

## **Emotional regulation and physical recovery in young athletes of individual and collective sport modalities**

### **Regulación emocional y recuperación física de los jóvenes deportistas en modalidades deportivas individual y colectiva**

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#### **Abstract**

Due to the influence of positive and negative affects experienced during competition on sports performance, emotional regulation is one of the psychological variables that are more interesting to the sport psychology field. In this sense, this study analyzes how the use of reappraisal and suppression stimulates or hampers the physical recovery of young athletes. All of this taking into account the mediating role of self-efficacy and cognitive anxiety experienced during competition. Three hundred Chilean athletes with ages from 11 to 18 years old participated in this study ( $M = 15.15$ ;  $SD = 2.38$ ). Specifically, 139 of them practiced individual sports (boating, athletics, swimming, rhythmic gymnastics and tennis) and 161 collective sports (basketball, volleyball, soccer and rugby). Results show that the use of cognitive reappraisal as a dispositional strategy is associated with positive affect. In addition, cognitive reappraisal promotes self-efficacy in athletes during competition and stimulates their physical recovery. Emotional suppression produces the opposite effect, being associated to negative affect and impairing physical recovery by cognitive anxiety. Results are also discussed related to differences observed in the use of these two emotional regulation strategies in individual and collective sports, along with their practice implications for the training of young athletes in both modalities.

**Key words:** cognitive reappraisal; emotional suppression; cognitive anxiety; self-efficacy; collective and individual sports.

#### **Resumen**

La influencia que los estados emocionales tienen en los deportistas cuando compiten ha hecho que la regulación emocional sea una de las variables psicológicas más interesantes a estudiar en los últimos años en el ámbito deportivo. En este sentido, este estudio analiza cómo los usos de las dos estrategias de regulación más usadas de forma disposicional favorecen o disminuyen la recuperación física de los deportistas jóvenes después de la competición. Todo ello teniendo en cuenta el papel mediador que la autoeficacia y la ansiedad cognitiva tienen en esa relación. Para este estudio se contó con la participación de 300 deportistas chilenos de 11 a 18 años ( $M = 15,15$ ;  $DT = 2,38$ ). En concreto, 139 practicaban deportes individuales (canotaje, atletismo, natación, gimnasia rítmica y tenis) y 161 deportes colectivos (básquetbol, voleibol, fútbol y rugby). Los resultados del estudio muestran que el uso de la reevaluación cognitiva como estrategia disposicional favorece la autoeficacia de los deportistas en competición y mejora la recuperación física. La supresión emocional, en cambio, se muestra como una estrategia desadaptativa que favorece la ansiedad cognitiva en competición y dificulta la recuperación física. Se discuten también los resultados respecto a las diferencias observadas en el uso de estas dos estrategias de regulación en deportes individuales y colectivos, y su implicación práctica en la preparación de los deportistas jóvenes en ambas modalidades deportivas.

**Palabras claves:** Reevaluación cognitiva; supresión; ansiedad cognitiva; autoeficacia; deportes individuales y colectivos.

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## Introduction

In the last years, the body of evidence concerning the influence of emotions, emotional states and their regulation on sports and physical activity has witnessed a considerable increase (Laborde, Dosseville & Allen, 2015; Ruiz, Raglin, & Hanin, 2015). In this sense, Hanin (1980, 1986, 2007, 2010), through a model based on individual zones of optimal functioning (*izof*), considers specific emotion patterns that reflect optimal individual performance levels and proposes that as anxiety increases so does muscular tension, while attention tends to decrease. According to this model, athletes will possibly perform better if they execute the sports activity within these zones. Likewise, training athletes personal resources and capacity to cope with stress and fatigue will enhance their physical recovery processes (Kellmann & Kallus, 2001) since the functionality of emotions has an impact before, during and after competition (Rodríguez-Salazar, Noreña & González, 2013).

The use of adaptive strategies by the athlete is fundamental to prevent overtraining, which can yield a decrease in physical performance and in enthusiasm towards the sports practice, and increase irritability and depressive symptoms (Nédélec, Halson, Abaidía, Ahmadi & Dupont, 2015; Urshausen & Kindermann, 2002). These data raise awareness of the need for developing strategies that, from training sessions, allow young athletes to manage situations of high emotional activation, which can cause them physical and psychological strain (Uphill, Lane & Jones, 2012).

