

Using Self-Determination Theory to Explain Sport Persistence and Dropout in Adolescent Athletes

Tomás García Calvo¹, Eduardo Cervelló², Ruth Jiménez¹,
Damián Iglesias¹, and Juan Antonio Moreno Murcia²

¹Universidad de Extremadura (Spain)

²Universidad Miguel Hernández de Elche (Spain)

Motivational characteristics are influential in shaping adolescents' desire to persist in sport or to discontinue their sport participation. *Self-determination theory* (Deci & Ryan, 2000) was utilized as the theoretical framework for this study. This theory examines whether sustained participatory involvement, defined as continued participation in the sport through the next year, was influenced by individuals' self-determined motivation and by the fulfillment of the three basic psychological needs of autonomy, competence, and relatedness. Four hundred ninety two soccer players between the ages of 13 and 17 years comprised the sample. Results indicated sport dropout was explained by higher levels of amotivation, external regulation, and introjected regulation and by lower satisfaction of relatedness and autonomy needs. The findings of this study contribute to the knowledge base on sport dropout as they supported many of self-determination theory.

Keywords: motivation, autonomy, relatedness, competence, dropout, sport.

Los aspectos motivacionales poseen una gran importancia sobre la persistencia o el abandono de la práctica deportiva en los adolescentes. En este estudio, partiendo de la *teoría de la autodeterminación* (Deci y Ryan, 2000), se trató de comprobar cómo incidían en la persistencia o el abandono los diferentes tipos de motivación y las necesidades psicológicas básicas de autonomía, competencia y relaciones sociales. En el estudio participaron 492 futbolistas, con edades comprendidas entre los 13 y 19 años. Los resultados demuestran que el abandono es explicado por altos niveles de desmotivación, motivación externa e introyectada, y bajos niveles de satisfacción con la autonomía y las relaciones sociales. Estos hallazgos pueden contribuir a conocer mejor el abandono deportivo y minimizarlo a partir de las propuestas de la teoría de autodeterminación.

Palabras clave: motivación, autonomía, relaciones, competencia, abandono, deporte.

Numerous studies have attempted to explain sport persistence and dropout in relation to participants' underlying psychological characteristics (e.g., Otis, Grouzet, & Pelletier, 2005; Vallerand, Fortier, & Guay, 1997). *Self-determination theory* is a highly appropriate conceptual framework from which to study sport persistence and dropout. The theory has been widely utilized in understanding motivational outcomes in other achievement contexts such as educational and work settings.

Self-determination theory distinguishes among three types of behavioral regulation that are associated with varying degrees of self-determined motivation. One form of motivation is intrinsic motivation that refers to those circumstances in which individuals freely engage in activities that they find to be interesting and enjoyable and which provide the opportunity for learning. People who are intrinsically motivated are engaged in specific activities for their own sake and for the pleasure, fun, and satisfaction inherent in their participation (Deci, 1975; Deci & Ryan, 1985). In this regard, involvement is characterized by an internal locus of causality and individuals consider their actions to be self-determined and volitional. Vallerand and Rousseau (2001) maintained that there are three types of intrinsic motivation in relation to sport involvement that correspond to the motivation for stimulating experiences, to gain knowledge, and to accomplish things.

A second type of motivation is extrinsic motivation in which individuals engage in activities because they value the associated outcomes. Such outcomes could include extrinsic rewards, and public recognition and praise. Extrinsic motivation itself lies on a continuum that is a reflection of the internalization process that varies from the more self-determined to the less self-determined. These expressions all involve initially external forms of regulation (Chirkov, Kim, Ryan, & Kaplan, 2003). In each circumstance, people act in such a way so as to attain a desired outcome, such as a tangible reward or to avoid a potential punishment.

