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### ► To cite this version:

Aline Vansoeterstede, Emilie Cappe, Damien Ridremont, Emilie Boujut. School burnout and schoolwork engagement profiles among French high school students: Associations with perceived academic stress and social support. *Journal of Research on Adolescence*, 2024, 10.1111/jora.12991 . hal-04634904

**HAL Id: hal-04634904**

**<https://hal.science/hal-04634904v1>**

Submitted on 8 Jul 2024

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**School burnout and schoolwork engagement profiles among French high school students: Associations with perceived academic stress and social support**

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## Abstract

Adolescents' wellbeing at school is positively affected by social support from parents, teachers, and peers, but negatively impacted by academic stress. However, little is known about how specific academic stressors are connected to study-related wellbeing profiles. This study used a person-centered approach to identify the profiles of high school students based on their schoolwork burnout (i.e., exhaustion, cynicism) and engagement levels to examine their associated levels of perceived academic stress, social support, lifestyle, and sociodemographic characteristics. Using a cluster analysis on a sample of 540 high school students (67.8% girls), we identified five profiles, labeled "Engaged" (22.4%), "Relaxed" (18.9%), "Overextended" (25.6%), "Disengaged" (17.6%), and "Burned out" (15.4%). The "Engaged" and "Relaxed" groups experienced similar levels of perceived social support, and the "Engaged" students showed higher academic stress levels. The "Overextended" group displayed high academic stress with lower social support, while the "Disengaged" group showed low rates of stress and social support. Finally, the "Burned out" group exhibited the highest academic stress and the lowest perceived support. The results are discussed within the demands–resources model of school burnout and clinical implications are presented for each profile.

*Keywords:* academic stress; person-centered approach; secondary education; school burnout; schoolwork engagement; social support

## Introduction

In recent research on adolescents' adjustment at school, burnout and schoolwork engagement have become promising indicators of negative and positive study-related wellbeing (Salmela-Aro, 2017). School burnout is a construct derived from professional burnout (Maslach & Schaufeli, 1993), and can be defined as a long-lasting syndrome emerging among students facing excessive academic demands (Salmela-Aro & Upadyaya, 2014b). It is generally described as a tridimensional construct including emotional exhaustion; fatigue resulting from strain and chronic schoolwork overload; cynicism, which reflects a loss of interest in one's work and school in general; and a feeling of inadequacy as a student, reflecting feelings of inefficacy or unachieved accomplishments in schoolwork (Salmela-Aro, Kiuru, Leskinen, & Nurmi, 2009). For some researchers, school burnout can be reduced to the central dimensions of exhaustion and cynicism (Romano, Angelini, Consiglio, & Fiorilli, 2022; Schaufeli, Bakker, Hoogduin, Schaap, & Kladler, 2001). School burnout predicts poor life satisfaction

and mental health and, especially, depressive symptoms (Vansoeterstede, Cappe, & Boujut, 2023).

Schoolwork engagement has been introduced as the positive opposite of school burnout (Salmela-Aro & Upadaya, 2012). Sometimes described as a long-term form of flow (Nakamura & Csikszentmihalyi, 2014), it reflects a positive and persistent state of mind characterized by energy, dedication, and absorption in one's work (Schaufeli et al., 2002; Upadaya & Salmela-Aro, 2013). Schoolwork engagement has also been linked to academic performance and competence (Salmela-Aro & Upadaya, 2012; Widlund, Tuominen, & Korhonen, 2023; Woo, Hong, & Ahn, 2020), and predicts a successful transition from secondary to tertiary education (Vasalampi, Salmela-Aro, & Nurmi, 2009). These two constructs are useful indicators of study-related wellbeing reflecting both the affective and cognitive aspects of students' subjective relation to their schoolwork.

They are increasingly being scrutinized in adolescent populations using variable-centered approaches. However, they have been relatively neglected from a person-centered perspective. Given that burnout is a multidimensional construct, research in adult populations has shown it to manifest in different profiles, ranging from the absence of burnout to severe burnout, through different profiles where only one or two dimensions are developed. Documenting the intermediate profiles between these two extremes is crucial for developing a more comprehensive understanding of this phenomenon (Leiter & Maslach, 2016). This article seeks to use a person-centered approach to studying school burnout and schoolwork engagement in high school students. It transcends the identification of profiles by aiming to characterize them through variables linked to the students' school experience: perceived school stress and perceived social support. In addition, this article will also explore the role of lifestyle and sociodemographic variables which have been underexplored thus far.

### **The Person-Centered Approach to School Burnout and Schoolwork Engagement**

Despite the overall negative correlation between school burnout and schoolwork engagement, research has shown that their dimensions can be amalgamated in diverse combinations in adolescents. Using person-centered approaches with American and Finnish high school students, studies have shown that a relatively high level of schoolwork engagement can co-exist with academic exhaustion (Salmela-Aro, Moeller, Schneider, Spicer, & Lavonen, 2016; Tuominen-Soini & Salmela-Aro, 2014). This "Engaged-exhausted" profile constituted 28% in Tuominen-Soini and Salmela-Aro's (2014) Finnish sample, and 45.8% and 33.3% in the Finnish and American samples, respectively, in the study by Salmela-Aro and colleagues (2016). Moreover, Tuominen-Soini and Salmela-Aro (2014) identified a profile (14% of the

sample) characterized by high cynicism and low engagement associated with low exhaustion and a sense of inadequacy.

While the “Engaged-exhausted” profile can be easily understood as an early burnout stage, at risk of developing complete school burnout, the existence of this “Disengaged” profile challenges established theoretical frameworks for understanding school burnout. The cynicism dimension in school burnout is supposed to result from high exhaustion. Traditionally, cynicism is considered as a response to burnout where a student seek to protect themselves by mentally detaching from school and schoolwork (Leiter, 1989; Leiter & Maslach, 1988; Vansoeterstede et al., 2023). However, “Disengaged” students display elevated levels of cynicism with no exhaustion. This implies that the “cynicism” dimension in school burnout may not solely derive from the exhaustion process. Referring to the Study Demands-Resources model (Oger, Broc, et al., 2022; Salmela-Aro, 2017), the elevated cynicism and low engagement in these students, in the absence of exhaustion, may arise from a motivational, rather than a chronic stress process.

### **Correlates of School Burnout and Schoolwork Engagement**

The Study Demands-Resources (SDR) model is an adaptation to the academic context of the Job Demands-Resources model (JDR; Bakker & Demerouti, 2007; Bakker, Demerouti, & Sanz-Vergel, 2014). It suggests that study-related wellbeing and performance depend on two processes. The first is an overtaxing process in which study-related demands (potential stressors), such as overload or academic pressure, lead first to burnout and then to impaired mental health. The second is a motivational process wherein the availability of personal and environmental resources, such as self-competence or social support, leads to schoolwork engagement followed by life satisfaction. Study-related resources are more robust predictors of schoolwork engagement, while study demands predict school burnout (Salmela-Aro & Upadyaya, 2014b).

According to the JDR model (Bakker, Demerouti, Taris, Schaufeli, & Schreurs, 2003), demands and resources interact, with resources mitigating the consequences of demands on burnout. A variable's moderating influence can manifest in several ways, such as lowering the level of demands produced within the organization, influencing how people perceive and respond to these demands cognitively, regulating how people react following cognitive evaluation, or lessening the negative health effects of these reactions (Kahn & Byosiere, 1992). One factor that is frequently associated to this kind of effect is social support. On the other hand, demands can mitigate the effect of resources on engagement: resources are supposed to impact work engagement or motivation, especially in high demand environments. This is

consistent with the JDR model's foundational tenet of resource conservation theory (Hobfoll, 1989, 2002).

According to the SDR model, a high level of cynicism without exhaustion could reflect a process of non-engagement rather than a process of chronic stress. “Disengaged” students’ lack of engagement may stem from limited personal and/or organizational resources. Indeed, research has indicated that students with low engagement perceive less social support (Ulmanen, Soini, Pietarinen, & Pyhältö, 2022), have lower self-esteem (Cadime et al., 2016; Zhao, Zheng, Pan, & Zhou, 2021), possess lower academic skills (Widlund et al., 2023), and exhibit a weak sense of academic efficacy (Oger, Martin-Krumm, et al., 2022; Teuber, Tang, Salmela-Aro, & Wild, 2021; Zhao et al., 2021). Examining if “Disengaged” students perceive or do not perceive stress in their school environment, while at the same time examining their resources, could, from a theoretical point of view, provide a better understanding of the emergence of this profile.

In the literature on school burnout and engagement, students' demands and resources have generally been studied in terms of their perceived stress and perceived social support. School stress is positively related to school burnout (Gerber et al., 2015; Jung, Kim, Ma, & Seo, 2015; Ponkosonsirilert et al., 2020), in particular with the exhaustion dimension (Meylan, Doudin, Curchod-Ruedi, Antonietti, & Stephan, 2015). When the study demands placed on a student are perceived to exceed their available resources, chronic school-related stress ensues, leading to school burnout (Lebert-Charron, Boujut, Beaudoin, & Quintard, 2019). Nevertheless, students may encounter various sources of stress in the school environment beyond high academic demands, and these additional factors can contribute to burnout or decreased engagement (Meylan, Doudin, Curchod-Ruedi, Antonietti, & Stephan, 2015). To prevent the development of school burnout among adolescents, identifying the relevant sources of stress for the development of burnout seems to be of the utmost practical relevance. Despite this, few studies have attempted to answer this question. Some have suggested that school burnout might be more strongly related to workload and success anxiety, but more research exploring a variety of stressors is needed to better understand which dimensions of academic stress are more relevant to school burnout (Meylan, Doudin, Curchod, & Stephan, 2011; Veyis, Seçer, & Ulaş, 2019). For example, only one study has examined the links between relational stressors and school burnout in a sample of Swiss French-speaking high school students, but did not distinguish between the different types of relational stressors (Meylan et al., 2011). Yet, it is likely that some relationships are more stressful than others. Regarding schoolwork engagement, it has been shown to be negatively associated with

perceived workload (Teuber, Nussbeck, & Wild, 2020), but, no study has yet examined this concept in relation various perceived academic stressors.

Social support is an important variable affecting study-related wellbeing (Lindfors, Minkkinen, Rimpelä, & Hotulainen, 2018; Salmela-Aro & Upadyaya, 2014; Ulmanen, et al. Soini, Pietarinen, & Pyhältö, 2022; Zhao et al., 2021). In the school context, three sources of support can be considered important, namely that of parents, teachers, and peers. Within the family, guardians offer support related to the overall development of adolescents and are the most important sources of support in protecting the mental health of young people (Rueger, Malecki, Pyun, Aycock, & Coyle, 2016). Support within the family and secure bonds with parents are associated with lower school burnout and higher schoolwork engagement (An, Yuan, Liu, Zhou, & Xu, 2018; Boyacı & Özhan, 2018; Shin, Lee, Kim, & Lee, 2012; Ulmanen, Soini, Pietarinen, & Pyhältö, 2022). However, in relation to study, the teacher's role is particularly important as they help shape study tasks and the classroom climate (Mælan, Tjomsland, Samdal, & Thurston, 2020; Stornes, Bru, & Idsoe, 2008). Specifically, support from teachers is associated with lower school burnout and higher schoolwork engagement (Meylan, Meylan, Rodriguez, Bonvin, & Tardif, 2020; Romano, Angelini, Consiglio, & Fiorilli, 2021; Romano, Tang, Hietajärvi, Salmela-Aro, & Fiorilli, 2020; Teuber et al., 2021). A meta-analysis highlighted teachers as the most important source protecting students from school burnout (Kim, Jee, Lee, An, & Lee, 2017). Peers might also play a role in promoting study-related wellbeing. Specifically, peers might enhance functional coping via modeling. For example, when included in stable peer groups, adolescents are more likely to re-engage in study tasks when facing adversity (Vollet & Kindermann, 2020). Moreover, it has been shown that the use of problem-centered coping is positively associated with academic performance, but when associated with social support seeking, it additionally fosters positive emotions (Amai & Hojo, 2021).

