
Original Article


Athlete burnout and motivational dynamics: a multiple case follow-up study among elite BMX riders

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ABSTRACT

Isoard-Gauthier, S., & Guillet-Descas, E. (2014). Athlete Burnout and Motivational Dynamics: A Multiple Case Follow-Up Study among Elite BMX Riders. *J. Hum. Sport Exerc.*, 9(1), pp.31-42. Aim of the study: The objective of the current study was to identify the motivational dynamics and the changes in the levels of burnout experienced among elite BMX riders during a competitive season. Methods: Data were collected each week during 32 weeks, among three BMX riders from an elite training structure. Paired sample t-tests were used to compare the means of each training phase two by two for each rider. Cohen's *d* effect sizes were calculated to determine if changes noted between phases were meaningful for the data. Findings: The results of the current study reinforced the hypothesis that burnout is (a) a process that develops over time (Dale & Weinberg, 1990), (b) a multidimensional syndrome (Raedeke & Smith, 2001) and (c) a process with inter-individual differences (Dale & Weinberg, 1990). **Key words:** EMOTIONAL AND PHYSICAL EXHAUSTION, INTRINSIC MOTIVATION, REDUCED SENSE OF ACCOMPLISHMENT, SPORT DEVALUATION.

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INTRODUCTION

The Bicycle Motocross (BMX) is a sport in which athletes must ride a track consisting of jumps, banked corners and other obstacles, and of a length between 340 and 400 meters. This sport requires physical qualities such as speed, power, explosiveness and endurance; and psychological qualities such as concentration, reflection and commitment (Zabala et al., 2009). The physical and psychological demands related to these qualities are repeated in every training and competition among elite athletes; this can then lead some of these athletes to feel exhausted as a result of this overwhelming context. In elite competitive context, the total dedication to the goals athletes (i.e., especially young invested in elite training structures) have set, the intensive workouts and lack of recovery, can lead individuals to never fully realize their athletic potential and to experience psychological difficulties such as athlete burnout (Lemyre et al., 2007).

Athlete burnout is conceptualized as a psycho-physiological syndrome that encompasses three salient and distinct - yet empirically interrelated - characteristics that are central to the athlete's experience in the sport context. As such, this conceptual model entails three core dimensions: (a) *emotional/physical exhaustion*, which is a negative response to the intense demands of training and competition; (b) *reduced sense of accomplishment*, which entails the feelings that one's sport experience is characterized by diminished achievement, abilities, or success; and (c) *sport devaluation*, which is characterized by a loss of interest and increased negative attitudes toward the sport activity (Raedeke & Smith, 2001; 2009). Athlete burnout has been considered as a long process that develops over time and differs among individuals (Dale & Weinberg, 1990).

As a consequence, it seems relevant to examine the changes on burnout among elite young athletes during a competitive season. The traditional experimental designs, such as correlational studies can partially answer the question of the development of athlete burnout. However, these methods require participants to remember how they felt during a period of time (e.g., in recent months). Follow-up studies request athletes to report their experience regularly (e.g., each day, each week or at each competition). This allows the researcher to examine more accurately their state at a specific time (Gagné & Blanchard, 2007). To our knowledge, only two qualitative and one follow-up studies have examined the changes on athlete burnout during a competitive season. Creswell and Eklund (2007), in a case study among nine rugby players, highlighted that burnout develops in different ways according to athletes. However they assumed that sport devaluation might be the last step of a sequence involving reduced sense of accomplishment, and emotional and physical exhaustion. Gustafsson et al., (2008), in another case study among three athletes, also assumed that the experience of athlete burnout is individual and the three burnout dimensions should develop differently according to athletes. More recently, Main and Landers (2012) used a quantitative follow-up case study and examined the development of athlete burnout during a 45-weeks season among one athlete. The results revealed that the three dimensions of athlete burnout have concomitantly increased during the preparation period and the main competitive phase, and decreased during the end of competitive season period. However, this study has not examined the psychological correlates responsible of the development of athlete burnout. Indeed, Gould (1996) has suggested that burnout is a "motivation gone awry" and so that the development of athlete burnout was linked to motivational factors.

Self-determination theory (SDT) has been assumed to be a powerful theory to explain athlete burnout as it has been widely used to predict well and ill-being in several domains (Cresswell & Eklund, 2005). Several studies have examined the links between the SDT concepts and athlete burnout. SDT states that intrinsic motivation and more self-determined forms of extrinsic motivation (i.e., identified and integrated

regulations) are associated with adapted consequences (emotional, cognitive and behavioral), while the non self-determined forms of motivation (i.e., introjected and extrinsic regulations) and amotivation are related to maladaptive consequences (Deci & Ryan, 2000). These motivational consequences on well-being are very relevant regarding athletes in elite training structures because they are exposed to a specific context with multiple demands. Indeed, each year, hundreds of young athletes are leaving home to join an elite training structure to pursue their sporting career. In this specific context, the motivational regulations might be linked to athletes' well-being, and more precisely could be associated to the susceptibility to athlete burnout.

Cresswell & Eklund (2005) have reported a positive link between amotivation and burnout, and a negative link between intrinsic motivation and burnout. Similarly, in a longitudinal study, Lemyre, Treasure and Roberts (2006) measured the motivation of athletes every three weeks and positive and negative affects every week between November and April. They also measured the three dimensions of burnout weekly between February and March. The results showed that athletes with motivation becoming less self-determined during the season have higher burnout scores at the season's end. Moreover, they showed that intra-individual variations in negative affect are related to the three dimensions of burnout. Recently, Lonsdale and Hodge (2011) have found that the self-determined forms of motivation were negatively predicting athlete burnout. Furthermore, they stated that the non self-determined forms of motivation were positively related to athlete burnout. Isoard-Gauthier et al. (2012) also found that the self-determined forms of motivation were negatively predicting athlete burnout; especially that intrinsic motivation is negatively related to reduced sense of accomplishment.