On the continuum of extrinsic motivation, external regulation is the least self-determined form of motivation because externally regulated behavior is motivated by rewards and punishments and driven by feelings of the need to comply. Introjected regulation is somewhat more self-determined in that this expression of extrinsic motivation depends upon self-control and the individual's goal is to avoid negative feelings such as guilt and anxiety, as well as to experience positive ego-related feelings such as pride (Ryan & Deci, 2000). With introjected regulation, the formerly external source of motivation is internalized and is reinforced through internal pressures such as anxiety or emotions and the person feels that they engage in a behavior because they "must" or "have to" (Ntoumanis, 2005). Identified regulation occupies the next place on the continuum and motivation centers of feelings of personal importance and the value of engaging in the activity. The

most complete form of internalization in extrinsically motivated behavior is known as integrated regulation. Individuals who have integrated regulation are motivated to engage in activities because their involvement in such tasks provides harmony or coherence with other aspects of their values and their identity (Deci & Ryan, 2002). This type of motivation not only involves identifying with the importance of the activity but also with the desire to integrate this sense of identification with other aspects of the self. Vallerand (1997) demonstrated that this type of regulation does not typically appear until people are sufficiently mature, which can complicate measurement issues with young people.

A third category of motivation is known as amotivation. Amotivation constitutes a psychological state in which people lack either a sense of efficacy or a sense of control with respect to attaining a desired outcome. In other words, they are not able to regulate themselves with respect to their behavior (Ntoumanis, Pensgaard, Martin, & Pipe, 2004). In this circumstance, the individual does not feel in control and the locus of control is external (Ryan & Deci, 2000).

Self-determination theory proposes that humans have three fundamental needs that must be satisfied in the social context. The first need is to feel autonomous in performing an activity. Autonomy involves being volitional and acting in such a way as to represent one's integrated sense of self (Deci & Ryan, 2000). The second need is to perceive relatedness with others in the community of involvement. A third fundamental need is to perceive competence in relation to the activity. Competence is widely regarded as fundamental to the expression of motivation in the sport context (Duda, 2005; Reinboth & Duda, 2006). Research supports the view that individuals who experience higher levels of satisfaction of the three fundamental needs express more self-determined forms of regulation (Deci & Ryan, 2000).

Previous research suggests that self-determination theory is a very applicable framework for the study of persistence and dropout in sport and exercise contexts (Frederick-Recascino & Ryan, 1995; Ryan & Deci, 2000; Vallerand & Rousseau, 2000). In their study of 281 Australian gymnasts, Ryan, Hohensee, Cooley, and Jones (2002) found that individuals who dropped out of gymnastics were more likely to have had extrinsic reasons for participation in the first place whereas those who continued with the sport of gymnastics tended to have initially intrinsic motives. Mullan and Markland (1997) found that those individuals who reported that they exercised infrequently had significantly lower levels of intrinsic motivation and identified regulation to exercise than did those individuals who indicated that they exercise regularly but for less than six consecutive months or those who exercised regularly for longer than six consecutive months.

One of the first studies to utilize self-determination theory for the understanding of persistence and withdrawal

behavior in an achievement context was conducted by Vallerand and Bissonnette (1992). These researchers assessed the academic motivation of 1042 Canadian college students to determine the extent to which different types of motivation influenced the students' persistence or withdrawal from school. Results indicated that the dropouts had significantly lower levels of identified, integrated, and intrinsic regulation than did those who remained in school. In a subsequent study, Vallerand, Fortier and Guay (1997) obtained similar results with 4,357 high school students and these findings indicated that the more self-determined students had lesser intentions and behaviors to drop out.

Frederick-Recascino, Lepes, Rubio, and Shelden (1997) conducted two prospective studies to test the hypothesis that intrinsic motivation leads to adherence and persistence in physical activity. The first study was comprised of a sample of 40 participants who practiced Tae Kwon Do and aerobics and supported the assumption that intrinsic reasons were related to persistence and adherence to the practice of the activity. In their study involving 155 individuals involved in fitness programs, they also found that intrinsic motivation was positively associated with continuance. In subsequent work, Frederick-Recascino and Schuster-Smith (2003) examined characteristics of competitiveness and intrinsic motivation in competitive cyclists and individuals engaged in fitness programs. These authors found that higher levels of competitiveness for the cyclists were positively correlated with interest and enjoyment motivation as well as with training frequency. For the exercise group, competitiveness was positively correlated with interest/enjoyment, competence, and appearance motives, but was unrelated to days per week of exercise. For both groups competitiveness was positively related to higher levels of intrinsic motivation.