Research has consistently shown that, in line with the SDR model, perceived stress at school is positively associated with burnout in secondary school students. However, few studies have explored the differential effects of various sources of school stress. Moreover, the relationship between perceived school stress and schoolwork engagement has received limited attention. While the associations between perceived social support and school burnout on one hand, and engagement on the other, have been extensively documented, very few studies have investigated the combined effects of social support and engagement.

In a person-centered approach, we can expect highly-engaged students to perceive strong support from their peers and low academic stress and observe the opposite for burned-

out students. However, what is the experience of students with more moderate wellbeing profiles at school? Do “Exhausted-engaged” students perceive too much school stress or not enough support? What about “Disengaged” students? Beyond theoretical considerations, to more accurately determine how students from different profiles experience stress and support could enlighten professionals about the specific needs of the students concerned to propose appropriate treatment or preventive measures.

### **School burnout and engagement, lifestyle, and sociodemographic variables**

While numerous studies in adults have demonstrated the significant role of lifestyle in preventing professional burnout and influencing recovery (Bakker & de Vries, 2021), research in adolescents remains limited. For example, little research has been done on the connection between students' extracurricular activities and school burnout in secondary schools. Yet, the beneficial impact of leisure activities, particularly structured ones, during adolescence is well-known, believed to play a protective role and positively impact development, including promoting school perseverance and achievement (Bartko & Eccles, 2003; Eccles, Barber, Stone, & Hunt, 2003; Larson & Kleiber, 1993). In the adult population, a recent meta-analysis identified leisure time as a crucial protective factor (Shoman et al., 2021). Research has also highlighted the importance of sleep in recovery from burnout, with potential protective effects observed among medical students (Membrive-Jimenez et al., 2022; Stewart & Arora, 2019; Wolf & Rosenstock, 2017). Despite limited research on the links between school burnout and sleep time, some studies suggest a negative association between sleep quality and school burnout (Gerber et al., 2015; Lehto, Kortesoja, & Partonen, 2019). Neither leisure activities nor sleep time have, to our knowledge, been studied in relation to adolescents' schoolwork engagement.

In addition to lifestyle variables, three sociodemographic factors could be particularly relevant concerning school burnout: gender, academic track, and socioeconomic background. Recent research has highlighted a significant association between gender and school burnout, with females identified as being at higher risk (Vansoeterstede et al., 2023). This could be due to boys may exhibiting lower stress sensitivity in relation to hormonal factors, such as lower excitability of the hypothalamus–pituitary–adrenal axis in relation to testosterone exposure (Bale & Epperson, 2015; Green & McCormick, 2016; Roberts & Lopez-Duran, 2019), or to girls being more susceptible to academic stress due to socio-psychological factors, including attaching greater importance to academic achievement alongside lower self-esteem and coping beliefs (Amai & Hojo, 2021; Haugan, Frostad, & Mjaavatn, 2021). On the other hand,



girls seem to be consistently more engaged in their schoolwork (Cadime et al., 2016; Teuber et al., 2021).

As previously mentioned, workload is a significant stress factor for students, positively associated with school burnout (Meylan et al., 2011; Veyis et al., 2019) and negatively to engagement (Teuber et al., 2020). It is likely that the increasing workload throughout schooling contributes to the observed rise in burnout levels as students progress through secondary education (Gungor, 2019; Lee, Puig, Lea, & Lee, 2013; Salmela-Aro & Read, 2017; Salmela-Aro & Upadyaya, 2014a). Additionally, developmental paths of school burnout vary by educational tracks, with academic education pathways showing higher burnout levels compared to vocational ones (Bask & Salmela-Aro, 2013; Lehto et al., 2019; Salmela-Aro & Tynkkynen, 2012). The links between educational track choice and engagement in schoolwork are unclear with previous studies revealing contradictory results (Salmela-Aro & Upadyaya, 2012; Teuber et al., 2021; Tuominen-Soini, Salmela-Aro, & Niemivirta, 2012).

It is known that wealthier families tend to have children who have a greater appreciation for school (Horanicová, Husárová, Gecková, Winter, & Reijneveld, 2022), and to be more cognitively and behaviorally committed to their schoolwork (Tomaszewski, Xiang, & Western, 2020). It has also been shown that parents with a higher educational level tend to have children with better self-regulation capacities, which in turn, positively influence adolescents' engagement and persistence at school (Katsantonis, Gibbons, Symonds, & Costello, 2024). Yet, the links between socioeconomic background with school burnout or engagement remain largely unexplored. Only three studies examined the links between school burnout and parental job category with contradictory results (Salmela-Aro & Upadyaya, 2017; Salmela-Aro, Upadyaya, Hakkarainen, Lonka, & Alho, 2017; Teuber et al., 2021).

### **The Present Study**

Research into study-related wellbeing profiles is scarce, limited to Finnish and US students. Conducting a person-centered analysis in diverse cultural contexts is highly relevant for two reasons. Firstly, it allows us to determine whether certain profiles are typical and independent of culture. From a theoretical perspective, this would allow the phenomena of school burnout and engagement to be better understood. Secondly, the person-centered approach enables one to assess the prevalence of high-functioning students and students in distress. This can be useful for international comparisons.

More importantly, research has, thus far, been limited to a descriptive approach, without interrogating the associated variables. However, it seems crucial to identify the factors associated with these profiles, particularly in terms of school experience. This is important both

for a better theoretical understanding of these phenomena, as well as for defining suitable prevention and remediation strategies. In particular, we must examine students' experiences of stress and support. For example, are students with different profiles exposed to different academic stressors? Do cynical students who are not burned out experience a form of academic stress or not? Do burned-out, engaged students perceive high academic stress, low social support, or both?

Hence, the aims of this study are: i) To identify study-related wellbeing profiles in a sample of French high school students, and ii) to examine how these profiles differ in terms of sources of perceived academic stress and social support, lifestyle, and sociodemographic factors.

## Methods

### Procedures

This study used a convenience sample. The participants were recruited during the 2021/2022 schoolyear through their school or social media (e.g., Instagram and Twitter). Information about the study was sent to 1,350 public and state-contracted private high schools in mainland France in October 2021. The information e-mail contained all the information needed for school principals to disseminate the study to their educational community without having to contact the research team. In addition, the research team released a call for participation addressed to parents through the parents' association and social media (e.g., Facebook, Twitter, and LinkedIn). To be eligible to participate, adolescents had to be enrolled in a high school program leading to the baccalaureate and have parental authorization if they were minors. Participants' consent was sought, and the confidentiality of responses guaranteed. The survey was anonymous and hosted on LimeSurvey. The entire survey took approximately 35 to 45 minutes to complete.

### Participants

Data were collected from 588 French students. After excluding participants who did not complete the school burnout and engagement questionnaires, the final sample consisted of 540 students:  $M_{\text{age}} = 16$ ;  $SD_{\text{age}} = 1.025$ ; 67.8% girls, 29.4% boys, 2.8% "other." Of these students, 174 (32.2%) were in 10<sup>th</sup> grade, 201 (37.2%) were in 11<sup>th</sup> grade, and 159 (29.4%) were in 12<sup>th</sup> grade. Finally, 30 students (5.6%) were in a vocational track, 169 (31.3%) were in their first year of academic and technological high school, 39 (7.2%) were studying in a technological track, and 302 (55.9%) were in an academic track.

## Measures

### *School Burnout*

School burnout was assessed using the French version of the School Burnout Inventory (SBI, Salmela-Aro et al., 2009; Meylan et al., 2015). The SBI consists of nine items measuring exhaustion (e.g., “I feel overwhelmed by my studies”), cynicism (e.g., “I feel a lack of motivation in my studies and often think of giving up”), and inadequacy as a student (e.g., “I often have feelings of inadequacy in my studies”). Participants rate each item on a 6-point Likert-type scale, ranging from 1 (*Completely disagree*) to 6 (*Completely agree*). In the French instrument, reliability indices are respectively:  $\alpha = .77$ ,  $\alpha = .65$ , and  $r = .37$  (Meylan et al., 2015). Since the reliability indices were unsatisfactory in this study, confirmatory and exploratory factor analyses were conducted. These analyses showed that one item in the Inadequacy factor loaded on the Cynicism factor. After the suppression of the second item on the Inadequacy dimension, a two-factor model clearly emerged explaining 45% of the total variance in the scale, with a Cronbach’s  $\alpha$  of .73 for the Exhaustion dimension and .77 for the Cynicism dimension.

### *Schoolwork Engagement*

Schoolwork engagement was assessed using the French version of the Schoolwork Engagement Inventory (Salmela-Aro & Upadyaya, 2012; Meylan et al., 2021). This scale consists of nine items assessing emotional engagement in schoolwork (e.g., “Time flies when I am studying”). Participants rate each item on a 7-point Likert-type scale, ranging from 0 (*Never*) to 6 (*Every day*). The reliability of the original French instrument is  $\alpha = .89$ . The scale has a one-factor structure. In this study, the overall Cronbach’s  $\alpha$  was .89.

### *Academic Stress*

Academic stress was assessed using the French Academic Stress Questionnaire developed by Meylan et al. (2011). The scale originally consisted of 16 items assessing 3 dimensions of stress: Social Relationships, Workload, and Success. Participants indicate whether they have encountered the problem and, if so, rate the item on a 4-point Likert-type scale, ranging from 0 (*Not stressed at all*) to 3 (*Very stressed*). Cronbach’s alphas of the original FASQ are, respectively, .74, .77, and .74.

In the present study, we use a modified version of the scale, to which new items were added so as to allow for the emergence of new stress dimensions. These items were suggested by students who had participated in previous data collections conducted by the Meylan team. They were selected with the help of three specialists in educational psychology. For example,

in the original scale, a global relationship stressor was identified, whereas the current version distinguished between three sources of relationship stress. Consequently, a principal component analysis was conducted on the identified 32 items. To determine the number of factors to retain for the analysis, several methods (Kaiser criterion, Cattell's scree test) were employed to carefully judge each plausible solution, and a six-factor solution was retained. We then examined factor loadings, retaining an item if the difference between its primary–secondary loadings was greater than .20. For the final stage, a principal component analysis (Varimax rotation) was conducted for the 25 retained items, with 6 factors explaining 61% of the total variance. The first component, Academic and Professional Future, was composed of five items (e.g., “Worrying about your professional future”); the second, Overload, was composed of six items (e.g., “Having too much homework to do”); the third, Relationships with Teachers, was composed of four items (e.g., “Lacking attention from teachers”); the fourth, Relationships with Peers, was composed of four items (e.g., “Being mocked by peers”); the fifth, Relationships with Parents, was composed of three items (e.g., “Announcing a bad grade to your parents”); the sixth, External Disturbances, was composed of three items (e.g., “Being disturbed by noise at school”). In this study, Cronbach's  $\alpha$ s were .85, .82, .80, .69, .77, and .66 for these components, respectively.

### ***Perceived Social Support***

Perceived social support was assessed using three subscales of the Children and Adolescents Social Support Scale (Malecki & Demary, 2002; Rueger, Malecki, & Demaray, 2008) adapted in French by Meylan, Doudin, Curchod-Ruedi, and Stephan (2015). Each subscale consists of 12 items assessing 4 sources of support: emotional, informational, evaluative, and instrumental. In this study, only subscales evaluating support from parents (e.g., “My parents show that they are proud of me”), teachers (e.g., “My teachers give me information in order to help me solve problems”), and peers (e.g., “My classmates give me good advice”) were used. The participants were asked to rate each item on a 6-point Likert-type scale, ranging from 1 (*Never*) to 6 (*Always*). Reliability coefficients for the subscales range from 0.94 to 0.96 (Meylan et al., 2015). In this study, Cronbach's  $\alpha$ s were 0.94, 0.91, and 0.95 for perceived support from parents, teachers, and peers, respectively.

### ***Sociodemographic Information***

**Gender** was coded by asking students to mark the most accurate alternative (1 = boys, 2 = girls, 3 = other).

**Parental education** was assessed by asking participants to indicate their parent's levels of education. Responses were re-coded in three categories: two parents with tertiary education, one parent with tertiary education, no parent with tertiary education.

