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Pupils' Adaptability at School, a Balance Between Demands and Resources?

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School burnout is affecting more and more adolescents. In order to develop appropriate preventative measures, the problem more than ever requires a detailed understanding of the mechanisms operating on students' capacity to adapt to circumstances rendered particularly difficult by the SARS-CoV-2 pandemic (COVID-19). In the absence of an explanatory framework in the field of school health, the JD-R model of work-related stress constitutes an original prism for reading the quality of pupils' adaptation to their school environment. The aim of this research is on the one hand to observe the predictive links between the different variables operationalized in the school JD-R model and on the other, to test the adequacy of this model against the data in schools acutely affected by the COVID situation. A total of 470 middle school, high school and 1st year BTS students agreed to participate in the longitudinal study. They were administered six scales spread over three measurement periods. The results of the predictive path analyses reveal that the hypotheses assumed are to a good degree verified. However, even if the model as a whole does not fit the data well, in their essence, the results point to the importance of strengthening students' own resources as well as those present within the school.

Keywords: secondary school students, demands and resources, school burnout, adaptation, health

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INTRODUCTION

Stress has become the evil of the twenty-first century for working people. Unfortunately, it spares neither children nor adolescents for whom anxiety-related psychological distress has been steadily increasing in recent years (Kramer and Garralda, 2000; Kessler et al., 2007; Moghaddam et al., 2016).

Academic achievement and social networks are said to be the main culprits (Machillot, 2017). Indeed, we live in a performance society that values performance and parents have high expectations, which in turn creates pressure that can be a source of anxiety for a child who may fear disappointing his or her parents or being punished by them (e.g., Meylan et al., 2015; Lebert-Charron et al., 2021). Social networks can also be responsible for creating stress related to relationships and self-image, while the use of social media is reportedly correlated with appearance

anxiety, body image concerns and eating disorders in adolescence (e.g., Ponti, 2019). For some, it may even be a question of school burnout (e.g., Salmela-Aro et al., 2009). Assessing the physical, but also psychological and social health of adolescents in schools is now a priority (e.g., Botsas, 2019).

The article by Salmela-Aro and Upadyaya (2014) presents an original approach not only to the determinants of students' coping skills within school but also to the consequences of burnout. For this study we have based our model of work stress on the resources that are potentially present (e.g., Hobföll, 2002). Its primary focus is therefore neither the negative variables of the work environment where a degree of control is left to individuals (e.g., Karasek, 1979), nor the balance between efforts and rewards (e.g., Siegrist, 1996).

The model, called "Job Demands-Resources" (JD-R) developed by Demerouti et al. (2001) in the organizational field, makes it possible to examine the environmental causes of stress (the relationship between the level of resources and the level of demands) as well as its consequences measured in terms of burnout or quality of life at work such as satisfaction or engagement.

Job Demands and Job Resources

Job demands correspond to aspects of work requiring physical or psychological effort, adaptation capacities or adjustment or recovery strategies (e.g., work overload, interpersonal conflict, and job insecurity). They are defined as "those physical, social, or organizational aspects of the job that require sustained physical or mental effort and are therefore associated with certain physiological and psychological costs" (Demerouti et al., 2001, p. 501). They inevitably generate fatigue, and they are thus more related to the health domain. For example, "they are the most important predictors of burnout" (Bakker et al., 2014, p. 393). Job resources are more related to the motivational side (e.g., feedback, job control, and social support). They are defined as "those physical, social, or organizational aspects of the job that may do any of the following: (a) be functional in achieving work goals; (b) reduce job demands and associated physiological and psychological costs; (c) stimulates personal growth and development" (Demerouti et al., 2001, p. 501).

The JD-R model postulates that employees who cannot meet the demands of their work due to a lack, absence or over-subscription of resources, may find themselves in a burnout situation linked to exhaustion and/or disengagement. However, if they have significant resources, their exhaustion will be mitigated by the buffering effect of the resources on the workload (Bakker et al., 2003). They will be able to cope with the demands, their level of burnout will be reduced and their general satisfaction level improved (Bakker and Demerouti, 2007). According to the JD-R model, therefore, when job demands are high, extra effort must be made to achieve work goals and avoid a drop in performance (Schaufeli and Taris, 2014). On the other hand, when resources are high, they counterbalance the potentially deleterious effects of job demands. This research aims to transpose this model to the school environment in order to study the determinants of engagement and burnout.

Job Demands-Resources in the School Domain

Salmela-Aro and Upadyaya (2014) four-wave longitudinal study investigates the applicability of this demand-resource model and specifically examines burnout and student engagement in schools. We base our research on this study. To our knowledge, it is the only one on this subject so far. At first glance, the model seems to offer a good representation of school burnout and its determinants. However, this test is only ecological and empirical, and would still need to be statistically tested against fit indices that evaluate the model's adequacy to field measurements. Moreover, if the proposed school JD-R model represents an innovative prism for analyzing what pupils experience and feel at school, it seems reasonable to suppose that it has the potential to capture issues at the heart of current events, such as the effects of the SARS-CoV-2 pandemic in a demanding school context. Indeed, the pandemic has reinforced the malaise already present in young people by encouraging the appearance of psychological distress (Gindt et al., 2020). The virus has in fact revealed and exacerbated the fragility caused in particular by isolation and confinement. Negative psychiatric consequences in adolescents have been revealed (Marques de Miranda et al., 2020). These alarming findings concerning young people's health make it more important than ever to take account of this social issue. The study by Salmela-Aro and Upadyaya (2014) in this context seems essential: any consideration of the strategies to be deployed to prevent burnout among students and to increase their satisfaction needs to verify the relevance of a framework based on demands and resources.