In the same line, Pelletier, Vallerand and Brière (2001) conducted a two-year prospective study to assess persistence in competitive swimming in a sample of 360 predominantly adolescent swimmers from Canada. The study was carried out in three phases of data collection spanning 22 months. Structural equation modeling analyses indicated that swimmers' perceptions of autonomy support positively predicted self-determined motivation (intrinsic motivation and identified regulation) but, surprisingly, also predicted introjected regulation. Conversely, swimmers' perception that their coaches used a controlling style was associated with higher levels of amotivation, external regulation, and introjected regulation. Self-determined motivation predicted participation in swimming at two follow-up phases (10 and 22 months later). Introjected regulation was found to be a positive predictor of persistence at 10 months but not at 22 months. External regulation and amotivation were negative predictors of persistence at the subsequent follow-up phases. Finally, mean comparisons between persistent and dropout swimmers revealed that the former had greater intrinsic motivation and identified regulation and lower external

regulation and amotivation. No differences in introjected regulation were found between the groups.

More recently, Ntoumanis (2005) examined whether contextual and personal motivational variables could predict student cognitive and affective experiences in school physical education (PE) as well as participation in optional PE during the subsequent school year. The sample for this study was comprised of 302 British students. The results indicated that need support provided by PE teachers was associated with greater student need satisfaction which, in turn, predicted self-determined motivation. Furthermore, multivariate analysis of variance indicated that those participants who opted for PE ($n = 171$), compared with those who did not ($n = 131$), reported more positive motivational experiences during the previous school year.

Guillet, Sarrazin, Carpenter, Trouilloud and Cury (2002) examined affective experiences and continuance and dropout outcomes among female team handball players. Their results indicated that players' handball enjoyment levels were associated with feelings of competence, autonomy, relatedness, perceived improvement, coach support, and amount of playing time. Furthermore, those players who discontinued their handball participation perceived themselves as significantly less competent, reported lower feelings of relatedness with their teammates, perceived less personal improvement, and had feelings of lesser coach support than did the persistent players. In similar research, Sarrazin, Vallerand, Guillet, Pelletier and Cury (2002) utilized a sample of 335 handball players and found that the three psychological needs predicted self-determined motivation. Feelings of autonomy were particularly important in this regard. In turn, self-determined motivation was negatively related with the behavioral intention to drop out of handball.

The primary purpose of this investigation was to examine the extent to which sport dropout in adolescent athletes can be predicted from self-determination theory. Furthermore, we wished to examine the independent effects of the three basic psychological needs on sport continuance and discontinuance. In this regard, it was anticipated that stronger feelings of autonomy, competence, and relatedness, as well as self-determined motivation, would be positively linked to the maintenance of sport involvement. On the other side, this relationship would be negatively associated with those Spanish participants that dropped out.

Method

Participants

The sample was comprised of 492 male youth soccer players who were affiliated with the federation level sport program in Spain. These players ranged in age from 13 to 17 years old ($M = 14.3$, $SD = 1.6$) and had played competitive soccer for an average of 6.3 years old. Moreover, there

were 178 with a mean age of 14.8 years old who dropped out and had played competitive soccer for an average of 5.6 years. Besides, 314 participants with an average age of 14.1 that had involved in the competitive sport for a mean of 6.8 years continued in the practice.

Procedure

Prior to participation in the study, permission to participate in the study was requested and received from the coaches and parents of the participants involved and the general purpose of the study was explained to these individuals. Participants provided verbal assent and written consent and completed their questionnaires in the locker room prior to a scheduled practice. The primary researcher was present on each occasion and the questionnaires took roughly 15-20 minutes to complete.