The participants were asked at what time they usually go to bed and try to sleep, and at what time they awaken on a typical school day. **Sleep time** was calculated by subtracting awakening time from bedtime.

The participants were asked if they practiced a **structured leisure activity** (conservatory, sport club, etc.). Involvement was coded as a binary variable (1 = practice or 0 = no practice).

### **Data Analysis**

To identify burnout profiles based on school burnout and engagement, a two-step cluster analysis was performed (Clatworthy, Buick, Hankins, Weinman, & Horne, 2005), with the *z*-scores of exhaustion, cynicism, and schoolwork engagement selected as clustering variables. First, hierarchical cluster analysis using Ward's method with squared Euclidian distance measures was conducted to determine the number of clusters. Based on the dendrogram and agglomeration schedule, the results suggested a five-cluster solution. Second, non-hierarchical cluster analysis (*K*-means) was performed on the data to determine the final clusters, which specified a five-cluster solution. ANOVA tests were then performed to identify the differences among the clusters in terms of sociodemographic characteristics (age, sleep time), the academic stress dimensions, and the perceived social support dimensions.

Following this, *F* ANOVA and Bonferroni post-hoc tests were used for homogenous variances, and Welch's ANOVA and Games-Howell post-hoc tests were used for non-homogenous variances. Chi-squared tests were performed to identify the differences among the profiles in terms of sociodemographic characteristics (gender, parental education, grade, type of high school, structured leisure activity). All the analyses were conducted with SPSS 28.0. Tests with  $p < .05$  were considered statistically significant.

### **Results**

Descriptions of the variables (Table A1) and their correlations using Spearman's rho (Table A2) are presented in the appendix. Parametric tests were conducted despite observed signs of non-normality in the variables under consideration, as we considered ANOVA to be a robust test for violations of normality (Blanca Mena, Alarcón Postigo, Arnau Gras, Bono Cabré, & Bendayan, 2017). Cluster analysis does not require normal distributions of the variables (Borgen & Barnett, 1987; Clatworthy et al., 2005).

## School Burnout and Schoolwork Engagement Profiles among High School Students

The results of the cluster analysis suggested a five-cluster solution. These clusters are presented in Table 1 and described below. A plot of Z-score means for each of the profiles can be found in Figure 1.

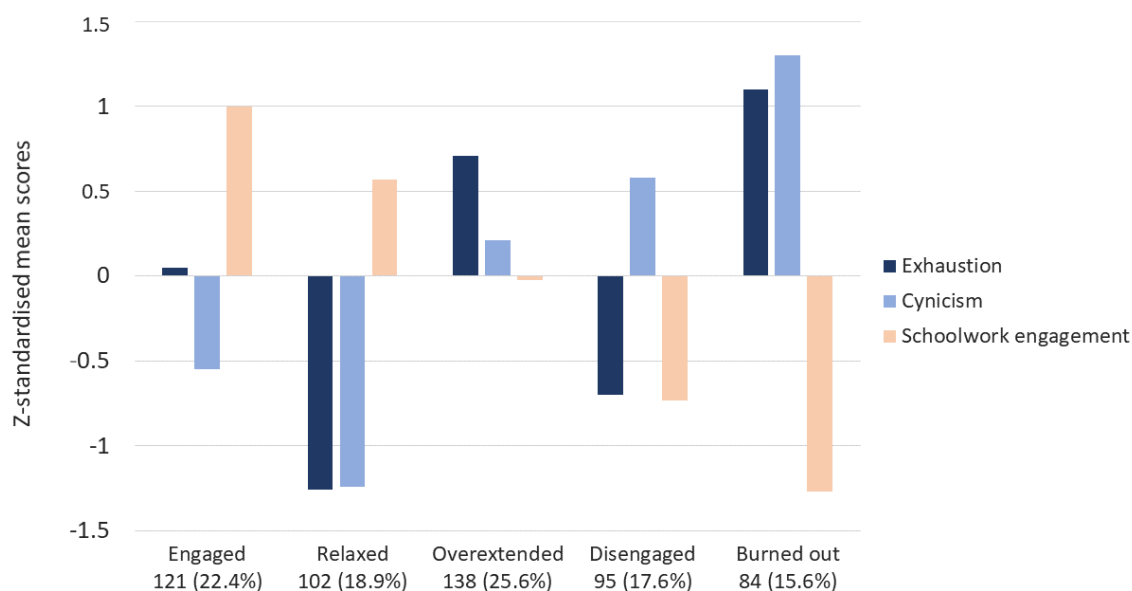
**Table 1**

*Z-score Means and Standard Deviations of Exhaustion, Cynicism, and Schoolwork Engagement by Profile (N = 540)*

Profile	N (%)	Exhaustion M (SD)	Cynicism M (SD)	Schoolwork en- gagement M (SD)
Engaged	121 (22.4%)	.05 (.58)	-.55 (.56)	1.00 (.46)
Relaxed	102 (18.9%)	-1.26 (.52)	-1.24 (.57)	.57 (.79)
Overextended	138 (25.6%)	.71 (.51)	.21 (.58)	-.02 (.58)
Disengaged	95 (17.6%)	-.70 (.50)	.58 (.58)	-.73 (.69)
Burned out	84 (15.6%)	1.10 (.64)	1.30 (.44)	-1.27 (.49)

**Figure 1**

*Z-score Means for the Five Profiles (N = 540)*



We found two profiles of well-functioning students: The “Engaged” profile was characterized by high engagement in schoolwork, average exhaustion, and low cynicism, and represented 22.4% of the sample ( $n = 121$ ). The “Relaxed” profile was characterized by high engagement in schoolwork, low exhaustion, and low cynicism, and represented 18.9% of the sample ( $n = 102$ ). Moreover, a distressed profile emerged: The “Burned out” profile was

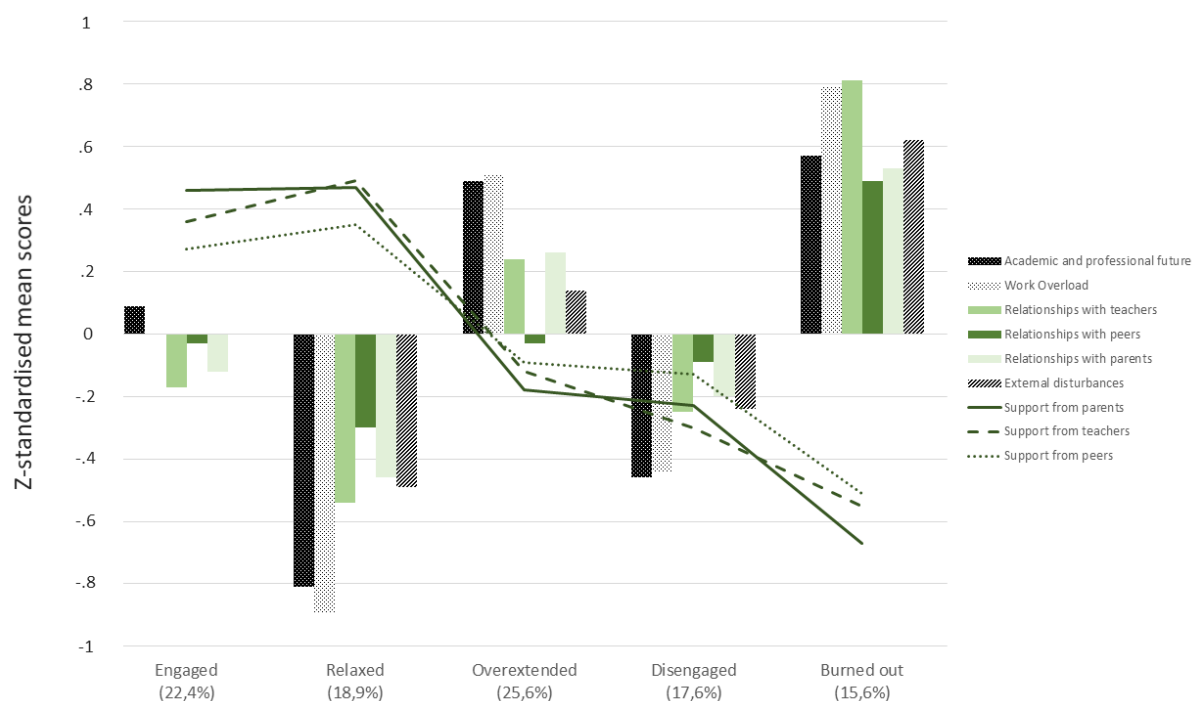
characterized by high exhaustion and cynicism, and low engagement in schoolwork, and represented 15.6% of the sample ( $n = 84$ ). An “Overextended” profile emerged, characterized by high exhaustion, average cynicism, and engagement in schoolwork, and represented 25.6% of the sample ( $n = 138$ ). Finally, a “Disengaged” profile was identified, which was characterized by high cynicism, and low exhaustion and engagement in schoolwork, and represented 17.6% of the sample ( $n = 95$ ).

### Group Differences in Academic Stress, Perceived Social Support, and Sociodemographic Variables

Table 2 presents the results of the one-way ANOVA tests ( $F$  or Welch) and Bonferroni’s or Games–Howell’s post-hoc tests performed to compare profiles in terms of academic stress and social support.  $Z$ -scores were used to facilitate an understanding of the differences among the profiles. The results are presented in Figure 2.

**Figure 2**

*Z-score Means of Stress and Support Variables for the Five Profiles ( $N = 540$ )*



Regarding academic stress, the results showed significant differences among the profiles in terms of academic and professional future stress (Welch [4,254] = 50.57;  $p < .001$ ), overload stress ( $F[4,255] = 75.51$ ;  $p < .001$ ), relationships with teachers stress (Welch [4,250] = 30.45;  $p < .001$ ), relationships with peers stress (Welch [4,249] = 6.48;  $p < .001$ ), relationships with parents stress (Welch [4,253] = 18.94;  $p < .001$ ), and external disturbances

stress (Welch [4.251] = 19.73;  $p < .001$ ). Students from the “Burned out” and “Overextended” profiles had higher scores for stress related to their academic and professional future, overload, relationships with teachers, and relationships with parents than students from the other profiles. The largest effect size was observed for work overload stress. Moreover, students from the “Burned out” profile had higher scores for stress related to relationships with peers and external disturbances than those from the other profiles. On the other hand, students from the “Relaxed” and “Disengaged” profiles had lower scores than those from the “Engaged” profile for stress related to their academic and professional future and overload, while students from the “Relaxed” profile had lower scores for stress related to relationships with teachers, relationships with parents, and external disturbances than students from the “Engaged” profile.