In light of these first results, the motivational dynamics and the development of athlete burnout during a competitive season are areas of future investigations, specifically using a follow-up perspective. To examine the motivational dynamics, several methods have been used. In the study of Lemyre et al. (2006), the authors calculated the self-determination index, but this index does not reveal the dynamics of each motivational regulation within the index (e.g., Vallerand et al., 2008). Indeed, same scores on the index may reflect different underlying processes. It is also possible to examine all the regulations, without calculating the index, however, the statistical treatment of these data might be difficult. The alternative then is to focus on one of them. We can investigate either intrinsic forms, which are considered the most self-determined and lead to more adaptive psychological consequences (e.g., persistence, satisfaction, pleasure; Sarrazin et al., 2002) or non self-determined forms, which are often linked to negative psychological consequences (e.g., withdrawal from the activity, lack of pleasure and satisfaction, anxiety; Kowall & Fortier, 1999). However, some studies which have used cluster analysis to examine the motivational profiles, showed that individuals with high self-determined motivation experienced positive affect (e.g., enjoyment, effort) regardless of the level of non self-determined motivation (Boiché et al., 2008). Accordingly, the current study focuses on intrinsic motivation because of the importance of positive affect associated with self-determined motivation and in order to shorten the questionnaire as in follow-up studies athletes have to fulfill the questionnaires every week and may grow tired to fulfill extended questionnaires.

In view of these considerations, the objective of the current study was to identify the motivational dynamics and the changes in the levels of burnout experienced among elite BMX riders during a competitive season. We hypothesized that intrinsic motivation and athlete burnout should develop during the competitive season. More precisely, we assumed that (a) the three dimensions of burnout should vary compared with each other during the season, and (b) intrinsic motivation of riders should follow the variations of athlete burnout, i.e., athlete burnout increases at the same time as intrinsic motivation decreases and vice versa.

MATERIAL AND METHODS

Participant and Procedures

Three elite BMX riders (aged of 19, 21 and 24 years old) participated in this study. These riders trained an average of 12.50 hours per week ($SD = 1.32$), had an average of 12 years ($SD = 2$) of experience in BMX, and competed at an international level (see Table 1).

After obtaining the approval of the coach, the questionnaires were sent by email to the riders on Thursday evening (so that the riders' responses were not influenced by their results in the competition) every week for eight months. The riders were free to fulfill or not the questionnaires. The 32 weeks of the study were divided into four periods of eight weeks depending on the training cycles (i.e., Phase 1: Physical preparation; Phase 2: Early season competition; Phase 3: Mid-season competition; Phase 4: End of season competition).

Table 1. Competitive Results of Athlete A, Athlete B and Athlete C

Training Phases	Date of competition	Type of competition	Results		
			Athlete A	Athlete B	Athlete C
Phase 2	12/12/2009	European Indoor	Quarter final	Quarter Final	3 rd
Phase 2	30/01/2010	European Indoor	5 th	Round	4 th
Phase 3	06/03/2010	National Championship	1 st	Round	5 th
Phase 3	20/03/2010	National Championship	1 st	Quarter final	5 th
Phase 3	03/04/2010	European Championship	5 th	8 th	Injured
Phase 3	10/04/2010	National Championship	2 nd	Quarter final	3 rd
Phase 4	24/04/2010	National Championship	5 th	Semi-final	1 st
Phase 4	29/05/2010	Final of the National Championship	1 st	Semi-final	3 rd

Measures

Intrinsic Motivation: Riders completed the subscale of intrinsic motivation of the "Echelle de Motivation dans les Sports" (EMS; Briere et al., 1995), to assess their intrinsic motivation towards BMX training and competition (e.g., "I practice BMX for the pleasure I feel when I am improving some of my weaknesses"). Participants responded using 5-point scale (1 = "not true at all", 5 = "very true"). Studies (see Vallerand & Losier, 1999, for a review) confirmed the factor structure of the scale and revealed satisfactory level of internal consistency as well as adequate test-retest reliability.

Athlete Burnout: The athletes' burnout was measured by a French version of the Athlete Burnout Questionnaire (Questionnaire du Burnout Sportif; QBS; Isoard-Gauthier et al., 2010). The questionnaire

consisted of four items measuring reduced sense of accomplishment (e.g., “It seems that no matter what I do, I don’t perform as well as I should”), four items measuring emotional and physical exhaustion (e.g., “I feel so tired from my training that I have trouble finding energy to do other things”), and four items measuring devaluation of the sport experience (e.g., “The effort I spend participating in my sport would be better spent doing other things”). Participants responded using 5-point scale (1 = “almost never”, 5 = “almost always”).

Data Analysis

Paired sample t-tests were used to compare the means of each phase two by two among the three riders. These tests compute the difference between two phases for each case (i.e., week), and tests to see if the average difference is significantly different from zero. Cohen’s *d* effect sizes were calculated to determine if changes noted between phases were meaningful for the data. Changes in intrinsic motivation and the three dimensions of athlete burnout are presented in Figure 1 for athlete A, in Figure 2 for athlete B and in Figure 3 for athlete C.

