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Burnout in university students: the mediating role of sense of coherence on the relationship between daily hassles and burnout

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Abstract

Student distress is considered as a specific public health issue as research has shown increased levels of anxiety, depression, and risk behaviors in this population. Students report high levels of daily hassles, workload, lack of meaning, manageability, and understanding throughout their university years. These factors lead to increased academic burnout. In line with these findings, the current study aimed at assessing the mediating role of sense of coherence in the relationship between daily hassles and academic burnout. Furthermore, in order to assess the importance of sense of coherence in the field of academic burnout research, the percentage of variance of academic burnout explained by the sense of coherence was compared with the percentage of variance explained by optimism—a widely studied protection factor in the field of burnout and negative affect. This paper also reports the French validation of the Maslach Burnout Inventory-Student Survey (MBI-SS) used in this study to assess academic burnout. The sample was composed of 328 students from three French universities. Results indicate that the French version of the three-factor model showed comparable reliability, sensitivity, and construct validity to the original MBI-SS. Sense of coherence played a mediating role between daily hassles and burnout. Furthermore, sense of coherence explained a larger portion of academic burnout variance than optimism. Results are discussed in light of past findings on academic burnout, and future prevention and treatment perspectives are suggested.

Keywords Students · Academic burnout · Sense of coherence · Optimism · Daily hassles

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Introduction

The present study aims at better understanding the pathways that lead to academic burnout by studying key risk, protection, and mediating factors. This in turn may lead to help in determining useful prevention interventions in the field of academic burnout. More specifically, this study focuses on identifying the mediating role of sense of coherence with regard to university students' mental health and burnout. We begin by presenting the current state of student mental health, followed by how the concept of burnout applied to university students has evolved over time. We then present currently identified academic risk and protection factors which have been studied in this field, with a particular focus on optimism and sense of coherence. We conclude by underlining the importance of studying the mediating roles of such factors to better understand the processes involved and thus design more effective interventions.

Student distress: current concerns

Student distress (anxiety and depression) has been increasingly recognized as a public health issue in various countries (e.g., Dyrbye et al. 2006b). More recently, studies have reported high levels of distress and risk factors in France (Boujut et al. 2009; Haag et al. 2018; Marais et al. 2018; Saleh et al. 2017), with some studies finding 30% of university students showing depression symptoms and 15% having had suicidal thoughts in the past 12 months (Lafay et al. 2003). Boujut et al. (2009) report that high student distress is associated with more health risk behaviors such as eating disorders and other addictive behaviors in first year students.

Academic attrition is relatively high with regard to the number of students who wish to be enrolled in higher education, particularly in disciplines like the social sciences. The French Ministry of Education statistical data show that among first year university students in France, only 48% pass, while 30% repeat their first year, 16% change their career orientation, and 6% abandon higher education studies (Ministère de l'Education Nationale 2010). Attrition rates remain significant in subsequent years and raise the question of academic burnout in students who first managed to pass but fail to continue.

This phenomenon both reflects difficulties in adapting to academic life, leading to less student satisfaction and higher levels of distress. It underlines hardship undergone by some students. Certain students develop active coping strategies to meet the demands of student life (e.g., Shankland et al. 2010), whereas others feel unable to change the situation which may lead to avoidance behaviors—passive coping strategies—such as substance abuse. This type of behavior may in turn lead to critical and negative attitudes towards studies, manifesting itself in a loss of interest and lack of confidence in the ability to graduate. The simultaneous presence of these components is known as *academic burnout syndrome*, inspired by past research on professional burnout syndrome, particularly in healthcare professions.

From healthcare burnout to the academic burnout

The predominant approach to burnout, developed by Maslach (1982), defines burnout as a psychological syndrome in response to chronic interpersonal stress factors in the workplace characterized by three dimensions: emotional exhaustion, depersonalization, and a decreased

sense of accomplishment. *Emotional exhaustion* refers to the experience of feeling overextended and depleted of one's emotional resources. This is considered as the individual stress component of the syndrome according to the transactional theory of stress (Lazarus and Folkman 1984). *Depersonalization* is characterized by maladaptive emotional detachment, which may occur in response to emotional exhaustion as an attempt to put distance between the self and service users by actively ignoring the qualities that make them unique and engaging people. This refers to the interpersonal level of burnout. The third dimension concerns *decreased personal accomplishment,* which describes a feeling that one's contributions are ineffective, unproductive, which results in a lowered sense of self-efficacy (Bandura 1977). This refers to the self-evaluation component of burnout (Maslach 1993). The burnout syndrome was explained through involvement in emotionally demanding contact with healthcare or social work recipients and was considered a result of a combination of environmental and individual vulnerability factors (Maslach 1982).

As further studies were carried out in this field, it became clear that burnout did not only appear in the health and human service fields but in a variety of occupations including managers (Lee and Ashforth 1993), military forces (Leiter et al. 1994), and sports (Maslach et al. 2001). The concept was thus extended and led to the modification of the original Maslach Burnout Inventory (MBI) into a more general psychometric measure (MBI-General Survey; Schaufeli et al. 1996).

More recently, university students have become a target for burnout research, as they appear to show various physical and psychological symptoms linked to stressful situations such as examinations and to reduced feelings of accomplishment (e.g., Hu and Schaufeli 2009; Zhang et al. 2007). Studies have been published on anxiety and depression in French students (e.g., Shankland et al. 2010), where starting university is correlated with higher levels of distress expressed through eating disorders, substance abuse, or other risky behaviors (e.g., Boujut et al. 2009; Vollrath 2000). Although students do not receive a salary, their studies can be considered as "work" insofar as they are engaged in structured and mandatory activities such as attending classes and completing assignments (Schaufeli and Taris 2005). They may also consider themselves as having a specific position for which they can be trained and in which they often feel pressure to perform. Hence, students can develop feelings of exhaustion because of study demands, show a detached and cynical attitude towards their study, and feel low academic self-efficacy (Hu and Schaufeli 2009). This has led to more recent research examining academic burnout.