**Table 2**

*Comparisons Among the Profiles in Terms of the Z-score Means and Standard Deviations of Academic Stress and Perceived Social Support Using ANOVA and Bonferroni's or Games–Howell Post-hoc Tests (N = 540)*

Variable	Engaged (A) (n = 121)	Relaxed (B) (n = 102)	Overex- tended (C) (n = 138)	Disen- gaged (D) (n = 95)	Burned out (E) (n = 84)	p	Eta2
Academic and professional future M (SD)	.09 (.88)	-.81 (.90)	.49 (.79)	-.46 (.94)	.57 (.75)	< .001	.276
	Post-hoc: E > A, B, D; C > A, B, D; A > B, D						
Work Overload M (SD)	.00 (.84)	-.89 (.73)	.51 (.82)	-.44 (.81)	.79 (.83)	< .001	.347
	Post-hoc: E > A, B, D; C > A, B, D; A > B, D; D > B						
Relationships with teachers M (SD)	-.17 (.85)	-.54 (.54)	.24 (1.00)	-.25 (.81)	.81 (1.25)	< .001	.187
	Post-hoc: E > A, B, C, D; C > A, B, D; A > B; D > B						
Relationships with peers M (SD)	-.03 (.93)	-.30 (.68)	-.03 (.86)	-.09 (.95)	.49 (1.33)	< .001	.058
	Post-hoc: E > A, B, C, D						
Relationships with parents M (SD)	-.12 (.91)	-.46 (.65)	.26 (1.06)	-.20 (.94)	.53 (1.09)	< .001	.112
	Post-hoc: E > A, B, D; C > A, B, D; A > B						
External disturbances M (SD)	.00 (.96)	-.49 (.61)	.14 (.98)	-.24 (.92)	.62 (1.23)	< .001	.117
	Post-hoc: E > A, B, C, D; C > B; A > B						
Support from parents M (SD)	.46 (.82)	.47 (.93)	-.18 (.90)	-.23 (.91)	-.67 (1.02)	< .001	.176
	Post-hoc: E < A, B, C, D; D < A, B; C < A, B						
Support from teachers M (SD)	.36 (.89)	.49 (.95)	-.12 (.88)	-.30 (.99)	-.55 (.99)	< .001	.140
	Post-hoc: E < A, B; D < A, B; C < A, B						
Support from peers M (SD)	.27 (.92)	.35 (1.01)	-.09 (.91)	-.13 (.87)	-.51 (1.12)	< .001	.086
	Post-hoc: E < A, B, C; D < A, B; C < A, B						

*Note.* Welch<sub>Academic and professional future</sub> (4.254) = 50.57;  $F_{\text{Overload}}$  (4.255) = 75.51; Welch<sub>Relationships with teachers</sub> (4.250) = 30.45; Welch<sub>Relationships with peers</sub> (4.249) = 6.48; Welch<sub>Relationships with parents</sub> (4.253) = 18.94; Welch<sub>External disturbances</sub> (4.251) = 19.73;  $F_{\text{Support from parents}}$  (4.517) = 27.622;  $F_{\text{Support from teachers}}$  (4.511) = 20.808; Welch<sub>Support from peers</sub> (4.238) = 10.341

Concerning the social support dimensions, the results showed significant differences among the profiles in terms of support from parents ( $F[4.517] = 27.622$ ;  $p < .001$ ), teachers ( $F[4.511] = 20.808$ ;  $p < .001$ ), and peers (Welch [4.238] = 10.341;  $p < .001$ ). The profiles characterized by high engagement (i.e., “Engaged” and “Relaxed”) were associated with

higher support from all sources. In contrast, students from the “Burned out” profile perceived less support from parents than their counterparts from the other profiles.

The results concerning sociodemographic variables for the Chi-squared tests used to compare profiles in terms of the nominal sociodemographic variables can be found in Table 3. Table 4 presents the results for the one-way ANOVA and Bonferroni’s post-hoc tests performed to compare profiles in terms of the continuous sociodemographic variables.

There were significant differences among the profiles in terms of gender ( $\chi^2[4] = 40.21, p < .001$ ), with females being overrepresented in the exhausted groups (“Overextended” and “Burned-out” profiles). There were also significant differences among the profiles in terms of the type of track ( $\chi^2[4] = 17.32, p < .01$ ). We found that students in the academic track are more often represented in the “Overextended” and “Burned out” profiles, but also in the “Engaged” profile.

Significant differences were detected in terms of grade ( $\chi^2[4] = 28.83, p < .001$ ). Indeed, those in the “Relaxed” profile were mainly in 10<sup>th</sup> grade ( $n = 55, 53.9\%$  vs  $n = 41, 34.2\%$  for the “Engaged” profile), while few were in the 12<sup>th</sup> ( $n = 17, 16.7\%$  vs  $n = 36, 30\%$  for the “Engaged” profile).

**Table 3**

*Comparisons Among the Profiles in Terms of Sociodemographic Variables with Chi-squared Tests (N = 540)*

	Engaged	Relaxed	Overextended	Disengaged	Burned out	$\chi^2$	p	Cramer's V
	<i>n</i> (%)	<i>n</i> (%)	<i>n</i> (%)	<i>n</i> (%)	<i>n</i> (%)			
Gender						40.21	< .001	.277
Females 366 (69,7)	89 (74.8)	52 (51.0)	108 (81.2)	52 (56.5)	65 (82.3)			
Males 159 (30,3)	30 (25.2)	50 (49.0)	25 (18.8)	40 (43.5)	14 (17.7)			
Parental education						17.45	< .05	.141
Two parents with tertiary education 86 (19.5)	72 (66.7)	54 (62.8)	49 (44.5)	32 (44.4)	34 (51.5)			
One parent with tertiary education 115 (26)	23 (21.3)	16 (18.6)	35 (31.8)	23 (31.9)	18 (27.3)			
No parent with tertiary education 241 (54.5)	13 (12.0)	16 (18.6)	26 (23.6)	17 (23.6)	14 (21.2)			
Grade						28.83	< .001	.164
10 <sup>th</sup> 178 (33.3)	41 (34.2)	55 (53.9)	32 (23.4)	28 (30.4)	22 (26.5)			
11 <sup>th</sup> 201 (37.6)	43 (35.8)	30 (29.4)	60 (43.8)	35 (38.0)	33 (39.8)			
12 <sup>th</sup> 155 (29)	36 (30.0)	17 (16.7)	45 (32.8)	29 (31.5)	28 (33.7)			
Type of track						17.32	< .01	.216
Academic 302 (81.4)	71 (85.5)	34 (68.0)	96 (89.7)	48 (70.6)	53 (84.1)			
Technological and vocational 69 (18.6)	12 (14.5)	16 (32.0)	11 (10.3)	20 (29.4)	10 (15.9)			
Structured leisure activity 331 (61.3)	85 (70.2)	75 (73.5)	81 (58.7)	51 (53.7)	39 (46.4)	21.06	< .001	.197

The results showed significant differences among the profiles in terms of sleep time ( $F[4,534] = 14.605$ ;  $p < .001$ ). Bonferroni's post-hoc tests demonstrated that "Burned out" students slept significantly less than those from other profiles, while those in the "Engaged" and "Relaxed" profiles had the longest sleep time, thus supporting H7a. Confirming H7b, a significant difference in structured leisure activity was found among the profiles ( $\chi^2[4] = 17.32$ ,  $p < .01$ ), with "Engaged" and "Relaxed" students being more likely to engage in structured leisure activities than their counterparts from other profiles. Finally, significant differences were also found in terms of parental education ( $\chi^2[4] = 17.45$ ,  $p < .05$ ), with two parents with tertiary education being overrepresented in the "Relaxed" and "Engaged" profiles, as expected (H7c).

**Table 4**

*Comparisons Among the Profiles in Terms of Sociodemographic Variables with ANOVA and Bonferroni's Post-hoc Tests (N = 540)*

Variables	Engaged (A) (n = 121)	Relaxed (B) (n = 102)	Overextended (C) (n = 138)	Disengaged (D) (n = 95)	Burned out (E) (n = 84)	p	Eta2
Sleep time M (SD)	7.59 (1.02)	8.16 (.57)	7.45 (1.01)	7.20 (1.16)	7.12 (1.24)	< .001	.099
	Post-hoc: E < A, B, C, D; D < A, B; C < B						

*Note.*  $F_{\text{Sleep time}}(4.534) = 14.61$

## Discussion

The present study's first objective was to identify study-related wellbeing profiles in French high school students. The second objective was to explore differences in sociodemographic characteristics, academic stress sources, and social support among these profiles.

### Profiles of School Burnout and Schoolwork Engagement

French high school students display various profiles of school burnout and schoolwork engagement. A cluster analysis identified one profile for distressed students (i.e., the "Burned out" group) and two well-functioning groups: namely the "Engaged" and "Relaxed" groups. In addition to these, more extreme, profiles, an "Overextended" and a "Disengaged" profile were identified.

In our sample, 15.6% of high school students could be considered as displaying a burnout profile, which is close to the results of previous research (Salmela-Aro et al., 2016; Tuominen-Soini & Salmela-Aro, 2014). This is significant since school burnout has been shown to impair mental health (Anonymous et al., 2023) and contribute to suicidal ideation (Wang et al., 2020; Zakari et al., 2008).

Two interesting results also emerged from the profile analysis. First, a "Disengaged" group was identified, characterized by high cynicism but very low exhaustion and schoolwork engagement. A similar profile was found among Finnish high schoolers (Tuominen-Soini & Salmela-Aro, 2014), but not for US or similar Finnish samples in 2016 (Salmela-Aro et al., 2016). Hence, our results contribute to the increasing evidence showing that high cynicism may exist independently from exhaustion. Yet, this raises questions about school burnout theory. According to Maslach and Schaufeli (1993), in professional burnout, cynicism develops as a coping mechanism aimed at protecting the worker from exhaustion by disengaging them

from the stressful situation. However, to the best of our knowledge, this mechanism has never been found to suppress exhaustion. This leads to the following question: Is the cynicism profile the last stage of the school burnout process, or does it reflect another process not led by stress? If the cynical profile is not the result of a long-lasting stress process, it could reflect a disengagement process led by a lack of resources. According to the demand–resources model of engagement and burnout (Bakker & Demerouti, 2007; Bakker et al., 2014), which has been successfully validated in the context of secondary education (Salmela-Aro & Upadyaya, 2014b), burnout and engagement depend on two distinct processes. School burnout emerges from overtaxing demands and leads to impaired health, while engagement arises from available resources and leads to motivation and implication in schoolwork. Although the model supposes there to be interactions between the two processes, with resources offering protection from burnout and overload impairing engagement, it is possible that disengagement emerges from a substantial lack of resources alone. In this case, the student might not engage in the academic track and fail to exert the effort required to succeed. This mechanism would protect their overall wellbeing, as other studies have shown that disengaged students display higher self-esteem and lower depressive symptoms than burned-out students and do not necessarily show other adjustment problems (Roeser, Strobel, & Quihuis, 2002; Tuominen-Soini & Salmela-Aro, 2014).

A second, interesting, result is the existence of a “Relaxed” group, which differed from the “Engaged” group. These two groups can be considered to be well-functioning; however, the former, while displaying very low exhaustion and cynicism, also showed a lower level of schoolwork engagement than the latter. These two groups also showed a high level of perceived support and often had at least one parent with a tertiary education degree. This could be due to the greater tendency of educated parents to involve themselves in their children’s academic lives (Avvisati, Besbas, & Guyon, 2010). The “Relaxed” group was overrepresented in the first year of high school, which could indicate that these students had yet to encounter difficult academic situations, as reflected in their extremely low level of academic stress. Academic stress and exhaustion in the “Engaged” group were average, but their schoolwork engagement levels were the highest of all profiles. This suggests that, in accordance with the demand–resources model and conservation of resources theory (Bakker & Demerouti, 2007; Bakker et al., 2014; Hobfoll, 2002), the effect of resources (here, parental education and social support) is higher in a high-demand context.

### **Associations with Gender, Perceived Academic Stress and Support, and Habits**

Our second aim was to investigate variations in sociodemographic characteristics, sources of academic stress, and social support among the identified profiles. We found that the exhausted profiles were associated with higher academic stress than the other groups, with the “Burned out” profile displaying higher levels of stress than the “Overextended” group. Work overload was the source of stress that best differentiated the groups, which is consistent with existing literature (Meylan et al., 2011). However, perceived stress related to students’ academic and professional future was the academic stress dimension with the highest scores for these two groups. This source of stress is characterized by fear of failure. Thus, although difficulty in coping with workload is undoubtedly a factor in exhaustion, our study suggests that difficulty in coping with workload may lead to fear of failure, which contributes to the development of school burnout. This implies that learning to set realistic goals and relativizing the impact of a bad grade could be important levers with which to prevent and manage school burnout. “Overextended” students also perceived higher stress from low and average exhaustion profiles related to relationships with teachers and parents. In contrast, the “Burned out” group showed higher perceived stress than the other groups in every dimension of academic stress, including relationships with peers and external disturbances. This may reflect their inability to cope with even minor daily hassles due to their exhaustion. Alternatively, It should be noted that peer-related stress includes conflict, exposure to mocking, intimidation, and extortion. It is possible that these students had been bullied, which would be an additional risk factor for school burnout (Guo & Li, 2022). As school burnout is known to cause depressive symptoms, it is also possible that these students would be irritable, leading them to more frequently engage in conflict (Vansoeterstede et al., 2023). An additional possible explanation is that these students might have low psychosocial competencies, including emotional intelligence, exposing them to more relational stressors and reducing their perception of social support (Fiorilli et al., 2020; Salmela-Aro & Upadyaya, 2020).