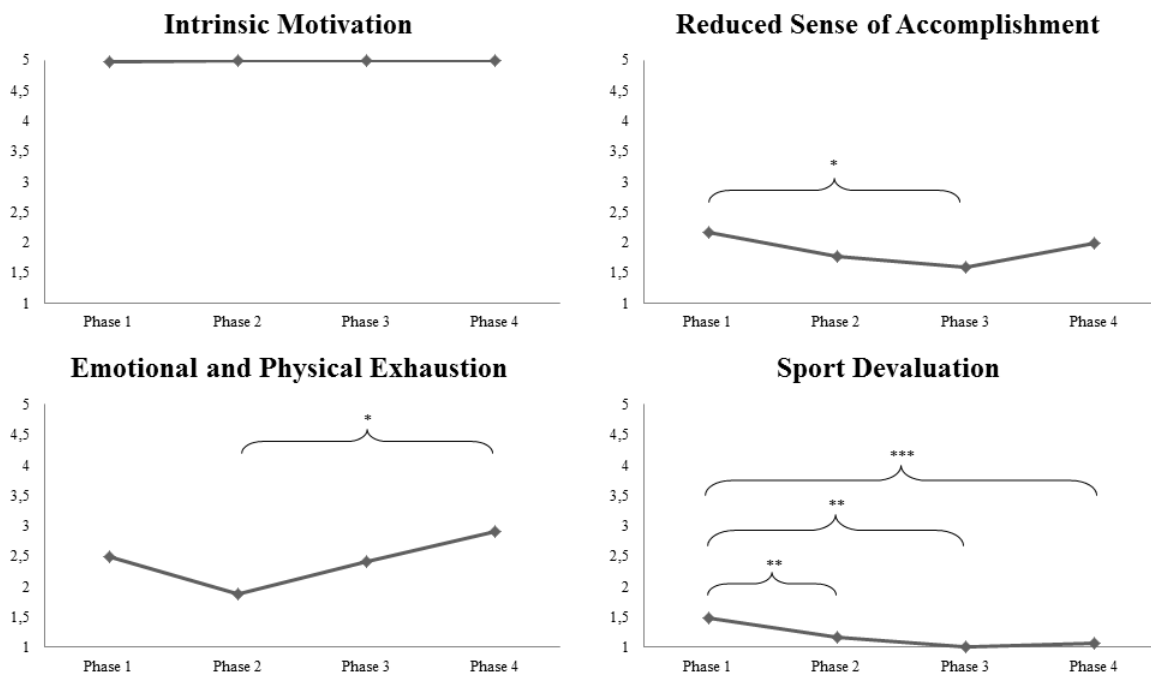


Figure 1. Changes in mean score of intrinsic motivation and three dimensions of athlete burnout over the four training phases for athlete A (***p*<.001; ***p*<.01; **p*<.05)

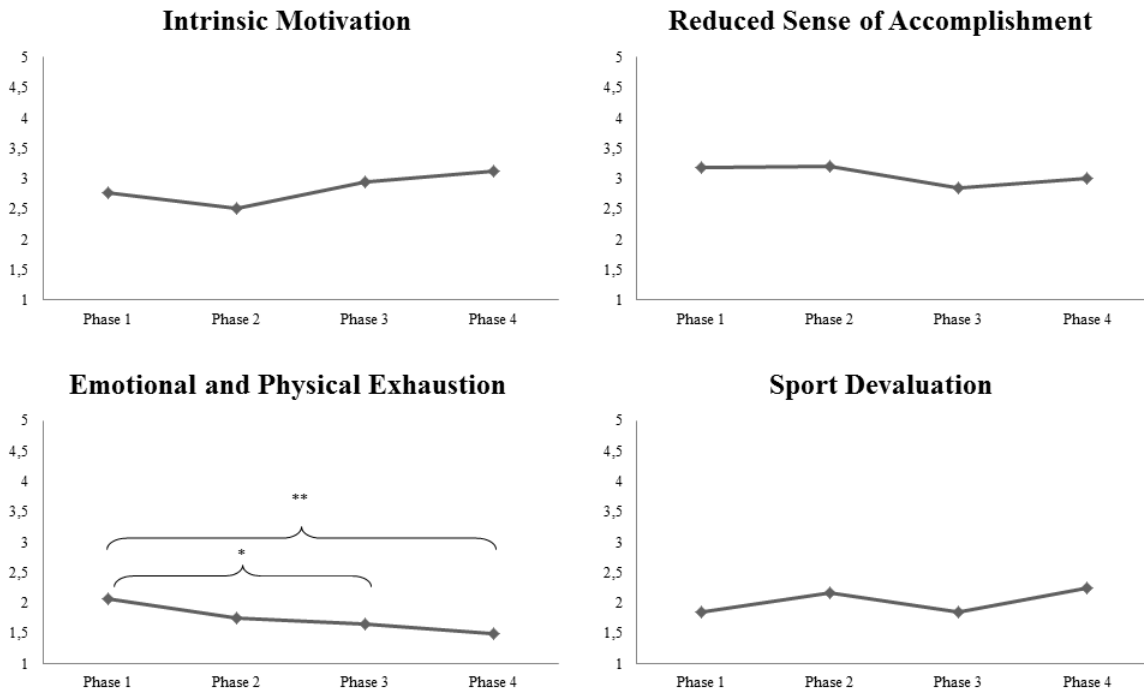


Figure 2. Changes in mean score of intrinsic motivation and three dimensions of athlete burnout over the four training phases for athlete B (** $p < .001$; * $p < .01$; $p < .05$)