### *Emotional Reappraisal and Suppression*

Emotional regulation promotes the activation of strategies to avert uncontrolled and excessive reactions caused by rage, anger, irritation, etc. In particular, it allows maintaining, increasing or decreasing emotional experience (Lane, Beedie, Jones, Uphill, & Devonport, 2012; Oriol, Filella & Gomila, 2014). There are several models of emotional regulation, but one of the most known is that developed by Gross and Thompson (2007). This model underlines the use of two dispositional strategies: *cognitive reappraisal*, understood as the capacity to generate changes at cognitive level as a consequence of the impact generated by a particular situation; and *suppression*, conceived as inhibition of emotional response (Brosschot, Verkuil & Thayer, 2010; Campbell-Sills, Simmons, Lovero, Rochlin, Paulus, Stein, 2011; Lane et al., 2012).

Cognitive reappraisal is a strategy that enhances the reduction of anxiety and stress states, allowing the individual to deal with stressful situations and transform them into opportunities, thus being considered adaptive (Lane et al., 2012; Oriol, Molina, DaCosta & Páez, 2015). On the contrary, suppression generates more stress and anxiety situations, since the individual inhibits and hides emotional response, causing muscular contractions (Gross, 1998; Gross & John, 2003; Richards & Gross, 2000; Suveg, Hoffman, Zeman & Thomassin, 2009).

During sports competitions, situations arise in which high intensity positive and negative states that influence sports performance are produced (Hanin, 2010; Putnam & Stifter, 2008). Thus, especially over the last few years, studies on emotional regulation have gradually become more important to the field of sports research (Jones, 2012; Lane et al., 2012). Furthermore, it has been observed that athletes perceive cognitive reappraisal as an adaptive strategy in terms of well-being and efficacy in the regulation of stressful situations during competition. This strategy also enhances the experience of positive emotions (Oriol et al., 2014; Uphill et al., 2012). The reverse effects are perceived in the case of emotional suppression (Oriol et al., 2015; Uphill, et al., 2012).

### *Cognitive Anxiety and self-efficacy during competition*

As abovementioned, pressure for achieving good performance generates feelings of fear and failure (Feltz, 2007; López Torres, Torregrosa, & Roca, 2007; Tsopani, Dallas & Skordilis, 2011). In this sense, if athletes do not feel self-confident enough to deal with pressure, they experience greater levels of cognitive anxiety. Regarding this matter, Martens, Burton, Vealey, Bump and Smith (1990) postulated the multidimensional anxiety theory, which relates self-confidence with cognitive anxiety, somatic anxiety, self-confidence and performance. These authors defined cognitive anxiety as fear of failure, which would be associated to mental aspects of the anxiety suffered by sportists. On the other hand, somatic anxiety would refer to athletes physiological reaction. Taking into account these variables for the evaluation of performance appears relevant if considered the high probability of suffering injuries posed by high levels of anxiety (Ivarsson, Johnson & Podlog, 2013; Olmedilla, Ortega & Gómez, 2014).

It is worth noticing that cognitive anxiety experienced during competition predisposes the athletes to negative thoughts and concerns, due to his fear of failure and to aversive consequences derived from certain situations (García, Inglés & Lagos, 2014). On the contrary, high levels of self-confidence may contribute to a better attention span of individuals, who concentrate more on the match, and thus recover rapidly after competition (Lane et al., 2012; Olmedilla et al., 2014). Anxiety may be interpreted as serving a facilitating role for good sports performance, yet depending on the athlete's deployment of regulation strategies (Hanin, 2010; Lane et al., 2012). Therefore, it is of special relevance to develop adaptive emotional regulation strategies in a dispositional form, during training and before competition, particularly in youth sport. Accordingly, former studies have evidenced the stressor character that the conditions of training, together with social organization of these processes, imply for young athletes, which is even more stressful than the sports practice during competition (Arthur-Banning, Wells, Baker & Hegreness, 2009; Carratalá, Gutiérrez, Guzmán & Pablos, 2011; Keegan, Spray, Harwood & Lavallee, 2010; Scheerder, Taks, Vanreusel & Renson, 2005). Moreover, differences can be found within the young sports field itself when considering the age at which is a athletes. Frequently, older athletes feel more secure and with greater control over a sport discipline (Balk, Adriaanse, De Ridder, & Evers, 2013; Ivarsson, Johnson & Podlog, 2013; Olmedilla, Ortega & Gómez, 2014).