Self-Efficacy

While students are likely to understand that a school institution will offer them resources that will help them meet the demands placed on them, it should also be recognized that they have their own personal resources. One such resource is their sense of self-efficacy (SE) (Bandura, 2006). This is defined as a student's belief in his or her ability to organize and execute any course of action required to produce a desired result (Bandura, 1997). In a school environment, a strong sense of self-efficacy results in a high level of motivation. It predicts academic success and has an effect on motivation in school (e.g., Relich et al., 1986). From a theoretical point of view, the question has been raised as to whether the feeling of self-efficacy is expressed in a global way or whether it is rather situation-dependent. Bong's (2004) work revealed that there are different kinds of SE, academic SE being distinguished from disciplinary SE. In the present study, the aim is to identify how a sense of academic efficacy, interacting with the demands and resources offered in school, can predict a variable related to motivation and commitment. A sense of SE also has an impact on health and burnout in both teachers (e.g., Maslach, 1982) and students (Salmela-Aro and Upadyaya, 2014). In teachers, for example, a strong sense of SE will help focus their efforts on problem solving. On the other hand, when their sense of SE is weak, they are likely to avoid confronting a problem and withdraw into themselves, which in turn increases their propensity for burnout (e.g., Chwalisz et al.,

1992). The consequence of a strong sense of SE among students can be just as beneficial, i.e., negatively predictive of burnout. In contrast, a weak sense of SE positively predicts burnout (Salmela-Aro and Upadyaya, 2014).

Insofar as such a framework can be shown to be adapted *a fortiori* to the new challenges imposed by the health situation, the resources and demands initially perceived by adolescents in their school environment together with their own resources (in particular Self-Efficacy; SE), should have an impact on their capacity to adapt in terms of school burnout or engagement (see **Figure 1**). These would then influence the nature of the students' adaptation to the context and their general life satisfaction. When the environment is perceived as supportive and safe, the student would feel satisfaction. On the contrary, a context in which the pupil does not feel confident, or one which he or she perceives to be toxic or uncertain, would predict a negative adaptation that translates at the psychological level by stress or school phobia, and at the academic level, by absenteeism and a greater probability of dropping out.

OBJECTIVES

The aim of this research is to put the JD-R model to the test in schools inspired by the study of Salmela-Aro and Upadyaya (2014). Specifically, the study was scheduled over the duration of the Autumn term, which is known to be particularly challenging. In particular, it aims to observe in a three times measurement study the reality of the postulated predictive links between the different variables operationalized in the model presented in **Figure 1** (this in accordance with the original study); and then to test the general adequacy of the model against the data in a school context impacted by the COVID-19 pandemic. In line with the original model in work environments (e.g., Bakker et al., 2014; Schaufeli and Taris, 2014) or school environments (Salmela-Aro and Upadyaya, 2014), resources are assumed to positively predict engagement and negatively predict burnout. On the same theoretical basis, demands are assumed to positively predict burnout and negatively predict engagement. Personal resources (SE) are assumed to negatively predict burnout and positively predict engagement which is in line with the results obtained by Salmela-Aro and Upadyaya (2014). Moreover, burnout and engagement are presumed to mediate the relationships between Demands, Resources and self-efficacy, on the one hand, and negative adaptation and life satisfaction on the other. Finally, we also assume that resources and demands will not be correlated as studies in the school field have shown (e.g., Salmela-Aro and Upadyaya, 2014; Teuber et al., 2021) unlike those in the organizational field (e.g., Demerouti et al., 2001).

MATERIALS AND METHODS

Participants and Procedure

A total of 470 middle school (7th to 9th grade), high school (10th to 12th grade) and first year university students from private and public schools in a single academic region, agreed to participate in the study. They were all volunteers, aged between 12 and 23 years (139 girls and 331 boys, Mage = 15.7 years, *SD* = 2.12) (**Table 1**).

In our country, in some schools it is possible to find boarders or half-boarders or day students. Boarding students are those who spend the week in school. They only go home on weekends and school holidays. Half-boarders are those who eat at school at lunchtime and go home every evening after school. Day pupils are those who don't eat at school at lunchtime and go home every evening. The time spent in school is therefore completely different between these different types of students (**Table 1**). In a traditional curriculum (without repeating a year), pupils are enrolled in secondary school from 11 to 15 years of age. From the age of 16 they enter either a high school, a technological high school or a vocational school. They can continue their studies at university or in the Senior Technician Curriculum, which also corresponds to a first year of university studies.

Questionnaires were administered in a paper-and-pencil format to students in various general, technological and vocational schools. The research project was initially presented to the school heads who agreed to participate and they in turn notified the students' families. Only those who agreed were asked to answer the different scales. Each participant was given a code to make their completed questionnaire anonymous. Measurements were made at three moments during the first term: at T1, at the beginning of the school year; at T2, at the end of November, which corresponds to the end of the first term; and at T3, just before the Christmas holidays. Six scales were administered, the details of which are given below. These three periods were chosen because they were intended to reveal how students could move from a situation of physical and mental freshness, just after the summer holidays, to a situation of fatigue due to the progressive increase in workload. Indeed, the second measurement time corresponds to the end of the teaching phases and the beginning of the revisions. The third measurement period, just before the Christmas holidays, corresponds to a traditional table-top examination phase in the school environment.

Measures

Six scales were administered to the participants for the purpose of the study during the Autumn term. Analysis of the data revealed good psychometric qualities for each scale. The administration of these scales was planned from September until the start of the Christmas holidays. At inclusion, T1, the following three variables were measured:

Demands/Resources

The tool used was the School Demands and Resources Measurement Scale called "EMERE." It is based on the JD-R model in education as developed by Oger et al. (2022). This scale is dedicated to the school environment (Oger et al., 2022) and is composed of two factors (study demands and resources). There are three items to assess the perceived level of demands (e.g., "I have to do my homework and be in class every day which requires a lot of mental effort"), and