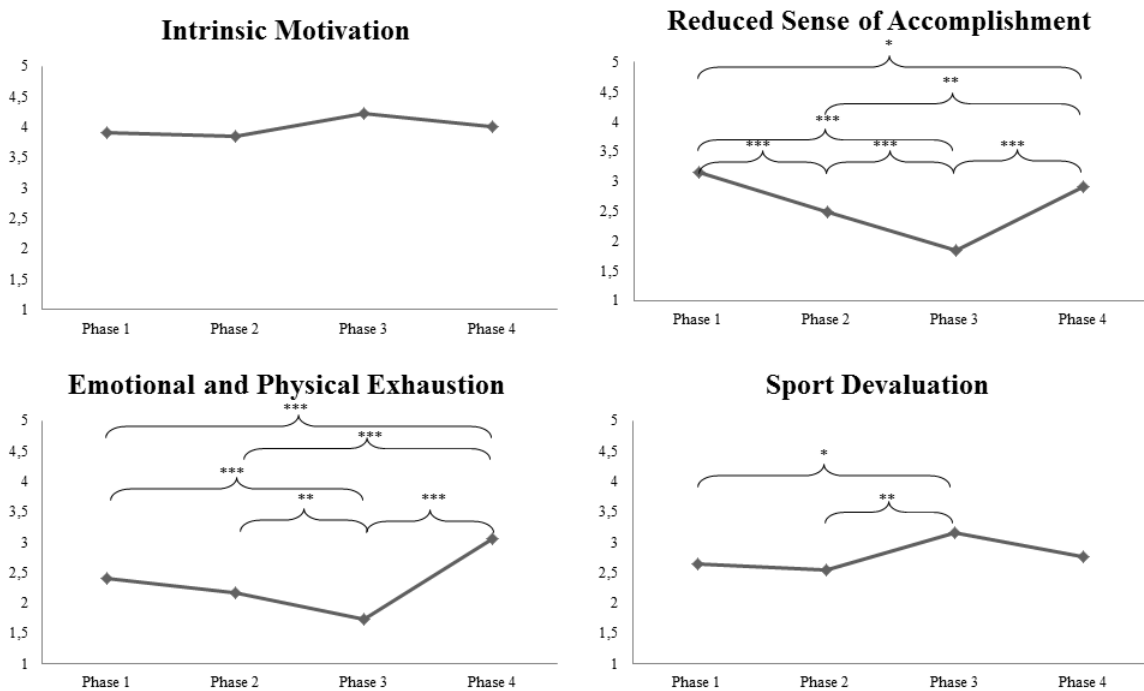


Figure 3. Changes in mean score of intrinsic motivation and three dimensions of athlete burnout over the four training phases for athlete C (** $p < .001$; * $p < .01$; $p < .05$)

RESULTS

Intrinsic Motivation

Paired-samples t-tests were conducted to compare levels of intrinsic motivation during the four phases of the competitive season among the three athletes. Among athlete A, no significant differences appeared on intrinsic motivation between the four phases. Among athlete B, there was a significant difference between the scores for phase 1 ($N=8$, $M=2.77$, $SD=.65$) and phase 4 ($N=8$, $M=3.41$, $SD=.22$); $t(7)=-2.38$, $p=.05$, 95% $CI=[-1.28,-0.003]$, $d=-0.84$. There was also a significant difference between the scores for phase 2 ($N=8$, $M=2.50$, $SD=.31$) and phase 3 ($N=8$, $M=3.20$, $SD=.16$); $t(7)=-4.86$, $p=.002$, 95% $CI=[-1.03,-0.36]$, $d=-1.72$. There was also a significant difference between the scores for phase 2 ($N=8$, $M=2.50$, $SD=.31$) and phase 4 ($N=8$, $M=3.41$, $SD=.22$); $t(7)=-6.03$, $p=.001$, 95% $CI=[-1.27,-0.56]$, $d=-2.13$. These results suggest that intrinsic motivation varied during the competitive season. Specifically, our results suggest that among athlete B, intrinsic motivation increased during the competitive season. Among athlete C, there was a significant difference between the scores for phase 1 ($N=8$, $M=3.90$, $SD=.25$) and phase 3 ($N=8$, $M=4.26$, $SD=.11$); $t(7)=-3.98$, $p=.005$, 95% $CI=[-0.58,-0.15]$, $d=-1.41$. There was also a significant difference between the scores for phase 3 ($N=8$, $M=4.26$, $SD=.11$) and phase 4 ($N=8$, $M=3.91$, $SD=.04$); $t(7)=8.78$, $p=.000$, 95% $CI=[0.25,0.44]$, $d=3.11$. These results suggest that intrinsic motivation varied during the competitive season. Specifically, our results suggest that among athlete C, intrinsic motivation increased between phases 1 and 3, and decreased between phases 3 and 4.