The demanding requirements to which athletes in competition are subjected, especially in young sports, should be tolerable according to the adaptability of every individual. Otherwise, if training demands or loads exceed the individuals' tolerance limits, they will produce fatigue, exhaustion, tiredness, low state of mind and stress, which, in turn, will cause a decrease in sports performance and poor physical recovery (Molinero, Salguero & Márquez, 2011; Wagstaff, 2014).

In this sense, this study is aimed at determining whether the use of emotional reappraisal and suppression strategies favor or impair physical recovery in athletes after a competition, considering the category of athletes. Furthermore, another aspect that should be taken into account is the difference in emotional regulation between individual and collective sports. In collective sports, the use of interpersonal regulation strategies appears to enhance individual processes of cognitive reappraisal (Campo, Sanchez, Ferrand, Rosnet, Friesen & Lane, 2016; Oriol et al., 2014), generating collective emotional synchrony processes, contrarily to expected in its individual counterpart (Zumeta, Oriol, Telletxea, Amutio & Basabe, 2015). To this end, structural equation modeling is conducted, controlling for sports category and differences between individual and collective sports. We expect that 1) suppression will have

an indirect effect on physical recovery via anxiety. Specifically, individuals resorting more frequently to dispositional suppression will present greater levels of cognitive anxiety during competition, which, in turn will hinder physical recovery; 2) the use of dispositional cognitive reappraisal is expected to increase self-efficacy, thus benefiting the sportiest physical recovery; 3) Differences between *sems* are expected between individual and collective sports.

### *Participants*

In this study, the sample is made up of 300 young competitive athletes with ages from 11 to 18 years old ( $M = 15.15$ ;  $SD = 2.38$ ). In Chile, individual is considered initial when they are able to function basically in a sports activity under competition, i.e., the initial category covers 11 to 14 year-old sportists. On the other hand, the advanced category is related to the progressive evolution of athletes, through which they acquire more command of the sport (Giménez Fuentes-Guerra, Abady Robles, 2010). The group is divided into initial (i.e., 11 to 14 years old), and advanced categories (14 to 18 years old). Out of the total sample, specifically 139 youngsters practiced individual sports (canoeing, athletics, swimming, rhythmic gymnastics and tennis) and 161 collective sports (basketball, volleyball, soccer and rugby). The sample was collected by convenience in different Chilean cities.

### *Procedures*

Ethical approval to conduct the study was provided by the University of Santiago ethical committee. At first, several sport clubs and training schools that taught different individual or collective sports were visited in order to inform the coaches and teachers about the study, and thereby obtain permission for applying the instrument. Clubs then informed parents on the study through an informed assent form. Subsequently, each athlete was given an informed consent explaining the characteristics and basic aspects of the research, which also pointed out that participation was voluntary and that they or their coaches could have access to the results.

Once participants accepted these conditions, the questionnaire was handed to them. The questionnaire was composed of several items extracted from different questionnaires, all related to the variables being studied. Emphasis was placed on the anonymity and confidentiality of the answers, which could also be left blank. Participants were also told that if any question arose, they could freely ask the researcher present, because the instrument was applied in the training place. It took athletes 15 to 20 minutes to complete the questionnaire.

### *Measures*

The emotional regulation instrument was enquired according to the form in which athletes usually used these strategies. Regarding the other instruments, participants were asked to respond thinking specifically of a competition context. The Spanish version of the questionnaires were reviewed by our research team to ensure that the language used in them was understandable in Chile, and one English philologist translated the questionnaires that were available only in English. A measurement model, whose adjustment indices are shown in the Results section, was used to test that all items had a commonality above .40 for each factor of all instruments, and that alphas were adequate, as reported for each instrument. Additionally, the adequate adjustment of the measurement model was also tested.

