



# French college students' sports practice and its relations with stress, coping strategies and academic success

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College students at university have to face several stress factors. Although sports practice has been considered as having beneficial effects upon stress and general health, few studies have documented its influence on this specific population. The aim of this comparative study was to determine whether the intensity of the college students' sports practice (categorized into three groups: rare, regular, or intensive) would influence their levels of stress and self-efficacy, their coping strategies, and their academic success/failure. Three self-completion questionnaires were administered to 1071 French freshmen during their compulsory medical visit at the preventive medicine service of the university. Results indicated that students with intensive sport practice reported lower scores of general stress, academic stress, and emotion-focused coping strategies, and higher scores of self-efficacy than those with rare practice. However, the proportion of successful students did not differ significantly between the three groups of sports practice.

**Keywords:** sport practice, stress, coping, academic success, college students

## INTRODUCTION

Perceived as a stressful, yet exciting experience, transition from high school to university is part of most individuals' life trajectories. It can be viewed both as a developmental and an educational transition. On the one hand, arriving at university is generally characterized by a separation from the family (McNamara, 2000) and corresponds to the stage of life called "emerging adulthood" (Arnett, 2004), the last before adulthood (Towbes and Cohen, 1996). During this time, between when one leaves home and, and when one gets involved in marriage, parenthood, and has a stable job, students have the possibilities to explore different roles in love – different partners – and work – study reorientation, part-time jobs. On the other hand, they have to adapt to a new scholar environment, often synonymous with anonymity, and to new teaching methods. It can be difficult to go from a classroom of 30–40 familiar peoples to a lecture theater of several hundred unknowns (Coulon, 2000).

Managing this transition can be an uneasy task: college students have to cope with several stressors. Loneliness is frequently experienced and mental-health related symptoms are generally observed (Boujut et al., 2004, 2009), and more specifically to French students, an overall unwell-being has been observed (USEM and LMDE, 2006). In 2007, 31% of them felt distressed and 35% had lost their self-confidence (versus, 30 and 33% in 2005, respectively). As a consequence, more than 10% have used antidepressant and more than 8% have had suicidal thoughts in the past 12 months. These concerns about students' conditions are also frequently reported in French daily newspapers: French freshmen also encounter great financial difficulties (Metro, 2007). Twenty percent live under the poverty threshold and 45.5% have to work to finance their studies (Grigon et al., 2000). All in all, half of

them generally drop out of university within their first year and only 39% obtain their bachelor in 3 years (Gruel, 2002). While this percentage can be partially explained by curricular reorientation or sabbaticals before seriously getting into studying, it also highlights the difficulties encountered by the French University system in helping its students to deal with academic environment stress-related.

As a response to these conditions, several studies proposed to develop specific questionnaires to assess students' academic stress (Bojuvoye, 2002) but very few evaluate the specific stress associated with being in first year (Boujut and Bruchon-Schweitzer, 2008a). Many researches have also been conducted to assess how to reduce students' stress, anxiety, and other mental-health related symptoms (Deckro et al., 2002). Physical activity is one answer, and its adaptive function has been clearly demonstrated (Anshel, 1996; Biddle et al., 2000) in terms of detoxification of stress-related compounds, outlet for anger and hostility, enhanced feelings of self-esteem and self-efficacy, periodic introspection, reduction of muscular tension, increased endorphin or improvement in sleep (Edwards, 2006), and reduction of various stress indices amongst adults (Dunn et al., 2001; Bhui, 2002). Physical exercise clearly appears as an effective way of coping with stress, and these results provide scientific supports regarding the importance of physical activity promotion as an effective way to help college students cope with the stress-related to their from high school to university. However, most students and young adults do not follow public health recommendations regarding the importance of physical exercise in daily life (Irwin, 2004), and a decrease in such activity has been reported upon entry at university (Butler et al., 2004; Racette et al., 2004; Nelson et al., 2007). For those who do practice, there is no specific arrangement in French Universities regarding academic

support or accommodation in their timetables, even when listed on the national high-level sportsmen list.

