

## Self-determined motivation and state of flow in an extracurricular program of Small Sided Games

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**Título:** Motivación autodeterminada y estado de flow en un programa extraescolar de Small Sided Games.

**Resumen:** El propósito de este trabajo fue analizar los efectos de un programa extraescolar de Small Sided Games (SSGs) basado en el fútbol sobre la motivación autodeterminada y el estado de flow. El programa tuvo una duración de 11 semanas y participaron 47 adolescentes varones del sector de Playa Ancha (Valparaíso, Chile) (15.57 ± .72 años). Se empleó un diseño cuasi-experimental pre-post test con un grupo control. Para evaluar la motivación se utilizó el Cuestionario de Regulación de la Conducta en el Ejercicio (BREQ-3) y para analizar el estado de flow se utilizó la Escala de Estado de Flow (FSS). Los resultados obtenidos indicaron efectos positivos del programa sobre la regulación intrínseca, la regulación introyectada, la desmotivación, la percepción del equilibrio reto-habilidad, la distorsión del tiempo y la experiencia autotélica. Estos datos sugieren que la participación deportiva en horario extraescolar podría incidir positivamente en la motivación autodeterminada y el estado de flow, mejorando la experiencia de práctica físico-deportiva en el contexto escolar.

**Palabras clave:** actividad física; juegos reducidos; adolescentes; motivación; flow.

**Abstract:** The aim of this work was to analyze the effects of a Small Sided Games (SSG) extracurricular program based on football in the self-determined motivation and state of flow. The program lasted 11 weeks and 47 adolescents from Playa Ancha (Valparaíso, Chile) (15.57 ± .72 years). A quasi-experimental design pre-post test was used with a control group. In order to evaluate the motivation, the Behavioural Regulation in Exercise Questionnaire (BREQ-3) was used, and, to analyze the flow, the Flow State Scale was used (FSS). The results obtained indicated positive effects of the program on intrinsic regulation, introjected regulation, amotivation, the perception of the challenge-skill balance, the distortion of time and the autotelic experience. These data suggest that sports participation in extracurricular hours could have a positive impact on self-determined motivation and the state of flow, improving the experience of physical-sporting practice in the school context.

**Keywords:** Physical activity; Small Sided Games; adolescents; motivation; flow.

### Introduction

Is vital to analyze the different aspects that may be involved in the realization of physical activity in the school context, specifically sports extracurricular activities, since these can improve and promote benefits both physical, social and psychological (American College of Sports Medicine, 2013), thus increases the motivation of students (Castillo, 2000; Cervelló & Santos-Rosa, 2000). For this reason, the purpose of this work was to analyze the effects of a Small Sided Games (SSG) extracurricular program based on football in the self-determined motivation and state of flow.

Motivation is a factor that influences behavior and is considered essential to persist in carry out any kind of task. In the field of the physical activity and sport, one of the most solid theories used to explain the adherence to physical practice is the Self-Determination Theory (SDT) (Deci & Ryan, 1985, 2000), which constitutes an important area of study in Sport Psychology (Gunnell, Crocker, Mack, Wilson, & Zumbo, 2014; Moreno, Cervelló & González-Cutre, 2010). This establishes that motivation can be explained through a continuum with different levels. At one end the intrinsic motivation would be. Briere, Vallerand, Blais and Pelletier (1995) they argue that intrinsic motivation is the practice of

an activity in the absence of contingency (rewards) external. In addition, it is associated with higher levels of self-determination and involves engagement in an activity for the pleasure that you get to do it. On the other hand, it would be the extrinsic motivation, which would include four types of control (integrated, identified, introjected and external).

The least self-determined of them is external regulation, occurs when the behavior is controlled by external contingencies (Deci & Ryan, 2000), for example "practical sport to show my friends how good I am", then the introjected regulation here there is a feeling of obligation for any reason (Ryan & Deci, 2000), for example "I feel bad if I did not take the time to practice sport", the more self-determined is identified regulation, (Deci & Ryan, 2000), for example "I practice sports because it is good for health". The most self-determined form of extrinsic motivation would be integrated regulation, is produced when a task is in line with a person's values and is included in their lifestyle (Ryan & Deci, 2000). Finally, in another of the poles would be the amotivation, which is the lowest level of self-determination and would be associated with the lack of intention to commit to a particular behavior (Deci & Ryan, 2000).