*Emotional Regulation Questionnaire.* The Emotional Regulation Questionnaire –*Erq-* (Gross & John, 2003), translated and adapted to Spanish by Rodríguez-Carvajal, Moreno-Jiménez and Garrosa (2006) was used. For this research the 10-item version of the original questionnaire were used. The use of emotional regulation strategies was evaluated, principally that of cognitive reappraisal, e.g., “*I control my emotions by changing the way I think about the situation I’m in*”. The scale ranged from 1 (Strongly disagree) to 7 (Totally agree). Cronbach’s alpha for this research was .82

*Recovery-Stress Questionnaire for Athletes (Restq sport).* This instrument was translated into Spanish based on the 76-item version of the *Recovery-Stress Questionnaire for Athletes* (RESTQ-76Sport, Kellmann & Kallus, 2001). This study used the subscale of physical recovery in sports, that is composed by 22 items. Questions like “*I recovered well physically*” were asked to participants. The scale ranged from 0 (Never) to 6 (Always). Cronbach’s alpha for this research showed adequate values of .87.

*Self-efficacy in Sport Questionnaire.* It was measured by the Perceived Competence Scale of the *Intrinsic Motivation Inventory* (McAuley, Duncan & Tammen, 1989), which focuses on assessing the competence perceived by the athletes (5-items) through questions such as: “*I think I’m pretty good at this sport*”, “*I am happy with my performance in this sport*”. The scale ranged from 1 (Totally disagree) to 7 (Totally agree). In addition, an appropriate Cronbach’s alpha was observed in this study .90.

*Cognitive Anxiety Questionnaire.* It was measured by cognitive anxiety subscale (5-items) of the Spanish version of *Csai-2R (18 items)*, translated and adapted by Andrade, Lois and Arce (2007). This includes 5 items: Questions like “*I am concerned I may not do as well in this competition as I could*” were asked, maintaining the Likert-type answer format with alternatives numbered from 1 (not at all) to 4 (very much). Cronbach’s alpha for this sample was .88.

*Positive and Negative Affectivity Scale.* Fredrickson’s (2009) scale was used in the form of 10-item version comprising 5 positive (amusement, gratitude, hope, joy, interest) and 5 negative affect (anger, awe, overwhelm, sadness, and fear). Athletes were asked to respond to what extent they experience these affective states during competition. Cronbach’s alpha was .82 and .87 for positive and negative affectivity, respectively.

#### *Data analysis*

Firstly, descriptive statistics were calculated, obtaining the correlations, means and standard deviations of all variables in this study. Subsequently, measurements and structural equation models were carried out using *Amos.20* to analyze the different relations between variables. The models fit was tested by the estimation of maximum-likelihood together with a bias-corrected confidence interval bootstrap test. This procedure provides a mean of the estimations obtained from samples provided in bootstrap and their standard error. The confidence intervals (differences between the highest and lowest estimated values of the different bootstrapping samples) of the regression weights and standardized regression weights showed that the estimated values were significantly different from zero, considering that the lack of normality does not affect estimations (Byrne, 2001). Typical indices were used for model fit, which was verified by  $\chi^2/g.l$  coefficient, Root Mean Square Error of Approximation, Standardized Root mean Square Residual and the relative fit indices Comparative Fit Index, (*Cfi*) and Incremental Fit Index (*Ifi*).

Values below 5 are considered acceptable for  $\chi^2/g.l$  coefficient, while in the case of *Rmse*, .8 indicates an acceptable fit, and values below .5 indicate a good model fit. On the other hand, values below .8 are preferable for SRMR (Hu & Bentler, 1999), while values above .90 indicate an acceptable fit for *Cfi* and *Ifi*.

Finally, a multi-group analysis was conducted to test invariance between models, taking into account both individual and collective modalities.