Measures

Self-determined motivation. An adapted version of the Sport Motivation Scale (SMS; Pelletier, Fortier, Tuson, Brière, & Blais, 1995) was used in this study. This measure had been previously translated into Spanish by Nunez, Martin-Albo, Navarro, and Gonzalez (2006) and was used to assess the players' soccer motivation. The SMS is a 28-item inventory comprised of seven subscales that assess the multifaceted dimensions inherent within self-determination theory. The subscales are intrinsic motivation to know (e.g., "for the pleasure it gives me to know more about the sport I practice"); intrinsic motivation toward accomplishments (e.g., "because I feel a lot of personal satisfaction while mastering certain difficult training techniques"); intrinsic motivation to experience stimulation (e.g., "for the pleasure I feel in living exciting experiences"); identified regulation (e.g., "because in my opinion it is one of the best ways to meet people"); introjected regulation (e.g., "because it is absolutely necessary to do sports if one wants to be in shape"); external regulation (e.g., "because it allows me to be well regarded by people that I know"); and amotivation (e.g., "I used to have good reasons for doing sports, but now I am asking myself if I should continue doing it"). Participants responded to all the stems using a 10-point Likert Scale anchored by the scores of 0 (*strongly disagree*) to 10 (*strongly agree*).

Relatedness. To assess players' perceived relatedness we used nine questions from the Group Environment Questionnaire (GEQ; Carron, Widmeyer, & Brawley, 1985). These items measure aspects of individual attraction social to the group. A sample item is "Some of my best friends are on this team". Athletes answered in a 10-point Likert Scale at the extremes by 0 (*strongly disagree*) to 10 (*strongly agree*).

Competence. To estimate players' perceived soccer competence we used the general perceived competence measure developed by (Nicholls, Patashnick, & Nolen,

1985). The question that was asked of the respondents was "What do you believe to be your level of ability to play soccer?" Respondents answered on the same scale from 0 (*very poor*) to 10 (*very good*).

Autonomy. To assess participants' feelings of autonomy in their practice and competition, a four-item questionnaire was employed that included questions such as "I can make decisions during training and competition." The same 0 (*strongly disagree*) to 10 (*strongly agree*) response continuum was used as with the other scales.

Sport persistence and dropout. Knowledge about the continuation or discontinuation of sport involvement of these athletes was available through access to federation sport license continuance data. From this data base, we were able to identify who maintained participation and who discontinued their participation during the following year and individuals were labeled as "persistors" or "dropouts". This measure was made one year after data collection.

Data analysis

The findings were assessed first through descriptive analysis of the raw data including means and standard deviations. Reliability of measures was also assessed during this phase. Secondly, correlational data was examined. Multivariate analysis of variance (MANOVA) was employed to determine whether significant differences were present between the group of athletes who persisted in sport and those who discontinued their participation. Finally, discriminant function analysis was used to examine which variables contributed the most to understanding persistence and dropping out.

Results

Preliminary Analyses

Descriptive statistics and internal reliability coefficients for the 492 participants are provided in Table 1. The Cronbach's alphas levels for each of the measures exceeded .70. Thus, all measures were considered to possess sufficient internal reliability to merit inclusion. The mean values for relatedness, competence and autonomy were slightly to moderately above the mid-points of each scale. Kurtosis and skew values are acceptable for the following analyses because they are within the range between 1, -1.

Correlational statistics are presented in Table 2. As can be seen, the directions of the correlations are theoretical correct. Thus, the indices of intrinsic motivation were all positively correlated with each other. Positive correlations were also present between the intrinsic forms of motivation and the three psychological needs. Amotivation correlated negatively with intrinsic motivation indices and with the three psychological needs.

Table 1
Means, Standard Deviations, Cronbach's Alpha levels, Kurtosis and Skewness Levels

	<i>M</i>	<i>SD</i>	<i>α</i>	<i>Kurtosis</i>	<i>Skewness</i>
Intrinsic Motivation Stimulation	7.76	1.70	.76	-.65	.70
Intrinsic Motivation Knowledge	7.76	1.65	.77	-.63	.62
Intrinsic Motivation Accomplishment	7.68	1.71	.79	-.66	.71
Identified Regulation	6.79	2.90	.80	-.29	-.15
Introjected Regulation	5.93	2.09	.70	-.26	-.20
External Regulation	3.81	2.14	.77	.30	-.31
Amotivation	1.98	1.02	.83	.82	.81
Relatedness	7.06	1.21	.75	-.23	.29
Competence	7.22	1.32	n/a	-.53	.76
Autonomy	6.71	1.36	.78	-.35	.54