Reduced Sense of Accomplishment

Paired-samples t-tests were conducted to compare levels of reduced sense of accomplishment during the four phases of the competitive season among the three athletes. Among athlete A, there was a significant difference between the scores for phase 1 ($N=8$, $M=2.17$, $SD=.57$) and phase 3 ($N=8$, $M=1.60$, $SD=.05$); $t(7)=3.03$, $p=.02$, 95% $CI=[0.13,1.02]$, $d=1.07$. This result suggests that reduced sense of accomplishment among athlete A decreased between phases 1 and 3. Among athlete B, there was a significant difference between the scores for phase 3 ($N=8$, $M=2.84$, $SD=.13$) and phase 4 ($N=8$, $M=3.00$, $SD=.11$); $t(7)=-3.58$, $p=.01$, 95% $CI=[-0.27,-0.05]$, $d=-1.26$. This result suggests that reduced sense of accomplishment among athlete B increased between phases 3 and 4. Among athlete C, there was a significant difference between the scores for phase 1 ($N=8$, $M=3.16$, $SD=.33$) and phase 2 ($N=8$, $M=2.48$, $SD=.20$); $t(7)=5.52$, $p=.001$, 95% $CI=[0.38,0.97]$, $d=1.95$. There was also a significant difference between the scores for phase 1 ($N=8$, $M=3.16$, $SD=.33$) and phase 3 ($N=8$, $M=1.84$, $SD=.35$); $t(7)=14.35$, $p=.000$, 95% $CI=[1.10,1.54]$, $d=5.07$. There was also a significant difference between the scores for phase 2 ($N=8$, $M=2.48$, $SD=.20$) and phase 3 ($N=8$, $M=1.84$, $SD=.35$); $t(7)=5.14$, $p=.001$, 95% $CI=[0.35,0.93]$, $d=1.82$. There was also a significant difference between the scores for phase 2 ($N=8$, $M=2.48$, $SD=.20$) and phase 4 ($N=8$, $M=2.90$, $SD=.27$); $t(7)=-7.25$, $p=.000$, 95% $CI=[-0.56,-0.28]$, $d=-2.56$. There was also a significant difference between the scores for phase 3 ($N=8$, $M=1.84$, $SD=.35$) and phase 4 ($N=8$, $M=2.90$, $SD=.27$); $t(7)=-9.03$, $p=.000$, 95% $CI=[-1.34,-0.78]$, $d=-3.19$. These results suggest that reduced sense of accomplishment varied during the competitive season. Specifically, our results suggest that among athlete C, reduced sense of accomplishment decreased between phases 1 and 3, and increased between phases 3 and 4.

Emotional and Physical Exhaustion

Paired-samples t-tests were conducted to compare levels of emotional and physical exhaustion during the four phases of the competitive season among the three athletes. Among athlete A, there was a significant difference between the scores for phase 2 ($N=8$, $M=1.75$, $SD=.47$) and phase 3 ($N=8$, $M=2.37$, $SD=.01$); $t(7)=-3.76$, $p=.007$, 95% $CI=[-1.02,-0.23]$, $d=-1.33$. There was also a significant difference between the scores for phase 2 ($N=8$, $M=1.75$, $SD=.47$) and phase 4 ($N=8$, $M=2.90$, $SD=.52$); $t(7)=-4.71$, $p=.002$, 95%

CI=[-1.74,-0.57], $d=-1.66$. There was also a significant difference between the scores for phase 3 ($N=8$, $M=2.37$, $SD=.01$) and phase 4 ($N=8$, $M=2.90$, $SD=.52$); $t(7)=-2.91$, $p=.02$, 95% CI=[-0.96,-0.10], $d=-1.03$. This result suggests that emotional and physical exhaustion among athlete A increased between phases 2 and 4. Among athlete B, there was a significant difference between the scores for phase 1 ($N=8$, $M=2.08$, $SD=.44$) and phase 4 ($N=8$, $M=1.50$, $SD=.20$); $t(7)=3.50$, $p=.01$, 95% CI=[0.19,0.97], $d=1.24$. This result suggests that emotional and physical exhaustion among athlete B decreased during the competitive season. Among athlete C, there was a significant difference between the scores for phase 1 ($N=8$, $M=2.65$, $SD=.17$) and phase 3 ($N=8$, $M=2.75$, $SD=.19$); $t(7)=8.73$, $p=.000$, 95% CI=[0.49,0.86], $d=3.09$. There was also a significant difference between the scores for phase 1 ($N=8$, $M=2.65$, $SD=.17$) and phase 4 ($N=8$, $M=2.75$, $SD=.00$); $t(7)=-5.78$, $p=.001$, 95% CI=[-0.93,-0.39], $d=-2.04$. There was also a significant difference between the scores for phase 2 ($N=8$, $M=2.55$, $SD=.36$) and phase 3 ($N=8$, $M=2.75$, $SD=.19$); $t(7)=4.92$, $p=.002$, 95% CI=[0.23,0.66], $d=1.74$. There was also a significant difference between the scores for phase 2 ($N=8$, $M=2.55$, $SD=.36$) and phase 4 ($N=8$, $M=2.75$, $SD=.00$); $t(7)=-3.83$, $p=.006$, 95% CI=[-1.43,-0.34], $d=-1.35$. There was also a significant difference between the scores for phase 3 ($N=8$, $M=2.75$, $SD=.19$) and phase 4 ($N=8$, $M=2.75$, $SD=.00$); $t(7)=-8.92$, $p=.000$, 95% CI=[-1.69,-0.98], $d=-3.16$. These results suggest that emotional and physical exhaustion varied during the competitive season. Specifically, our results suggest that among athlete C, emotional and physical exhaustion decreased between phases 1 and 3, and increased between phases 3 and 4.