Initial studies have found that the syndrome of academic burnout—as measured by indices of emotional exhaustion, cynicism, and decreased sense of personal accomplishment—appears to be common in certain academic fields, notably medicine and other healthcare-related disciplines. However, academic burnout is currently also being examined in other academic fields.

Throughout various countries of Europe, America, and Asia, student burnout is frequent in students in medicine and healthcare-related fields. For example, a multi-center study of 4287 medical students in the USA reported a burnout prevalence of approximately 50% (Dyrbye et al. 2008). After 1 year, 27% of the burned-out students had recovered, while 73% remained afflicted. Furthermore, of the students who did not initially show any burnout syndrome, 31% developed one the following year. Hence, though the data suggest that burnout is reversible, this syndrome is likely to affect a majority of students over 4 years. Other studies with smaller samples report similar findings, with burnout rates ranging from 45 to 56% (e.g., Dyrbye et al. 2006a). Importantly, and contrary to popular belief, burnout is not a benign rite of passage for

these students (Jennings 2009). It is experienced as a painful, disorienting period of life, with serious potential consequences for the student's mental health (Dyrbye et al. 2006b) as well as for patient care. Medical students show elevated rates of anxiety, depression, and suicidal thoughts not only when compared to their level of mental health at university entry but also when compared to age-matched peers (Dyrbye et al. 2008). Not only is burnout a risk for medical students who become at least twice as likely to have suicidal ideation than other students, it also becomes a risk for patients in their care. Indeed, high depersonalization scores—one of the three components of burnout, which can be observed through excessive detachment—have been shown to correlate with lower levels of empathy in students (Jennings 2009; Thomas et al. 2007). Thus, in medical residents, burnout was shown to be positively linked to a general decrease in professional performance (Maslach et al. 2001) and to self-reported suboptimal patient care, including medical errors (Shanafelt et al. 2002).

The second relevant body of research examines academic burnout in higher education domains not necessarily concerned by professional-patient relationships. In this case, the burnout syndrome encompasses the academic environment and is based on the assumption that any university student may experience high levels of pressure and overwork linked to higher education. Individual responses to higher education demands are thus assessed in order to analyze the implications of study pressure on student well-being. During the past few decades, many studies have been carried out on academic burnout (e.g., Balogun et al. 1996; Chang et al. 2000; Fimian et al. 1989; Meier and Schmeck 1985; Yang 2004). The attitudes and beliefs reported by these studies underline fatigue when facing higher education demands (emotional exhaustion), loss of interest in studies (cynicism), and lack of self-efficacy concerning the selected field of study. This research has allowed scholars to identify certain risk and protective factors that may be targeted to design effective prevention programs.

Academic burnout: risk and protective factors

Research underlines the impact of certain individual traits such as neuroticism, type A behavior, and type D personality on burnout (for more details, see Maslach et al. 2001; Skodova et al. 2016). However, situational factors appear to have an even stronger relationship with the syndrome (Maslach and Leiter 1997). This encourages further research into situational factors such as daily hassles and into potential protection factors against the effects of perceived daily hassles, factors that may help reduce the impact of daily hassles on student distress and academic burnout. In order to better tailor such interventions, it is important to better understand how daily hassles affect academic burnout.

In academic contexts, studies underline the following risk factors in burnout: workload (Carmel and Bernstein 1990; Maslach et al. 2001), insufficient control, self-efficacy or feeling of autonomy and external locus of control (e.g., Alene and Kassie 2017; Rahmati 2015), lack of social support (as shown through a large recent meta-analysis by Kim et al. 2017), lack of appropriate feedback (e.g., Dyrbye et al. 2009), lack of fairness (e.g., Silver and Glicken 1990), and value conflict (e.g., Hafferty and Franks 1994).

Although a few published studies have been carried out concerning academic burnout protection factors, one factor that has received considerable attention is optimism. Optimism has been shown to be an important mental health promotion factor (Sheier et al. 2001). In a given population, when facing adversity, optimists tend to expect more positive outcomes, whereas pessimists will expect negative outcomes, a tendency which yields a greater

propensity to experience negative feelings such as anxiety, guilt, anger, sadness, and despair (Scheier and Carver 1992). Conversely, optimism is linked to positive physical and mental health outcomes in the general population and in students (Aspinwall and Taylor 1992). Optimism is also correlated with active coping styles (e.g., Fontaine et al. 1993), which in turn decreases the prevalence of academic burnout (Maslach et al. 2001). When facing demands, optimistic students appear to respond actively, using task-focused strategies, and explain success as a result of work rather than an inner ability, while pessimistic students tend to avoid challenging situations (Eronen et al. 1998; Martin et al. 2003; Nurmi et al. 2003; Salmela-Aro et al. 2009). Recent studies on academic burnout have shown that optimism is linked to greater student engagement and reduced burnout (Nurttila et al. 2015).