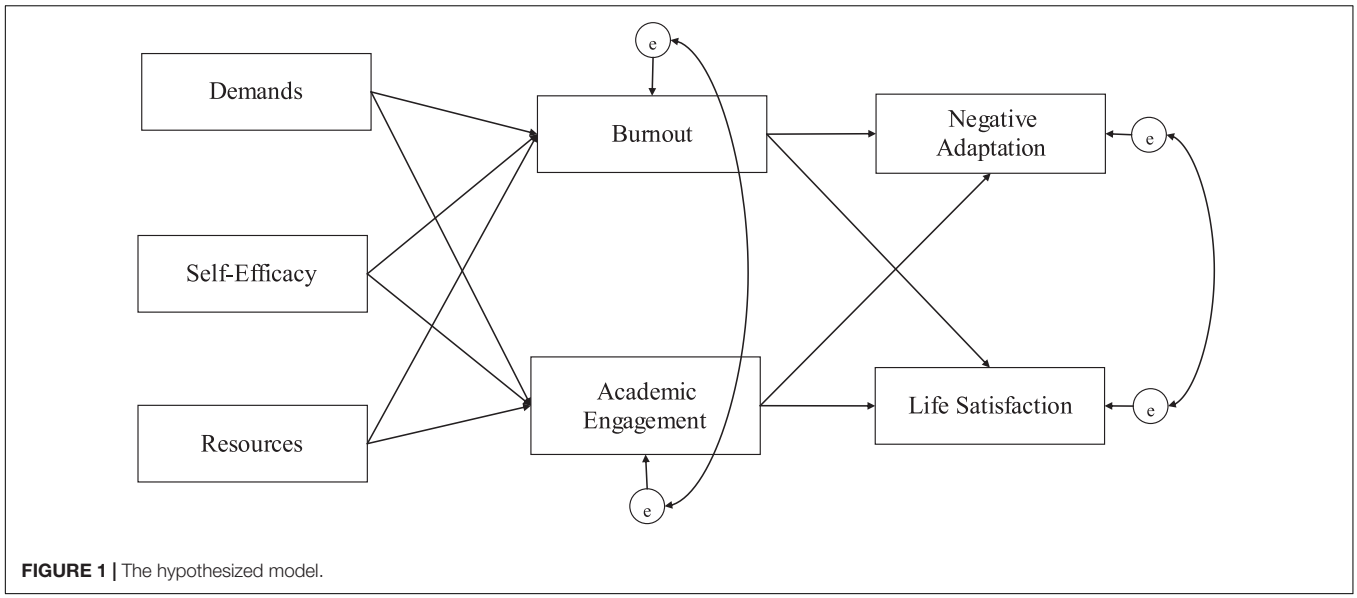

FIGURE 1 | The hypothesized model.

TABLE 1 | Descriptive data according to the school regime, to the gender and the type of schools.

School regime			Type of schools			
			Col	**HS**	**THS**	**VC**
1/2B	Gender	F	70	3	3	4
		M	59	5	7	70
	Total		**129**	**8**	**10**	**74**
DS	Gender	F	6	0	1	0
		M	1	1	0	17
	Total		**7**	**1**	**1**	**17**
B	Gender	F	0	21	10	11
		M	0	39	35	71
	Total		**0**	**60**	**45**	**82**
Total	Gender	F	76	24	14	15
		M	60	45	42	158
	Total		**136**	**69**	**56**	**173**

1/2 B, Half Boarder; DS, Day Students; B, Boarder; Col, College pupils; HS, High School; THS, Technological High School; VC, Vocational School; STC, students in Senior Technician Curriculum (1st year university).

three items on perceived resources (e.g., "I have moral support in my environment—boy/girlfriends, other students, teachers, educational counselors, supervisors, parents—when a difficult or stressful situation occurs"). Participants respond on a scale from 1 (strongly disagree) to 7 (strongly agree) according to the frequency with which the situations mentioned occur. The higher the score, the greater the perceived demands of the school on the student. For perceived resources, the higher the score, the higher the level. Finally, the greater the gap between the two (demands and resources), the more the imbalance is in favor of one or the other. For the EMERE, the construct validity is adequate (χ^2, p = 0.41, CFI = 0.99; TLI = 0.99; SRMR = 0.045; RMSEA = 0.06) (Oger et al., 2022) and the internal consistencies in this study for the two dimensions are satisfactory, with Cronbach's alpha (Cronbach, 1951) and omega coefficient (Raykov, 2001) values of 0.71 and 0.72, respectively, for "demands." For "resources," the consistency is satisfactory with $\alpha = 0.69$ and $\omega = 0.74$.

Self-Efficacy

The tool used is the questionnaire developed by Masson and Fenouillet (2013). It measures students' sense of self-efficacy in general at school, in French and in mathematics. Here, it is contextualized to middle or high school. The items were written in accordance with the recommendations of Bandura (2006). This scale comprises three sub-scales: a school SE scale, overall level composed of three items (e.g., "if the exercise is very difficult, I look for a way to find the solution anyway"); a French SE scale composed of four items (e.g., "I understand French exercises"); and a mathematics SE scale composed of four items (e.g., "I always manage to finish my math exercises"). Responses are given on a scale of 1 (Not at all true) to 6 (Totally true). This gives the overall school SE score that was calculated. The higher the score, the better the school SE. The scale showed sound construct validity (χ^2, $p < 0.001$, CFI = 0.95; TLI = 0.93; RMSEA = 0.08) (Masson and Fenouillet, 2013). In line with the research question on the school environment in general and not on a subject-by-subject basis, only the "general" subscale was used. Accordingly, the two other subscales, in French and mathematics, were dropped. The internal consistency of the scale in this study was found to be satisfactory ($\alpha = 0.81$ and $\omega = 0.81$).

The items of the general SE were created "by ensuring that they refer to the individual's belief in being able to organize and carry out a series of actions in order to succeed in a task. We therefore find here, on the one hand, the notion of competence and mastery but also that of controllability. Indeed, for a given task, the individual will judge to what extent he considers himself competent and he will also evaluate his ability to implement

strategies to become so" (Masson and Fenouillet, 2013, p. 382–387). In view of the object of the study, these are the items that were used here.