Sport Devaluation

Paired-samples t-tests were conducted to compare levels of sport devaluation during the four phases of the competitive season among the three athletes. Among athlete A, there was a significant difference between the scores for phase 1 ($N=8$, $M=1.47$, $SD=.25$) and phase 2 ($N=8$, $M=1.17$, $SD=.17$); $t(7)=2.83$, $p=.02$, 95% CI=[0.50,0.55], $d=1.00$. There was also a significant difference between the scores for phase 1 ($N=8$, $M=1.47$, $SD=.25$) and phase 3 ($N=8$, $M=1.01$, $SD=.02$); $t(7)=5.002$, $p=.002$, 95% CI=[0.24,0.68], $d=1.77$. There was also a significant difference between the scores for phase 1 ($N=8$, $M=1.47$, $SD=.25$) and phase 4 ($N=8$, $M=1.06$, $SD=.08$); $t(7)=3.73$, $p=.007$, 95% CI=[0.15,0.66], $d=1.32$. There was also a significant difference between the scores for phase 2 ($N=8$, $M=1.17$, $SD=.17$) and phase 3 ($N=8$, $M=1.01$, $SD=.02$); $t(7)=2.62$, $p=.03$, 95% CI=[0.01,0.30], $d=0.92$. There was also a significant difference between the scores for phase 3 ($N=8$, $M=1.01$, $SD=.02$) and phase 4 ($N=8$, $M=1.06$, $SD=.08$); $t(7)=-2.42$, $p=.05$, 95% CI=[-0.11,-0.001], $d=-0.85$. These results suggest that sport devaluation varied during the competitive season. Specifically, our results suggest that among athlete A, sport devaluation decreased between phases 1 and 3, and increased between phases 3 and 4. Among athlete B, there was a significant difference between the scores for phase 1 ($N=8$, $M=1.84$, $SD=.46$) and phase 4 ($N=8$, $M=2.25$, $SD=.13$); $t(7)=-2.73$, $p=.03$, 95% CI=[-0.76,-0.05], $d=-0.96$. There was also a significant difference between the scores for phase 3 ($N=8$, $M=1.85$, $SD=.29$) and phase 4 ($N=8$, $M=2.25$, $SD=.13$); $t(7)=-3.95$, $p=.006$, 95% CI=[-0.64,-0.16], $d=-1.40$. These results suggest that sport devaluation among athlete B increased between phases 1 and 4. Among athlete C, no significant differences appeared on sport devaluation between the four phases.

DISCUSSION

The purpose of the present study was to identify the motivational dynamics and the changes in the levels of burnout experienced among elite BMX riders during a competitive season. The results partially supported our hypothesis on the development of athlete burnout and intrinsic motivation.

Among two of the athletes, intrinsic motivation and the three dimensions of athlete burnout developed concomitantly and in line with the theoretical expectations.

Intra-Individual Changes on the Three Dimensions of Athlete Burnout during the Competitive Season

The current study results showed that for athlete A, reduced sense of accomplishment decreased between phases 1 and 3, emotional and physical exhaustion increased between phases 2 and 4, and sport devaluation decreased between phases 1 and 3, and increased between phases 3 and 4. These results highlight the multidimensional nature of athlete burnout (Raedeke & Smith, 2001) with the three dimensions developing at different point in time. More precisely it seems that reduced sense of accomplishment and sport devaluation concomitantly decreased between phases 1 and 3, and that emotional and physical exhaustion and sport devaluation both increased in the latest phases of the season (i.e., between phases 3 and 4 for sport devaluation, and between phases 2 and 4 for emotional and physical exhaustion). These results are in line with the results of Gustafsson et al. (2008). Indeed in their qualitative case study, the authors founded that for one athlete, emotional and physical exhaustion was the first burnout dimension to develop, then sport devaluation followed the development of exhaustion, and finally reduced sense of accomplishment was the last dimension to increase. The results of athlete A seemed to follow this sequential development; emotional and physical exhaustion started to increase after phase 2, sport devaluation started to increase after phase 3 and it can be hypothesis that reduced sense of accomplishment might have follow these two dimensions after phase 4 (i.e., from the graphical representation of scores reported by athlete A during the season, we can observe the initiation of a non-significant increase in reduced sense of accomplishment after phase 3).

Regarding athlete B, reduced sense of accomplishment increased between phases 3 and 4, emotional and physical exhaustion decreased during the competitive season, and sport devaluation increased during the competitive season. These results also highlight the multidimensional nature of athlete burnout (Raedeke & Smith, 2001) and are consistent with past studies results. In accordance with the results of Cresswell & Eklund (2007), among athlete B, reduced sense of accomplishment increased between phases 3 and 4, and sport devaluation increased during the competitive season. Cresswell & Eklund (2007), in a qualitative case study, highlighted that reduced sense of accomplishment and sport devaluation increased during the competitive season especially due to the failure to meet performance goals and the fear of missing selection for international team. Regarding emotional and physical exhaustion reported by this athlete, it might be surprising that this dimension decreased during the competitive season as sport devaluation and reduced sense of accomplishment increased. However, Cresswell & Eklund (2007) have explained this decreased in emotional and physical exhaustion, by what they called the "preseason exhaustion". Indeed, during the physical preparation phase, the athletes might report higher level of emotional and physical exhaustion due to the repetition of physical training which are often very demanding at the physical and emotional levels, repetitive and less interesting than the technical training. For, Cresswell & Eklund (2007), these reported higher levels of exhaustion are not characteristics to the experience of burnout and disappear after recovery periods that follow the physical preparation.