There are, however, noticeably fewer studies investigating the mechanisms by which these factors are related to academic burnout. Besides optimism, one of the mediating processes that could help understand the pathway towards burnout is sense of coherence. This concept refers to a global orientation to view life as comprehensible, manageable, and meaningful (Antonovsky 1979). It highlights the paradigm shift from a pathogenic focus (risk factors) to a "salutogenic" focus (health promotion). Antonovsky (1987) coined the term "fortigenesis" to refer to individual strengths one can build on in order to foster well-being. Sense of coherence has been shown to have a positive influence on physical and mental health (Eriksson and Lindstöm 2005). In university settings, sense of coherence is related to higher levels of well-being, health behaviors, optimism, self-efficacy, lower levels of distress, higher levels of achievement, and lower levels of burnout (Bíró et al. 2010; Bracha and Bocos 2015; Carmel and Bernstein 1990; Davidson et al. 2012; Grayson 2007; Posadzki et al. 2010). However, as past research has underlined the difficulties encountered by first year university students (daily hassles when facing a new environment, new relationships, new social and academic demands, with less social support), this might affect the sense of coherence, leading to higher levels of burnout. For example, previous studies on academic burnout have underlined the consequent workload, responsibilities, and value conflicts when students have to cope with academic work as well as fieldwork (Dyrbye et al. 2006a).

Unlike optimism, sense of coherence has not received much attention in the research on academic burnout. Some articles report measuring sense of coherence in relation to health and health-related behaviors (e.g., Binkowska-Bury and Motyka 2007; Posadzki et al. 2010; von Bothmer and Fridlund 2003). However, only a few articles report measuring sense of coherence in relation to well-being in university students (Bíró et al. 2010; Carmel and Bernstein 1990; Davidson et al. 2012; Posadzki et al. 2009; Tartas et al. 2014), and only one has assessed its relationship to academic burnout (Bracha and Bocos 2015).

The aim of the present study was to assess the impact of daily hassles on academic burnout in French university students and to understand the role of Sense of Coherence in this relationship. Based on these findings, a further aim was to suggest useful interventions that may reduce the impact of daily hassles on academic burnout. Thus, our hypothesis was that daily hassles have an effect on academic burnout and that this effect was mediated by Sense of Coherence. Further exploratory analyses examined the relative importance of *sense of coherence* in explaining academic burnout variance compared with optimism, which is more commonly assessed in higher education studies. The first part of the study will present the French validation of the Maslach Burnout Inventory-Student Survey (MBI-SS) as it was used to assess academic burnout in this study. The second part will examine how sense of coherence may play a mediating role.

Methods

This study is based on a cross-sectional design aimed at testing the abovementioned hypotheses, as well as validating the French version of the MBI-SS. The validation of the French version will be presented first, as the second part of the study is based on this measure.

Part 1. Validation of the French version of the MBI-SS

The first burnout studies carried out on student populations used a slightly modified version of the MBI-General Survey (MBI-GS)—itself being an adaptation of the Maslach Burnout Inventory (Maslach et al. 1996)—replacing the term "patients" by "students" (e.g., Balogun et al. 1996; Chang et al. 2000; Fimian et al. 1989; Gold et al. 1989; Meier and Schmeck 1985; Yang and Cheng 2005). However, this adaptation was unsatisfactory and potentially measured other constructs which altered the validity of this instrument (Schaufeli et al. 2002). Schaufeli et al. (2002) therefore proposed a new version of the MBI and the operationalization of the concept of academic burnout became possible through this adaptation called MBI-Student Survey. The MBI-GS was used as a reference tool to be adapted because it is now the most frequently used in research studies (more than 90%, Schaufeli and Enzmann 1998). The use of the MBI-Student Survey highlighted the presence of significant burnout rates among higher education populations and enabled this tool to be validated through various research studies. As the MBI-GS, the MBI-SS is composed of three subscales measuring the core dimensions of burnout: emotional exhaustion, cynicism, and reduced feeling of personal accomplishment, which has been adapted to the academic context and thus named "lack of academic self-efficacy." The questions were adapted in order to fit the academic context.

Translation process

A translation and back-translation were carried out on the original scale following Vallerand's transcultural adaptation process (1989). The original MBI-SS version was composed of 15 items scored using a 7-point Likert scale from 0 (never) to 6 (every day). The present French version of the scale (see Appendix 1) is thus composed of 15 items divided into three dimensions: (1) emotional exhaustion, defined as the feeling of being overwhelmed and exhausted by one's workload (five items, e.g., "Studying or attending classes is really a strain for me"), (2) cynicism towards the studies (five items, e.g., "I doubt the significance of my studies"), and (3) academic self-efficacy (five items, e.g., "I can effectively solve the problems that arise in my studies"). A specific score is given for each dimension.

Validation process

The validation process of a translated tool consists of several steps. The first step aimed at assessing the structure validity (three-factor model) and internal consistency of the subscales

(Cronbach's alpha). The second step aimed at assessing the test-retest reliability, which was carried out on a separate sample of 88 students, not included in the other sample of 328 students. The third step aimed at assessing the construct validity through correlations with mental health variables and with student burnout risk factors (anxiety, depression, life satisfaction, daily hassles).

Participants

The present study was conducted on a sample of 328 third and fourth year students in psychology, educational sciences, sports, and sociology in three French universities, aged from 19 to 57 ($M = 22.67$, SD = 4.12). These study fields were selected because the course organizations are similar, with field work and dissertations which have to be carried out and handed in during fourth year (Masters) and generate high levels of stress in students. They volunteered for the study—which was presented as a research on student health—and were informed that statistical analyses would be conducted anonymously. A majority of females (82%) answered the questionnaire (a larger proportion than the actual discrepancy in these fields of study). From the original sample of 347 participants who completed the questionnaire during classes (which means all students who were present that day completed the questionnaire), the data of ten participants were eliminated from the initial sample because there was at least one missing response on the MBI-SS. Nine multivariate outliers were also identified by calculating Mahalanobis distance and excluded from analyses. Analyses were therefore performed on the 328 remaining participants (see Table 1 for a sample description).