Our results confirm existing literature showing that highly-engaged profiles perceived high support from parents, teachers, and peers. However, on the contrary, burned-out students displayed low perceptions of support (Ulmanen, Soini, Pietarinen, Pyhältö, & Rautanen, 2022). The “Relaxed” and “Engaged” groups showed similar patterns of support, while the “Burned out” profile showed the lowest level of perceived parental support. This aligns with the principles of the demand–resources model, which postulates that resources are positively associated with engagement and negatively associated with burnout (Bakker & Demerouti, 2007; Bakker et al., 2014).

Our findings further validate the notion that females and those following the academic track are more prone to experiencing exhaustion and school burnout. Concerning gender, our results confirmed previous results showing that females are more likely to be affected by school burnout (Vansoeterstede et al., 2023). Several studies have shown that female students tend to attach more importance to academic success while showing weaker coping beliefs than their male counterparts (Haugan et al., 2021; Murberg & Bru, 2004; Wilhsson, Svedberg, Högdin, & Nygren, 2017). It has also been suggested that feminine and masculine hormones might have divergent effects. Feminine hormones would have an exciting effect on the hypothalamic–pituitary–adrenal axis, which is responsible for the stress response (Dorn et al., 1996; Green & McCormick, 2016; Roberts & Lopez-Duran, 2019). Furthermore, we found that students in the academic track were more likely to belong to the “Overextended” group, and less likely to belong to the “Relaxed” and “Disengaged” groups. This confirms prior research showing that students in the academic track are more exposed to exhaustion (Lehto et al., 2019; Salmela-Aro, Kiuru, & Nurmi, 2008; Salmela-Aro & Tynkkynen, 2012). This suggests that less demanding tracks can promote student wellbeing, but also disengagement, thus completing the inconclusive results found in prior research on engagement according to educational track (Teuber et al., 2021; Tuominen-Soini et al., 2012).

The only distinguishable grade difference was observed in the “Relaxed” group, where students were enrolled in lower-level classes than those in the other groups. This could be explained by the fact that in earlier grades, workload and the stress associated with the pressure to succeed, as well as academic orientation, are not as significant as in later grades (Esparbès-Pistre, Bergonnier-Dupuy, & Cazenave-Tapie, 2015).

Our study also extends existing knowledge by showing that burned-out adolescents tend to have less sleep time than well-functioning students. This reduced sleep time is likely due to delayed bedtime (Maksniemi et al., 2022). However, more research is needed to identify the potential causes of this delayed bedtime. For instance, it could be due to more time being dedicated to homework or to anxiety related to going to bed. Research has suggested that stressed students tend to have poorer sleep quality and might use problematic coping strategies to help them sleep (Pascoe, Hetrick, & Parker, 2020). Unfortunately, this likely contributes to the burnout process by reducing learning capacities (Curcio, Ferrara, & De Gennaro, 2006).

Another novel contribution of this study is its exploration of leisure activities in association with school burnout and schoolwork engagement. Our results suggest that involvement in such activities can foster schoolwork engagement and protect students from school

burnout. Prior research on leisure activities among adolescents has suggested that participation in structured activities can be more beneficial for adolescents' positive development than other leisure activities, especially for educational outcomes (Beauchemin, Hutchins, & Patterson, 2008; Eccles & Barber, 1999; Eccles & Templeton, 2002; Mahoney & Cairns, 1997; Mahoney, Larson, Eccles, & Lord, 2005). According to Eccles and Templeton (2002), structured activities offer settings in which to experience challenges. These challenges are likely to foster the development of coping skills that might be useful during academic adversity (Heaslip, Davis, & Barber, 2021; Mukesh, Acharya, & Pillai, 2023). Moreover, they contribute to the development of social networks comprising peers and adults that can support adolescents during stressful situations.

Finally, our study advances our comprehension of the relationships among school burnout, engagement, and parents' educational levels—an area that has been relatively underexplored, with conflicting results having previously been reported (e.g., Lessard, 2019; Salmela-Aro & Upadyaya, 2017; Salmela-Aro, Upadyaya, Hakkarainen, Lonka, & Alho, 2017). Notably, our findings reveal that students with both parents holding tertiary education degrees are more likely to belong to well-functioning profiles. This underscores the protective role of parental education in promoting school well-being. It is possible that parents with a higher educational level have more resources at their disposal to help their children with their schoolwork, and more generally with understanding the implicit expectations of school (Bourdieu & Passeron, 1964). This result may also be due to confounding variables. In fact, higher levels of education are generally linked to increased economic, and therefore better financial, human, and social, capital, which can promote better overall health and academic success (Liu, Peng, Zhao, & Luo, 2022; Selvitopu & Kaya, 2023; World Health Organization & Calouste Gulbenkian Foundation, 2014).

### **Limitations and Future Research**

This study is not free from limitations. First, its objectives involved describing student profiles based on school burnout and schoolwork engagement scores, and exploring these profiles' associations with sociodemographic characteristics, academic stress, and social support. Hence, the study design employed a cross-sectional design and its results should not be understood as causal. Specifically, the role of social support must be interpreted cautiously since many studies have suggested its relationship with social support and engagement might be bidirectional (Hughes & Chen, 2011; Hughes, Luo, Kwok, & Loyd, 2008; Rautanen, Soini, Pietarinen, & Pyhältö, 2022). Second, the scale used to assess school burnout did not show good measurement invariance. We did not find the three dimensions that Meylan et al., (2015)



originally determined; rather, our analyses revealed only two dimensions. This is not too concerning since, for many authors, the two dimensions used in this study (exhaustion and cynicism) correspond to the central component of burnout (Schaufeli et al., 2001; Sonnentag, 2005). However, this clarifies the weakness of this scale, as has already been highlighted in previous studies (Meylan et al., 2015; Pilkauskaite-Valickiene, Zukauskiene, & Raiziene, 2011). This weakness may well be due to the third dimension (inadequacy) containing only two items. Further research is needed to develop a more reliable scale to measure school burnout among secondary school students. The Burnout Assessment Tool–Core Symptoms has recently been adapted for an Italian sample of middle school students and could represent an excellent candidate to replace the SBI in European studies (Romano et al., 2022; Schaufeli et al., 2020). Third, the school stress scale also shows relative weakness for two of its dimensions, which have Cronbach's alphas below .70 (.66 and .69 for the peer relations and external disturbance dimensions, respectively). Results concerning these dimensions must be taken with caution and confirmed by other studies. Fourth, our results for the role of structured leisure activities in relation to academic wellbeing are only exploratory. More studies are required to better understand what type of activities more adequately protect students from school burnout, since research has suggested that physical activities might be more useful than other types (Boelens, Smit, Raat, Bramer, & Jansen, 2022). Finally, we based our study on a convenience sample, thus limiting the generalizability of the results. Further studies should be conducted using more representative samples.

### **Practical Implications: Meeting High School Students' Needs**

Our results have important practical implications as they allow us to identify that student profiles likely have diverse needs. Indeed, both the “Engaged” and “Relaxed” students appeared to be well adjusted. “Engaged” students experience a good balance between the stresses of academic life and the support available to them, and offer require no help other than a distant watch to ensure they maintain this balance over time. Similarly, “Relaxed” students are not in a challenging situation and our results show that they could benefit from a little extra stress. They should be encouraged to make ambitious orientation choices or increase their workload or level of academic challenge, adding options or choosing a more demanding stream, for example, if it corresponds to their aspirations.

However, our analysis also shows that two other student profiles display obvious signs of imbalance: the “Exhausted” and “Burned-out” groups. Despite a perception of average social support, the former suffer from relatively high stress levels in several areas: academic and professional future, work overload, relationships with teachers, and relationships with parents.

These students likely feel some performance pressure imposed by adults. They may also suffer from negative perfectionism (Choi et al., 2020; Luo, Wang, Zhang, Chen, & Quan, 2016; Seong, Lee, & Chang, 2021). These students may benefit from counselling interviews to assess their situations and identify problem areas. These interviews should identify possible sources of support, provide resources for improving work organization and planning, and prepare orientation projects. Additionally, psychoeducation on stress and the importance of a healthy lifestyle for mental health would also be beneficial.

The “Burned out” group showed signs of stress that had spread to all academic areas and perceived very little support from any source. These students need to be fully assessed, including psychopathologically, and referred for treatment if necessary. The various sources of stress should be assessed to identify those that can be alleviated (including possible bullying). Depending on the extent of exhaustion, such accommodations as reduced class attendance, assessments, or temporary cessation may also need to be considered. Psychoeducation is also important, as is a review of healthy lifestyle measures to increase sleep time for proper recovery. Physical activity should be recommended since it has been shown to be effective in alleviating school burnout (Tang, Zhang, Yin, & Fan, 2021).

Finally, the “Disengaged” group did not seem to be suffering but showed signs of needing to be academically re-mobilized. This could involve working on the meaning of school, motivation, values, and career guidance.

From the teachers’ perspective, although they should be concerned by stress among their students, they often lack the competencies needed to address this issue. Yet, providing students with learning environments aimed at reducing school stress and fostering peer and teacher support would aid in the primary prevention of school burnout. Consequently, professional training on stress reduction should be integrated into initial and lifelong learning. The ongoing implementation of psychosocial skills training programs in France holds promise for enhancing teachers’ capacity to effectively support students. Nonetheless, thorough evaluation is imperative to assess their efficacy.

### **Compliance with Ethical Standards**

The content of this manuscript is consistent with the Code of Ethics for French psychologists. Data collection was entirely anonymous, and the data have been stored in accordance with the European General Data Protection Regulation. The participants and their parents received information about the study and provided consent before the students’ participation. The ethical committee of Université Paris Cité approved this study (N°IRB 00012020-99). This study was not funded. The authors have no conflict of interest.

## References

- Amai, K., & Hojo, D. (2021). Early adolescent psychological adaptation differences by stress-coping profiles: A latent transition analysis. *Anxiety, Stress, & Coping*, *35*(5), 574–591. <https://doi.org/10.1080/10615806.2021.1980782>
- An, Y., Yuan, G., Liu, Z., Zhou, Y., & Xu, W. (2018). Dispositional mindfulness mediates the relationships of parental attachment to posttraumatic stress disorder and academic burnout in adolescents following the Yancheng tornado. *European Journal of Psychotraumatology*, *9*(1), 1472989. <https://doi.org/10.1080/20008198.2018.1472989>
- Avvisati, F., Besbas, B., & Guyon, N. (2010). Parental Involvement in School: A Literature Review. *Revue D'Economie Politique*, *120*(5), 759–778. <https://doi.org/10.3917/redp.205.0759>
- Bakker, A. B., & de Vries, J. D. (2021). Job Demands–Resources theory and self-regulation: New explanations and remedies for job burnout. *Anxiety, Stress, & Coping*, *34*(1), 1–21. <https://doi.org/10.1080/10615806.2020.1797695>
- Bakker, A. B., & Demerouti, E. (2007). The Job Demands-Resources model: State of the art. *Journal of Managerial Psychology*, *22*(3), 309–328. <https://doi.org/10.1108/02683940710733115>
- Bakker, A. B., Demerouti, E., & Sanz-Vergel, A. I. (2014). Burnout and work engagement: The JD–R approach. *Annual Review of Organizational Psychology and Organizational Behavior*, *1*(1), 389–411. <https://doi.org/10.1146/annurev-orgpsych-031413-091235>
- Bakker, A. B., Demerouti, E., Taris, T. W., Schaufeli, W. B., & Schreurs, P. J. G. (2003). A multigroup analysis of the job demands-resources model in four home care organizations. *International Journal of Stress Management*, *10*(1), 16–38. <https://doi.org/10.1037/1072-5245.10.1.16>
- Bartko, W. T., & Eccles, J. S. (2003). Adolescent Participation in Structured and Unstructured Activities: A Person-Oriented Analysis. *Journal of Youth and Adolescence*, *32*(4), 233–241. <https://doi.org/10.1023/A:1023056425648>
- Bask, M., & Salmela-Aro, K. (2013). Burned out to drop out: Exploring the relationship between school burnout and school dropout. *European Journal of Psychology of Education*, *28*(2), 511–528. <https://doi.org/10.1007/s10212-012-0126-5>
- Beauchemin, J., Hutchins, T. L., & Patterson, F. (2008). Mindfulness meditation may lessen anxiety, promote social skills, and improve academic performance among adolescents

