to reduce the negative effects of extrinsic motivation using internalization, which is the means by which individuals reconstruct behaviors that were previously controlled externally, in a way that they become more self-determined (Deci & Ryan, 2000). Thus, an activity that is initiated by external control can, over time, take over other types of internal regulations (Gagné, Ryan, & Bargmann, 2003; Wilson, Rodgers, Blanchard, & Gessel 2003), to the point of the individual believing to be autonomous in choosing his behavior (Markland & Ingledew, 2007).

In the interpretation of the results of the present study, it is important to take into account the fact that the participants are practicing weight training for more than six months, having already surpassed the critical period of adhesion (Buckworth & Dishman, 2002). Thus, it is expected of them to be more autonomous in their practice, which may be different for beginners in the modality.

The present study found that motivational regulations were related to the amount of time practicing weight training for women, meaning that women who practice weight training for less than a year feel less internally pressured when not practicing in relation to those that practice for over a year, for they present lower introjected regulation. Furthermore, women who practice weight training for more than five years recognize and appreciate the benefits of this practice (identified regulation) more than those practicing for less time. Confirming the findings of this study, Pelletier, Fortier, Vallerand, and Briere (2001) found that IM and IDR were predictive of persistence in the practice of PE during the 22 months of their research. Wilson et al. (2003) found that 70% (n = 53) of practitioners who joined the 12 weeks of exercise proposed in the study revealed a moderate to high increase in identified and intrinsic regulation.

As for motivational regulations and objectives of practicing weight training for men and women, the results of this study showed a tendency that the higher the INR in women, the more she seeks weight loss through the practice of weight training and this weight loss appears to be associated with an increase in muscle mass. Unlike women, it can be said that men do not feel obliged to practice weight training to lose weight, however, they feel good and healthier if they are thinner, because their EXR was associated negatively with the reason "weight loss" and positively associated with the reason "health and wellness" for men.

According to Alves, Pinto, Alves, Mota and Leirós (2009), the increase in muscle mass in the expense of adipose tissue may be related to both the aesthetic standards imposed by society today, as well as improved health. A higher muscle mass is associated, among other factors, to increased basal metabolism and, therefore, weight training can contribute to body fat reduction and prevent future weight gain (Fleck & Kraemer, 2006).

In a systematic review of international studies that used SDT to analyze the practice of physical exercise, Teixeira et al. (2012) draws attention to the fact that one cannot affirm that health concerns can easily be defined as an intrinsic or extrinsic motivation, for it depends on the significance of such motive for the individual. Thus, it is possible to suggest that men and

women seek the practice of weight training targeting both fitting in aesthetic standards and preventing health risk factors.

Another trend indicated in this study, is that while men feel pressured to practice weight training to increase muscle mass, women who practice weight training aiming to increase muscle mass are the ones who appreciate and enjoy weight training the most. A sculptural body with architected muscles is more than a personal desire, it is almost an imposition of modern society, being considered, by many, to be an important element for success in interpersonal relationships (Crossley, 2006; Ludorf, 2009). This reality is found in gyms, where in many cases physical appearance is the only or the most important goal of its regulars.

In the literature, the presented idea is that men have a greater concern with the development of the thorax and upper limbs, while women, with the abdomen, buttocks and lower limbs (Hansen & Vaz, 2004; Sabino, 2000). Frederick-Recascino (2002) suggests that social pressure to obtain a certain prototype of beauty is higher for women than for men, and this may contribute to different levels of self-determination among these. Thus, the fact that women are more pressured than men to be within the imposed beauty standards may explain why aesthetics motives to practice PE are higher for women than for men. This situation causes the self-determination to practice PE to be lower for women.

In the study by Kilpatrick, Hebert and Bartholomew (2005), it was found that men were more motivated by reasons related to the development of strength and endurance, social recognition, challenge and competition, while women were more motivated to reasons related with the concern with their body weight. Pavón, Moreno, Gutiérrez, and Sicilia (2004) tested the existence of possible differences between men and women engaged in physical activity in the aesthetic dimension and found that women are significantly more motivated by reasons related to aesthetics than men. Gillison, Standage, and Skevington (2006) found that in men the motives for exercise practice were related to physical condition and health, while women referred to the motives of muscle toning, health and appearance.