Another 88 third and fourth year psychology students took part in the reliability test of the French version of the MBI-SS. They were aged from 20 to 58 ($M = 24.50$, SD = 7.87), and majority were females (76.1%).

Procedure

The questionnaire was administered during academic sessions after having completed an informed consent. The students were asked to remain silent and the instructor asked to hand in the questionnaires in a box in order not to have direct contact with the students having filled out the forms. The measures were taken during the second part of the academic year, before the final exams. For the reliability test, 2 weeks separated the two tests.

Table 1 Sample description

Variable	Categories	Number (%)
Gender	Male	59 (18)
	Female	269 (82)
Level of education	Bachelor	202 (61.6)
	Masters	126 (38.4)
Living alone	Yes	130 (39.6)
	No	198 (60.4)
Having children	Yes	10 (3)
	No	318 (97)

Measures

The following instruments were aimed at testing the convergent validity of the French version of the MBI-SS following the hypothesis according to which academic burnout is positively correlated to anxiety, depression symptoms, and perceived disturbance related to daily hassles and negatively correlated with life satisfaction.

Student burnout

The level of burnout was assessed using the French version of the MBI-SS (Schaufeli et al. 2002), a 15-item scale with three dimensions. Participants had to respond to 15 items using a 7-point Likert scale ranging from 0 (*never*) to 6 (*every day*). The mean scores were 2.42 (SD = 1.18) for emotional exhaustion (α = .76), 2.09 (SD = 1.57) for cynicism (α = .86), and 3.68 (SD = 1.00) for academic self-efficacy (α = .70).

Anxiety

The levels of anxiety were recorded using the French-Canadian version of the State-Trait Anxiety Inventory by Spielberger (1983), adapted by Gauthier and Bouchard (1993). The STAI is composed of two distinct parts—state and trait anxiety—of 20 items each, scored on a 4-point Likert scale (from 1 to 4). For the present study, trait anxiety was tested as it is considered to be more specifically related to burnout as the latter develops progressively rather than after a short period of state anxiety. Internal consistency was satisfactory for this scale (α = .90 for the Trait Anxiety Scale). The mean score was 2.347 (SD = .490).

Depression

The presence of depression symptoms was assessed using the French version (Führer and Rouillon 1989) of the Center for Epidemiological Studies Depression Scale by Radloff (1977), a 20-item scale scored using a 4-point Likert scale, ranging from 0 (rarely or none of the time) to 3 (most or all of the time). The scale is composed of four subscales which converge on a higher-order depression factor (for the French version, see Morin et al. 2011): negative affect, positive affect, somatic complaints, and interpersonal interactions problems (e.g., unfriendly, disliked). In the present study, only global depression score was used. Internal consistency was satisfactory for the global scale (α = .90). The mean score was .88 (SD = .49).

Satisfaction with life

Current life satisfaction was assessed using the French version (Blais et al. 1989) of the Satisfaction With Life Scale (Diener et al. 1985). The scale is composed of five items scored on a Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree). Internal consistency was satisfactory for this scale (α = .82). The mean score was 4.64 (SD = 1.20).

Daily hassles

Daily hassles were assessed using the French version of the Daily Hassles Scale Revised (Holm and Holroyd 1992), adapted by Réveillère et al. (2001). The 65 items are scored using a

4-point frequency scale (1 *never* to 4 *frequent*) and a disturbance scale (from *not at all disturbed* to *very much disturbed*). The mean scores were 1.18 (SD = .37) for the frequency scale (α = .91) and 1.32 (SD = .47) for the disturbance scale (α = .94).

Results part 1

MBI-SS structure validity

A confirmatory factor analysis (CFA) with the maximum likelihood (ML) method was performed on the variance-covariance matrix (Joreskog and Sorbom 2003) using M+. Goodness of fit of the three-factor model was tested with χ^2 (a nonsignificant value corresponds to an acceptable fit). Because χ^2 are known to increase with sample size and degree of freedom (Schermelleh-Engel et al. 2003), the χ^2 was complemented by examining other indices that depend on a conventional cutoff. Hu and Bentler (1999) have recommended the use of two fit indices: the standardized root mean square residual (SRMR) and the root mean square error of approximation (RMSEA). Table 2 also reports the Comparative Fit Index (CFI) and the Tucker-Lewis Index (TLI). An SRMR < .08 indicates a good fit and < .10 an acceptable fit. An RMSEA < .06 indicates a good fit. A CFI and TLI > .90 are generally interpreted as indicating an acceptable fit. The chi-square statistic of the model was χ^2 (204) df = 83, and p < .001. The χ^2/df ratio is expected to be lower than 3. Here, χ^2/df ratio = 2.46. For the other fit indices, the SRMR was .058 and the RMSEA was .067, a CFI of .92, and a TLI of .91. Their combination indicated an acceptable fit.

The three factors correlate with each other in this model: there is a positive correlation between Emotional Exhaustion and Cynicism (r = .56, p < .001) and negative correlations between Academic Self-Efficacy and the two other factors, Emotional Exhaustion and Cynicism (r = − .18, p = < .01 and r = − .42, p < .001, respectively).

Reliability of the French version of the MBI-SS

Data analyses show satisfactory internal consistency for each factor: Emotional Exhaustion (α = .78), Cynicism (α = .90), and Academic Self-Efficacy (α = .70). This analysis was conducted on another sample composed of 88 participants, recruited using the same procedure as the participants from the first sample. Participants filled out only the MBI-SS and demographic questions. The questionnaires were handed out in an interval of 15 days (M = 9.126, SD = 7.962). Sixty-two percent of the questionnaires were returned at time 2. The correlations between each burnout dimension at time 1 and time 2 were calculated. Results show high correlations for Emotional Exhaustion (r = .847, p < .001), Cynicism (r = .877, p < .001), and Academic Self-Efficacy (r = .824, p < .001), indicating a good stability.