Even if the positive influences of physical activity on health outcomes have been demonstrated, the question of its negative consequences is also well documented. The expected benefits of physical activity are believed to be substituted by physical and emotional difficulties when this activity becomes too intensive, especially for high-level sportsmen (Décamps and Boujut, 2011), and exposure to several stress factors is one of the main consequences of intensive sports practice (Woodman, 2003). The physical effects of these stressors on individuals are generally described in terms of sleep or appetite difficulties (Smith and Thelen, 1984; Silva, 1990), and muscular injuries or overtraining (Mc Kinnon, 2000; Brun et al., 2008). These problems are sometimes associated with severe emotional and psychological troubles such as depressive feelings (Silva, 1990; Gould and Dieffenbach, 2002) and specific forms of burn out (Raedeke and Smith, 2001; Goodger et al., 2007). Consequently, sportsmen have to develop specific coping strategies to reduce the intensity of these negative consequences (Cox, 2005), and such an adaptation is necessary to achieve their intended goals. Indeed, goal achievement is part of any adjustment process and, regarding college students, this achievement is described in terms of academic success (Furnham et al., 2002).

Most of the studies about stress, coping, and health, including the present research, refer to Lazarus and Folkman's transactional models of stress (Lazarus and Folkman, 1984; Bruchon-Schweitzer, 2002), and recent studies have proposed to examine the influence of transactional factors such as stress and coping strategies upon academic success (e.g., Boujut and Bruchon-Schweitzer, 2008b). Those on the assessment of coping strategies before an examination (from 4 to 20 days before) revealed a positive relationship between problem-focused coping strategies and passing exams (Edwards and Trimble, 1992; Endler and Parker, 1994). The use of such coping strategies 10 days before an examination was also positively correlated to state-anxiety on the day of the examination, but was not found to influence academic performance (Bolger and Kellaghan, 1990).

Academic success also appears to be influenced by dispositional characteristics. A meta-analysis showed that individual characteristics, such as self-efficacy, can explain academic performance (Multon et al., 1991). More precisely, self-efficacy was found to increase perseverance, tenacity, and therefore subsequent performance. Bandura (1997) also stated that it increases motivation by facilitating the adequacy between the goal and the efforts required to achieve it. Self-efficacy is also related to the ability to use coping strategies, especially decision making strategies in order to use effectively its own resources (Betz and Hackett, 1983), to lower scores of anxiety in stressful situations (Chemers et al., 2001), and to greater sensitivity to positive feedback (Bouffard-Bouchard, 1990). Finally, self-efficacy is believed to lead individuals to perceive stressful situations as challenges rather than threats (Chemers et al., 2001).

Considering the literature on the influence of stress and coping strategies upon academic success, and on the positive effects of sports practice on stress, we suggest that sports practice might be liable to influence academic success. While some authors considered that involvement in a sports practice explains sportsmen

academic failure (Martin, 2002), rigorous planning of the activities is likely to assist both academic and sport success. As Lassarre et al. (2003) have shown non-academic activities can be considered as a predictor of academic success. Moreover, caution should be taken when investigating the positive or negative effects of the sports practice. As mentioned by Décamps and Boujut (2011), most of the researches were limited to comparisons between sportsmen and the overall population (e.g., Hausenblas and Symons Downs, 2001; Hausenblas and McNally, 2004), but the differences between these two categories of individuals cannot simply be attributed to sports practice. This dichotomization according to sports practice can also be regarded as inadequate since, on the one hand, this practice can be intensive for some sportsmen and moderate for others, and on the other hand, non-sportsmen can have an occasional sports practice. One way to overcome this limitation is to study sports practice intensity (rare, regular, or intensive), instead of considering sportsmen versus non-sportsmen only (Décamps and Boujut, 2011). As such, we consider as sports practice, all physical activity associated or not with competition.