At T2, the following two variables were measured:

Burnout

The tool used to measure burnout at school is the one validated by Gautheur et al. (2010) for sport and school environments. It is the Burnout Measurement Scale (BMS), based on the Athlete Burnout Questionnaire by Raedeke and Smith (2001), following the recommendations of Cresswell and Eklund (2005). A scale composed of twelve items relating to the three components of burnout (physical and/or emotional exhaustion, low self-esteem and reduced sense of accomplishment) was validated, four items per component; for physical exhaustion (e.g., "I feel physically worn out by my days at college or high school"); for emotional exhaustion (e.g., "I have no idea what I'm doing," "I don't know what I'm doing," etc.); for low self-esteem (e.g., "I don't care about succeeding at college or high school, yet I should care"); and for accomplishment (e.g., "I feel that whatever I do, I don't get the results I should"). For each of these, the individual answers on a five-point scale from 1 (never) to 5 (always). For school burnout, in accordance with the recommendations, a single burnout score was calculated: the higher the score, the higher the level of burnout (Raedeke and Smith, 2001; Gautheur et al., 2010). The scale showed sound construct validity (χ^2, $p < 0.001$, CFI = 0.96; GFI = 0.95; RMSEA = 0.07) (Gautheur et al., 2010). In this study, the internal consistency was found to be satisfactory ($\alpha = 0.88$ and $\omega = 0.88$). The design of the scale allows it to be adapted to various types of contexts and audiences (college, high school, university) in accordance with the original version (Raedeke and Smith, 2001).

School Engagement

The Schaufeli et al. (2019) scale—the UWES-3, in its version adapted to the school environment (UWES-S)—was administered to participants. It consists of three items, each of which is based on one of three dimensions: "absorption" (e.g., "I am completely absorbed in my schoolwork"), "dedication" (e.g., "I am passionate about my schoolwork in college or high school"), and "vigor" (e.g., "I am overflowing with energy for my schoolwork"). Each item is rated on a Likert scale ranging from 1 (never encountered) to 7 (encountered every day). A high score indicates a high level of engagement in schoolwork. The scale shows sound construct validity (χ^2, $p < 0.001$, CFI = 0.92; TLI = 0.92; RMSEA = 0.04; 90% $\geq$ 0.043–0.045) (Schaufeli et al., 2019). In this study, the scale was found to be robust with good internal consistency ($\alpha = 0.89$ and $\omega = 0.89$).

At T3, the following variables were measured:

Life Satisfaction

Life satisfaction is a relatively stable cognitive appraisal of one's life as it is subjectively perceived to be (Fenouillet et al., 2014). The scale administered was that of Fenouillet et al. (2014). It is the Multidimensional Students' Life Satisfaction Scale (MSLSS) of Huebner (1994) in its French version. The questionnaire consists of thirty questions relating to the themes of "family" (e.g., "I love spending time with my parents"), "friends" (e.g., "my friends help me if I need them"), "life" and "school" (e.g., "I learn a lot of things" and "I learn a lot of things in high school"), "the place where I live" (e.g., "I love the neighborhood where I live") and "myself" (e.g., "I am a good person"). It "provides an adequate measure of students' school wellbeing in the different contexts of the scale" (Fenouillet et al., 2014, p. 83). Responses are given on a scale from 1 (strongly disagree) to 7 (strongly agree). The higher the score, the better their satisfaction with life at school. The scale showed sound construct validity [$\chi^2(400) = 1081.02$, CFI = 0.93; TLI = 0.92; RMSEA = 0.07] (Fenouillet et al., 2014). In this study, the internal consistency of the scale as a whole was satisfactory ($\alpha = 0.92$ and $\omega = 0.93$).

Negative Adaptation

Negative adaptation is not a psychological construct but a sum of observations revealing how pupils adapt to their school environment and how they experience their schooling. In order to measure it, a scale has been developed. This is a composite scale constructed from indicators reflecting the extent to which a pupil is aligned with the school environment or shows signs of poor acclimatization (poor educational outcomes, attendance at the infirmary, absenteeism from class, college/school-related stress). The scale takes the form of 5 assertions (1- "I have good school results;" 2- "in recent months, I have often gone to the infirmary"; 3-I have been absent from class a lot in the last few months," 4- "I feel stressed about school" and 5- "I like going to college"") for which the respondents are asked to evaluate their degree of agreement on a 5-point Likert scale. After reversing items 1 and item 5, all the scores were summed to obtain a single indicator of negative adaptation. The higher the score, the more negative is a pupil's adjustment to the school environment. Finally, the results revealed internal consistencies within acceptable limits ($\alpha = 0.53$ and $\omega = 0.57$).

Data Analysis

Analyses were performed using the "lavaan" library available on the R software (version 3.6.2). Path analysis was performed using data from the variance-covariance matrix involving the variables of interest (see **Table 2** with Pearson's ρ correlation estimates).

Given the significant violation of the multivariate normality of the distribution between the variables (Mardia Skewness = 292.63; $p < 0.001$; Mardia Kurtosis = 5.46; $p < 0.001$), the Robust Maximum Likelihood estimator (MLR) was chosen to estimate the model and the standardized coefficients (β) of its different paths. To establish the general adequacy of the model, we relied on the interpretation of the Goodness-of-Fit indices with regard to the recommendations of Hu and Bentler (1999), i.e., absolute indices less than 0.06 or 0.08, respectively, for the Root Mean Square Error of Approximation (RMSEA) and the Standardized Root Mean Square Residual (SRMR), and incremental indices greater than 0.95 for the Comparative Fit Index (CFI) and the Tucker—Lewis Index (TLI). These benchmarks, understood as guidelines and values close to standards (e.g., CFI/TLI > 0.90; RMSEA/SRMR up to 0.10),

TABLE 2 | Variance-covariance-correlation matrix (*N* = 470).