Several studies have shown that high levels of intrinsic motivation are associated with a greater likelihood of enjoying practicing physical or sports activity and increased adherence to this type of tasks (Cox, Ullrich-French, & Sabiston, 2013; Lonsdale, Sabiston, Raedeke, Ha & Sum, 2009). Like-

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wise, in other works found data suggesting that extrinsic motivation or amotivation increases possibilities of desertion and lack of motivation (García-Calvo, Cervelló, Jiménez, Iglesias, & Moreno, 2010). In the school environment, scientific evidence has shown that generating an adequate motivational climate in which intrinsic motivation increases allows students to enjoy more physical-sports practice and improve learning processes (Moreno, Sicilia, Cervelló, Huéscar, & Dumitru, 2011; Ntoumanis, 2005; Taylor, Ntoumanis, Standage, & Spray, 2010).

Also, when the intrinsic motivation determines the participation in any context, including physical practice, there is a greater probability of experiencing what is called flow states (Jackson, Kimiecik, Ford, & Marsh, 1998; Schüler, Sheldon, & Fröhlich, 2010; Sicilia, Moreno, & Rojas, 2008). This construction was developed by Csikszentmihalyi (1975, 1997) and was applied to sports by Jackson (1995, 1996). The flow state refers to the optimal subjective experience that allows facing a task in the best possible psychological conditions and is characterized by the following aspects: Balance between skill and challenge, fusion of action and thought, clarity of objectives, clear feedback and direct, concentration on the task being performed, sense of control, loss of self-consciousness or inhibition, distortion of time perception and experience autotelic (Csikszentmihalyi, 1990). It is important to assess these circumstances when the physical practice is analyzed at school age for people who develop flow experiences tend to become more involved in the tasks that they are performing and to get a greater satisfaction, which can favorably affect their participation in this type of activities (Gouveia, Pais-Ribeiro, Moreira, & Carvalho, 2012; Swann, Keegan, Piggott, & Crust, 2012). In this sense, Moreno, Cervelló and González Cutre-Coll (2006) emphasize that the best way to achieve intrinsic motivation during physical-sport practice is to achieve the state of flow. Indeed, reaching this positive state of mind will obtain great levels of enjoyment, fun and achievement during the practice of physical activity (Jackson, 1996).

To better understand the relationship between the practice of extracurricular physical activity and motivational processes, there are studies that have attempted to determine these relationships (Jiménez, Cervelló, Santos-Rosa, García-Calvo e Iglesias, 2006; Jiménez, Cervelló, García-Calvo, Santos-Rosa, & Iglesias, 2007). In the same way, some works that have shown a greater perception of the state of flow during physical education classes in those adolescents who practiced extracurricular physical activity (Cervelló, Moreno, Alonso, & Iglesias, 2006, Moreno, Alonso, Martínez, & Cervelló, 2005).

In the school context, there are many strategies that can be developed as physical and sports activities. Following this line, the Small Sided Games (SSG) has become a strategy for technical-tactical, physical and psychological improvement. Since the internal logic of the game is maintained and by altering various elements, it can facilitate motor learning and improve performance during the game (Casamichana & Cas-

tellano, 2010; Hill-Hass, Dawson, Impellizzeri & Coutts, 2011; Mesquita, Farias, & Hastie, 2012). Multiple research based on the SSG have focused on the field of football, being used as an alternative to traditional training, since they can adapt to both the multiple possibilities of action and the characteristics of the players (Casamichana & Castellano, 2009). In addition, they can be considered as an especially attractive and advantageous method for training young people (Impellizzeri, Marcora, Castagna, Reilly, Sassi et al., 2006), benefiting adherence, motivation towards physical-sporting practice and increasing the participation and involvement in the game (Bondarev, 2011).