The aim of the present research was to examine group differences in sports practice intensity (rare, regular versus intensive) on college students' academic success, stress, and coping strategies. Specifically, we have formulated the following hypotheses:

- (1) Students with a regular or intensive sports practice will report lower levels of perceived stress and emotion-focused coping strategies and higher levels of problem-focused coping strategies and self-efficacy than those whose sport practice is rare.
- (2) There will be a greater proportion of students with a regular or intensive sports practice to success in their studies than of students with a rare practice.

## MATERIALS AND METHODS

### PARTICIPANTS AND PROCEDURE

One thousand seventy-one first year students (381 males and 690 females, average age of 18.7 years old) have participated in this study. Students were asked to complete a self-evaluation questionnaire during their compulsory medical visit at the preventive medicine service of the university. Measures of self-efficacy, perceived stress, and coping strategies were included.

According to the French legal system, ethic approval is not required in studies using non-abrasive methods, such as surveys. However, approval from the head of the university and director of the preventive medicine service were obtained, and students who participated in this study were informed of the aim of the study and all gave their consent. Confidentiality regarding the collected data was respected.

### MEASURES

*Self-efficacy* was assessed using the French validation (Bruchon-Schweitzer, 2002) of Schwarzer's Self-Efficacy Questionnaire (Schwarzer, 1992). This scale uses four-point Likert scales (1/false to 4/true) and consists of 10 items that evaluate optimistic self-beliefs used for coping with a variety of situations (e.g., "I believe that successful outcomes are due to one's own actions"). This measure has shown good reliability ( $\alpha = 0.73$ ).

*Perceived stress* was measured with the Freshmen Stress Scale (Boujut and Bruchon-Schweitzer, 2009). This scale appears to be the only specific questionnaire designed for first year students whose validity has been tested in a French context. Respondents were asked to evaluate their perceived stress in 25 situations on five-point Likert scales (1/not at all to 5/a very much). This measure allows for a general score of perceived stress and four specific scores: (1) academic stress (e.g., “examination revisions” or “new working methods” . . .), (2) stress-related to university disorganization (e.g., “monotony of lessons,” “poor organization within the university,” or “lack of attention from teachers”), (3) loneliness (e.g., “feelings of loneliness” or “difficulties to meet new people”), and (4) social perturbation (e.g., “relational difficulties with family and friends”). Cronbach’s alphas for each factor were satisfactory (ranging from 0.71 to 0.82).

*Coping strategies* were measured with the (Vitaliano et al., 1985) Ways of Coping Checklist – Revised, validated in French by Cousson et al. (1996). This 27 items questionnaire evaluates, on a four-point Likert scale (1/no to 4/yes), three categories of ways of coping with stress: problem-focused strategies, emotional-focused strategies, and social support seeking. Problem-focused coping refers to activities through which problems are directly confronted, whereas emotional-focused coping, to activities that reduce the degree of emotional distress induced by the stressful situation. Participants were asked to respond with respect to a stressful situation that occurred at the beginning of the academic year. Cronbach’s alphas scores of 0.79, 0.72, and 0.73 were obtained, respectively.

*Intensity of sports practice* was assessed by a single item in the questionnaire. Students were asked to specify the frequency of their sports practice (less than once a week, less than 8 h per week, or 8 h and more per week). According to the literature, sports practice was considered as intensive when occurring more than 8 h per week (Choquet et al., 1998). As such, 406 students (26.4% of male) were considered as having a rare sports practice (rare and not every often); 173 students (33.5% of male), a regular practice (every week but less than 8 h); 492 students (43.9% of male), an intensive practice (8 h or more per week).

*Academic success* was “evaluated” at the end of the academic year. The data was provided by the university administration. They were asked to indicate if each student had succeeded or failed. Academic success was considered for those who were allowed to pass in second year. Once participants’ questionnaire were paired with their academic success/failure, data were irreversibly anonymized.