## Results

### *Descriptive statistics*

First, correlations between dispositional emotional regulation strategies and experience of positive and negative affects during competition were calculated. Results show that the use of dispositional cognitive reappraisal is significantly associated to the athlete's experience of amusement ( $r = .13, p < .022$ ), gratitude ( $r = .15, p < .008$ ) and hope ( $r = .24, p < .000$ ) during competition. On the contrary, suppression is associated with experiencing anger ( $r = .12, p < .031$ ) overwhelm ( $r = .13, p < .019$ ) and fear ( $r = .12, p < .028$ ).

Regarding its relation with the variables of the model, as observed in Table 1, physical recovery is positively related to cognitive reappraisal ( $r = .29, p < .001$ ) and to self-efficacy ( $r = .55, p < .001$ ), but negatively to suppression ( $r = -.19, p < .01$ ) and to cognitive anxiety ( $r = -.37, p < .01$ ).

Table 1. Descriptive statistics and correlations between the variables of this study

Variable	<i>M</i>	<i>SD</i>	<i>Range</i>					
1. Cognitive anxiety	1.97	.39	0-4	--	.			
2. Self-efficacy	3.05	.49	1-7	-.27***	--			
3. Cognitive reappraisal	5.76	1.19	0-6	-.07	.29***	--		
4. Suppression	3.95	1.59	0-6	.35***	-.01	.21**	--	
5. Physical recovery	4.31	1.70	1-7	-.37***	.55***	.27***	-.19**	--

\*\* $p < .01$ ; \*\*\* $p < .001$  (bilateral)

### *Measurement and Structural model*

First, the measurement model was tested to verify that all instruments were suitable for the study's sample. In the first measurement model calculated, it was observed that in one of the *Erq* items, corresponding to suppression, the weight was below .35. Thus, the item was discarded (Table 3.). A full measurement model was also tested for divergent validity of the latent factors. An adequate fit was obtained:  $X^2/df = 1,66, df = 199; p < .001; Cfi = .94; Tli = .93; Srmr = .04; Rmse = .04$ .

To analyze differences in the indirect effects of the emotional regulation strategies (reappraisal and suppression) on physical recovery with and without mediators, a model with no mediators was calculated. A significant indirect effect was observed on cognitive reappraisal ( $b = .43; p > .001$ ) as well as a direct negative effect of suppression ( $b = -.16; p > .05$ ) over physical recovery.

Table 2. Measurement and Structural model adjustment

Models	$\chi^2$	df	$\chi^2/df$	<i>Cfi</i>	<i>Tli</i>	<i>Srmr</i>	<i>Rmse</i>
Model 1	360,594	220	1,63	,92	,93	,04	,05
Model 2	331,099	199	1,66	,94	,93	,04	,04
Model 3	134,879	62	2,74	,94	,93	,05	,06
Model 4	343,193	202	1,70	,93	,92	,04	,03

Model 1= First measurement model; Model 2= Second measurement model; Model 3= Model without mediators; Model 4 = Model with mediators

Subsequently, a structural equation modelling with multiple mediators was conducted controlling for the effect of age (see Model 4). As expected, as the age of athletes increase, so does their capacity for physical recovery. The indirect effects were calculated using bias-corrected confidence interval bootstrap test in order to compute the structural model considering the mediators. Different authors hold that bootstrapping is one of the most important methods to test the effect of the variables intervening (MacKinnon, 2008; MacKinnon, Lockwood & Williams, 2004). The model showed an adequate fit  $X^2/df = 1.70$ ,  $df = 202$ ;  $p < .001$ ;  $Cfi = .93$ ;  $Tli = .92$ ;  $Srmr = .04$ ;  $Rmse = .03$ .

Results showed an indirect effect between reappraisal and physical recovery via self-efficacy ( $p < .05$ , 95%  $Ci = [-.095, -.011]$ ). The indirect effect in this model was ( $b = .29$ ;  $p > .001$ ). An indirect effect was also observed on suppression via cognitive anxiety ( $p < .001$ , 95%  $Ci = [.044, .86]$ ). The direct effect of suppression on physical recovery stopped being significant in this model, due to the effect of the mediator. In addition, significant direct effects of reappraisal on self-efficacy ( $b = .20$ ;  $p > .001$ ) and of suppression on cognitive anxiety ( $b = .27$ ;  $p > .001$ ) were seen. The same is true between self-efficacy and physical recovery ( $b = .56$ ;  $p > .001$ ). On the other hand, there is a negative relation between cognitive anxiety and physical recovery ( $b = -.15$ ;  $p > .01$ ).