Therefore, the objective of this study was to analyze the effects of an extracurricular program of football-based SSG on self-determined motivation and the state of flow. As well as, try to find the positive effects of SSG on motivational aspects (self-determined motivation and the state of flow) in a group of Chilean school children.

## Method

### Participants

The participants in the investigation were 47 adolescents from Playa Ancha (Valparaiso, Chile) of lower middle class and with a high socioeconomic and sociocultural vulnerability index. Students enrolled belong to the 1st and 2nd year of High School courses, with ages between 14 and 17 years old ( $M \pm SD$ : age =  $15.57 \pm .72$  years). The selection of participants was made according to the following criteria: leaving excluded any student who was a federated athlete and did not have the authorization of the parents. It should be noted that the students participated voluntarily in the development of the research. The participants were not assigned to the group according to random criteria. That is, natural or intact groups were used, since the class groups were already established by the school. The sample was divided into two groups, control ( $n = 23$ ) and experimental ( $n = 24$ ).

### Measures and material

Motivation in the school classes of Physical education. In order to assess this variable the Spanish version of the Behavioural Regulation in Exercise Questionnaire was used (BREQ-3) (González-Cutre, Sicilia, & Fernández, 2010; Wilson, Rodgers, Loitz, & Scime, 2006). This questionnaire, formed by 23 items, is used to collect information on different motivational regulations involved in the behavior of the physical exercise. It is structured in 6 factors: Intrinsic regulation (i.e., Because I believe that the exercise is fun), integrated regulation (i.e., Because it goes with my life style), identified regulation (i.e., Because I value the benefits of the physical exercise), introjected regulation (i.e., Because I feel guilty when I do not practice it), external regulation (i.e., Because people tell me that I must do it) and amotivation (i.e., I do not see why I have to do it). In order to respond to this

questionnaire a Likert scale of 0 (nothing true) to 4 (totally true) was used. The analyses of reliability carried out in this study indicated a suitable internal consistency (Alpha of Cronbach) for the different subscales (.72 - .84).

*Flow state.* In order to analyze this variable the Spanish version of BREQ-3, the Flow State Scale was used (FSS) (García-Calvo, Jiménez, Santos-Rosa, Reina, & Cervelló, 2008; Jackson y Marsh, 1996). This instrument is constituted by 36 items and it analyzes diverse aspects associated with the flow states. It shows a structure of 9 factors: Balance between challenge-ability (e.g., I knew that my capacity would allow me to face the challenge that is) was placed in front of me, automatism (e.g., I made the correct gestures automatically without thinking), clarity of objectives (e.g., I knew clearly what I wanted to do), feedback clarity (e.g., It knew really clearly that I was doing it well), concentration (e.g., feeling of control, (e.g., My attention was completely focused on what I was doing), loss of self-awareness (e.g., I didn't care what the others think of me), time distortion (e.g., the passage of time seemed to be different from the normal one) and autotelic experience (e.g., I really enjoyed what it was doing). In order to respond this questionnaire a Likert type scale was used, from 1 (totally disagree) to 10 (totally agree). The analyses of reliability made in this study indicated a suitable internal consistency (Alpha of Cronbach) for the different subscales (.72 - .84).

### Procedure

After an ethical committee from the Universidad de Playa Ancha was accepted, the investigation project assigned by General Investigation Department (DIGI) code EFI 01-13. Later, the authorities of the public high school Maria Luisa Bombal and the parents were informed by means of a letter. Signed consent on behalf of the parents was received and permission from the direction of the school was obtained, respecting, in addition, the principles of the declaration of Helsinki. A quasi-experimental design pre-post test with a control group was used in this research.

The BREQ-3 and FSS questionnaires were completed by the students in a classroom at the school. To resolve any doubts that may arise, the researchers were present during

the session, so they completed these tests in the hours scheduled for this extracurricular program. Prior to the intervention period, the experimental group conducted two sessions of familiarization with the SSGs and with dimensions of the playing field. The session per day of SSGs based on soccer had a total duration of 75 minutes. The design of the SSGs corresponded with a 3 vs. 3. The total area was 300 m<sup>2</sup> (20 x 15 m) and per player of 50 m<sup>2</sup>. Two parts of 30 minutes were performed, having a rest between parts of 5 minutes. All sessions were preceded by a 10-minute warm-up based on activation and joint mobility games. The total intervention period was 11 weeks, with a frequency of two weekly work sessions.