**ANALYSIS OF DATA**

In order to test the scores differences between the three groups on self-efficacy, stress, and coping, means comparisons were performed with ANOVA and Tukey *post hoc* tests were conducted in order to determine which groups differ from each other. Chi-square tests were also computed to evaluate the proportion of successful students in each group.

**RESULTS**

Significant differences between the three groups were observed on self-efficacy [ $F(2,1070) = 4.66, p = 0.01$ ], general perceived stress [ $F(2,1070) = 9.28, p < 0.001$ ], academic stress [ $F(2,1070) = 13.88, p < 0.001$ ], loneliness [ $F(2,1070) = 3.01, p = 0.05$ ], social perturbation [ $F(2,1070) = 6.77, p < 0.001$ ], and emotion-focused coping strategy [ $F(2,1070) = 6.81, p < 0.001$ ; see **Table 1**].

More specifically, Tukey *post hoc* indicated that college students with an intensive sports practice reported significantly low scores of general perceived stress than those with a rare and regular practice; and this comparison holds for academic stress and emotion-focused coping strategy. Significant differences between the two extreme groups were also observed. College students whose practice is rare reported lower scores on self-efficacy, loneliness, and social perturbation than those with an intensive practice (see **Table 1** for details). As such, Hypothesis 1 was partially confirmed.

While 54% of students have passed their examination, chi-square analysis revealed no differences in terms of success/failure and sports practice [ $\chi^2(2) = 2.82, ns$ ; see **Table 2**]. Hypothesis 2 was not confirmed. Students with rare practice are not less

**Table 1 | Means, SDs, and comparisons of students’ scores for self-efficacy, perceived stress, and coping strategies according to their sports practice (n = 1071).**

		Sport practice			F(2,1070)
		Rare (n = 406)	Regular (n = 173)	Intensive (n = 492)	
Self-efficacy		27.01 <sup>a</sup> (3.63)	27.07 <sup>a,b</sup> (4.23)	27.8 <sup>b</sup> (4.04)	4.66**
Perceived stress	General score	57.57 <sup>a</sup> (14.93)	56.68 <sup>a</sup> (15.88)	53.12 <sup>b</sup> (15.51)	9.28***
	Academic stress	17.53 <sup>a</sup> (5.14)	17.63 <sup>a</sup> (5.37)	15.81 <sup>b</sup> (5.5)	13.88***
	Stress-related to university disorganization	7.51 <sup>a</sup> (2.95)	7.56 <sup>a</sup> (3.05)	7.19 <sup>a</sup> (2.97)	1.64
	Loneliness	8.64 <sup>a</sup> (3.71)	8.37 <sup>a,b</sup> (3.47)	8.04 <sup>b</sup> (3.59)	3.01*
	Social perturbation	7.66 <sup>a</sup> (2.93)	7.32 <sup>a,b</sup> (2.95)	6.95 <sup>b</sup> (2.75)	6.77***
Ways of coping	Problem-focused strategies	28.8 <sup>a</sup> (4.02)	29.27 <sup>a</sup> (4.26)	29.15 <sup>a</sup> (4.09)	1.06
	Emotion-focused strategies	23.37 <sup>a</sup> (4.6)	23.24 <sup>a</sup> (5.01)	22.21 <sup>b</sup> (4.97)	6.81***
	Social support seeking	21.4 <sup>a</sup> (4.05)	21.46 <sup>a</sup> (3.92)	21.35 <sup>a</sup> (4.16)	0.05

\* $p \leq 0.05$ ; \*\* $p \leq 0.01$ ; \*\*\* $p < 0.001$ .

The means in columns with exponents (a, b) represent significant differences at  $p < 0.05$ , using Tukey *post hoc*.

**Table 2 | Percentage of academic success and failure within students according to their sport practice ( $n = 1071$ ) and Chi-square effect.**

	Sport practice			$\chi^2$	$p$
	Rare ( $n = 406$ ; %)	Regular ( $n = 173$ ; %)	Intensive ( $n = 492$ ; %)		
Failure	48.0	47.6	42.4	2.82	0.24
Success	52.0	52.4	57.6		

successful in their academic studies that those with regular or intensive sports practice.

