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## CASE REPORT

### A Case Report of Danish Students' Wellbeing and Stress in a Time of Crisis and Recoveries

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## ABSTRACT

This article examines Danish students' wellbeing, distinguishing between emotional, social, and academic wellbeing and between different types of stressors, understood as factors that can respectively induce and mitigate the risk of stress. An exploratory factor analyses on data from Danish students in December 2022 empirically confirm the three dimensions of wellbeing and identify two stressor factors (anxiety and security). The article illustrates how the wellbeing and stressor factors can be used in a cluster analysis to identify and clarify students at risk. In a cross-sectional perspective focusing on December 2022, the article identifies six clusters of Danish students with different levels of wellbeing and stressors. The students in the different clusters have varying characteristics with regard to the five factors (three wellbeing and two stressors) and thus also to what degree they each suffer. By applying The Stress Framework, we characterize the different clusters as a cluster with no stress (20% of the students), a cluster with positive-to-tolerable stress (20% of the students), a cluster with tolerable stress (23% of the students), a cluster with tolerable-to-toxic stress (16% of the students), and two clusters with toxic stress (9% and 12% of the students respectively). Finally, we discuss which of the clusters of students that are in risk of negative long-term educational consequences, and we suggest that it is important to implement mitigating initiatives aimed at students with characteristics as those in the identified clusters with tolerable-to-toxic and toxic stress.

**Keywords:** Covid-19 pandemic; primary school; emotional wellbeing; social wellbeing; academic wellbeing; stressors, students at risk

## Introduction

Childrens' and young people's wellbeing is declining, both globally 1,2 and in Denmark 3,4, and the COVID pandemic is suggested to have accelerated this decline.5,6,7 The decline in wellbeing is suggested to be related to many different factors such as performance and competition culture, individualisation, experiences of pressure, an unpredictable labour market, self-representation in real-life and on social media etc.8,9,10 In the wake of COVID-19 it is suggested to be due to feeling of loneliness, break in everyday routines, fear and worry about illness and stress 11,12,13,14,15 and a decrease academic engagement and in perceived coping and self efficacy.16,17 However, recent studies also indicate some unexpected positives associated with our ability to overcome the devastating pandemic. Qvortrup 15 and Qvortrup & Lykkegaard 18 find that students, parents, school staff and school leaders point at several learning potentials from COVID-19. A year after the first COVID-19 outbreak, the students are asked about their experiences of the period, and, in addition to a lot of negatives, they highlight the at that time very soon coming vaccine, they express a relief that bad things come to an end, and they highlight that the period has given them new perspectives on the world, life and school. This indicates that stressful experiences do not necessarily only have negative effects, but that they, when you approach recovery from them, can also bring feelings of relief and gratitude with them. This complexity indicates that we, in order to understand the current state of wellbeing among children and young people in-depth, need a differentiated concept of wellbeing. This suggestion aligns with other researchers advocating for examining dimensions of wellbeing that go beyond subjective wellbeing. 19,20,21,22,23,24,25, 26,27 It is argued that subjective wellbeing leads us to neglect important aspects of psychological functioning.28,29,30 Wellbeing is not only issues of enjoyment and satisfaction, that is whether children and young people are 'feeling good', but also involve dimensions such as personal fulfillment and realization of one's potential, that is whether they are 'doing well' 19 in different contexts.31 To meet the need of a differentiated concept of wellbeing that captures not only emotions and degrees of life satisfaction 32,33,34, that is hedonic aspects of wellbeing 35, but also aspects of functioning comprising meaning, self-actualization and personal growth at the individual level 28 and commitment to socially shared goals and values at the social level 36, that is eudaimonic aspects of wellbeing 35, this article suggests a concept of wellbeing in schools consisting of three clearly defined dimensions, namely, emotional wellbeing, social wellbeing and academic

wellbeing. Furthermore, the article investigates current Danish students' wellbeing based on a cluster analysis on three wellbeing dimensions and different stressors and discusses how the differentiated concept helps us to identify and understand, which students are at risk.

The article research question is: Which students are – in a time of crises and recovery – at risk of negative long-term educational consequences?

The article is based on data in the form of surveys conducted with grade 3-9 students (N=3.837) from 43 different primary schools in nine Danish municipalities.