### Data analysis

Descriptive and inferential analyses were made. Analyses of comparison of means (*t-student*) to analyze the previous differences between groups regarding the anthropometric measures and physical conditions were performed. In addition, analyses of bifactorial variance (ANOVA) were applied for each scale of the BREQ-3 and the FSS with the *group* with two levels (experimental and control) as the first factor and the variable *pre-post* with two levels (previous values and after the intervention) as the second. The main effects and the interaction between variables were studied, using the statistical of *Bonferroni* to evaluate the meaning. In addition, analyses of reliability (Alpha of Cronbach) for each scale of questionnaires were carried out. The statistical program used was the SPSS in its version 20.

## Results

### Analysis of the BREQ-3 values

In table 1, the means, standard deviations and the values of the test *Kolmogorov-Smirnov* for the BREQ-3 factors are shown. As you can observe, the data followed a normal distribution. In addition, suitable values of asymmetry (between -1.17 and 1.46) and kurtosis (between -1.81 and 1.26) were obtained.

**Table 1.** Mean, standard deviations and reliability analysis for each BREQ-3 factor.

		Grupo control			Grupo experimental		
		M	DT	K	M	DT	K
Intrinsic Regulation	Pre	12.83	3.56	1.16	11.79	3.46	.73
	Post	12.35	3.08	.94	13.54	2.50	1.01
Integrated Regulation	Pre	12.70	2.72	.92	11.63	3.55	.69
	Post	12.35	3.65	.89	11.92	3.48	1.05
Identified Regulation	Pre	10.43	2.04	.97	10.00	3.09	1.22
	Post	9.74	2.91	.63	9.13	3.98	1.04
Introjected Regulation	Pre	5.61	3.23	.81	6.83	3.33	.55
	Post	6.26	4.42	.62	4.17	3.34	.91
External Regulation	Pre	6.09	4.55	.78	7.75	4.57	.93
	Post	6.26	4.72	.98	4.50	4.57	.84
Amotivation	Pre	5.35	5.79	1.02	7.13	5.24	.90
	Post	5.96	4.30	.64	4.13	3.30	1.29

To analyze the differences between the groups, mixed factorial ANOVAs were applied. No significant values were found in the main effects of the variables *pre-post* and *group*, although we did observe significant effects of interaction for the scales *intrinsic motivation* ( $F_{[1,45]} = 5.44; p < .05; \eta^2 = .11; 1-\beta = .63$ ), *introjected regulation* ( $F_{[1,45]} = 4.12; p < .05; \eta^2 = .08; 1-\beta = .51$ ) and *amotivation* ( $F_{[1,45]} = 4.34; p < .05; \eta^2 = .09; 1-\beta = .53$ ). In addition, there were significant traces for the external regulation factor ( $F_{[1,45]} = 3.53; p = .067; \eta^2 = .07; 1-\beta = .45$ ).

In figure 1 the simple comparisons of the factors between the groups and intragroups can be observed, whose interaction has been significant or has had traces of significance. As you can see, there weren't any differences, in any case, between the pretest measures or between the posttest. Nevertheless, there were significant differences between the measures pre and post in the experimental group.

**Analysis of the FSS values**

In table 2 the means, standard deviations and the values of the test *Kolmogorov-Smirnov* for the FSS factors are shown. As you can observe, the data followed a normal distribution. In addition, suitable values of asymmetry (-1.21 - .71) and kurtosis (-1.64 - 1.02) were obtained.