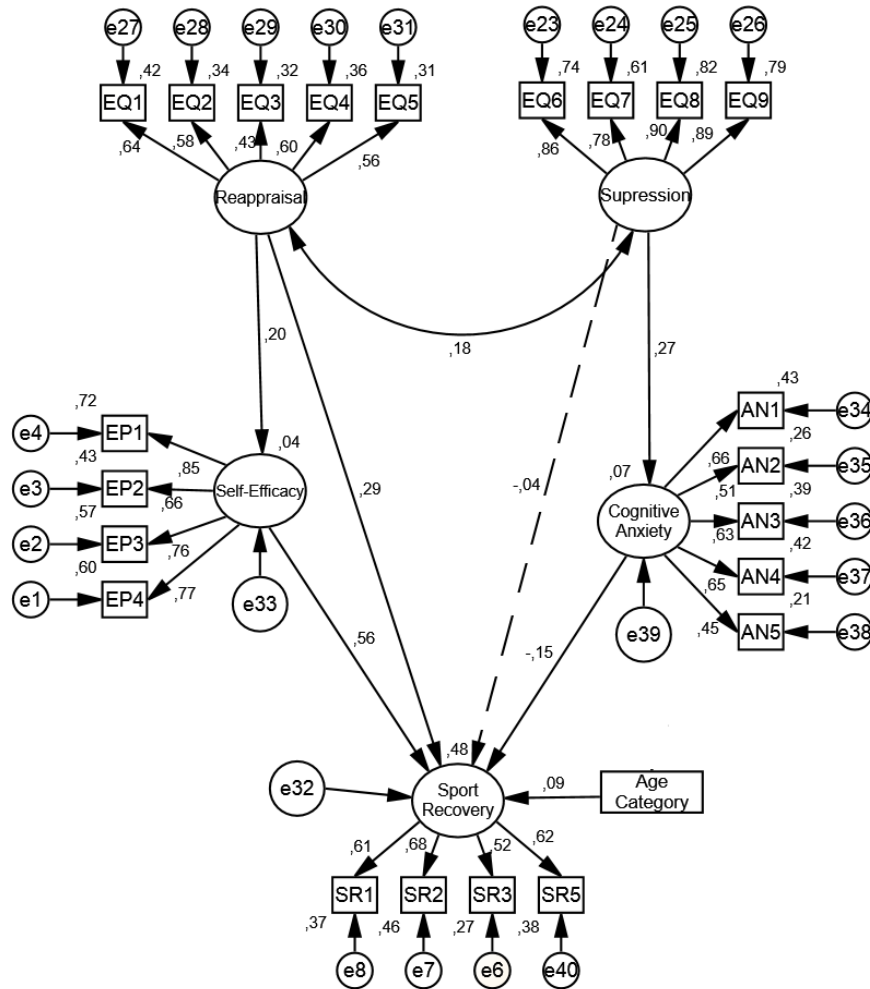


Figure 1. Structural equation model with mediators controlling for age category.

A multi-group analysis was carried out to test invariance by individual or collective sport modality (see Figure 1). This analysis in a first step, constraints are imposed to the factor loads. In the second one, constraints are attributed to the covariance between the latent factors and, finally, the covariances between measurement errors are maintained equal in both samples.

Chi-squared  $\chi^2$  statistical values and the probability level related to them allow verifying whether these constraints worsen the model statistical fit. When comparing both models, associated probability values above .05 indicate the absence of variation between both samples, since constraints do not worsen the fit of the model to data (Byrne, 2001).

Differences were found in the results of models unconstrained (Model 1) and with invariance in factor load (Model 2). The difference between these two models is the minimum criterion to determine the inexistence of invariance (Arbuckle, 2006). Furthermore, differences were also observed among the other models (see Table 3).