## Theoretical framework

### *Wellbeing*

As suggested in the introduction, we in this article take a perspective on wellbeing that includes not only issues of enjoyment and satisfaction (the question of whether students are 'feeling good'), but also involve dimensions such as personal fulfillment and realization of one's potential (the question of whether students are 'doing well'). We thus anchor our understanding of wellbeing not only in a psychological framework, but also include social aspects and relational actions and attitudes in ongoing communicative processes, and referring to Aspelin 37, we suggest that wellbeing refers to relational actions and attitudes in ongoing communicative processes. Schapira & Aram 31 divide the concept of wellbeing into an emotional part, which is children's emotions, understanding and empathy, and a social part that is the effectiveness of an individual's social interactions across a variety of contexts. With reference to Hochschild's 38 concept of 'emotion work', in which individuals manage emotions related to their professional role, we suggest distinguishing between the social contexts and the more academic contexts of schools and classrooms. Thus, wellbeing is multifaceted in nature, incorporating not only mental or emotional wellbeing, but also whether the students are thriving socially and academically.39 As suggested by Dodge et al. 40, we merge "constructs such as happiness, positive affect, low negative affect, and satisfaction with life" (p. 223) and "positive psychological functioning and human development" (ibid.). The focus on positive functioning has attracted increased attention since the 2000s.41,42 While students' wellbeing is multifaceted, as already stated, each of the three dimensions of this experience – emotional, social, and academic wellbeing – additionally has a multifaceted character. Referring to Keyes 43, we suggest that "Emotional wellbeing is a cluster of symptoms" (p. 208), incorporating both general emotions and feelings directed towards the school. We suggest social wellbeing to include not only the ability to

adapt (i.e., lability and flexibility) and the feeling of belonging to or being part of a social group or a social community 44, but also positive relations with others and autonomy.<sup>28</sup> Academic wellbeing

is about the students' mindsets about and attitudes to their learning environments (meaning, engagement) (Table 1).

**Table 1: Three dimensions of wellbeing**

<b>Emotional dimension of wellbeing</b>	<b>Social dimension of wellbeing</b>	<b>Academic dimension of wellbeing</b>
encompasses individuals' tendency to be satisfied with daily life, experience life positive, feel self-confident and think positively 45	refers to the experience of belonging to a social group or a social community in which participation and the engagement of the individual are recognized and valued 46	refers to the experience of belonging to an academic group or an academic community in which participation and the engagement of the individual are recognised and valued 46

Finally, in accordance with Dodge et al. 40, we suggest that wellbeing centers on a state of equilibrium or balance, which is affected by life events or challenges – and by the educational context. We do not conceptualize positive and negative feelings within each of the multiple dimensions as opposite ends of the same continuum, but as distinct dimensions that can exist at the same time and can stem from and address either the same or different conditions.<sup>47,48</sup> Thus, a student can have both positive and negative feelings of satisfaction, engagement, recognition, and belonging at the same time. This is consistent with Headey's demonstration that positive and negative feelings of happiness are only moderately negatively correlated.<sup>49</sup>

Based on our conceptual references as set out above, our understanding of wellbeing is illustrated in Figure 1. This figure illustrates the multifaceted nature of wellbeing in terms of the three dimensions of emotional wellbeing, social wellbeing, and academic wellbeing, and additionally in their interaction with and influence on each other in a

given educational context. Studies show that children's ability to manage emotions and behaviors is crucial to their participation in learning.<sup>50,44</sup> It is also linked to higher academic success in later life, better friendships, and the ability to engage in pro-social behaviors.<sup>51,44,52</sup> Wellbeing can therefore be thought of not only as a pedagogical factor in developing children's social competences.<sup>53</sup> Furthermore, wellbeing can be thought of as a means for personal development, fulfillment, and making a contribution to the community.<sup>54</sup>

**Stressors**

To investigate the possible consequences of meeting contemporary stressors (among these COVID-19 anxiety), the article refers to The Stress Framework (TSF), developed by Jack Shonkoff and colleagues.<sup>55,56,57</sup> This framework distinguishes between three types of stress, positive stress, tolerable stress, and toxic stress (elaborated in Table 2), caused by stressors such as physical, emotional, intellectual, and material deprivations experienced by children.<sup>58</sup>