- with learning disabilities. *Complementary Health Practice Review*, 13(1), 34–45.  
<https://doi.org/10.1177/1533210107311624>
- Blanca Mena, M. J., Alarcón Postigo, R., Arnau Gras, J., Bono Cabré, R., & Bendayan, R. (2017). Non-normal data: Is ANOVA still a valid option? *Psicothema*, 29(4), 552–557.
- Boelens, M., Smit, M. S., Raat, H., Bramer, W. M., & Jansen, W. (2022). Impact of organized activities on mental health in children and adolescents: An umbrella review. *Preventive Medicine Reports*, 25, 101687. <https://doi.org/10.1016/j.pmedr.2021.101687>
- Borgen, F., & Barnett, D. (1987). Applying Cluster Analysis in Counseling Psychology Research. *Journal of Counseling Psychology*, 34, 456–468. <https://doi.org/10.1037/0022-0167.34.4.456>
- Bourdieu, P., & Passeron, C. (1964). *Les héritiers. Les étudiants et la culture*. Paris: Les Editions de Minuit.
- Boyacı, M., & Özhan, M. B. (2018). The Role of Hope and Family Relations of School Burnout among Secondary School Students: A Structural Equation Modeling. *TED EĞİTİM VE BİLİM*, 43(195), 137–150. <https://doi.org/10.15390/EB.2018.7536>
- Cadime, I., Pinto, A. M., Lima, S., Rego, S., Pereira, J., & Ribeiro, I. (2016). Well-being and academic achievement in secondary school pupils: The unique effects of burnout and engagement. *Journal of Adolescence*, 53, 169–179. <https://doi.org/10.1016/j.adolescence.2016.10.003>
- Choi, H., Cho, S., Kim, J., Kim, E., Chung, J., & Lee, S. M. (2020). The mediating effect of introjected motivation on the relation between perfectionism and academic burnout. *Journal of Psychologists and Counsellors in Schools*, 33(2), 207–219.  
<https://doi.org/10.1017/jgc.2020.8>
- Clatworthy, Jane., Buick, Deanna., Hankins, Matthew., Weinman, John., & Horne, Robert. (2005). The use and reporting of cluster analysis in health psychology: A review. *British Journal of Health Psychology*, 10(3), 329–358.  
<https://doi.org/10.1348/135910705X25697>
- Curcio, G., Ferrara, M., & De Gennaro, L. (2006). Sleep loss, learning capacity and academic performance. *Sleep Medicine Reviews*, 10(5), 323–337.  
<https://doi.org/10.1016/j.smr.2005.11.001>
- Dorn, L. D., Burgess, E. S., Susman, E. J., von Eye, A., DeBellis, M. D., Gold, P. W., & Chrousos, G. P. (1996). Response to oCRH in Depressed and Nondepressed Adolescents: Does Gender Make a Difference? *Journal of the American Academy of Child &*

- Adolescent Psychiatry*, 35(6), 764–773. <https://doi.org/10.1097/00004583-199606000-00016>
- Eccles, J. S., & Barber, B. L. (1999). Student council, volunteering, basketball, or marching band: What kind of extracurricular involvement matters? *Journal of Adolescent Research*, 14(1), 10–43.
- Eccles, J. S., Barber, B. L., Stone, M., & Hunt, J. (2003). Extracurricular Activities and Adolescent Development. *Journal of Social Issues*, 59(4), 865–889. <https://doi.org/10.1046/j.0022-4537.2003.00095.x>
- Eccles, J. S., & Templeton, J. (2002). Extracurricular and Other After-School Activities for Youth. *Review of Research in Education*, 26(1), 113–180. <https://doi.org/10.3102/0091732X026001113>
- Esparbès-Pistre, S., Bergonnier-Dupuy, G., & Cazenave-Tapie, P. (2015). Le stress scolaire au collège et au lycée : Différences entre filles et garçons. *Éducation et Francophonie*, 43(2), 87–112. <https://doi.org/10.7202/1034487ar>
- Fiorilli, C., Farina, E., Buonomo, I., Costa, S., Romano, L., Larcan, R., & Petrides, K. V. (2020). Trait Emotional Intelligence and School Burnout: The Mediating Role of Resilience and Academic Anxiety in High School. *International Journal of Environmental Research and Public Health*, 17, 3058. <https://doi.org/10.3390/ijerph17093058>
- Gerber, M., Feldmeth, A. K., Lang, C., Brand, S., Elliot, C., Holsboer-Trachsler, E., & Pühse, U. (2015). The Relationship between Mental Toughness, Stress, and Burnout among Adolescents: A Longitudinal Study with Swiss Vocational Students. *Psychological Reports*, 117(3), 703–723. <https://doi.org/10.2466/14.02.PR0.117c29z6>
- Green, M. R., & McCormick, C. M. (2016). Sex and stress steroids in adolescence: Gonadal regulation of the hypothalamic–pituitary–adrenal axis in the rat. *General and Comparative Endocrinology*, 234, 110–116. <https://doi.org/10.1016/j.ygcen.2016.02.004>
- Gungor, A. (2019). Investigating the relationship between social support and school burnout in Turkish middle school students: The mediating role of hope. *School Psychology International*, 40(6), 581–597. <https://doi.org/10.1177/0143034319866492>
- Guo, D., & Li, C. (2022). Peer status buffers the detrimental Effects of peer victimization on School Burnout among Chinese adolescents via negative cognition. *Current Psychology*, 1–9. <https://doi.org/10.1007/s12144-022-03867-5>
- Haugan, J. A., Frostad, P., & Mjaavatn, P.-E. (2021). Girls suffer: The prevalence and predicting factors of emotional problems among adolescents during upper secondary school

- in Norway. *Social Psychology of Education*, 24(3), 609–634.  
<https://doi.org/10.1007/s11218-021-09626-x>
- Heaslip, G. P., Davis, H., & Barber, B. L. (2021). Extracurricular activity participation in early adolescence predicts coping efficacy one year later. *Australian Journal of Psychology*. <https://doi.org/10.1080/00049530.2021.1884000>
- Hobfoll, S. E. (1989). Conservation of resources: A new attempt at conceptualizing stress. *American Psychologist*, 44(3), 513–524.
- Hobfoll, S. E. (2002). Social and Psychological Resources and Adaptation. *Review of General Psychology*, 6(4), 307–324. <https://doi.org/10.1037/1089-2680.6.4.307>
- Horanicová, S., Husárová, D., Gecková, A. M., Winter, A. D. de, & Reijneveld, S. (2022). Family Socioeconomic Status and Adolescent School Satisfaction: Does Schoolwork Support Affect This Association? *Frontiers in Psychology*, 13: 841499.  
<https://doi.org/10.3389/fpsyg.2022.841499>
- Hughes, J. N., & Chen, Q. (2011). Reciprocal effects of student–teacher and student–peer relatedness: Effects on academic self-efficacy. *Journal of Applied Developmental Psychology*, 32(5), 278–287. <https://doi.org/10.1016/j.appdev.2010.03.005>
- Hughes, J. N., Luo, W., Kwok, O.-M., & Loyd, L. K. (2008). Teacher-student support, effortful engagement, and achievement: A 3-year longitudinal study. *Journal of Educational Psychology*, 100(1), 1–14. <https://doi.org/10.1037/0022-0663.100.1.1>
- Jung, I., Kim, J., Ma, Y., & Seo, C. (2015). Mediating Effect of Academic Self-Efficacy on the Relationship between Academic Stress and Academic Burnout in Chinese Adolescents. *International Journal of Human Ecology*, 16(2), 63–77.  
<https://doi.org/10.6115/ijhe.2015.16.2.63>
- Kahn, R. L., & Byosiére, P. (1992). Stress in organizations. In *Handbook of industrial and organizational psychology, Vol. 3, 2nd ed* (pp. 571–650). Palo Alto, CA, US: Consulting Psychologists Press.
- Katsantonis, I., Gibbons, R. A., Symonds, J. E., & Costello, N. (2024). To persist or not? Examining the relations between parental education, self-regulation, school engagement and persistence in post-compulsory education. *British Educational Research Journal*. Scopus. <https://doi.org/10.1002/berj.4012>
- Kim, B., Jee, S., Lee, J., An, S., & Lee, S. M. (2017). Relationships between social support and student burnout: A meta-analytic approach. *Stress and Health*, 34(1), 127–134.  
<https://doi.org/10.1002/smi.2771>

- Larson, R. W., & Kleiber, D. A. (1993). Structured Leisure as a Context for the Development of Attention During Adolescence. *Loisir et Société / Society and Leisure*, 16(1), 77–98. <https://doi.org/10.1080/07053436.1993.10715443>
- Lebert-Charron, A., Boujut, E., Beaudoin, M., & Quintard, B. (2019). Du stress au burnout scolaire : Définitions, déterminants psychosociaux, évaluation et pistes de prévention. *Pratiques Psychologiques*, 27(1), 57–69. <https://doi.org/10.1016/j.prps.2019.02.002>
- Lee, J., Puig, A., Lea, E., & Lee, S. M. (2013). Age-related differences in academic burnout of Korean adolescents. *Psychology in the Schools*, 50(10), 1015–1031. <https://doi.org/10.1002/pits.21723>
- Lehto, J. E., Kortesoja, L., & Partonen, T. (2019). School burnout and sleep in Finnish secondary school students. *Sleep Science*, 12(1), 10–14. <https://doi.org/10.5935/1984-0063.20190051>
- Leiter, M. P. (1989). Conceptual Implications of Two Models of Burnout: A Response to Golembiewski. *Group & Organization Studies*, 14(1), 15–22. <https://doi.org/10.1177/105960118901400103>
- Leiter, M. P., & Maslach, C. (1988). The impact of interpersonal environment on burnout and organizational commitment. *Journal of Organizational Behavior*, 9(4), 297–308. <https://doi.org/10.1002/job.4030090402>
- Leiter, M. P., & Maslach, C. (2016). Latent burnout profiles: A new approach to understanding the burnout experience. *Burnout Research*, 3(4), 89–100. <https://doi.org/10.1016/j.burn.2016.09.001>
- Lessard, L. (2019). *Friends as academic resources: How friendships facilitate school-related adjustment during adolescence* (Thesis, University of California). University of California, Los Angeles. Retrieved from <https://ezproxy.u-paris.fr/login?url=https://search.ebscohost.com/login.aspx?direct=true&db=psyh&AN=2020-04052-039&lang=fr&site=ehost-live>
- Lindfors, P., Minkkinen, J., Rimpelä, A., & Hotulainen, R. (2018). Family and school social capital, school burnout and academic achievement: A multilevel longitudinal analysis among Finnish pupils. *International Journal of Adolescence and Youth*, 23(3), 368–381. <https://doi.org/10.1080/02673843.2017.1389758>
- Liu, J., Peng, P., Zhao, B., & Luo, L. (2022). Socioeconomic Status and Academic Achievement in Primary and Secondary Education: A Meta-analytic Review. *Educational Psychology Review*, 34(4), 2867–2896. <https://doi.org/10.1007/s10648-022-09689-y>