Table 3. Multi-group analysis by sport modality (individual and collective)

Models	$\chi^2$	df	$\chi^2/df$	$\Delta\chi^2$	$\Delta df$	Cfi	Tli	Srmr	Rmse
Model 1	646,693	404	-	-	17	,92	,92	,07	,045
Model 2	709,317	421	1.68	78,53*	,23	,92	,92	,07	,046
Model 3	725,232	427	1.69	93,21*	,26	,92	,92	,07	,045
Model 4	739.908	430	1.72	100,41*	,29	,93	,92	,06	,045

\*  $p < .001$  Model 1: Unconstrained; Model2: Measurement weights; Model3: Structural covariance; Measurement residuals

Figure 2 shows how direct effects on the mediators of cognitive reappraisal and suppression are less in collective sports compared to individual sports. The same is true for the direct effect of mediators on physical recovery, and in the case of cognitive anxiety, its relation with collective sports is non-significant. Finally, the indirect effect of cognitive reappraisal on physical recovery is also greater in the case of individual sports.

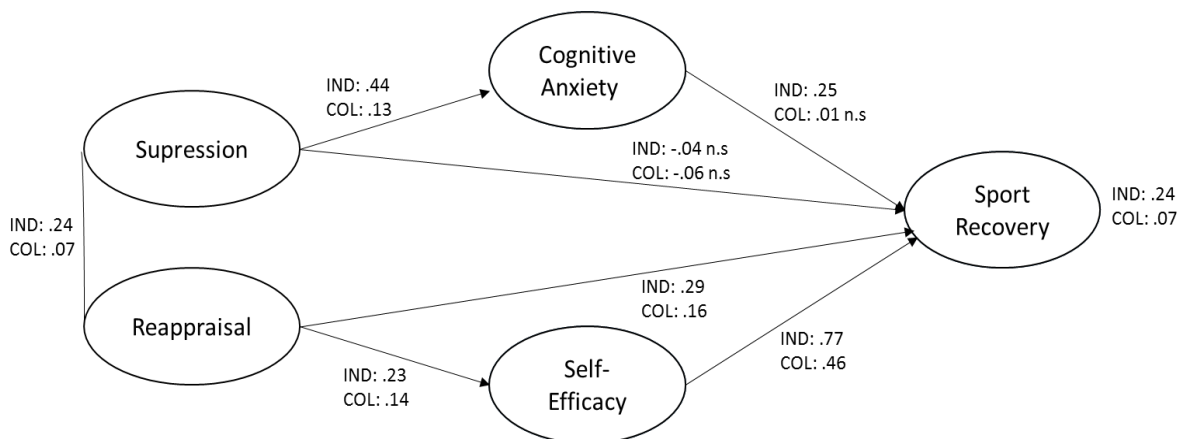


Figure 2. Differences in direct effects between individual and collective sport.

## Discussion

Currently, in some sports, demanding training sessions have become an issue, since they negatively affect sports performance and generate fatigue, exhaustion, tiredness, low state of mind and stress. In this sense, according to the *Izof* model developed by Hanin (2007; 2010), it is fundamental for athletes to regulate their emotional states prior to, during and after competitions, in order to equip them with more tools for dealing with high sports requirements. Therefore, this study was aimed at analyzing how the use of emotional reappraisal and suppression favor or impair physical recovery in young sportists after competition.

First, the results of this study show that the use of dispositional cognitive reappraisal is related to experiencing positive affects during competition, specifically of amusement, gratitude and hope. These results are coincident with the formerly found association between the use of cognitive reappraisal and pleasant emotions in competition from the work of Uphill, Lane and Jones (2012). In contrast, the use of suppression is associated with experiencing negative affects such as anger, overwhelm and fear.