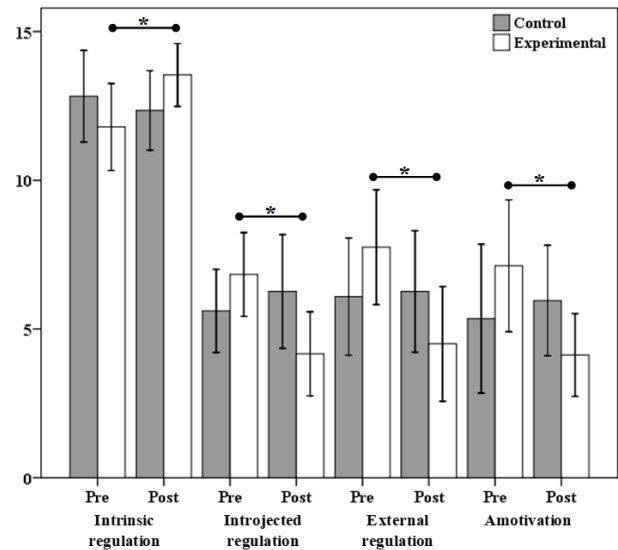


Figure 1. Simple comparisons for the intrinsic motivation, extrinsic regulation and Amotivation scales (BREQ-3) \*  $p < .05$

Table 2. Means, standard deviations and analysis of reliability for each factor of the FSS.

		Control group			Experimental Group		
		M	DT	Z	M	DT	Z
Balance challenge-ability	Pre	28.61	6.50	1.05	25.75	9.71	0.65
	Post	29.61	6.21	0.96	32.58	5.73	0.62
Automatism	Pre	23.09	7.95	0.83	21.42	9.02	1.34
	Post	25.83	6.94	0.78	28.71	9.67	1.26
Clarity of objectives	Pre	29.22	7.38	0.62	32.25	7.33	0.96
	Post	29.96	8.19	0.77	32.75	5.17	0.72
Feedback clarity	Pre	28.17	6.73	1.27	28.42	9.01	1.16
	Post	29.78	6.49	1.19	29.08	7.65	1.15
Concentration	Pre	32.39	4.37	0.77	31.92	4.84	0.64
	Post	29.26	8.04	0.93	32.21	4.71	0.94
Feeling of control	Pre	30.39	9.20	1.02	31.38	5.30	0.67
	Post	30.35	8.27	0.74	32.21	6.43	1.23
Loss of self-awareness	Pre	26.04	7.64	1.03	27.71	9.84	1.21
	Post	26.39	6.95	0.63	28.79	9.42	1.06
Time distortion	Pre	28.30	5.46	0.84	27.67	7.32	0.97
	Post	26.96	5.82	0.83	31.33	5.87	0.93
Autotelic experience	Pre	31.00	9.21	1.22	32.50	9.08	1.35
	Post	30.70	8.33	0.75	36.79	3.92	1.20

Mixed factorial ANOVAs were applied to analyze the differences between the groups, which indicated significant values in the main effects of the variable *pre-post* for the scales *balance challenge-ability* ( $F_{[1,45]} = 9.03; p < .01; \eta^2 = .17; 1-\beta = .84$ ) and *automatism* ( $F_{[1,45]} = 12.95; p < .001; \eta^2 = .22; 1-\beta = .94$ ), although not in the main effects of the variable *group*. Also, significant effects of interaction were observed for the scales *balance challenge-ability* ( $F_{[1,45]} = 5.01; p < .05; \eta^2 = .10; 1-\beta = .59$ ), *time distortion* ( $F_{[1,45]} = 5.11; p < .05; \eta^2 = .10; 1-\beta = .60$ ) and *autotelic experience* ( $F_{[1,45]} = 4.77; p < .05; \eta^2 = .09; 1-\beta = .57$ ). In addition, for the factor *concentration*, there were t significant trac-

es in the interaction effects ( $F_{[1,45]} = 3.65; p = .06; \eta^2 = .08; 1-\beta = .47$ ).

In Figure 2 the simple comparisons of the factors between the groups and intragroups can be observed, whose interaction has been significant or has had traces of significance. As you can see, there were no differences, in any case, between the measures pretest, although there were in posttest, in time distortion and *autotelic experience*. On the other hand, in the control group there were no differences between the measures pre and post, but there were in the experimental group: in *balance challenge-ability*, as well as in *time distortion* and *autotelic experience*.