	N	Mean	*SD*	1	2	3	4	5	6	7
1. Resources T1	470	16.3	4.1	**16.85**	0.01	0.10	0.23***	−0.20***	0.40***	−0.27***
2. Demands T1	470	13.0	4.2	0.25	**17.70**	0.02	−0.01	0.22***	−0.02	0.15**
3. Self-efficacy T1	470	12.8	3.1	1.34	0.21	**9.75**	0.35***	−0.35***	0.33***	−0.25***
4. Engagement T2	470	12.6	4.2	4.06	−0.10	4.64	**17.98**	−0.49***	0.48***	−0.43***
5. Burnout T2	470	30.1	8.6	−7.20	7.95	−9.37	−17.74	**73.78**	−0.48***	0.56***
6. Life satisfaction T3	470	159.6	25.2	41.78	−2.59	25.94	51.25	−103.37	**634.65**	−0.56***
7. Negative adaptation T3	470	10.3	3.2	−3.56	2.04	−2.54	−5.80	15.40	−44.75	**10.17**

*Variance is displayed in the diagonal; Covariance and Correlation's coefficients are given, respectively, below and above the diagonal. Asterisk flag significant Pearson correlation coefficients as follow: *p < 0.05; **p < 0.01; ***p < 0.001. The bolded values specified limits of the diagonal.*

are acceptable insofar as the pattern of indices would converge globally toward a same conclusion (Jackson et al., 2009).

RESULTS

The Goodness-of-Fit indices show that the model as a whole does not fit the data correctly. Indeed, if the SRMR (= 0.06) and the CFI (0.91) are in the standards, the other indices are not acceptable with regard to the cut-offs, i.e., considering the robust Yuan-Bentler test, here significant χ^2 (18) = 673.56; $p < 0.001$, the TLI of 0.75 and the RMSEA equal to 0.149, CI95% (0.118–0.183) (Kenny et al., 2015). Despite the poor overall fit of the model, analysis of the local indices (path analyses and covariances) remains still possible.

The predictive paths are globally significant (**Figure 2**).

More precisely, demands (β = 0.23; $p < 0.001$), resources (β = -0.17; $p < 0.001$) as well as Self-Efficacy (SE) (β = -0.34; $p < 0.001$) at T1 predict burnout at T2. Burnout at T2 in turn predicts both "negative adaptation" (β = 0.46; $p < 0.001$) and life satisfaction (β = -0.32; $p < 0.001$) at T3. A significant covariance is observed between negative adaptation at T3 and life satisfaction at T3 (Cov = -0.35; $p < 0.001$). At the same time, SE and resources at T1, but not demands (β = -0.01; $p = 0.772$), predict engagement at T2 ($\beta_{SE} = 0.33$; $p < 0.001$; $\beta_{ress} = 0.20$; $p < 0.001$). On the other hand, engagement predicts life satisfaction (β = 0.32; $p < 0.001$) and negative adaptation (β = -0.20; $p < 0.001$) at T3. There is at last a covariance between engagement and burnout at T2 (Cov = -0.40; $p < 0.001$).

DISCUSSION

This research was based on Salmela-Aro and Upadyaya (2014) study, which reveals that the demands and resources related to both the environment (school) and to the students, determine their engagement with school and level of burnout. These in turn predict their levels of depression or satisfaction. In the present study, the aim was more specifically to measure the impact on adaptation to the school context and to satisfaction. The interest was twofold: on the one hand, to exploit, as previously (Salmela-Aro and Upadyaya, 2014), an original reading of the mechanisms involved in the quality of life of pupils at school and their ability to adapt. On the other hand, it was to address a public health problem that recent studies show to be increasingly serious amongst adolescents, particularly in this period of pandemic (e.g., Rolland et al., 2020; Jones et al., 2021; Stavridou et al., 2021). It is crucial to identify the mechanisms involved in order both to prevent a deterioration in adolescent mental health and then, if need be, to be able to manage it and promote a quality-of-life policy within schools.

Main Findings

The strength of the present study is that it was carried out according to a design with three measurement times, planned over 4 months (from September to December), making it possible to operationalize and test the temporal precedence of the predictors on the explained variables. Furthermore, this study involved a sample of more than 450 participants, another strong point with regard to the methodology adopted. In essence, the results obtained are in line with those of Salmela-Aro and Upadyaya (2014), but in a school context marked by profound changes due to the pandemic. They reveal predictive links between the variables measured at three points in time, at the start of the school year, then 10 weeks later, at the end of the first term and finally just before the Christmas holidays. This period is traditionally a busy one for students and a potential source of dropout and dissatisfaction, depending on how they perceive the level of resources and demands. It is therefore clear that their perceptions will predict their overall level of satisfaction 2 months later. The level of demands perceived at the start of the school year, for its part, predicts exhaustion 10 weeks later. This level of exhaustion in turn predicts negative adjustment, which is negatively related to satisfaction. Overall, the model assumed in **Figure 1** was validated. Thus, the way in which students perceive the demands and resources at school from the beginning of the school year influences their overall wellbeing, either by altering it (negative adaptation) or, on the contrary, by promoting or reinforcing it (satisfaction). In the end, the results of this study reinforce and complement those of Salmela-Aro and Upadyaya (2014).