Note: n/a = One item only

Table 2
Correlations Among the Variables Included in the Study

	1	2	3	4	5	6	7	8	9
1. Intrinsic Stimulating									
2. Intrinsic Knowledge	.61**								
3. Intrinsic Accomplishment	.62**	.68**							
4. Identified Regulation	.48**	.58**	.53**						
5. Introjected Regulation	.04	.07	.18**	.27**					
6. External Regulation	.39**	.34**	.44**	.40**	.53**				
7. Amotivation	-.26**	-.21**	-.15**	.04	.55**	.28**			
8. Relatedness	.49**	.49**	.38**	.42**	-.21**	-.06	-.34**		
9. Competence	.32**	.22**	.34**	.20**	.17**	.15**	-.12**	.31**	
10. Autonomy	.19**	.21**	.12*	.06	-.25**	-.09	-.25*	.20	.07

* $p < .05$; ** $p < .001$

Main Analyses

Table 3 provides the results of the MANOVA and discriminant function analyses that were conducted to examine differences between those who persisted in soccer and those who dropped out over the course of the following year. A significant MANOVA, $F(9, 492) = 40.70$, $p < .0001$, Wilks' lambda = .56 revealed that significant differences existed between groups in their motivational profiles. The discriminant function analysis revealed that five predictor variables contributed significantly to the explanation of the differences between the groups with discriminant factor loadings exceeding .30 on each of these five variables. In order of importance, the variables that were most important in discriminating between those

who maintained their participation in soccer and those discontinued their participation were amotivation (.83), external regulation (.45), relatedness (-.40), introjected regulation (.39), and perceived autonomy (-.33). The interpretation of these results is that those individuals with lower levels of amotivation, external regulation, and introjected regulation and higher levels of feelings of relatedness and perceived autonomy were less likely to discontinue their soccer participation than were their counterparts who reported less favorable perceptions. The discriminant function analysis resulted in an accurate classification of 90% of the overall sample, including 79% of those who discontinued their participation (sport dropouts) and 94% of those who maintained their participation (sport persistors).

Table 3
Mean Comparisons and Discriminant Function Analysis Coefficients for Persistors and Dropouts

Variables	Persistent players		Dropout players		F	Discriminant coefficient
	M	SD	M	SD		
Amotivation	.98	1.01	3.63	1.52	352.89**	.83**
External regulation	3.11	2.01	4.91	1.94	85.66**	.45**
Relatedness	7.11	1.29	6.58	1.23	18.71**	-.40**
Introjected regulation	6.02	2.08	6.55	1.84	7.52*	.39**
Autonomy	6.98	1.36	6.58	1.32	16.51**	-.33**
Identified regulation	6.63	2.14	7.07	1.91	4.75*	.12
Intrinsic motivation for Stimulating.	7.99	1.54	7.39	1.82	13.76**	-.11
Intrinsic motivation for Knowledge.	7.91	1.62	7.53	1.56	6.57*	-.08
Competence	7.16	1.29	7.13	1.51	.061	.09
Intrinsic motivation for Accomplishment.	7.78	1.66	7.42	1.80	5.42*	-.04

* $p < .05$; ** $p < .001$

Discussion

The purpose of this study was to examine predictors of sport continuance and discontinuance among adolescent athletes using self-determination theory as a guiding theoretical framework. As was apparent through correlational and multivariate analyses, higher levels of amotivation, external regulation, and introjected regulation, and lower levels of relatedness and autonomy were associated with sport dropouts. Conversely, stronger feelings of relatedness and autonomy and lower levels of amotivation, external regulation and introjected regulation explained sport persistence. Contrary to expectations emerging from self-determination theory, perceived competence was not associated with sport continuance.

Findings similar to these have been obtained in previous research (Ntoumanis, 2005; Sarrazin et al., 2002) although discriminant analysis had not been utilized in these studies to identify the most important contributors to sport continuance and discontinuance, although they used a structural equation modeling to clarify this aspect. The discriminant function analysis revealed that the most important contributor to explaining dropout was amotivation. Pelletier and colleagues (2001) also found that amotivation was a strong predictor of sport withdrawal. It is logical that amotivation would be a strong contributor to sport withdrawal because an individual in an amotivated state has neither intrinsically- nor extrinsically-related motives for continuing.