**Table 2: Three types of stress proposed by The Stress Framework**

<b>Positive stress</b> refers to the moderate, short-term stress caused by mild kind of stressors. This type of stress is a normal part of life and learning to adjust to it is an essential aspect of a healthy development, where children learn to successfully navigate and manage stressful events, either by themselves or with the support of adults.	<b>Tolerable stress</b> refers to stress caused by severe kinds of stressors that could damage students' wellbeing and development, but which either occur for shorter periods allowing time for recovery or are remedied by protective circumstances such as positive relationships and presence of supportive adults. Therefore, the damages do not occur.	<b>Toxic stress</b> refers to strong, frequent, or prolonged stress caused by stressful events that are chronic, uncontrollable, and/or experienced without the child having the support of caring adults.
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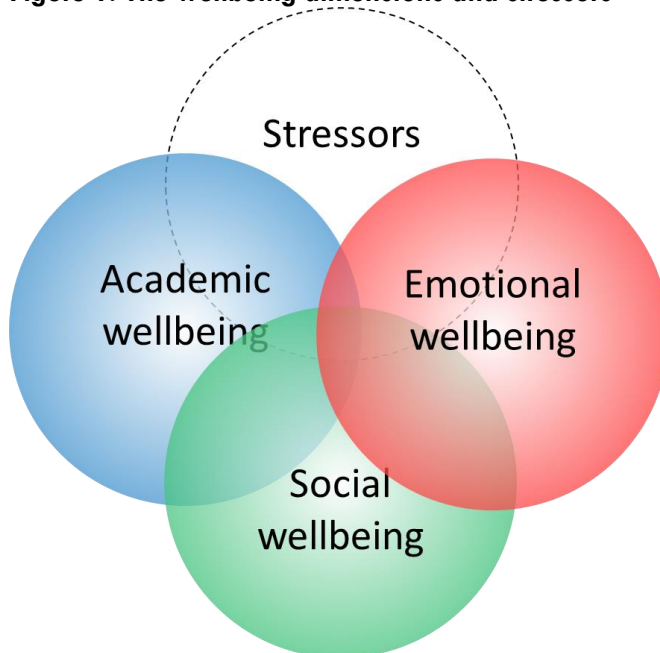
When toxic stress occurs, it may undermine wellbeing and weaken the ability to adapt in school, and to form successful relationships throughout life.<sup>59,60,61</sup> Studies suggest that children who experience toxic stress during childhood are far more

likely to display anti-social behaviour (i.e., social wellbeing) and poor mental health (i.e., emotional wellbeing) later in life, and perform more poorly in school and at work (i.e., academic wellbeing).<sup>62,63,64</sup>

With reference to Shanks & Robinson 58, we assume that children *experience* stressors differently and the same stressors thus affect students' wellbeing and specific type of stress (c.f. Table 2) differently. For some students, stressors may induce stress, while the same stressors for other students may mitigate the risk of stress. The latter is described by Shanks & Robinson 58 as positive stress because students learn to navigate and manage stressful events. Besides this subject-dependency, the stressors are suggested to be context-dependent, i.e., they will have different effects depending on the context in which they are experienced, e.g. whether there are mitigating factors such as a safe environment. Shanks & Robinson 58 thus define

stressors as factors that can respectively induce and mitigate the risk of stress. Besides the experience of a safe environment, we suggest that that students' level of emotional, social and academic wellbeing can be decisive for how students react to stressful events. Based on the above, it is not possible once and for all, regardless of individual children and specific contexts, to determine how stressors (like the ones related to COVID-19) affect students' wellbeing and type of stress. Hence, we need to investigate across contexts and across individuals. The interaction between stressors and the wellbeing factors is illustrated with the inclusion of stressors in figure 1.

**Figure 1: The wellbeing dimensions and stressors**



### Methods and Data

The article draws on data from surveys distributed in December 2022 as part of the research project "Covid-19, Building Back Better". The data set consists of survey responses from 3.837 primary school students (grade 3-9) from 43 different schools in nine selected Danish municipalities. Surveys were answered by the students during school hours, where the pedagogical staff supported the younger respondents, to minimise overall dropout and specific dropout from students, who found the survey challenging to read and respond to. The survey responses had a slightly overrepresentation from grade 6-8 students and equal gender distribution (see Appendix 1).

The surveys were created purposefully consisting of 94 items, most of them to be answered on a five-point Likert scale (from 'never' to 'always'). In

this article, we draw on a subset of items, see Appendix 2) addressing students' wellbeing, stressors and feelings of recovery as well as three background items (gender, grade, and municipality).