Theoretical Implications

More specifically, the results reveal a link between student burnout and negative adjustment. Two alternatives can be considered in order to understand this. Firstly, they may suggest that students with burn-out would tend to be absent from classes

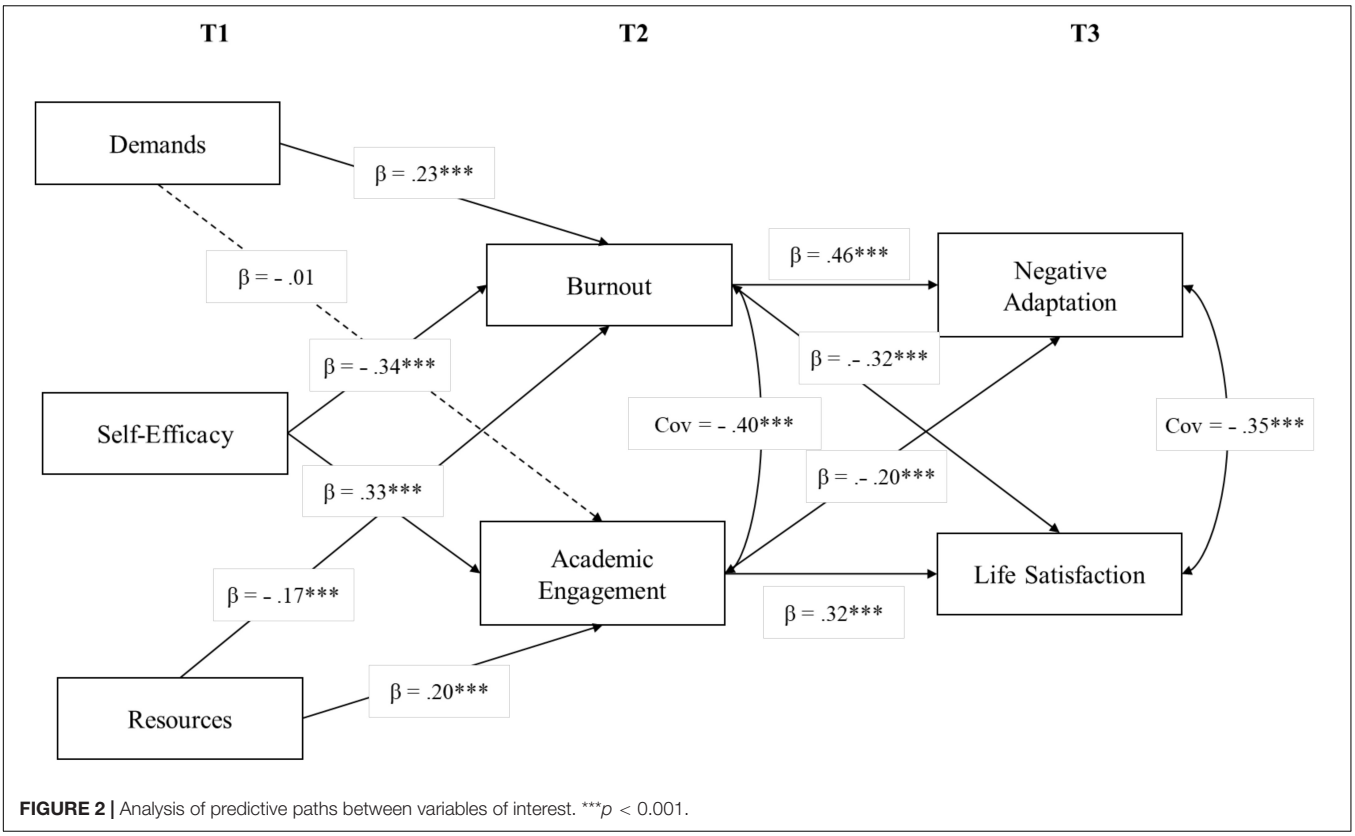

FIGURE 2 | Analysis of predictive paths between variables of interest. ***$p < 0.001$.

or school (drop-out) and feel unwell (stress), requiring more frequent visits to the infirmary. Exhausted, they would also feel less competent (e.g., Martin-Krumm et al., 2011) and would be likely to go to school less often. These results could also suggest that students seeking to avoid psychological discomfort would adopt avoidance strategies by fleeing the school environment through repeated absences or attendance at the infirmary. Burnout would be linked to a level of demands perceived at the outset by the pupils in their school environment to be greater than that of both personal resources (SE) and external resources (those of the school). Students who lack self-confidence, feel overloaded and think they cannot count on their teachers, peers or parents to help them when they need them, could easily find themselves in burnout and drop out in order to protect themselves. In the end, this strategy could be beneficial for them in terms of mental health, even if its consequences in terms of academic success are catastrophic.

Conversely, pupils with a high SE, who are able to organize themselves to manage their workload, and who perceive benevolence and possible support from those around them (peers, teachers, family, etc.) would tend to be more committed to school tasks. This engagement in turn impacts on their life satisfaction.

The results, determined from data gathered during a single term, make it possible to imagine that over a longer period of time the effects could be more pronounced, with an increasingly deleterious impact on demands. In itself, this would not necessarily be problematic as personal and environmental resources increase over time. This possibility requires further study. The overall results confirm that indicators of student adaptation, such as engagement or satisfaction, are variables of interest in the exploitation of the model in the school environment (Oger et al., 2022).

Our study is intended as a contribution toward an evaluation of the JD-R model's external validity. Originating from work psychology, the JD-R model is increasingly being applied to the school domain since it aligns with the reasoning of Schaufeli et al. (2020) that "the activities of athletes, volunteers, and students can be seen as work, and hence, they may also suffer from burnout. Recently, it has been claimed that parents can suffer from burnout as well" (p. 5). It is therefore clear that the problem of burnout impacts on a wide range of domains. If the JD-R model proves to be functional in terms of primary prevention, then its potential application in the field of research is very broad.

The purpose of our study is then not to test the specificity of a school-based JD-R model so much as to add to the existing literature on its relevance in a school or student environment (Salmela-Aro and Upadyaya, 2014; Oger et al., 2022; Salmela-Aro et al., 2022). On qualitative aspects, the specificity of the model is probably marginal to the choices children make. In a professional environment, employees have relative autonomy and develop a set of resources over the course of their employment history. The issues are not the same for children. They are "prisoners" of the system. Schooling is compulsory and they are dependent on their parents. To this extent a child has no choice and may feel that he or she is *subjected* to the school environment. The resources

available to children are mainly derived from the family unit and the school structure in which they live, while the same is true for the demands to which they must respond and adapt. A qualitative study conducted in both organizational and school environments would make it possible to identify the specificities of the two applications of the model.

Practical Implications

From a practical point of view, the results make it possible to envisage interventions designed to impact on both demands and resources with a view to limiting or reducing the negative effects of the former while favoring the development of the latter.