External regulation and introjected motivation were also important predictors of sport withdrawal. These findings are consistent with hypotheses and correspond with Deci and Ryan's (1985) initial expectations about the role of extrinsic motivation in affecting motivation. However, none of the three dimensions of intrinsic motivation as identified in the SMS were significantly linked to sport continuance

in the discriminant function analysis. These results were not consistent with those expected, because intrinsic motivation was a strong predictor of the persistence or sport dropout (Ntoumanis, 2005; Pelletier et al., 2001). We consider that this concern might be due to the inclusion of the psychological needs in our study, because as it has been demonstrated in the results, they have an influence in the persistence or dropout, being more important that amotivation as it has been indicated by Self-Determination Theory. Furthermore, differences in the type of analyses with respect to other works could also influence in the findings.

In terms of the three essential psychological needs of autonomy, competence, and relatedness, both autonomy and relatedness were significant predictors of sport persistence. However, perceived competence did not have an influential role in explaining this result. Relatedness, as assessed through feelings of group cohesion, was particularly influential in explaining sport continuance. This was logical given that feelings of belonging and integration within a team should contribute to the desire to maintain involvement with the group (Beal, Cohen, Burke, & McLendon, 2003). The influence of both autonomy and relatedness on the motive to persist is consistent with other findings (see Deci & Ryan, 2002).

Perceived competence did not prove to be a significant predictor of sport continuance. This finding was surprising given the frequency with which perceived competence has been identified as an important predictor of persistence and other adaptive behaviors in sport and achievement contexts (Cervelló et al., 2007; Dweck, 2002; Guillet et al., 2002; Ntoumanis, 2005; Roberts, 2001; Sarrazin et al., 2002). It could be that our sample differed in important ways from the sample studied in research by Ntoumanis (2005) and Guillet et al (2002). It may be that the participants in this study were of higher ability than the samples used

in previous studies and that perceived competence levels were more similar among athletes of this ability level or perhaps not as relevant of an influence to their continued participation. Thus, relatedness and autonomy needs may be more important in explaining sport continuance and dropout than perceived competence (Duda, 2005). It is also possible that the instrument we used and which contained only a single item was not the best measure possible for capturing perceived competence in these athletes.

Amotivation was the single motivational perspective to understand sport persistence and dropout. Similar outcomes have been found by Ntoumanis (2005), Pelletier and colleagues (2001), and by Vallerand and his associates (1997). In order to this, coaches, and people in charge of teaching and training with young athletes, should avoid that participants lose their motivation or decrease their self-determination level in the sport practice. However, it would be interesting to promote a positive motivational climate, optimizing the satisfaction through the psychological needs with the aim to minimize the lack of motivation and improve intrinsic motivation (García Calvo, Leo, Martín & Sanchez, 2008).

It is remarkable to note that important differences existed in the feelings of relatedness and autonomy between those who did, and did not persist and increasing feelings of relatedness and autonomy, and intrinsic motives for participation, should be beneficial to fostering sport involvement over time (Guillet et al., 2002).

In closing we will identify a few limitations to the study and should help to promote future prospective. As was previously mentioned, the perceived competence measure was not perfect, because it was measured through just one item. Moreover, other limitations that should be improved for future researches are the lack of the assessment of the players' dropout reasons. Thus, we might differ between controllable or uncontrollable dropout. It would also be useful to take a more long-term view of participation across a time period of two or three (Pelletier et al., 2001) years to see to what extent these same variables maintain their importance. Longitudinal studies that included interventions to positively affect the basic psychological needs and intrinsic motivation of adolescent athletes as means of reducing sport dropout could be particularly insightful in contributing to our understanding of sport continuation and dropout.