### Statistical analysis

Prior to analysis, the dataset was cleaned, and 8 items were reversed (marked with \* in Appendix 2) so that 5 on the Likert scale corresponds to a positive value (high wellbeing and security or low anxiety) and 1 on the Likert scale corresponds to a negative value (low wellbeing and security or high anxiety). Statistical analyses were carried out in SPSS 28.0.

### Exploratory Factor Analysis

Exploratory factor analysis (EFA) was used to investigate whether the theoretically described

dimensions of wellbeing could be identified in our data and to exploratory investigate underlying stressor dimensions.

The datasets' suitability for factor analysis was firstly evaluated using Kaiser-Meyer-Olkin measure of sampling adequacy ( $KMO > 0.5$ ) and Bartlett's test of sphericity. We tested for skewness and kurtosis and as two items showed some skewness, we decided to perform Principal Factor Analysis, where assumptions about distributions are not essential (though normality of variables enhances the factor solution).<sup>65</sup> We conducted the principal axis factoring for each of the domains; emotional, social, and academic wellbeing and the stressors. We used a Promax rotation (useful for large datasets) that allowed factors to correlate. We included resulting factors which met Kaiser's criteria (eigenvalues  $\geq 1$ ).<sup>66</sup> The final set of items making up the factors was determined by testing the internal consistency of the factors using Cronbach's alpha (standardized  $\alpha$ ), and two items were removed to improve  $\alpha$ , c.f., grey shading in Appendix 2. All factors met the criteria of  $\alpha > 0.6$ .<sup>67</sup>

Mean scores of the resulting factors (excluding grey shaded items in Appendix 2) were calculated. These mean factor scores were used for cluster analysis.

### Cluster analysis

Cluster analysis was used to exploratorily divide students into groups based on similarities and dissimilarities among their survey responses.

We conducted a hierarchical agglomerative cluster analysis using Wards' linkage with squared Euclidian distance as a measure of dissimilarity on the mean factor scores of the three wellbeing factors and the identified stressor factors as input variables, in order to optimize the minimum variance within clusters<sup>68</sup>, and to establish clusters of relatively equal sizes and shapes.<sup>69</sup> Since all the mean factor scores were ordinal and measured on a five-point Likert scales, variables were not standardized before analysis. We tested solutions with 3-7 clusters and agreed upon the 6-cluster solution as all clusters still included a substantial part of the students (smallest cluster had 9% of the students).

### Statistical tests

ANOVA were used to compare the factor means between the identified clusters of students and  $\chi^2$  Goodness of Fit tests were used to test how students' background variables in the clusters differed from the total sample.

## Results

### Wellbeing

The exploratory factor analyses confirmed the three dimensions of wellbeing based on our theoretical framework. This provides empirical evidence of our theoretical assumptions about the wellbeing dimensions.

The emotional wellbeing factor consisted of variables that measured happiness, mood, school motivation and the liking of teachers (see Appendix 2). Emotional wellbeing was most defined by observed variables that measured feelings of happiness.

The social wellbeing factor consisted of variables that measured feelings of understanding, fitting in, being heard and having good classmates (see Appendix 2). Social wellbeing was most defined by the observed variable that measured the sense of fitting in.

The academic wellbeing factor consisted of variables that measured getting new ideas based on school activities, liking/enjoying school activities and motivation for learning more (see Appendix 2). Academic wellbeing was most defined by the observed variable that measured the desire to learn and learning being fun.

There is a medium to strong correlation between the three wellbeing factors (see Appendix 3).

### Stressors

The exploratory factor analyses identified two separate stressor factors that in accordance with Shanks & Robinson 58 are factors that can respectively induce and mitigate the risk of stress. We have named the factors anxiety and security respectively.

The anxiety factor consisted of variables that measured students' fear of getting ill, of parents/friends getting ill, of war, not having enough money and of running out of energy resources (see Appendix 2) and were thus an anticipated inducing stress factor. Anxiety was most defined by the observed variable that measured fear of running out of energy resources.

The security factor consisted of variables that measured students' feeling safe, believing that their family and country (Denmark) are good at handling crises and the acknowledgement that it is important that countries need to cooperate (see Appendix 2) and were thus an anticipated mitigating stress factor. Security had a lower, though acceptable, Cronbach's alpha and was most defined by the observed variable that measured the believe that the students' country (Denmark) was able to handle crises and uncertainties.

The two stressor factors did not correlate (see Appendix 3). The wellbeing factors were

significantly correlated with the security factor and not with the anxiety factor.