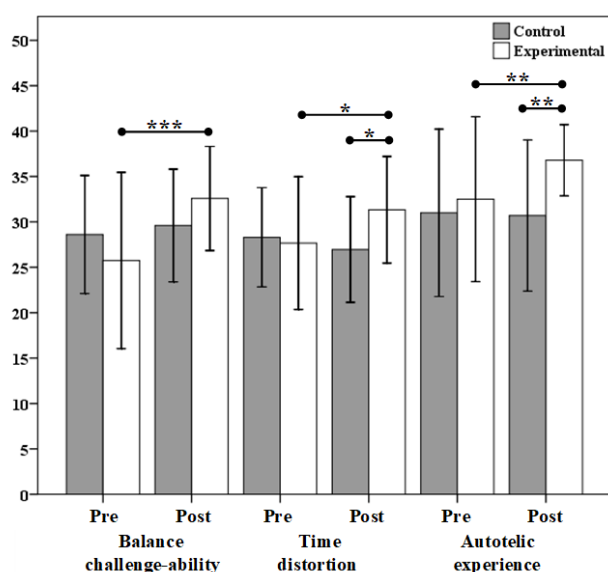


Figure 2. Simple comparisons for the scales balance challenge-ability, time distortion and autotelic experience (FSS) \* $p < .05$ ; \*\* $p < .01$ ; \*\*\* $p < .001$ .

## Discussion

The aim of this study was to analyze the effects of an extracurricular program SSG football based on football in the self-determined motivation and state of flow. The results obtained have shown positive effects of the program on the experimental group in the self-determined motivation and the state of flow. These results are in line with other studies that have pointed out the impact that extracurricular practice has on motivation and optimal experience in a school context (Cervelló et al., 2006; Jiménez et al., 2006; Moreno et al., 2005).

First of all, the experimental group has increased the levels of intrinsic motivation and the rate of extrinsic motivation and amotivation has decreased. The origin of this change could be in the significant learning produced in extracurricular hours and the increase of the perceived capacities for the practice of physical activity (Velez, Golem, & Arant, 2010; Fortier, Duda, Guerin, & Teixeira, 2012; Teixeira, Carraça, Markland, Silva, & Ryan, 2012).

Secondly, the extracurricular program based on the SSG is a teaching strategy that has demonstrated to be effective

for sports learning (Harvey, Cushion, Wegis and Massa-Gonzalez, 2010, Mesquita et al., 2012). Specifically, the structure used (3 vs. 3) is considered adequate to improve physical performance and the level of technical-tactical efficiency in collective sports (Hill-Hass et al., 2011; Foster, Twist, Lamb, & Nicholas, 2010; Gabbett, Jenkins, & Abernethy, 2009).

Thirdly, the program has been effective to improve various aspects to the state of flow, such as the balance between challenge and skill, time distortion and autotelic experience. These states make it possible to develop an optimal experience which increases the likelihood of enjoying more with the task that is being done and increases adherence to them. In this work we have observed changes in self-determined motivation and flow state, which could explain the changes of this last variable. In fact, it is considered that the self-determined motivation is positively related to vitality, positive affect, self-esteem, satisfaction, interest, concentration, effort and persistence when performing physical activity (Vallerand, 2007). In this sense, the increase of intrinsic motivation would cause the students to value more the physical-sport practice in the school context (Amado, Leo, Sánchez-Miguel, Sánchez-Oliva, & García-Calvo, 2011; Ramis, Torregrosa, Viladrich, & Cruz, 2013).

Future studies should introduce the evaluation of sports learning, physical condition and basic psychological needs achieved after the intervention program. At the same time, information about perceptions such as self-concept or motor self-efficacy. Furthermore, it is suggested to extend the sample to the female gender to see if it reproduces the found in the present studies and if there are differences in function of this variable.

Despite the limitations, this study provides new evidence on the relationship between the practice of physical activity and formal aspects of self-determined motivation and flow states. This information can be useful for professionals engaged in sports promotion schoolchildren and teachers of Physical Education, to better understand the motivational aspects involved in contexts of physical practice. Also, the SSG are valued as an effective tool to be implemented in these ages to contribute to increase the possibilities of adherence to the practice of physical activity.

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