References

- Beal, D. J., Cohen, R. R., Burke, M. J., & McLendon, C. L. (2003). Cohesion and performance in groups: A meta-analytic clarification of construct relations. *Journal of Applied Psychology, 88*(6), 989-1004.
- Carron, A. V., Widmeyer, W. N., & Brawley, L. R. (1985). The development of an instrument to assess cohesion in sport teams: The Group Environment Questionnaire. *Journal of Sport Psychology, 7*(3), 244-266.
- Cecchini, J. A., Méndez, A. & Contreras, O. R. (2005). *Motivos de abandono de la práctica del deporte juvenil*. [Reasons for dropout from youth sport]. Cuenca: Universidad de Castilla-la Mancha.
- Cervelló, E. M., Escartí, A., & Guzmán, J. F. (2007). Youth sport dropout from the achievement goal theory. *Psicothema, 19*, 65-71.
- Chirkov, V., Kim, Y., Ryan, R. M., & Kaplan, U. (2003). Differentiating autonomy from individualism and independence: A self-determination theory perspective on internalization of cultural orientations and well-being. *Journal of Personality and Social Psychology, 84*(1), 97-110.
- Deci, E. L. (1971). Effects of externally mediated rewards on intrinsic motivation. *Journal of Personality and Social Psychology, 18*, 105-115.
- Deci, E. L. (1975). *Intrinsic motivation*. New York: Plenum.
- Deci, E. L., & Ryan, R. M. (1985). *Intrinsic motivation and self-determination in human behavior*. New York: Plenum Press.
- Deci, E. L., & Ryan, R. M. (2000). The "what" and "why" of goal pursuits: Human needs and the self-determination of behavior. *Psychological Inquiry, 11*, 227 - 268.
- Deci, E. L., & Ryan, R. M. (2002). Self-determination research: Reflections and future directions. In E. L. Deci, & R. M. Ryan (Eds.), *Handbook of self-determination research* (pp. 431-441). Rochester, NY: University of Rochester Press.
- Deci, E. L., Eghrari, H., Patrick, B. C., & Leone, D. R. (1994). Facilitating internalization: The self-determination perspective. *Journal of Personality, 62*, 119-142.
- Duda, J. L. (2005). Motivation in sport: The relevance of competence and achievement goals. In A. J. Elliot, & C. S. Dweck (Eds.), *Handbook of competence and motivation* (pp. 273-308). New York: Guilford Publications.
- Dweck, C. S. (2002). The development of ability conceptions. In A. Wigfield, & J. S. Eccles (Eds.), *Development of achievement motivation* (pp. 57-88). San Diego, CA: Academic Press.
- Frederick-Recascino, C. M. (2002). Self-determination theory and participation motivation research in the sport and exercise domain. In E. L. Deci, & R. M. Ryan (Eds.), *Handbook of self-determination research* (pp. 277-294). Rochester, NY: University of Rochester Press.
- Frederick-Recascino, C. M., & Ryan, R. M. (1995). Self-determination in sport: A review using cognitive evaluation theory. *International Journal of Sport Psychology, 26*, 5-23.
- Frederick-Recascino, C. M., & Schuster-Smith, H. (2003). Competition and intrinsic motivation in physical activity: A comparison of two groups. *Journal of Sport Behavior, 26*(3), 240-254.
- García Calvo, T.; Leo, F. M.; Martín, E., & Sánchez Miguel, P. A. (2008). El compromiso deportivo y su relación con factores disposicionales y situacionales contextuales de la motivación. *Revista Internacional de Ciencias del Deporte, 12*(4), 45-58.
- Guillet, E., Sarrazin, P., Carpenter, P. J., Trouilloud, D., & Cury, F. (2002). Predicting persistence or withdrawal in female handballers with social exchange theory. *International Journal of Psychology, 37*(2), 92-104.