*Grouping students based on wellbeing and stressors*

First, we identify clusters, i.e., patterns in individual students' survey responses and second, we discuss and characterise the groups of students particularly in risk based on their wellbeing and stressors.

Based on the three extracted wellbeing factors and the two stressor factors described above, we identified six groups of students with distinct characteristics (see Appendix 4). In Figure 2 below, we illustrate wellbeing and stressors according to their means in each group.

**Fig. 2** Six student clusters based on wellbeing and stressors (note that the green color indicates positive levels on all dimensions (i.e., high wellbeing and security respectively low anxiety), while red color indicates a negative value on all dimensions (i.e., low wellbeing and security respectively high anxiety))



The six clusters scored significantly different on all wellbeing factors and stressors (except for academic wellbeing and security for cluster C&E and D&F and anxiety for cluster A&C, see appendix 5).

Referring to Figure 2 (and Appendix 4) we initially identify cluster A, B, and C as groups of students, with high wellbeing and cluster D, E and F as groups of students with lower wellbeing. As shown in appendix 4, the mean scores on emotional wellbeing are between 2,31 (cluster F) and 4,49 (cluster A). Four of the clusters (A, B, C and D) have a mean score higher than 3, hence they are colored green. Regarding social wellbeing, the mean scores are between 2,67 (cluster F) and 4,46 (cluster A). Five of the clusters (A, B, C, D, E) have a mean score higher than 3. Finally, the mean scores on academic wellbeing are between 2,33 (cluster F) and 3,79 (cluster A), with four of the clusters (A, B, C and D) having a mean score higher than 3. The mean scores on the anxiety factor are between 2,43 (cluster D)

and 4.47 (cluster E). Four clusters (A, C, E and F) have a mean score higher than 3. With the security factor, all clusters have a mean score higher than 3 (between 3,26 and 4,42). As the summated response scales range from 1 to 5, a general conclusion is that the wellbeing among the students in the sample is good and that academic wellbeing is most challenged. However, two of the clusters (E and F) – that is 21% of the students – are low on the wellbeing factors. In the following, we use The Stress Framework to discuss in which of the clusters, the students might be at risk of negative educational consequences.

Students in cluster A report both high levels of wellbeing and security and low levels of anxiety. As such, this is the cluster of students who are the least at risk. Students in cluster B and C resemble students in cluster A. However, students in cluster B report some levels of anxiety and students in cluster C report lower levels of academic wellbeing. We

term cluster B *positive-to-tolerable*, because we assume that anxiety is situational and temporary (e.g., fear of getting ill due to COVID). We suggest cluster C to be a tolerable level of stress, since we assume that academic wellbeing is not situationally determined to the same degree as anxiety but refers to long-term experiences with school lasting than anxiety. Furthermore, we suggest that academic wellbeing is crucial for the students' educational aspirations, which means that students with low levels of academic wellbeing are in some risk of long-term educational consequences.

Students in cluster F show a noticeable level of anxiety and low security, and we believe that they are at risk of experiencing *toxic stress*. Toxic stress can undermine the students' wellbeing (and students in cluster F do indeed score lower on wellbeing than students in additional clusters) and thus weaken their ability to adapt in school and, thereby increasing their risk of long-term negative educational consequences. Compared to the students in cluster F, the students in cluster D and E scores higher on security and lower on anxiety respectively. For students in cluster D the feeling of security might act against them feeling stressed, however, their low wellbeing makes us categorize them as having *tolerable-to-toxic*. Whereas we categorise students in cluster E as *toxic stress*, as we do not believe that the lack of anxiety is enough to shield the students from their low wellbeing and security.

As we have now identified the groups of students particularly at risk, we will turn to describing the populations of the 'at risk clusters'. The number of female students is considerable higher in cluster D and F and considerably lower in cluster A, C and E (see Appendix 6). This indicates that there is a gender-difference with girls being overrepresented in clusters with high anxiety, but also that females are overrepresented (cluster D and F) and underrepresented (cluster E) respectively in the at-risk clusters, making it more complex to make any conclusions regarding gender sensibility risks of long-term negative educational consequences. The proportion of older students (grades 6-9, see Appendix 6) are higher in the 'at risk' cluster D, E and F, whereas the proportion of younger students (grade 3-5) are higher in the lesser at-risk clusters A, B, and C (see Appendix 6). We find no differences in cluster distributions according to municipalities (see appendix 6).