Table2 CFA results for the three-factor model

Model	χ^2	df	χ^2/df	RMSEA [90% CI]	SRMR	TLI	CFI
Three-factor	204	83	2.46	.067 [.055, .078]	.058	.91	.92

RMSEA root mean square error of approximation, *[90% CI]* RMSEA confidence interval at 90%, *SRMR* standardized root mean square residual, *TLI* Tucker-Lewis Index, *CFI* Comparative Fit Index

The mean scores on each dimension show high inter-individual sensitivity, as mean scores on Emotional Exhaustion range from 0 to 5.60, scores on Cynicism range from 0 to 6, and scores on Academic Self-Efficacy range from 1.17 to 5.83. As skew and kurtosis are lower than 1 for the mean score of each dimension, scores are normally distributed: Emotional Exhaustion (skewness of .53; SE = .14; kurtosis = − .32; SE = .27), Cynicism (skewness of .69; SE = .14; kurtosis = − .35; SE = .27), and Academic Self-Efficacy (skewness of − .16; SE = .14; kurtosis = − .55; SE = .27).

Construct validity of the French MBI-SS

Construct validity was assessed through correlations with anxiety, depression, life satisfaction, and daily hassles. As one of the dimensions of the MBI-SS is positively framed (Academic Self-Efficacy), the hypotheses proposed in this study distinguish the type of correlation expected between the variables of interest and the three burnout dimensions.

Before carrying out statistical analyses, we carried out descriptive statistics to examine the relationships between demographic or situational variables and academic burnout.

Descriptive statistics

Linear regressions revealed marginal effects on certain dimensions of academic burnout. A small, but statistically significant, effect was shown for gender, with women exhibiting greater levels of burnout on two of the three dimensions of academic burnout, namely Emotional Exhaustion (β = − .17, p = .002, R^2 = .026) and Academic Self-Efficacy (β = − .17, p = .002, R^2 = .03). Younger students showed slightly higher levels of Emotional Exhaustion (β = − .17, p = .002, R^2 = .03) and lower levels of Academic Self-Efficacy (β = .12, p = .03, R^2 = .01) than older students. Having children had a small but statistically significant effect on Cynicism (β = .151, p = .006, R^2 = − .020) and Emotional Exhaustion (β = .118, p = .033, R^2 = .011). There was no effect of living alone and working during studies on any dimension. In sum, results show that gender, age, and having children have a marginal effect on some dimensions of academic burnout.

Concurrent validity

Positive correlations were expected between the two burnout dimensions (Emotional Exhaustion and Cynicism) and trait anxiety, state depression, and daily hassles. Conversely, we expected negative correlations of life satisfaction. The opposite correlations were expected for Academic Efficacy (see Table 3 for the results).

Table 3 Pearson correlations between the three dimensions of burnout and psychological variables

	Emotional exhaustion	Cynicism	Academic self-efficacy
Anxiety	.48**	.44**	− .27**
Depression	.51**	.48**	− .25**
Optimism	− .28*	− 33**	.27**
Daily hassles-disturbance	.45**	.34**	− .12*
Daily hassles-frequency	.51**	.43**	− .20**
Satisfaction with life	− 25**	− .31**	.23**

**p < .001; **p < .01

As expected, the results showed that trait anxiety and state depression were positively linked with Emotional exhaustion and Cynicism (and negatively linked to Academic Self-Efficacy), and perceived disturbance related to daily hassles was positively correlated with emotional exhaustion. As hypothesized, life satisfaction was negatively correlated with Emotional Exhaustion and Cynicism and positively correlated with Academic Self-Efficacy.

Discussion part 1

The results of the present multicenter study showed that the French version of the MBI-SS had satisfactory psychometric qualities and convergent validity. The results are coherent with past research on burnout underlining its positive correlations with anxiety, depression, and daily hassles (Iacovides et al. 2003; Iacovides et al. 1999; Kirsi et al. 2005) and negative correlations with life satisfaction (e.g., Aspinwall and Taylor 1992; Chang 1998; Shankland et al. 2010).

The results of our study underline good psychometric properties for the French version of the MBI-SS as measured on a sample of 328 university students. As in the original model (Schaufeli et al. 2002), the three burnout factors correlated with each other as follows: there was a positive correlation between Emotional Exhaustion and Cynicism and negative correlations between Academic Efficacy and the two other factors (Emotional Exhaustion and Cynicism, although the correlation is weak between Academic Efficacy and Emotional Exhaustion). Furthermore, data analyses showed satisfactory internal consistency for each factor ($\alpha > .70$) on the total 328 student sample. Cronbach's alpha coefficients obtained were superior to those presented by Hu and Schaufeli (2009) for Emotional Exhaustion and Cynicism and are similar for Academic Self-Efficacy. The French version of the MBI-SS also showed satisfactory test-retest reliability on an 88 student sample. High correlations were obtained between time 1 and time 2 tests for the three burnout dimensions, indicating a good stability. The scores on each dimension also revealed high inter-individual sensitivity, as the students used the full range of possible scores. These psychometric properties underline the usefulness of this tool to assess burnout symptoms in French students.

Descriptive statistics showed that demographic and situational variables (gender, age, having children, living alone, and working during studies) had a small or null effect on certain academic burnout dimensions; none of these variables appear to be important risk factors in our sample.