- Luo, Y., Wang, Z., Zhang, H., Chen, A., & Quan, S. (2016). The effect of perfectionism on school burnout among adolescence: The mediator of self-esteem and coping style. *Personality and Individual Differences, 88*, 202–208.  
<https://doi.org/10.1016/j.paid.2015.08.056>
- Mælan, E. N., Tjomsland, H. E., Samdal, O., & Thurston, M. (2020). Pupils' perceptions of how teachers' everyday practices support their mental health: A qualitative study of pupils aged 14–15 in Norway. *Scandinavian Journal of Educational Research, 64*(7), 1015–1029. <https://doi.org/10.1080/00313831.2019.1639819>
- Mahoney, J. L., & Cairns, R. B. (1997). Do Extracurricular Activities Protect Against Early School Dropout? *Developmental Psychology, 33*(2), 241–253.
- Mahoney, J. L., Larson, R. W., Eccles, J. S., & Lord, H. (2005). Organized activities as developmental contexts for children and adolescents. *Organized Activities as Contexts of Development: Extracurricular Activities, after-School and Community Programs, 3–22*.
- Maksniemi, E., Hietajärvi, L., Ketonen, E. E., Lonka, K., Puukko, K., & Salmela-Aro, K. (2022). Intraindividual associations between active social media use, exhaustion, and bedtime vary according to age—A longitudinal study across adolescence. *Journal of Adolescence, 94*(3), 401–414. <https://doi.org/10.1002/jad.12033>
- Malecki, C. K., & Demary, M. K. (2002). Measuring perceived social support: Development of the child and adolescent social support scale (CASSS). *Psychology in the Schools, 39*(1), 1–18. <https://doi.org/10.1002/pits.10004>
- Maslach, C., & Schaufeli, W. B. (1993). Historical and conceptual development of burn-out. In W. B. Schaufeli, C. Maslach, & T. Marck, *Professional Burn-Out: Recent Developments in the Theory and Research* (pp. 1–16). Washington, DC: Taylor & Francis.
- Membrive-Jimenez, M., Gomez-Urquiza, J., Suleiman-Martos, N., Velando-Soriano, A., Ariza, T., De la Fuente-solana, E., & Canadas-De la Fuente, G. (2022). Relation between Burnout and Sleep Problems in Nurses: A Systematic Review with Meta-Analysis. *Healthcare, 10*(5). <https://doi.org/10.3390/healthcare10050954>
- Meylan, N., Doudin, P. A., Curchod, D., & Stephan, P. (2011). School burnout in adolescents: Differences in background variables and exploration of school-related stress at the end of compulsory schooling. *Ricerche Di Psicologia, 4*, 539–563.  
<https://doi.org/10.3280/RIP2011-004006>
- Meylan, N., Doudin, P.-A., Antonietti, J.-P., & Stéphan, P. (2015). Validation Française du School Burnout Inventory = School Burnout Inventory: A French validation.



- European Review of Applied Psychology / Revue Européenne de Psychologie Appliquée*, 65(6), 285–293. <https://doi.org/10.1016/j.erap.2015.10.002>
- Meylan, N., Doudin, P.-A., Curchod-Ruedi, D., & Stephan, P. (2015). Burnout scolaire et soutien social : L'importance du soutien des parents et des enseignants = School burnout and social support: The importance of parent and teacher support. *Psychologie Française*, 60(1), 1–15. <https://doi.org/10.1016/j.psfr.2014.01.003>
- Meylan, Nicolas, Doudin, P.-A., Curchod-Ruedi, D., Antonietti, J.-P., & Stephan, P. (2015). Stress scolaire, soutien social et burnout à l'adolescence : Quelles relations ? *Éducation et Francophonie*, 43(2), 135–153. <https://doi.org/10.7202/1034489ar>
- Meylan, Nicolas, Meylan, J., Rodriguez, M., Bonvin, P., & Tardif, E. (2020). What Types of Educational Practices Impact School Burnout Levels in Adolescents? *International Journal of Environmental Research and Public Health*, 17(4), 1152. <https://doi.org/salmela-aro>
- Meylan, Nicolas, Valls, M., Vaudroz, C., Suchaut, B., & Tardif, E. (2021). *Engagement dans le travail scolaire : Mesure et liens avec le burnout et la réussite*. Presented at the 11<sup>ème</sup> congrès de l'Association Francophone de Psychologie de la Santé. Paris.
- Mukesh, H. V., Acharya, V., & Pillai, R. (2023). Are extracurricular activities stress busters to enhance students' well-being and academic performance? Evidence from a natural experiment. *Journal of Applied Research in Higher Education*, 15(1), 152–168. <https://doi.org/10.1108/JARHE-06-2021-0240>
- Murberg, T. A., & Bru, E. (2004). School-Related Stress and Psychosomatic Symptoms Among Norwegian Adolescents. *School Psychology International*, 25(3), 317–332. <https://doi.org/10.1177/0143034304046904>
- Nakamura, J., & Csikszentmihalyi, M. (2014). The Concept of Flow. In M. Csikszentmihalyi (Ed.), *Flow and the Foundations of Positive Psychology: The Collected Works of Mihaly Csikszentmihalyi* (pp. 239–263). Dordrecht: Springer Netherlands. [https://doi.org/10.1007/978-94-017-9088-8\\_16](https://doi.org/10.1007/978-94-017-9088-8_16)
- Oger, M., Broc, G., Martin-Krumm, C., Le Roux, F., Muller, A., & Tarquinio, C. (2022). Pupils' Adaptability at School, a Balance Between Demands and Resources? *Frontiers in Education*, 7: 814376. <https://doi.org/10.3389/feduc.2022.814376>
- Oger, M., Martin-Krumm, C., Fenouillet, F., Müller, A., Le Roux, F., Tarquinio, C., & Broc, G. (2022). Quality of life at school: Between vulnerability and robustness of students. *Psychology in the Schools*, 59(8), 1686–1700. <https://doi.org/10.1002/pits.22719>

- Pascoe, M. C., Hetrick, S. E., & Parker, A. G. (2020). The impact of stress on students in secondary school and higher education. *International Journal of Adolescence and Youth*, 25(1). <https://doi.org/10.1080/02673843.2019.1596823>
- Pilkauskaite-Valickiene, R., Zukauskiene, R., & Raiziene, S. (2011). The role of attachment to school and open classroom climate for discussion on adolescents' school-related burnout. *Procedia - Social and Behavioral Sciences*, 15, 637–641. <https://doi.org/10.1016/j.sbspro.2011.03.155>
- Ponkosonsirilert, T., Laemsak, O., Pisitsungkagarn, K., Jarukasemthawee, S., Audboon, S., & Leangsuksant, T. (2020). Stress, self-compassion, and school burnout in Thai high school students. *International Journal of Adolescent Medicine and Health*. <https://doi.org/10.1515/ijamh-2020-0109>
- Rautanen, P., Soini, T., Pietarinen, J., & Pyhältö, K. (2022). Dynamics between perceived social support and study engagement among primary school students: A three-year longitudinal survey. *Social Psychology of Education*. <https://doi.org/10.1007/s11218-022-09734-2>
- Roberts, A. G., & Lopez-Duran, N. L. (2019). Developmental influences on stress response systems: Implications for psychopathology vulnerability in adolescence. *Comprehensive Psychiatry*, 88, 9–21. <https://doi.org/10.1016/j.comppsy.2018.10.008>
- Roeser, R. W., Strobel, K. R., & Quihuis, G. (2002). Studying Early Adolescents' Academic Motivation, Social-Emotional Functioning, and Engagement in Learning: Variable- and Person-Centered Approaches. *Anxiety, Stress, & Coping*, 15(4), 345–368. <https://doi.org/10.1080/1061580021000056519>
- Romano, L., Angelini, G., Consiglio, P., & Fiorilli, C. (2021). The Effect of Students' Perception of Teachers' Emotional Support on School Burnout Dimensions: Longitudinal Findings. *International Journal of Environmental Research and Public Health*, 18(4), 1922. <https://doi.org/10.3390/ijerph18041922>
- Romano, L., Angelini, G., Consiglio, P., & Fiorilli, Caterina. (2022). An Italian Adaptation of the Burnout Assessment Tool-Core Symptoms (BAT-C) for Students. *Education Sciences*, 12(124). <https://doi.org/10.3390/educsci12020124>
- Romano, L., Tang, X., Hietajärvi, L., Salmela-Aro, K., & Fiorilli, C. (2020). Students' Trait Emotional Intelligence and Perceived Teacher Emotional Support in Preventing Burnout: The Moderating Role of Academic Anxiety. *International Journal of Environmental Research and Public Health*, 17(13), 4771. <https://doi.org/10.3390/ijerph17134771>

- Rueger, S. Y., Malecki, C. K., & Demaray, M. K. (2008). Relationship Between Multiple Sources of Perceived Social Support and Psychological and Academic Adjustment in Early Adolescence: Comparisons Across Gender. *Journal of Youth and Adolescence*, 39(1), 47–61. <https://doi.org/10.1007/s10964-008-9368-6>
- Rueger, S. Y., Malecki, C. K., Pyun, Y., Aycocock, C., & Coyle, S. (2016). A meta-analytic review of the association between perceived social support and depression in childhood and adolescence. *Psychological Bulletin*, 142(10), 1017–1067. <https://doi.org/10.1037/bul0000058>
- Salmela-Aro, K. (2017). Dark and bright sides of thriving—School burnout and engagement in the Finnish context. *European Journal of Developmental Psychology*, 14(3), 337–349. <https://doi.org/10.1080/17405629.2016.1207517>
- Salmela-Aro, K., Kiuru, N., Leskinen, E., & Nurmi, J.-E. (2009). School Burnout Inventory (SBI): Reliability and validity. *European Journal of Psychological Assessment*, 25(1), 48–57. <https://doi.org/10.1027/1015-5759.25.1.48>
- Salmela-Aro, K., Kiuru, N., & Nurmi, J.-E. (2008). The role of educational track in adolescents' school burnout: A longitudinal study. *British Journal of Educational Psychology*, 78(4), 663–689. <https://doi.org/10.1348/000709908X281628>
- Salmela-Aro, K., Moeller, J., Schneider, B., Spicer, J., & Lavonen, J. (2016). Integrating the light and dark sides of student engagement using person-oriented and situation-specific approaches. *Learning and Instruction*, 43, 61–70. <https://doi.org/10.1016/j.learninstruc.2016.01.001>
- Salmela-Aro, K., & Read, S. (2017). Study engagement and burnout profiles among Finnish higher education students. *Burnout Research*, 7, 21–28. <https://doi.org/10.1016/j.burn.2017.11.001>
- Salmela-Aro, K., & Tynkkynen, L. (2012). Gendered pathways in school burnout among adolescents. *Journal of Adolescence*, 35(4), 929–939. <https://doi.org/10.1016/j.adolescence.2012.01.001>
- Salmela-Aro, K., & Upadaya, K. (2012). The Schoolwork Engagement Inventory: Energy, Dedication, and Absorption (EDA). *European Journal of Psychological Assessment*, 28(1), 60–67. <https://doi.org/10.1027/1015-5759/a000091>
- Salmela-Aro, K., & Upadyaya, K. (2012). The Schoolwork Engagement Inventory: Energy, dedication, and absorption (EDA). *European Journal of Psychological Assessment*, 28(1), 60–67. <https://doi.org/10.1027/1015-5759/a000091>