## Discussion

This article suggests a differentiated concept of wellbeing distinguishing between emotional, social and academic wellbeing. An exploratory factor analyses on data from Danish students in December 2022 empirically confirmed the three

dimensions of wellbeing. This provides empirical evidence of the conceptual assumptions about the wellbeing dimensions. Furthermore, the article identifies two stressor factors (anxiety and security). The two stressor factors did not correlate (see Appendix 3). The wellbeing factors were significantly correlated with the security factor but did not correlate with the anxiety factor. This suggests that wellbeing and anxiety are independent feelings and gives us – similar to the proposal from The Stress Framework that stress can be remedied by protective circumstances such as positive relationships and presence of supportive adults – reason to suggest that both good levels of wellbeing and the experience of security can mitigate anxiety. We also find support for this in Gallagher, Smith, Richardson, D'Souza, & Long 70, who find that hope mitigates negative consequences from COVID-19.

The article illustrates how the wellbeing and stressor dimensions can be used in a cluster analysis to identify and clarify students at risk. In a previous article we found that the wellbeing dimensions fluctuated across six data collections in the period April 2020 to June 2022 71, which confirms the point described in the beginning that we are in a complex time of crises and recoveries. Based on this, it is our belief that groups of students at risk are highly dynamic. In a cross-sectional perspective focusing on December 2022, the article identifies six clusters of Danish students with different levels of wellbeing and stressors (Figure 2, and Appendix 4). By applying The Stress Framework, we suggest that the students in cluster D, E and F are particularly at risk of negative long-term educational consequences. Thus, it is important to implement mitigating initiatives aimed at students with characteristics like those in these clusters.

As described above, our analyses confirm the assumptions of the introduction that we need differentiated approaches to understand the current student cohort. However, across the various clusters we find that they suffer mostly in terms of 'doing well' academically and 'feeling good', while 'doing good' socially is generally at a more acceptable level. Our analyses do not suggest whether low levels of social and academic wellbeing can be explained by performance and competition culture, individualisation, experiences of pressure, an unpredictable labor market as suggested by studies referenced in the introduction or by the fact that the Danish students were sent home for school for long periods. In Denmark, parents were ordered to keep their children at home at the beginning of March 2020. After five weeks of closure, the schools undertook a controlled re-opening for the youngest students (grade 0–5, ages 5/6-10/11) – with older students (grade 6–10, ages 12/13-15/16)



following four weeks later. The summer and autumn were characterised by great uncertainty with many shorter and longer local school closures due to fluctuating infection rates, until all schools had to close again at the end of the year 2020. The second reopening took place for the youngest students (year groups 0-4) on February 8th, 2021, while the oldest students were back every second week from 15 March 2021 (year group 9, graduating students) or April 6th, 2021 (year groups 5-8). On May 18th, 2021, all students were back full time until they all went on six weeks of summer holiday five weeks later. After a fairly stable period just after the summer holidays, infection rates rose again over the autumn and winter of 2021, where at times large percentages of students and also teachers were absent either because they themselves were ill, because infection among close relatives or due to local school closures. Just before the Christmas holidays, on December 15th, the ministry had to close all schools in Denmark again due to sky-high infection rates. Schools reopened January 4th 2022, and remained open for the rest of the studied period. As described, the oldest students were home the longest, and if these periods are contributing factors, it is consistent with the fact that, according to our analyses, the oldest students suffer the most. However, it is a well-known phenomenon that older students are generally lower in terms of wellbeing than younger students - perhaps because they experience pressure to a greater extent, are more aware of challenges and of themselves - and what are the reasons for the lower level for the oldest students in this case, we cannot say anything for sure about. In addition to age differences, we found differences between the different clusters regarding gender, but this turned out to be very complex.

### *Limitations*

The schools for this study was collected during a period marked by major changes and time-consuming tasks for the schools, which meant that it was not easy to get municipalities and schools to participate. Thus, the study lacks from of a systematic sampling design, which questions the ability to generalize beyond the analytical sample.