Construct validity was supported by the correlations observed between the three burnout dimensions and the other variables measured. Concurrent validity—assessed using anxiety and depression inventories—underlines the close relationship between academic burnout and negative emotionality as shown in the vast burnout literature (e.g., Maslach et al. 2001). Finally, as hypothesized, academic burnout was negatively correlated with life satisfaction, which further underlines the validity of this scale. However, as a recent study suggests (Morgan et al. 2015) an inefficacy scale should be used rather than an efficacy scale, as the inefficacy scale appears to be more strongly correlated to the two other dimensions of burnout than their efficacy scale.

In our sample, the results also show a low correlation between the Emotional Exhaustion subscale and the Academic Self-Efficacy subscale. This touches on debates regarding possible different continua between positive and negative emotionality and between strengths and vulnerabilities. Huta and Hawley (2010) for example show that levels of strengths predicted

depression recovery while levels of vulnerability did not. They also showed that strengths were more related to well-being (life satisfaction, vitality, meaning in life), while vulnerabilities related more to ill-being (negative affect, depression), although on some aspects strengths and vulnerabilities showed (inverse) correlations (hope, forgiveness). Likewise, other evidence suggests that psychological and neurobiological mechanisms underlying positive and negative affect are, to some extent, distinct (e.g., Davidson and Irwin 1999; Diener and Emmons 1984). We would therefore also recommend using an Academic Inefficacy subscale rather than an Academic Self-Efficacy subscale to measure academic burnout and the correlations between the three burnout dimensions.

Part 2. Test of hypotheses

Our hypothesis was that daily hassles had an effect on academic burnout and that the sense of coherence mediated the relationship between daily hassles (frequency and disturbance) and academic burnout. A secondary aim was to explore the relative importance of sense of coherence in explaining academic burnout variance, compared to optimism (a more commonly studied variable in this field).

Participants and procedure

The same sample and same procedure as in part 1 were used to test the hypotheses on the effects of daily hassles on academic burnout, the mediating role of *sense of coherence*, and to explore the relative importance of optimism and sense of coherence in explaining the variance in academic burnout.

Measures

The same measures of academic burnout and daily hassles were used as presented in part 1, and measures of sense of coherence and optimism were added.

Sense of coherence

Sense of coherence was assessed using the French version (Gana and Garnier 2001) of the sense of coherence scale (Antonovsky 1993). The short form is composed of 13 items scored on a 7-point Likert frequency scale. Internal consistency was satisfactory for this scale ($\alpha = .76$). The mean score was 4.29 (SD = .81).

Optimism

Trait optimism was assessed through the French version (Trottier et al. 2008) of the Life Orientation Test Revised (Scheier et al. 1994). The scale is composed of six items comprising (once the four filler items excluded). Scores are given on a 5-point Likert scale ranging from 0 (*strongly disagree*) to 4 (*strongly agree*). Internal consistency was satisfactory for this scale ($\alpha = .80$). The mean score was 2.01 (SD = .73).

Results part 2

The mediation analyses of daily hassles (frequency and disturbance) on the three dimensions of burnout by sense of coherence were tested using the Preacher and Hayes (2008) SPSS macro. The results of the analyses with daily hassles-frequency and daily hassles-disturbance as predictors are presented respectively in Tables 4 and 5. Direct effects of daily hassles (frequency and disturbance) were significant for two of the three dimensions of burnout, namely Emotional Exhaustion and Cynicism. Total effects of daily hassles (frequency and disturbance) on the three dimensions of burnout were all significant. Sense of coherence was related to the three dimensions of burnout. In addition, all the indirect effects were found to be significant.

Taken together, the results showed that sense of coherence partially mediated the relationship between daily hassles (frequency and disturbance) and Emotional Exhaustion and Cynicism—these direct effects remaining significant when controlling for sense of coherence. In addition, there was a total mediation of the relationship between daily hassles (frequency and disturbance) and Academic Self-Efficacy subscale by sense of coherence—this direct effect of was not significant when controlling for sense of coherence.

In order to conduct our exploratory analyses, we ran linear regressions to assess the percentage of variance attributed individually to each predictor: sense of coherence and optimism. Sense of coherence accounted for 28% of the variance of academic burnout, while optimism accounted for 14% of the variance of academic burnout, suggesting the greater predictability of sense of coherence.

Discussion part 2

Results show a direct effect of daily hassles-frequency and disturbance on two of the three dimensions of academic burnout: emotional exhaustion and cynicism (see Tables 4 and 5). This underlines the fact that daily hassles appear to be an important factor of student distress and should be targeted in future interventions. Although interventions often do not target the *occurrence or frequency* of daily hassles directly, as they are

Table 4 Results of mediation analyses of the associations between daily hassles-frequency and the three burnout dimensions by Sense of Coherence

	Effect of daily hassles-frequency on SOC (path a: $b = -1.182$, $t(334) = -11.855$, $p < .001$)									
	Direct effect of SOC on DV (b path)			Total effect of daily hassles-frequency on DV (c path)			Direct effect of daily hassles-frequency on DV (c′ path)			Indirect effects (ab path) Bias corrected CI (95)
	b	$t(326)$	p	b	$t(326)$	p	b	$t(326)$	p	Lower CI Higher CI
DV: Emotional Exhaustion	−.29	−3.57	<.001	1.60	10.57	<.001	1.26	7.06	<.001	.17 .56
DV: Cynicism	−.66	−5.96	<.001	1.80	8.50	<.001	1.02	4.24	<.001	.52 1.08
DV: Academic Self-Efficacy	0.40	5.24	<.001	−.53	−3.67	<.001	−.055	−.33	.74	−.69 −.31