- Salmela-Aro, K., & Upadyaya, K. (2014a). Developmental trajectories of school burnout: Evidence from two longitudinal studies. *Learning and Individual Differences, 36*, 60–68. <https://doi.org/10.1016/j.lindif.2014.10.016>
- Salmela-Aro, K., & Upadyaya, K. (2014b). School burnout and engagement in the context of demands-resources model. *The British Journal of Educational Psychology, 84*(1), 137–151. <https://doi.org/10.1111/bjep.12018>
- Salmela-Aro, K., & Upadyaya, K. (2017). Co-development of educational aspirations and academic burnout from adolescence to adulthood in Finland. *Research in Human Development, 14*(2), 106–121. <https://doi.org/10.1080/15427609.2017.1305809>
- Salmela-Aro, K., & Upadyaya, K. (2020). School engagement and school burnout profiles during high school – the role of socio-emotional skills. *European Journal of Developmental Psychology*. <https://doi.org/10.1080/17405629.2020.1785860>
- Salmela-Aro, K., Upadyaya, K., Hakkarainen, K., Lonka, K., & Alho, K. (2017). The dark side of internet use: Two longitudinal studies of excessive internet use, depressive symptoms, school burnout and engagement among Finnish early and late adolescents. *Journal of Youth and Adolescence, 46*(2), 343–357. <https://doi.org/10.1007/s10964-016-0494-2>
- Schaufeli, W. B., Bakker, A. B., Hoogduin, K., Schaap, C., & Kladler, A. (2001). On the clinical validity of the maslach burnout inventory and the burnout measure. *Psychology & Health, 16*(5), 565–582. <https://doi.org/10.1080/08870440108405527>
- Schaufeli, W. B., Desart, S., & De Witte, H. (2020). Burnout Assessment Tool (BAT)—Development, Validity, and Reliability. *International Journal of Environmental Research and Public Health, 17*(24), 9495. <https://doi.org/10.3390/ijerph17249495>
- Schaufeli, W. B., Martínez, I. M., Pinto, A. M., Salanova, M., & Bakker, A. B. (2002). Burnout and Engagement in University Students: A Cross-National Study. *Journal of Cross-Cultural Psychology, 33*(5), 464–481. (Sage CA: Thousand Oaks, CA). <https://doi.org/10.1177/0022022102033005003>
- Selvitopu, A., & Kaya, M. (2023). A Meta-Analytic Review of the Effect of Socioeconomic Status on Academic Performance. *Journal of Education, 203*(4), 768–780. <https://doi.org/10.1177/00220574211031978>
- Seong, H., Lee, S., & Chang, E. (2021). Perfectionism and academic burnout: Longitudinal extension of the bifactor model of perfectionism. *Personality and Individual Differences, 172*, 110589. <https://doi.org/10.1016/j.paid.2020.110589>

- Shin, H., Lee, J., Kim, B., & Lee, S. M. (2012). Students' perceptions of parental bonding styles and their academic burnout. *Asia Pacific Education Review, 13*(3), 509–517. <https://doi.org/10.1007/s12564-012-9218-9>
- Shoman, Y., El May, E., Marca, S., Wild, P., Bianchi, R., Bugge, M., ... Guseva Canu, I. (2021). Predictors of Occupational Burnout: A Systematic Review. *International Journal of Environmental Research and Public Health, 18*(17). <https://doi.org/10.3390/ijerph18179188>
- Sonnentag, S. (2005). Burnout research: Adding an off-work and day-level perspective. The views expressed in Work & Stress Commentaries are those of the author(s), and do not necessarily represent those of any other person or organization, or of the journal. *Work & Stress, 19*(3), 271–275. <https://doi.org/10.1080/02678370500386473>
- Stewart, N., & Arora, V. (2019). The Impact of Sleep and Circadian Disorders on Physician Burnout. *Chest, 156*(5), 1022–1030. <https://doi.org/10.1016/j.chest.2019.07.008>
- Stornes, T., Bru, E., & Idsoe, T. (2008). Classroom Social Structure and Motivational Climates: On the influence of teachers' involvement, teachers' autonomy support and regulation in relation to motivational climates in school classrooms. *Scandinavian Journal of Educational Research, 52*(3), 315–329. <https://doi.org/10.1080/00313830802025124>
- Tang, L., Zhang, F., Yin, R., & Fan, Z. (2021). Effect of Interventions on Learning Burnout: A Systematic Review and Meta-Analysis. *Frontiers in Psychology, 12*: 645662. <https://doi.org/10.3389/fpsyg.2021.645662>
- Teuber, Z., Nussbeck, F. W., & Wild, E. (2020). The Bright Side of Grit in Burnout-Prevention: Exploring Grit in the Context of Demands-Resources Model among Chinese High School Students. *Child Psychiatry and Human Development, 52*(3), 464–476. <https://doi.org/10.1007/s10578-020-01031-3>
- Teuber, Z., Tang, X., Salmela-Aro, K., & Wild, E. (2021). Assessing Engagement in Chinese Upper Secondary School Students Using the Chinese Version of the Schoolwork Engagement Inventory: Energy, Dedication, and Absorption (CEDA). *Frontiers in Psychology, 12*: 638189. <https://doi.org/10.3389/fpsyg.2021.638189>
- Tomaszewski, W., Xiang, N., & Western, M. (2020). Student engagement as a mediator of the effects of socio-economic status on academic performance among secondary school students in Australia. *British Educational Research Journal, 46*, 610–630. <https://doi.org/10.1002/berj.3599>

- Tuominen-Soini, H., & Salmela-Aro, K. (2014). Schoolwork engagement and burnout among Finnish high school students and young adults: Profiles, progressions, and educational outcomes. *Developmental Psychology, 50*(3), 649–662.  
<https://doi.org/10.1037/a0033898>
- Tuominen-Soini, H., Salmela-Aro, K., & Niemivirta, M. (2012). Achievement goal orientations and academic well-being across the transition to upper secondary education. *Learning and Individual Differences, 22*(3), 290–305. <https://doi.org/10.1016/j.lindif.2012.01.002>
- Ulmanen, S., Soini, T., Pietarinen, J., & Pyhältö, K. (2022). Development of students' social support profiles and their association with students' study wellbeing. *Developmental Psychology, 58*(12), 2336–2349. <https://doi.org/10.1037/dev0001439>
- Ulmanen, S., Soini, T., Pietarinen, J., Pyhältö, K., & Rautanen, P. (2022). Primary and Lower Secondary School Students' Social Support Profiles and Study Wellbeing. *The Journal of Early Adolescence, 42*(5), 613–646.  
<https://doi.org/10.1177/02724316211058061>
- Upadyaya, K., & Salmela-Aro, K. (2013). Development of school engagement in association with academic success and well-being in varying social contexts: A review of empirical research. *European Psychologist, 18*(2), 136–147. <https://doi.org/10.1027/1016-9040/a000143>
- Vansoeterstede, A., Cappe, É., & Boujut, E. (2023). A systematic review of longitudinal changes in school burnout among adolescents: Trajectories, predictors, and outcomes. *Journal of Adolescence, 95*(2), 224–247. <https://doi.org/10.1002/jad.12121>
- Vasalampi, K., Salmela-Aro, K., & Nurmi, J.-E. (2009). Adolescents' self-concordance, school engagement, and burnout predict their educational trajectories. *European Psychologist, 14*(4), 332–341. <https://doi.org/10.1027/1016-9040.14.4.332>
- Veyis, F., Seçer, İ., & Ulaş, S. (2019). An Investigation of the Mediator Role of School Burnout Between Academic Stress and Academic Motivation. *Journal of Curriculum and Teaching, 8*, 46. <https://doi.org/10.5430/jct.v8n4p46>
- Vollet, J. W., & Kindermann, T. A. (2020). Promoting persistence: Peer group influences on students' re-engagement following academic problems and setbacks. *International Journal of Behavioral Development, 44*(4), 354–364.  
<https://doi.org/10.1177/0165025419880614>
- Wang, Q., Hu, W., Ouyang, X., Chen, H., Qi, Y., & Jiang, Y. (2020). The relationship between negative school gossip and suicide intention in Chinese junior high school

- students: The mediating effect of academic burnout and gender difference. *Children and Youth Services Review*, *117*, 105272.  
<https://doi.org/10.1016/j.chilyouth.2020.105272>
- Widlund, A., Tuominen, H., & Korhonen, J. (2023). Reciprocal Effects of Mathematics Performance, School Engagement, and Burnout During Adolescence. *British Journal of Educational Psychology*, *93*(1), 183–197.
- Wilhsson, M., Svedberg, P., Högdin, S., & Nygren, J. M. (2017). Strategies of Adolescent Girls and Boys for Coping with School-Related Stress. *The Journal of School Nursing*, *33*(5), 374–382. <https://doi.org/10.1177/1059840516676875>
- Wolf, M. R., & Rosenstock, J. B. (2017). Inadequate sleep and exercise associated with burnout and depression among medical students. *Academic Psychiatry*, *41*(2), 174–179.  
<https://doi.org/10.1007/s40596-016-0526-y>
- Woo, S., Hong, H., & Ahn, D. (2020). *Influences of family environment on academic engagement and academic achievement of high achieving middle school students in Korea*. Presented at the 16<sup>th</sup> Asia Pacifica Conference on Giftedness, Daegu, Korea. Daegu, Korea.
- World Health Organization, & Calouste Gulbenkian Foundation. (2014). *Social determinants of mental health* (p. 54). Geneva: World Health Organization.
- Zakari, S., Walburg, V., & Chabrol, H. (2008). Étude du phénomène d'épuisement scolaire, de la dépression et des idées de suicides chez des lycéens français = Study of burnout, depression and suicidal thoughts among French high-school students. *Journal de Thérapie Comportementale et Cognitive*, *18*(3), 113–118.  
<https://doi.org/10.1016/j.jtcc.2008.06.005>
- Zhao, Y., Zheng, Z., Pan, C., & Zhou, L. (2021). Self-Esteem and Academic Engagement Among Adolescents: A Moderated Mediation Model. *Frontiers in Psychology*, *12*: 690828. <https://doi.org/10.3389/fpsyg.2021.690828>

## Appendix A

**Table A1**

*Descriptive Statistics for Quantitative Variables (N = 540)*

Variable	Minimum	Maximum	Mean	Median	Mode	Standard Deviation	Skewness	Kurtosis
Age	13.00	20.00	16.00	16.00	16	1.03	0.14	-0.03
Sleep time	1:30	11:30	7:45	7:00	8:00	1.11	-0.80	3.06
Academic and professional future	1.00	4.00	2.77	2.80	4	0.92	-0.35	-1.04
Work overload	1.00	4.00	2.32	2.33	2	0.80	0.04	-1.02
Relationships with teachers	1.00	4.00	1.61	1.25	1	0.75	1.35	1.14
Relationships with peers	1.00	3.75	1.25	1.00	1	0.50	2.62	7.45
Relationships with parents	1.00	4.00	1.83	1.67	1	0.90	0.99	-0.07
External disturbances	1.00	4.00	1.73	1.67	1	0.80	1.07	0.35
Support from parents	12.00	72.00	50.48	51.50	72	14.33	-0.34	-0.72
Support from teachers	12.00	72.00	47.88	47.00	40	12.23	-0.07	-0.32
Support from peers	12.00	72.00	46.22	47.00	48	15.41	-0.21	-0.73
Exhaustion	4.00	24.00	14.11	14.00	12	5.05	-0.06	-0.66
Cynicism	4.00	24.00	14.62	15.00	16	5.35	-0.14	-0.74
Engagement	0.00	54.00	27.06	28.50	29	13.81	-0.19	-0.85



**Table A2***Spearman Correlations between all Quantitative Variables (N = 540)*

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.
1. Age	1													
2. Sleep time	-.131**	1												
3. Academic and professional future	.212**	-.114**	1											
4. Work overload	.221**	-.155**	.595**	1										
5. Relationships with teachers	.140**	-.136**	.463**	.486**	1									
6. Relationships with peers	-0.003	-0.07	.265**	.314**	.374**	1								
7. Relationships with parents	-.037	-.180**	.469**	.382**	.321**	.354**	1							
8. External disturbances	.102*	-.063	.440**	.407**	.420**	.328**	.270**	1						
9. Support from parents	.002	.290**	-.182**	-.178**	-.234**	-.234**	-.298**	-.207**	1					
10. Support from teachers	-.038	.212**	-.126**	-.168**	-.309**	-.121**	-.085	-.038	.402**	1				
11. Support from peers	.01	.123**	-.101*	-.135**	-.214**	-.242**	-.147**	-.291**	.373**	.377**	1			
12. Exhaustion	.177**	-.176**	.559**	.660**	.485**	.260**	.312**	.371**	-.245**	-.218**	-.184**	1		
13. Cynicism	.143**	-.301**	.288**	.390**	.344**	.223**	.273**	.213**	-.358**	-.309**	-.192**	.442**	1	
14. Engagement	-.077	.236**	-.106*	-.212**	-.237**	-.115**	-.135**	-.071	.392**	.414**	.358**	-.209**	-.557**	1

*Note.* \* $p < 0.05$ ; \*\* $p < 0.01$