Finally, among athlete C, reduced sense of accomplishment and emotional and physical exhaustion decreased between phases 1 and 3, and increased between phases 3 and 4, while sport devaluation remained stable during the competitive season. These results are consistent with past studies. Cresswell & Eklund (2007) have assumed that reduced sense of accomplishment, and emotional and physical exhaustion might develop reciprocally. Indeed, athletes with high feelings of reduce accomplishment might want to work harder to experience feelings of accomplishment, but this might increase emotional and physical exhaustion. In parallel, exhaustion might increase reduced sense of accomplishment because when athletes are exhausted they might not perform as well as possible. The authors also highlighted that reduced sense of accomplishment increased with contextual factors such as injury and failure to meet performance goals. As revealed by table 1, during the phase 3, the athlete C has experienced a decline in

his performances and an injury. Then, it can be hypothesized, in line with the findings of Cresswell & Eklund (2007), that this athlete might have wanted to train harder because of the lowest results and the injury he got during this phase, and then have experience higher feelings of reduced accomplishment and exhaustion. Among this athlete, it can also be observed that sport devaluation remained stable during the season. It can then be hypothesis that this dimension is only weakly linked to the variations on the two others dimensions of athlete burnout. Indeed, Cresswell & Eklund (2007) and Gustafsson et al. (2008) have all assumed that sport devaluation might be the last step of a developmental sequence between emotional and physical exhaustion, and reduced sense of accomplishment. In accordance with this assumption, it can be hypothesis that for athlete C, sport devaluation should have increased only if exhaustion and reduced sense of accomplishment remained at high levels during a long period of time.

Intra-individual Tendencies between Intrinsic Motivation and Athlete Burnout

In line with past studies results (Isoard-Gauthier et al., 2012; Lonsdale & Hodge, 2011), the results showed that for athlete A, levels of intrinsic motivation were high and stable, and levels of athlete burnout were quite low (i.e., below 2,5 on a 5-point scale for the three dimensions) during the competitive season. It has been shown that self-determination index is negatively correlated to the three dimensions of athlete burnout (Lonsdale & Hodge, 2011), and more precisely that intrinsic motivation is negatively linked to reduced sense of accomplishment (Isoard-Gauthier et al., 2012). Even so, some variations on the three dimensions of athlete burnout have however been noticed. This is in accordance with the study of Gustafsson et al. (2008), which have highlighted that some highly motivated athletes could also report an increasing exhaustion and declining performance.

Among athlete B, the results showed that intrinsic motivation decreased while emotional and physical exhaustion increased during the competitive season. This result confirmed those of Lemyre et al. (2006) which showed that a negative motivational trend (i.e., a motivation becoming less and less self-determined) is linked to higher burnout. However, the current study results also shown that in the same time that intrinsic motivation increased, sport devaluation and reduced sense of accomplishment also increased. This result – a priori unexpected or contrary to theoretical predictions – can be explained by Cresswell & Eklund (2007) observations that among two participants positive perceptions and experiences were associated with events objectively similar to those of participants who reported experiences reminiscent of burnout. It then can be assumed that the evolution of the reduced sense of accomplishment and sport devaluation in this case might have been influenced by other factors (e.g., contextual factors) than intrinsic motivation.

The results showed that for athlete C, intrinsic motivation increased while reduced sense of accomplishment and emotional and physical exhaustion decreased between phases 1 and 3, and intrinsic motivation decreased while reduced sense of accomplishment and emotional and physical exhaustion increased between phases 3 and 4. These results are in agreement with past studies on the longitudinal relationships between motivation and athlete burnout (Isoard-Gauthier et al., 2012; Lemyre et al., 2006; Lonsdale & Hodge, 2011). Indeed, Lemyre et al. (2006) have shown that a negative motivational trend is linked to higher burnout while a positive motivational trend is linked to lower burnout among athletes during a competitive season. Furthermore, Isoard-Gauthier et al. (2012), and Lonsdale & Hodge (2011) have also revealed that self-determined motivation is negatively linked to the three dimensions of athlete burnout. Additionally, sport devaluation remained stable during the competitive season among athlete C. It can be assumed that the variations reported by this athlete on intrinsic motivation during the competitive season might have not affected the level of sport devaluation, as the level of intrinsic motivation remained

high (i.e., scores higher than 3,5 on a 5-point scale during the four phases), even if some variations occurred during the season.

The present study has limitations that must be considered. Our goal was to try to identify the psychological dynamics that is associated to athlete burnout. However, in view of our results, it is difficult to examine causality and reciprocity. Indeed, the relationships between the different variables of the study can evoke trends, but it is difficult to determine real influences between variables. Another limitation is the phenomenon of "habituation"; we can assume that repeated measurements could lead riders to get used to the questionnaires and thus influence their responses (i.e., automated responses and fewer reflections on the sensations they have felt during the week).

Despite these limitations, the results of this study leads to more accurate information on the changes of athlete burnout during a competitive season among elite BMX riders. As a result, it is preliminary to future studies adopting a longitudinal methodology, including a full year follow-up (i.e., 54 weeks) with a larger number of athletes (i.e., girls and boys, different sports). Future studies will have a number of responses per week sufficient to perform statistical analyzes aimed to examine the evolution and the causality between the variables in repeated measurements [e.g., Autoregressive Integrated Moving Average (A.R.I.M.A., Guastello, Johnson & Rieke, 1999; Spray & Newell, 1986)].