### **Conclusion**

This article, is based on three dimensions of wellbeing, emotional, social, and academic wellbeing, and two types of stressors, anxiety and security, that can respectively induce and mitigate the risk of stress. We identify and characterize Danish students' wellbeing and stress two and a half years after the outbreak of COVID-19 in Denmark, which had major consequences for students with prolonged school closures. To do this we use exploratory factor analyses and cluster analysis on data collected in Denmark in December 2022. The article identifies six clusters with different levels of wellbeing and stressors. By applying The Stress Framework, we characterize the different clusters as a cluster with no stress (20% of the students), a cluster with positive-to-tolerable stress (20% of the students), a cluster with tolerable stress (23% of the students), a cluster with tolerable-to-toxic stress (16% of the students), and two clusters with toxic stress (9% and 12% of the students). The Danish case is used to illustrate how to identify and clarify students at risk of long-term educational consequences.

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## Appendices

### Appendix 1: Expected and observed distribution with regard to grade and gender.

Students are anticipated to be equal distributed with regards to grade (two students from grade 10 are excluded from analysis) and students (who have not identified with 'other gender') are expected to be equal distributed between girls and boys. Significant differences from expected distribution are tested with  $\chi^2$  analyses. For grade-analysis with  $df=1$  are critical values for  $\chi^2$  are 3,841 (0.05), 6.635 (0.01) and 10.828 (0.001).

Grade	Expected N	Observed N	Residual	Chi <sup>2</sup>
3	547,9 (12,5%)	505 (14,3%)	-42,9	3,35
4	547,9 (12,5%)	508 (14,3%)	-39,9	2,90
5	547,9 (12,5%)	489 (14,3%)	-58,9	6,32*
6	547,9 (12,5%)	568 (14,3%)	20,1	0,74
7	547,9 (12,5%)	594 (14,3%)	46,1	3,89*
8	547,9 (12,5%)	633 (14,3%)	85,1	13,23***
9	547,9 (12,5%)	538 (14,3%)	-9,9	0,18
10		2 (0,1%)		
Girls	1893,6 (49,35%)	1818 (47,4%)	-75,6	3,02
Boys	1893,6 (49,35%)	1970 (51,3%)	76,4	3,08
Other		49 (1,3%)		
Total		3837 (100%)		

### Appendix 2: Survey Items, empirical factors, loadings, reliability and descriptives (mean factor scores and standard deviation)

Items	Empirical Factors	Loadings	Cronbach's $\alpha$	Mean Factor Score	SD
I am happy	Emotional well-being	0,778	0,852	3,54	0,889
I am in a good mood		0,773			
I am unhappy *					
I am motivated in school		0,704			
I am happy to attend school		0,784			
I like my teachers		0,615			
I feel understood	Social well-being	0,736	0,822	3,75	0,734
I feel like I fit in		0,817			
I feel heard		0,749			
I feel excluded *					
I have good classmates		0,628			
The activities in school are boring *	Academic well-being	0,662	0,875	3,14	0,796
The activities in school makes me want to learn more		0,852			
The activities in school helps me get new ideas		0,691			
Learning new things in school is fun		0,826			
I like class activities in school		0,792			
I am affraid of getting sick *	Anxiety	0,592	0,831	3,53	0,966
I am affraid that my family/friends will get sick *		0,676			
I am affraid of war *		0,705			
I am affraid that we dont have enough money *		0,748			
I am affraid that our energy ressources will run out *		0,776			
I generally feel very safe	Security	0,415	0,636	3,82	0,660
I generally think that in my family we are good at handling crises and uncertainties		0,559			
I generally think that we in Denmark are good at handling crises and uncertainties		0,711			
Over the past few years, I have learned a lot about the importance of international cooperation.		0,544			

**Appendix 3: Correlation between wellbeing and stressors**

	Emotional wellbeing	Social wellbeing	Academic Wellbeing	Anxiety	Security
Emotional wellbeing	-	0,580**	0,552**	0,102**	0,397**
Social wellbeing		-	0,431**	0,157**	0,452**
Academic Wellbeing			-	0,083**	0,366**
Anxiety				-	0,027
Security					-

\*\* Correlation is significant at the 0.01 level (2-tailed)

**Appendix 4: Descriptive statistics for the clusters**

Cluster	A	B	C	D	E	F
N	511 (20%)	524 (20%)	610 (23%)	427 (16%)	229 (9%)	303 (12%)
Emotional Wellbeing	4,49	4,14	3,48	3,17	2,95	2,31
Social Wellbeing	4,46	4,05	3,87	3,53	3,28	2,67
Academic wellbeing	3,79	3,47	3,05	3,06	2,41	2,33
Anxiety	4,15	2,89	4,20	2,43	4,47	3,26
Security	4,32	3,94	3,83	3,77	3,26	3,28