- Martens, R. (1970). Influence of participation motivation on success and satisfaction in team performance. *Research Quarterly*, 41(4), 510-518.
- Mullan, E., & Markland, D. (1997). Variations in self-determination across the stages of change for exercise in adults. *Motivation and Emotion*, 21(4), 349-362.
- Nicholls, J. G., Patashnick, M., & Nolen, S. B. (1985). Adolescents' theories of education. *Journal of Educational Psychology*, 77, 683-692.
- Ntoumanis, N. (2005). A prospective study of participation in optional school physical education using a self-determination theory framework. *Journal of Educational Psychology*, 97(3), 444-453.
- Ntoumanis, N., Pensaard, A. M., Martin, C., & Pipe, K. (2004). An idiographic analysis of amotivation in compulsory school physical education. *Journal of Sport & Exercise Psychology*, 26, 197-214.
- Núñez, J. L., Martín-Albo, J., Navarro, J. G., & González, V. M. (2006). Preliminary Validation of a Spanish Version of the Sport Motivation Scale. *Perceptual and Motor Skills*, 102(3), 919-930.
- Otis, N., Grouzet, F. M. E., & Pelletier, L. G. (2005). Latent motivational change in an academic setting: A 3-year longitudinal study. *Journal of Educational Psychology*, 97(2), 170-183.
- Pelletier, L. G., Fortier, M. S., Vallerand, R. J., & Brière, N. M. (2001). Associations among perceived autonomy support, forms of self-regulation, and persistence: A prospective study. *Motivation and Emotion*, 25, 279-306.
- Pelletier, L. G., Fortier, M. S., Vallerand, R. J., Tuson, K. M., Brière, N. M., & Blais, M. R. (1995). Toward a new measure of intrinsic motivation, extrinsic motivation, and amotivation in sports: The sport motivation scale (SMS). *Journal of Sport and Exercise Psychology*, 17, 35-53.
- Reinboth, M., & Duda, J. L. (2006). Perceived motivational climate, need satisfaction and indices of well-being in team sports: A longitudinal perspective. *Psychology of Sport and Exercise*, 7(3), 269-286.
- Roberts, G. C. (2001). Understanding the dynamics of motivation in physical activity: The influence of achievement goals and motivational processes. In G. C. Roberts (Ed.), *Advances in motivation in sport and exercise* (pp. 1-50). Champaign: IL: Human Kinetics.
- Robinson, T. T., & Carron, A. V. (1982). Personal and situational factors associated with dropping out versus maintaining participation in competitive sport. *Journal of Sport Psychology*, 4(4), 364-378.
- Ryan, R. M., & Deci, E. L. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development, and wellbeing. *American Psychologist*, 55, 68-78.
- Ryan, R. M., Frederick, C. M., Lepes, D., Rubio, N., & Sheldon, K. M. (1997). Intrinsic motivation and exercise adherence. *International Journal of Sport Psychology*, 28, 335 - 354.
- Ryska, T. A., Hohensee, D., Cooley, D., & Jones, C. (2002). Participation motives in predicting sport dropout among Australian youth gymnasts. *North American Journal of Psychology*, 4(2), 199-210.
- Sarrazin, P., Vallerand, R., Guillet, E., Pelletier, L., & Cury, F. (2002). Motivation and dropout in female handballers: A 21-month prospective study. *European Journal of Social Psychology*, 32(3), 395-418.
- Thøgersen-Ntoumani, C., & Ntoumanis, N. (2006). The role of self-determined motivation in the understanding of exercise-related behaviours, cognitions and physical self-evaluations. *Journal of Sports Sciences*, 24(4), 393 - 404.
- Vallerand, R. J. (1997). Toward a hierarchical model of intrinsic and extrinsic motivation. In M.P. Zanna (Ed.), *Advances in experimental social psychology* (Vol. 29, pp. 271-360). New York: Academic Press.
- Vallerand, R. J., & Rousseau, F. L. (2001). Intrinsic and extrinsic motivation in sport and exercise: A review using the hierarchical model of intrinsic and extrinsic motivation. In R. N. Singer, H. A. Hausenblas, & C. M. Janelle (Eds.), *Handbook of sport psychology* (pp. 389-416). New York: Wiley.
- Vallerand, R. J., Fortier, M. S., & Guay, F. (1997). Self-determination and persistence in a real-life setting: Toward a motivational model of high school dropout. *Journal of Personality and Social Psychology*, 72(5), 1161-1176.
- Wang, C. K. J., Chatzisarantis, N. L. D., Spray, C. M., & Biddle, S. J. H. (2002). Achievement goal profiles in school physical education: Differences in self-determination, sport ability beliefs, and physical activity. *British Journal of Educational Psychology*, 72, 433-445.

Received December 10, 2008

Revision received January 26, 2010

Accepted February 13, 2010

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.