In the present study, the reasons "health and wellness" and "leisure and socialization" were associated to the more internal regulations in men and women (identified regulation, intrinsic motivation). According to the assumptions of SDT, the reasons cited are mediated by more extrinsic regulations (identified and integrated regulation), because the subject is not joining in the activity for the pleasure and satisfaction that it provides, but rather, seeking some reward arising from the practice. Moreno and González-Cutre (2006) pointed out that the pleasure of engaging in any PE is related to the benefits that this practice provides to the physical and/or mental health of the individual. Balbinotti and Capozzoli (2008) state that pleasure is associated to feelings of well-being, fun and satisfaction with the practice. Furthermore, the pleasure assumes the interest towards the activity as well as the need and importance of the practice, perceived by the practitioner (Balbinotti & Capozzoli, 2008). In the case of weight training, pleasure seems to be directly associated with the result that such training can provide if performed in a well supervised, correct manner, meaning it should be considered as a more extrinsic motivation. These results can be aesthetic, such as increased body mass and decreased body fat percentage, or may be related to the training

itself, like being able to perform the proposed exercises, with a periodic increase in the overloads. Thus, the results obtained with the practice of exercise, can lead the practitioner to enjoy it, increasing their motivation to practice.

The age of the practitioners has also been referred to as a differentiating variable of the autonomic regulation to practice exercise, because the reasons for the practice change throughout life (Campbell et al., 2001). In this study, it was found that with the increase in age, both men and women worry less about body image and more about health and wellness. It was also found that women belonging to the age group of 51-60 years old feel less internally pressured when they do not practice weight training than those belonging to other age groups, for they present lower introjected regulation.

Over the years, PE practitioners seek the maintenance of health and well-being with the practice, which differentiate the older practitioners from the ones belonging to other age groups, where there is a concern with aesthetic factors (Beck, Gillison, & Standage, 2010; Moreno, Hellín, & Rodríguez-García, 2004; Klain et al. 2016). This trend was also identified by Beck, Gillison and Standage (2010), that found that motives related to physical appearance decreased as the age increased, as result of a change in values, objectives and circumstances of health over time, so that more importance is given to the improvement in physical function and to the health benefits offered by the practice of physical exercise. In a similar manner, Moreno, Hellín, and Rodríguez-García (2004) found that the reasons for the practice of PE of elderly people were related to fun and relaxation, and the reasons related to body image and appearance decreased in this age group.

Regarding the level of education, it was found that men who have completed higher education practice weight training focusing more at weight loss than men that only completed basic education. The higher educational level is associated with a greater understanding of the benefits in health provided by the practice of PE (Domingues, & Araujo, 2004). Santos and Knijnik (2006) concluded that many PE practitioners associate the practice with body weight control, considering this is a form of preventing obesity and health maintenance. Thus, it is possible to suggest that men with higher educational levels practice weight training seeking the control of body weight in favor of improvements in health.

Considering the results and discussions presented, it was found that SDT is a viable and useful theory for the understanding of the motivation for the practice of weight training, and it can be applied by researchers and professionals involved in this context. Suggested that professionals working in gyms get to know the profile of weight training practitioners, trying to develop a taste for the practice and, consequently, more self-determined motivations. To focus the practice of weight training only on extrinsic reasons may discourage the practitioner, causing him to give up the practice if he is not able to reach the predetermined goals. SDT suggests the development of three basic psychological needs, as follows: competence, autonomy and relatedness (Deci & Ryan, 1985). A professional guidance that fosters these three needs can be helpful to increase IM and ensure permanence in PE practice (Kilpatrick, Hebert & Jacobsen, 2002; Mangeau & Vallerand, 2003; Moreno & Rodríguez-García, 2006).

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