**Appendix 5: Factor mean correlations for clusters**

Clusters	Emotional wellbeing		Social wellbeing		Academic wellbeing		Anxiety		Security		
	Mean dif.	Sig.	Mean dif.	Sig.	Mean dif.	Sig.	Mean dif.	Sig.	Mean dif.	Sig.	
A	B	-0,353*	<,001	-0,407*	<,001	-0,311*	<,001	-1,260*	<,001	-0,378*	<,001
	C	-1,003*	<,001	-0,583	<,001	-0,738*	<,001	0,059	0,871	-0,495	<,001
	D	1,315*	<,001	0,930*	<,001	0,721*	<,001	1,723*	0,000	0,548*	<,001
	E	1,535*	<,001	1,180*	<,001	1,375*	<,001	-0,320*	<,001	1,064*	<,001
	F	2,179*	0,000	1,783*	0,000	1,452*	<,001	0,893*	<,001	1,046*	<,001
B	C	0,651*	<,001	0,176*	<,001	0,428*	<,001	-1,309*	<,001	0,117*	0,032
	D	0,963*	<,001	0,523*	<,001	0,411*	<,001	0,463*	<,001	0,170*	<,001
	E	1,183*	<,001	0,773*	<,001	1,064*	<,001	-1,580*	<,001	0,686*	<,001
	F	1,827*	0,000	1,375*	<,001	1,141*	<,001	-0,367*	<,001	0,668*	<,001
C	D	0,312*	<,001	0,347*	<,001	-0,017	0,999	1,772*	0,000	0,054	0,805
	E	0,532*	<,001	0,597*	<,001	0,637*	<,001	-0,271*	<,001	0,569*	<,001
	F	1,176*	<,001	1,199*	<,001	0,714*	<,001	0,942*	<,001	0,551*	<,001
F	D	-0,864*	<,001	-0,853*	<,001	-0,731*	<,001	0,830*	<,001	-0,498*	<,001
	E	-0,644*	<,001	-0,602*	<,001	-0,077	0,846	-1,213*	<,001	0,018	1,000
D	E	0,220*	<,001	0,250*	<,001	0,654*	<,001	-2,043*	<,001	0,516*	<,001

\* = p < 0.05, \*\* = p < 0.01, \*\*\* = p < 0.001

**Appendix 6: Distribution of students within clusters (Percentage of total N)**

		<b>Cluster A</b>	<b>Cluster B</b>	<b>Cluster C</b>	<b>Cluster D</b>	<b>Cluster E</b>	<b>Cluster F</b>
	<b>N</b>	511	524	610	427	229	303
<b>Grade</b>	3 <sup>rd</sup>	12,5	11,1	4,4***	6,6***	3,9***	3,0***
	4 <sup>th</sup>	15,7	14,5	10,0*	13,3	6,6**	6,3***
	5 <sup>th</sup>	16,8*	12,8	11,3	10,8	8,3	11,6
	6 <sup>th</sup>	11,7	12,4	14,6	13,8	21,4**	19,8*
	7 <sup>th</sup>	16,8	16,4	18,9*	18,3	18,8	15,5
	8 <sup>th</sup>	11,5**	15,8	23,3***	20,6*	23,6**	23,1**
	9 <sup>th</sup>	14,9	17,0	17,5*	16,6	17,5	20,5**
	10 <sup>th</sup>	0,0	0,0	0,0	0,0	0,0	0,3
<b>Gender</b>	Boy	64.6***	51.0	61.8***	34.0***	64.6**	37.6***
	Girl	34.8***	48.3	37.7***	65.3***	31.9***	59.1**
	Other	0.6	0.8	0.5	0.7	3.5**	3.3**
<b>Municipality</b>	I	25,8	24,0	22,0	22,7	19,2	22,1
	II	9,2	7,3	8,0	7,3	9,2	9,2
	III	46,8	47,9	49,0	47,8	46,3	48,2
	IV	3,9	5,5	6,7	7,7	5,7	5,9
	V	0,0	0,0	0,0	0,0	0,0	0,0
	VI	2,3	0,6	2,0	0,9	0,9	0,3
	VII	11,9	14,1	12,0	13,3	18,3	13,5
	VIII	0,0	0,2	0,0	0,0	0,0	0,0
	IX	0,0	0,4	0,3	0,2	0,4	0,7

\* =  $p < 0.05$ , \*\* =  $p < 0.01$ , \*\*\* =  $p < 0.001$