## DISCUSSION

### THE ROLE OF SPORT PRACTICE

The present study has shed some light on sports practice and its relation to two sets of variables, which, it was suggested, would play a role in students' academic success. The first set consists of dispositional variables, such as self-efficacy. The set includes transactional variables, like coping strategies and perceived stress.

Self-efficacy, as a dispositional variable, was found to be linked to sports practice: the more intense sports practice is, the higher self-efficacy is. While we were expecting differences between students with regular/intensive versus rare practice, our results indicated a regular practice has the same benefit on self-efficacy than a rare one. And as such, an intensive sports practice has beneficial effects on individuals. Since psychological and physical issues may occur when sports practice becomes too intensive (Silva, 1990; Gould and Dieffenbach, 2002), our findings suggest that positive and negative consequences of such practice might coexist. Additional research is required in order to test this statement with a more complex research protocol based on the assessment of these two types of consequences, with, for example, addiction to sport practice (Kernn, 2007) or over-investment syndrome (Goodger et al., 2007) versus well-being (Deckro et al., 2002) or coping self-efficacy (Chesney et al., 2006).

The benefits of an intensive practice can also be associated to transactional variables. Accordingly to the obtained scores of perceived stress and coping, college students with an intensive practice's general perceptions and strategies appeared to be more adaptive than those whose practice is rare. This is congruent with previous researches (Anshel, 1996; Biddle et al., 2000). However, this statement is based on specific perceived stress dimensions and it shall be reminded that no difference was observed between the three groups for stress-related to the university disorganization, problem-focused coping strategies and social support seeking. Subsequent researches are required in order to confirm these findings or precise its specificities. Moreover, since intensive sports practice might be harmful as it expose sportsmen to high sources of stress (Woodman, 2003), this practice might have a positive effect for individuals who progressively learn to face the stressors with the use of functional coping strategies (Cox, 2005).

The most interesting finding concerns the absence of difference between college students with rare practice and those whose practice is regular. It suggests that the benefit of a sport practice should not be over-generalized, and that it is not the presence or

absence of a regular sports practice that might influence college students' perceived stress and coping strategies, but the intensity of the practice: students with a regular practice did not perceive less stress and did not cope more efficiently than those whose practice is rare. However, lower levels of stress and dysfunctional coping were observed for those with an intensive sports practice. These results seem to be in contradiction with the literature on the positive effects of sports practice (Edwards, 2006), and on the negative effects of an intensive practice (Mc Kinnon, 2000; Brun et al., 2008).

### LIMITATIONS

The research counts several limitations. Students' personal characteristics with an intensive practice may be different from those in the studies about intensive sportsmen physical or psychological difficulties. These appear when sports practice exceed 15 h per week (Décamps et al., 2011), and the question used in this research only allows for a distinction between students practicing more than 8 h per week and those practicing less than 8 h per week. Further investigation is required in order to determine if differences can be observed between an intensive sports practice (around 8–12 h a week) and a "very intensive" practice (15 h or more). Our three-group-classification of sports practice can also be criticized as there is no mean to distinguish students with rare sports practice (less than once a week) and those who never practice any kind of sports. However, this decision was taken in response to the literature that neglects the importance of the intensity of sports practice when comparing sportsmen to the overall population (Décamps and Boujut, 2011). Replication of this study with another sample of students will provide a great consistency of these findings, and the use of a four-group-classification would provide for additional understanding on the influence of sports practice intensity on students' stress, coping strategies, and academic success.

Nevertheless it should be reminded that intensive sports practice, generally identified as a vulnerability factor (Mc Kinnon, 2000; Goodger et al., 2007; Brun et al., 2008), may not be a real vulnerability for college students. However, the benefit of an intensive sports practice in our study stays limited to a decrease in perceived stress and in the use of dysfunctional coping strategies. Therefore, an increase in the use of functional coping strategies is required to conclude that intensive sports practice has a real positive influence on college students. Additional studies investigating specific coping strategies, such as problem solving, planning activities, and other functional strategies would be relevant to complete our findings.