SOC sense of coherence, *DV* dependent variable, *CI* confidence interval

Table 5 Results of mediation analyses of the associations between daily hassles-disturbance and the three burnout dimensions by Sense of Coherence

	Effect of daily hassles-disturbance on SOC (path a: $b = -.76$, $t(334) = -8.88$, $p < .001$)									
	Direct effect of SOC on DV (b path)			Total effect of daily hassles-disturbance on DV (c path)			Direct effect of daily hassles-disturbance on DV (c′ path)			Indirect effects (ab path) Bias-corrected CI (95)	
	b	$t(326)$	p	b	$t(326)$	p	b	$t(326)$	p	Lower CI	Higher CI
DV: Emotional Exhaustion	−.39	−5.07	<.001	1.15	9.19	<.001	.85	6.32	<.001	.18	.44
DV: Cynicism	−.77	−7.42	<.001	1.14	6.49	<.001	.55	3.01	<.001	.42	.81
DV: Academic Self-Efficacy	.43	6.06	<.001	−.26	−2.24	.026	.069	.55	.58	−0.47	−.21

SOC sense of coherence, *DV* dependent variable, *CI* confidence interval

considered an inevitable part of life particularly for students with more limited financial and social resources, interventions can target the *perception*, *interpretation*, *and management* of daily hassles. For instance, it would be useful to target the way students may deal with these hassles (developing problem-focused coping strategies; Endler et al. 1990), how they relate to them (training cognitive restructuring; Beck 1997), and how they perceive their daily life in general (reducing the negativity bias such as defined by Baumeister et al. 2001). Following Lazarus and Folkman's transactional model of stress, past research has shown that problem-focused coping strategies enhance the quality of student adaptation to higher education (reduced anxiety and depression symptoms; e.g., Shankland et al. 2010). It appears therefore to be helpful to train students in problem-focused coping strategies.

Second, following the same transactional model, it would be useful to change students' stress appraisals: what they currently consider as daily hassles may be considered as challenges rather than as threats (Skinner and Brewer 2002). Past research has shown that a mindfulness-based intervention can reduce the perception of hassles as sources of stress and enhance the perception of them instead as motivating challenges (Shankland et al. 2016). Acceptance and commitment approaches may also help in changing the way students relate to their daily hassles, thereby reducing the disturbance they can generate (Danitz and Orsillo 2014; Frögéli et al. 2016; Grégoire et al. 2016; Levin et al. 2014; Muto et al. 2011).

Third, general life satisfaction may be targeted in order to reduce the negativity bias in students. The negativity bias can be defined as the tendency to pay more attention and react more strongly to the negative aspects of daily life than to positive ones, which in fact are more frequent than the negative ones (Baumeister et al. 2001; Cacioppo et al. 1999; Lewick et al. 1992; Pratto and John 1991; Rozin and Royzman 2001). Some students experience high levels of loneliness during their time at university and it has been found to increase the negativity bias (Cacioppo and Patrick 2008), thereby reducing self-regulation abilities, which in turn can have an adverse effect on relationships and academic outcomes. Positive psychology interventions such as gratitude journaling can reduce the negativity bias in students and enhance satisfaction with university life (Emmons and McCullough 2003). Compared to writing five daily hassles or five events

of their choice, students who wrote up to five things they felt grateful for at the end of the day showed lower levels of anxiety and depression symptoms, increased vitality, and life satisfaction (Emmons and McCullough 2003). Furthermore, gratitude has been shown to enhance the quality of relationships (for a review, see Algoe 2012), feelings of belonging, and prosocial behaviors (e.g., Froh et al. 2010). Positive psychology interventions such as the gratitude journal could thus represent interesting avenues to prevent academic burnout.

The mediating role played by the sense of coherence in the relationship between daily hassles and academic burnout for the three burnout subscales appears to be in line with our hypothesis according to which university students face a number of changes and hassles that challenge their sense of coherence which directly affects levels of burnout such as represented by Emotional Exhaustion, Cynicism, and Academic Self-Efficacy beliefs. The results show a partial mediation for Emotional Exhaustion and Cynicism and a complete mediation for Academic Self-Efficacy. Academic Self-Efficacy may not be directly linked to daily hassles, as it is rather the feeling of academic inefficacy that may be related as reported in the discussion related to the first part of the study. However, the mediational role of sense of coherence on Academic Self-Efficacy may be explained by the fact that when there are fewer daily hassles in university life, sense of coherence is less shattered and enables more confidence in one's ability to respond to the demands of student life. Indeed, sense of coherence has been shown to be related to self-efficacy in various studies (see Trap et al. 2016). The mediating role of sense of coherence on all three dimensions of academic burnout is in line with past research showing the relationship between lack of sense of coherence and student distress. Specific interventions aimed at enhancing students' sense of coherence would be useful as sense of coherence is known to develop mainly before 30 years old (Antonovsky 1979; Volanen et al. 2006) and is considered as a health-promoting resource that enhances positive mental health (Eriksson et al. 2007).

Our complementary exploratory analyses also underline the importance of sense of coherence in explaining academic burnout. Results showed that sense of coherence appears to be a factor explaining a more important part of academic burnout variance (28%) than other commonly studied factors related to mental health such as optimism (14%). This result encourages further research into the role of sense of coherence in academic burnout and how it can be enhanced through specific interventions for first year students in order to help make more sense of student life. As presented above, interventions that target effective coping strategies as well as emotion regulation appear to be particularly useful in enhancing dimensions of sense of coherence such as feelings of manageability (Antonovsky 1979). As Antonovsky (1987) underscored, each new experience of successful stress management during the development of sense of coherence reinforces the feeling of manageability and self-efficacy beliefs, which in turn increase coping resources available for future events. Furthermore, past research has shown that positive relationships and social support were associated with sense of coherence (Chu et al. 2016; Evans et al. 2010; Natvig et al. 2006). Hence, increasing emotion regulation skills appears to be a useful protective factor, which also leads to increased sense of coherence. This is particularly promising, as various interventional studies have shown that emotion regulation is an ability that can be fostered through brief interventions (e.g., Fletcher et al. 2009; Kotsou et al. 2011).