In line with the first hypothesis of this study, results confirm the indirect effect of dispositional emotional suppression on physical recovery via cognitive anxiety experienced during competition. In particular, suppression of emotions impairs the capacity of the athletes to reduce emotional intensity, triggering symptoms of cognitive anxiety. The use of that strategy is characterized by suppression of the emotional response, which might cause a block at cognitive level as well as anxiety during competition. This coincides with the view of some authors with respect to the need of developing strategies that allow athletes to direct attention and keep focus, yielding cognitive changes when high intensity emotional situations occur (Hanin, 2007; Jones, 2012). The use of suppression can also have costs at physical level, such as blocks and muscular tension, hindering physical recovery and causing injuries (Beatty, Faver & Janelle, 2015; Mankad & Gordon 2010; Wagstaff, 2014). On the contrary, the second hypothesis postulated that cognitive reappraisal enhanced physical recovery via self-efficacy. Unlike emotional suppression, cognitive reappraisal is more focused on cognitive changes that allow a person to reinterpret an emotional situation (Gross & Thompson, 2007). Based on the results obtained, the frequent use of cognitive reappraisal by athletes results in greater capacity to focus attention on competition, thus increasing self-confidence. For instance, in a recent experimental study carried out with 53 college soccer students, it was observed that those students that employed cognitive reappraisal as a regulation strategy more frequently could make decisions in a more precise form than the group of athletes that used another strategies such as rumination, expressive suppression, expressive revealing.

In sports competition, the capacity to maintain attention and concentration is key for athletes to manage emotional states and increase confidence in their performance (Hanin, 2010; Jones, 2012). Therefore, regulation of emotional states depends on the cognitive interpretation made by athletes during competition and on the deployment of strategies that allow athletes to maintain, reduce or increase the intensity experienced. Reinterpreting a situation cognitively can promote the reduction of anxiety and stress states, since this implies that athletes have more tools for diverting or refocusing attention to an objective (Lane et al., 2012; Oriol et al., 2015), which, in turn, has direct impact on the improvement of physical recovery after competition.

Finally, results related to the third hypothesis present the differences in emotional regulation processes between individual and collective modalities of the sports practice. Data show that the use of regulation strategies and mediators in individual sports is greater than in collective sports. This leads us to reflect on the important influence of interpersonal regulation processes and emotional contagion among the athletes of a team on collective sports (Campo et al., 2016; Zumeta et al., 2015).

In collective sports, emotional regulation processes not only are produced individually, but also collectively, since teammates provoke, whether deliberately or not, the deployment of strategies for emotional regulation by their colleagues (Zumeta et al., 2015). In this sense, differences in regression weights of individual and collective sports point to dissimilar emotional work between both sports modalities. Previous studies report that support and collective work potentiate social relationships and that the latter strengthens the confidence and personal resources of each team member (Coan, 2008; Little, Kluemper, Nelson & Gooty, 2012; Rimé, 2009). This would reinforce the idea that training in interpersonal regulation strategies and positive emotional contagion in collective sports perhaps is more effective than the development of self-regulation strategies. Therefore, it is necessary to carry out further studies oriented to confirm the differences between both sports modalities regarding emotional work during training.

### *Limitations*

One of the limitations of this study is that the sample was selected by convenience, as this was the sample available for the study. However, it would be more suitable for further studies to carry out randomization processes. Other important limitation refers to the nature of the instruments used, which were not previously adapted to the Chilean sports context, in spite of having a measurement analysis conducted to test the adequacy of the variables to be used in the SEM model. Additionally, it is necessary to validate each instrument in the Chilean context to better use them in future. Finally, sports modalities should be classified according to their motor relationships (Lavega Alonso, Etxebeste & Lagardera, 2014), because each individual or collective sport has specific characteristics into which future research should delve.

### **Conclusions**

To conclude, these results show the importance that the use of regulation strategies in a dispositional form during competition has to young athletes. In this sense, it is fundamental to teach athletes from early ages to cognitively reinterpret situations that generate high emotional activation and cause attention and concentration to divert during a match. Undoubtedly, one of the key aspects in the current study is to acknowledge what strategies are more efficient in competitive situations. Nevertheless, to this end, athletes must learn to manage the intensity of their emotional responses regularly from the first years of competition as well as to better understand their emotional processes. Opposite results are observed when young athletes frequently use suppression, since the emotional response is blocked and this generates tension and a greater anxiety.

Finally, it is also worth noticing the effect of the group on emotional regulation processes during competition. These differences show the importance of continuing further developing this research line, analyzing the effects of these strategies not only taking into account the individual or collective nature of the sport, but also the different motor, cooperation-opposition, opposition and individual relationships within it.

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