### RESEARCH PERSPECTIVES

The relationship between self-efficacy and sports practice would also require further investigations. According to theoretical models in health psychology (Bruchon-Schweitzer, 2002), personality, and other dispositional characteristics such as self-efficacy are considered as stable and unlikely to evolve with time. As such, sports practice cannot be considered as liable to enhance or decrease self-efficacy, and the relations between self-efficacy, perceived stress, coping strategies, and sports practice merits further examination: the observed differences within the three groups can be attributed to the intensity of sports practice, but to different levels

of self-efficacy. Two different interpretations can be proposed and will merit subsequent researches. On the one hand, and from a dispositional point of view (Torres and Solberg, 2001), the transactions between an individual and its environment may be influenced by self-efficacy, and more precisely the way this environment is perceived. A high-level of self-efficacy will then be considered as predicting a low level of perceived stress and, consequently, a low level of emotional coping strategies. On the other hand, and from a dynamical point of view (Rodgers et al., 2002), the interaction between sports practice and self-efficacy may enhance individuals' capacity to cope with sports environment stressors by using or selecting coping strategies identified as functional. This second interpretation assumes the existence of a learning phenomenon that could appear faster when individuals, such as sportsmen, are used to face stressful or hostile environments. This learning phenomenon refers to the distinction proposed by Lassarre et al. (2003) between short-term and long-term coping strategies in the stress episode model, which suggest that learning can be considered as a long-term adaptation. Additional researches should thus attempt to determine the respective influence of self-efficacy and sports practice upon perceived stress and coping strategies.

The proportion of successful students did not differ significantly between the three groups of sports practice. This result appears contrary to the literatures. While sports practice can be viewed as a handicap for college students in their academic success (Martin, 2002), non-academic activities are considered as likely to increase chances of success (Lassarre et al., 2003). Our findings provide support for an indirect association between sports practice and success. Although not significant, there appear to be a greater number of successful students in the intensive sports practice group. Additional studies are required to test this observation with other groups of participants. These future studies should be based on more refined measures of academic success (such as the exact grade) which would clarify the relationships between sports practice and academic success. If confirmed, such a result could

permit to consider college students' involvement in sports to be as beneficial as part-time jobs, just like any other non-academic activities (Lassarre et al., 2003). The way freshmen success was apprehended is also questionable. Even if our data confirm the failure rates observed in France, the low tuition fees in French Universities might be responsible for the lack of students' involvement in their academic studies; and one also to be careful when talking about academic failure regarding this population of emerging adults. This stage of life described by Arnett (2004) as the age of exploration and instability. What is viewed as academic failure can just be a change of plans (academic reorientation, sabbatical, etc.). In future researches, this should be controlled by the evaluation of students' motivational processes and career goals.

While we cannot conclude on the causal effects between the studied factors, comparative studies appear as the first step in identifying the main psychological variables that relate to sports practice. They allow for the detection of specific students' profiles that can be considered as more vulnerable than others to health issues. Consequently, our results give a more refined understanding of the literature on sports practice influence with group comparisons (Hausenblas and Symons Downs, 2001; Hausenblas and McNally, 2004). Additional comparative studies remain necessary to investigate the links between sports practice and other psychological factors before testing any predictive models with statistical tests such as path analysis.

## CONCLUSION

This study has given evidence for the assessment of sports practice intensity and not only its presence or absence. It also suggested that dichotomizing the consequences of college students' sports practice into positive and negative is too reductive to describe the multiplicity of its impact, and that the consequences of such coexistence of positive and negative effects is not necessarily contradictory. This result gives new perspectives for health prevention campaigns or for health promotion with physical activities for college students, teenagers, and young adults.

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