When arriving at university, building new relationships may be an important challenge for certain individuals who are more vulnerable to feelings of loneliness and social exclusion (Cacioppo and Patrick 2008). If these individuals lack self-regulation skills (a tendency which increases as feelings of loneliness increase according to the studies carried out by Cacioppo and his colleagues), they will tend to become less prosocial (e.g., Twenge et al. 2007), which in turn will contribute to reduce their ability to develop positive relationships and benefit from social support. Hence, creating contexts or developing interventions that target social support and positive student relationships may be of particular use in enhancing effective coping strategies, feelings of manageability, and thus sense of coherence.

Another means of enhancing sense of coherence may target teachers themselves. Supportive teacher-student relationships have been shown to be positively associated with the development of sense of coherence (Bowen et al. 1998). Furthermore, workload has been shown to affect sense of coherence (Carmel and Bernstein 1990). Hence, teachers could be trained to better help students through the work that they need to do in order to enhance their feelings of manageability and academic self-efficacy.

Research studies on emotional skills training for teachers have shown that it increased their emotion-related skills and helped create a supportive learning environment, thereby reducing student levels of stress (e.g., Jennings and Greenberg 2009). Therefore, integrating emotional skills training programs in higher education for both students and faculty members could be a useful avenue for future interventional research in this field.

General discussion

As shown in previous studies, the frequency of academic burnout (e.g., Dyrbye et al. 2006; 2008), its impact on academic and field work (e.g., Jennings 2009; Thomas et al. 2007), and for the student's mental health (e.g., Dyrbye et al. 2006b) underline the importance of taking this problem seriously into account at university and not just for medical students. The present multicenter study enabled the French validation of an academic burnout assessment tool: the MBI-SS. The results reveal good psychometric properties which encourages the use of this scale in research and prevention of academic burnout.

As hypothesized, sense of coherence explained a large portion of variance (28%) in the relationship between daily hassles and academic burnout—a higher portion of variance than optimism (14%) which has been shown to be a protective factor against burnout (e.g., Chang and Chan 2015). This encourages working on the meaning of life as a potential source of resilience in a student population as underlined by positive psychology studies on other populations (e.g., Steger and Frazier 2005).

As in previous research, daily hassles were associated with higher levels of academic burnout. Furthermore, as suggested, sense of coherence mediated the relationship between daily hassles and academic burnout. These results underline the importance of sense of coherence in academic burnout and also suggest that it is important to work on reducing the salience of daily hassles in university students' minds. Indeed, research on the negativity bias and on depressive symptoms have underlined that negative mood enhances the negativity bias (e.g., Chen et al. 2008), thus leading to a downward spiral. In order to reduce academic burnout, it may be useful to implement interventions aimed

at attentional training and emotion regulation to reduce the negativity bias. Second and third wave cognitive behavior therapies have assessed various types of interventions that help downregulate negative emotions (second wave cognitive behavior therapy targeting cognitive restructuring; e.g., Beck 1997), upregulate positive emotions (positive psychology interventions, e.g., Seligman et al. 2005), or change one's relationship to negative emotionality in order to protect from the downward spiral (Acceptance and Commitment Therapy, Hayes et al. 2012; Mindfulness-Based Interventions, Segal et al. 2002).

As suggested above, more contextual interventions could also be developed, targeting teacher support and student workload manageability in order to increase sense of coherence and reduce student distress (Bowen et al. 1998; Carmel and Bernstein 1990; Jennings and Greenberg 2009).

Limitations and future perspectives

The main limitation of this study is the cross-sectional nature of the design, which impedes reaching a definitive conclusion about the direction of the relationship between sense of coherence and the three burnout dimensions. In this study, third and fourth year students were selected in order to make sure burnout symptoms would have had time to develop during the first college years in some students, and because previous studies on academic burnout have underlined the important workload, responsibilities and sometimes conflicting values students have to cope with (Dyrbye et al., 2006). However, in this study, the frequency (1.18/4) and disturbance (1.32/4) levels of daily hassles were quite low. Further studies should continue to assess burnout levels in French first year students (Bouteyre et al. 2007) with this validated scale specifically designed for this population, as it has been shown that student burnout developed more rapidly than professional burnout (Oger et al. 2007) and that first year students are at high risk for distress symptoms (e.g., Shankland et al. 2010). It would also be useful to carry out a longitudinal study from first year to doctoral studies in order to assess the evolution of burnout symptoms and to compare the scores between different fields with regard to self-determination theory (Ryan and Deci 2000). Indeed, it may be that certain contexts (healthcare studies) compared to others (psychology or sociology) are less prone to basic psychological needs satisfaction. This in turn leads to more extrinsic motivation, which reduces the sense of meaning of studies, and would lead to reduced engagement and increased cynicism.

To conclude, our contribution in this article is threefold: (1) the paper presents the French validation of the MBI-SS which appears to be a useful tool for research studies as well as for the assessment of student mental health prevention and promotion programs which are to be carried out in universities through new public health approaches (Ladner et al. 2016); (2) the paper contributes to the understanding of certain mechanisms underlying academic burnout; and (3) links the field of academic burnout research to that of positive psychology, suggesting ways of preventing academic burnout.

Compliance with ethical standards

Conflict of interest None.

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