Intervening in demands in the school context means taking an interest in the workload that pupils are faced with (given amount of work, timetables, transport time, alternating school, and holiday times). The fear of failure, of disappointing or of not being up to scratch in assessments, tests and examinations is also mentioned when the demands of the institution are mentioned, since the results depend on the orientation, and therefore the future, in the mind of the adolescent. Orientation is therefore in itself a source of anxiety. On the other hand, the various pressures exerted by school heads on their teachers to respond to the competitiveness between schools (Shahmohammadia, 2011) and then, in turn, those of the teachers toward their pupils, is also part of the constraints of the school. These high demands create a psychological pressure that creates a climate of authority, order, effort and competition to achieve the best results at all costs, which is detrimental to the wellbeing of the student (Sarremejane, 2017). Finally, "strong family pressure at school, a potential source of conflictual parent-child relationships, can be conducive to the development of intense school stress which, in the long term, can lead to burnout" (Lebert-Charron et al., 2021, p. 64). In the end, a systemic vision of the problem should be envisaged, and it should not be left to the school alone, but to the educational structure as a whole. This applies not only to the school, but also to the family and the entire educational fabric in which the child is likely to be involved.

Mentioning resources in the school environment is tantamount to mentioning the support the students can receive from teachers who, for example, agree to take time to re-explain concepts outside the classroom, or whose encouragements reassure and stimulate (or restore) young people's confidence in themselves. Mutual help between classmates may also provide support to a child as may the relationships within families: the support of parents and teachers is known to be a significant resource for the wellbeing of the pupil (Meylan et al., 2014). Knowing that young people can count on various actors in the education system (supervisors, school nurse and/or psychologist, etc.) with whom they can exchange ideas or obtain help is also an example of a resource. In terms of personal resources, we opted to deal with self-efficacy.

Taking into account this balance between demands and resources, tending either toward exhaustion and negative adaptation, or toward engagement and life satisfaction, provides some clues to improving the quality of adaptation of young people at school. Improving working conditions makes sense here by also giving students the means to strengthen their own resources (e.g., SE, stress management, emotional management).

In view of the work that has been carried out in the organizational environment where the JD-R model has been shown to provide key elements for a primary burnout prevention policy (e.g., Demerouti et al., 2021), school deans could draw inspiration from it in order to establish a logic of health and effectiveness by considering motivation. Indeed, it may not be necessary initially to lower the level of academic demands; it may be equally effective to increase the scope of possible resources available to students (e.g., counseling, tutoring, extracurricular activities such as physical activity, drawing or music, a structure for welcoming parents, active pedagogies or school job-crafting schemes, etc.).

Strengthening Self-Efficacy at School

Given the impact of self-efficacy (SE) both on the quality of life of pupils at school and on their academic performance, it would seem vital that attention be paid to the different ways of supporting the available resources, particularly the support that teachers and parents can provide. It would be appropriate in this context to return to the recommendations of Bandura, for example (Bandura, 2007; Masson and Fenouillet, 2013). First and foremost, pupils should learn to capitalize on their mastery experiences. It is as important for them to learn from their mistakes, as it is for them to identify the resources involved when they succeed in tasks. On the other hand, providing opportunities for them to learn by watching their peers, would contribute to the reinforcement of SE. Verbal persuasion, i.e., encouragement, needs to be given special attention, especially qualitatively (e.g., giving "tips" for success in a task). Physiological and emotional states are of great importance, especially in negatively impacting on SE. They will be the subject of the next section. Finally, the integration of efficiency information should free teachers from having to think of learning as dependent on the completion of tasks of increasing difficulty. Indeed, pupils compare themselves to each other. When they fail in a task, if they notice that they are alone in having difficulties while their peers succeed, they are prone to blame themselves for their failure which in turn is likely to have a negative impact on their SE. If the task is problematic for all pupils, however, they are more likely to attribute the difficulty to the task and so avoid damage to their sense of SE. To conclude, it is worth emphasizing the importance of making available any information that may help students to succeed and so contribute to reinforcing SE. Let us return to the importance of physiological and emotional states.

Strengthening Stress and Emotional Management

Although it is sometimes forgotten, physical activity has been widely demonstrated to be relevant to stress management and emotional regulation, both in children (e.g., Ratey, 2008) and adults (Ratey and Loehr, 2011). Amongst other things, it helps prevent burnout (e.g., Isoard-Gautheur et al., 2019) and if promoted in school could provide primary prevention in the long term. Other types of action, such as the different programs of

emotion and stress management that have been developed for use in schools, deserve special attention. For example, Shankland and Rosset (2016) program is based, among other things, on mindfulness. The effects of this meditative practice have been widely demonstrated in the fields of physical and psychological health (e.g., Tomlinson et al., 2018), particularly in relation to primary prevention (e.g., Verdonk et al., 2021). It is in this perspective that mindfulness could be developed in schools, not only as a method of stress and emotion management, but also as a way to approach the problem of school burnout.

The aim, amongst others, is to provide examples of effective practice (see Martin-Krumm, 2021, for a review). This seems all the more urgent and crucial in the context of confinements.