CONCLUSIONS

The results of the current follow-up study reinforce the hypothesis that burnout is (a) a long process that develops over time (Dale & Weinberg, 1990), (b) a multidimensional syndrome (Raedeke & Smith, 2001, 2009) and (c) a process with inter-individual differences (Dale & Weinberg, 1990). As a result, it is important that athletes, coaches and support staff remained aware of the possible signs and symptoms of athlete burnout and the motivational trend associated to it during the competitive season, in order to intend interventions aimed to reduce this syndrome at the beginning of its appearance among athletes.

REFERENCES

1. Boiché, J., Sarrazin, P., Grouzet, F. M. E., Pelletier, L. G., & Chanal, J. (2008). Students' Motivational Profiles and Achievement Outcomes in Physical Education: A Self-Determination Perspective. *Journal of Educational Psychology, 100*, pp.688-701
2. Brière, N. M., Vallerand, R. J., Blais, M. R., & Pelletier, L. G. (1995). Développement et validation d'une mesure de motivation intrinsèque, extrinsèque et d'amotivation en contexte sportif: l' Echelle de Motivation dans les Sports (EMS). [Development and validation of an instrument to measure intrinsic motivation, extrinsic motivation and amotivation in the sport context: l'Echelle de motivation dans les sports]. *International Journal of Sport Psychology, 26*(4), pp.465-489.
3. Cresswell, S. L., & Eklund, R. C. (2005). Changes in athlete burnout and motivation over a 12-week league tournament. *Medicine and Science in Sports and Exercise, 37*(11), pp.1957-1966.
4. Cresswell, S. L., & Eklund, R. C. (2007a). Athlete burnout: A longitudinal qualitative study. *The Sport Psychologist, 21*, pp.1-20.
5. Dale, J., & Weinberg, R. S. (1990). Burnout in sport: A review and critique. *Journal of Applied Sport Psychology, 2*(1), pp.67-83.
6. 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*, pp.227-268.

7. Gagné, M., & Blanchard, C. (2007). Self-determination theory and well-being in athletes. In M. S. Hagger & N. L. D. Chatzisarantis (Eds.), *Intrinsic motivation and selfdetermination in exercise and sport* (pp. 243-254). Champaign, IL: Human Kinetics.
8. Gould, D. (1996). Personal motivation gone awry: Burnout in competitive athletes. *Quest*, 48, pp.275-289.
9. Guastello, S. J., Johnson, E. A., & Rieke, M. L. (1999). Nonlinear dynamics of motivational flow. *Nonlinear Dynamics, Psychology, and Life Sciences*, 3, pp.259-274.
10. Gustafsson, H., Hassmén, P., Kenttä, G., & Johansson, M. (2008). A qualitative analysis of burnout in elite Swedish athletes. *Psychology of Sport and Exercise*, 9, pp.800-816.
11. Isoard-Gauthier, S., Guillet-Descas, E., & Lemyre, P. N. (2012). A prospective study of the influence of perceived coaching style on burnout propensity in elite adolescent athletes: using a self-determination theory perspective. *The Sport Psychologist*, 26, pp.282-298.
12. Isoard-Gauthier, S., Oger, M., Guillet, E., & Martin-Krumm, C. (2010). Validation of a French version of the Athlete Burnout Questionnaire: Le questionnaire du Burnout Sportif (QBS) in Competitive Sport and Physical Education Context. *European Journal of Psychological Assessment*, 26(3), pp.203-211.
13. Kowal, J. & Fortier, M. S. (1999). Motivational determinants of flow: Contributions from Self-Determination Theory. *Journal of Social Psychology*, 139, pp.355-368.
14. Lemyre, P. N., Roberts, G. C., & Stray-Gundersen, J. (2007). Motivation overtraining and burnout: Can self-determined motivation predict overtraining and burnout in elite athletes?. *European Journal of Sport Science*, 7(2), pp.115-126.
15. Lemyre, P. N., Treasure, D. C., & Roberts, G. C. (2006). Influence of variability in motivation and affect on elite athlete burnout susceptibility. *Journal of Sport and Exercise Psychology*, 28, pp.32-48.
16. Lonsdale, C., & Hodge, K. (2011). Temporal ordering of motivational quality and athlete burnout in elite sport. *Medicine and Science in Sports and Exercise*, 43, pp.913-921.
17. Main, L. C., & Landers, G. J. (2012). Overtraining or Burnout: A Training and Psycho-Behavioural Case Study. *International Journal of Sports Science & Coaching*, 7(1), pp.23-31.
18. Raedeke, T. D., & Smith, A. L. (2001). Development and preliminary validation of an athlete burnout measure. *Journal of Sport and Exercise Psychology*, 23, pp.281-306.
19. Raedeke, T. D., & Smith, A. L. (2009). *The athlete burnout questionnaire manual*. Morgantown, West Virginia University : Fitness Information Technology.
20. Sarrazin, P., Vallerand, R. J., Guillet, E., Pelletier, L., & Cury, F (2002). Motivation and Dropout in Female Handballers: A 21-month Prospective Study. *European Journal of Social Psychology*, 37, pp.92-104.
21. Spray, J. A., & Newell, K. M. (1986). Time series analysis of motor learning: KR versus non-KR. *Journal of Human Movement Studies*, 5, pp.59-74.
22. Vallerand, R. J., Pelletier, L. G., & Koestner, R. (2008). Reflections on self-determination theory. *Canadian Psychology*, 49, pp.257-262.
23. Zabala, M., Sanchez-Munoz, C., & Mateo, M. (2009). Effects of the administration of feedback on performance of the BMX cycling gate start. *Journal of Sports Science and Medicine*, 8, pp.393-400.