LIMITATIONS AND PERSPECTIVES

A first limitation is statistical. Although the JD-R model adapted for schools taken from the study by Salmela-Aro and Upadyaya (2014) has undeniable empirical validity—the predictive leads being consistent and significant in our study as well—it has to be said that the model as a whole only inadequately fits the data. Indeed, while the CFI and SRMR are good, this is not the case for the TLI nor for the RMSEA, which are more penalizing regarding sample size (Chen et al., 2008). This diagnosis may also suggest that: 1/the model is not parsimonious, in which case only the most essential predictive leads should be retained from a conceptual point of view (Gana and Broc, 2019); 2/the model is not good enough compared to the null model, due to the low correlations observed between certain variables of interest (thus reducing the incremental part of the model tested on the null model) (Kenny, 2020); 3/the model is not good enough because it omits to specify certain links that have a significant statistical weight (e.g., Satisfaction at T3 on Engagement at T2 or on Resources at T1 according to the modification indices of the model). However, such modifications improving the quality of the adjustment would not make sense given the temporality of the measurements (a variable at T3 cannot predict a variable at T1 or T2). Moreover, such a strategy to improve the fit of the model is not recommended (MacCallum et al., 1996). It may be recalled that poor overall fit of a model does not mean that it is invalid to interpret the local indices, just that a better explanation could be found to summarize the variance-covariance matrix (Gana and Broc, 2019). Correcting lack of fit involves rewriting the model to fit the data better, which was not our objective. That's why we have not attempted to address the problems with these issues but have sought rather to identify their source for further research. Apart from the possibilities already raised another reason for the results being not always satisfactory could be that our procedure includes incomplete features. This problem could be addressed by redesigning the procedure with the addition of key variables e.g., a test of the differential impact of age or gender through multigroup confirmatory factor analysis (MGCFA) (Jöreskog, 1971). Those analyses will require adequate sample size. Finally, on the question of fit, we note that we lack a point of comparison, insofar as the main study by Salmela-Aro and Upadyaya (2014) does not test the fit of the model.

Another limitation concerns the context of the research. As mentioned in the introduction, if some students are suffering at school, the current pandemic context reinforces this observation. In "normal" times, would the students' responses have been the same? Is the malaise accentuated? It is not possible to answer these questions, but it is important to be aware of them when reading the results of this study.

In terms of perspectives, it might be useful to consider either analysis taking into account the class level and to study the dynamics of the processes involved. Do middle school students perceive things differently from their high school counterparts? Is it possible to observe breaking points? If so, what countermeasures should be considered? Studies confirm, for example, the value of developing lessons on the importance of taking care of one's diet, engaging in regular physical activity, having a satisfactory quality of sleep (e.g., Tortella et al., 2021). A means to highlight the dynamics of the processes involved in a pupil's quality of life—indicators of wellbeing, of coping skills or, inversely, indicators of suffering—would make it easier to identify the key moments at which it is important to be vigilant. Similarly, it would make it easier to target potential interventions as part of a primary prevention approach. It could be of particular interest to follow cohorts of pupils, from their entry into 7th grade to their exit from the secondary system at the end of 12th grade. Such a study might help to identify the key points that lead the majority of students to persist in school while a minority drop out. How does the institution weigh on their decision to drop out? Does the demands-resources model provide some insight and, if so, how can dropout be avoided?

While in the organizational field resources and demands are correlated, in our school-specific study we found that these variables were independent (as other studies in this field have shown). We assume that this is related to the timing of the study. In both ours and Salmela-Aro and Upadyaya (2014) study, measurements were taken at the beginning of the school year. It would be interesting to investigate whether the same independence between demands and resources exists at the end of the school year or whether, on the contrary, it is possible to make the same findings as in the organizational field.

Refining the analysis using a clinical approach based on interviews with students would make it possible to identify their specific needs and their expectations of the school environment. An analysis of the impact of this balance between demands and perceived resources on the quality of life at school, on adaptation and in turn on success, is another avenue to explore. It would allow recommendations to be formulated that aim at the health of pupils and avoiding school dropout. In this sense, this work is in line with the institutional logic that places "student wellbeing at the heart of education policy" (e.g., in France since November 2015)—all the more important in the context of the uncertainties linked to the enduring pandemic which reinforces certain ills. If, as Bezard and Rouquette (2019) suggest, "the first signs of mental disorders often appear at school or in the university training place (.) and 75% of psychiatric pathologies diagnosed

during the course of a lifetime began before the age of 24, then school-based prevention programs are of great interest" (p. 385). Shown to be of fundamental importance, mental health education can be envisaged through the knowledge and development of students' resources.

CONCLUSION

The aim of our study, based on Salmela-Aro and Upadyaya (2014) study, was on the one hand to test the JD-R model in a school environment, and on the other, to understand what may lead some students to be satisfied while others are suffering. The results obtained corroborate those of the original study. The present research carried out during the first part of a school year shows that over a relatively short period of time in relation to the whole of schooling, when pupils perceive high demands in their school environment, a problem of exhaustion may arise. This leads to avoidance behavior such as absenteeism, increased use of the infirmary and disengagement, which in turn leads to a decline in their life satisfaction.

In essence, these results corroborate previous work that suggests that an adolescent's engagement in schooling promotes wellbeing (Pietarinen et al., 2014). The results reveal that the equation of "demands/resources perceived by students at school" must be in balance, or ideally tilted in favor of resources, in order for students to grow, learn, develop and flourish. The quality of a pupil's adaptation needs to be taken into account not only from the perspective of academic success and prevention of school dropout, but also from that of the health of the child—the future adult—which is ultimately in line with the elements already highlighted by Lyubomirsky et al. (2005). The school certainly has its share of requirements in terms of rules to be respected and content to be learned, and this is fundamental: it is part of its instructional and educational mission. But the school also has a formative role: to train the adult of tomorrow. This is only possible if the young person perceives a certain number of accessible resources conducive to their adaptation and feels confident. To act on this lever, knowing in more detail what pupils think, feel and experience at the heart of the school would be an asset in strengthening these resources. Examining this matter seems especially important in the light of the crisis we are experiencing today.

DATA AVAILABILITY STATEMENT

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

ETHICS STATEMENT

Ethical review and approval was not required for the study on human participants in accordance with the local legislation and institutional requirements. Written informed consent to participate in this study was provided by the participants' legal guardian/next of kin.

AUTHOR CONTRIBUTIONS

MO conducted the study and wrote the article. GB performed the statistics and contributed to writing the article. CM-K supervised the whole study and its design. FL and AM contributed to the data collection, data analysis, and discussion part of the article. CT made a significant theoretical contribution and participated in the writing of the article. All authors contributed to the article and approved the submitted version.

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