

European Expert Network on
Economics of Education (**EENEE**)

Quality of School Life and Student Outcomes in Europe

EENEE Analytical Report No.44

Prepared for the European
Commission

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May 2021

44



EUROPEAN COMMISSION

Directorate-General for Education, Youth,
Sport and Culture Directorate A — Policy
Strategy and Evaluation

Unit A.4 — Evidence-Based Policy and Evaluation

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European Commission B-1049 Brussels

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ISBN: 978-92-76-21384-0

doi: 10.2766/268609

NC-01-20-520-EN-N

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Results at a glance

This report provides an analytical framework for measuring EU students' perceptions of the quality of their school life. It does so by adapting existing concepts and measurement tools to the school-related well-being data gathered by the OECD Programme for International Student Assessment (PISA) in 2018. Building on the social-structural perspective of the quality of school life and using individual data from 189 468 15-year-old EU students from the PISA 2018 assessment cycle, the study offers a structured model for measuring the quality of school life as a multidimensional construct. This involves students' sense of opportunity and achievement, the quality of their interpersonal relationships with their teachers, their exposure to a safe and cooperative learning environment, and their overall sense of belonging to the school and school community.

The study captures the quality of school life aspects that could be considered universal across European school systems, despite the specific national policy, institutional and socio-cultural influences, and provides strong evidence of the importance of their promotion in EU countries. The quality of school life has been found to have a significant positive impact on academic results of EU students even after controlling for student gender and socioeconomic background. It is evident that students tend to have higher academic achievement, irrespective of their gender and family circumstances if they have more positive feelings of being accepted and liked by the rest of the group; experience more supportive, understanding and encouraging teaching styles; are exposed to a more cooperative learning environment; find school more relevant for their future education and career; feel safe in their classrooms and believe in their ability to cope with schoolwork. Different patterns have been observed in different countries, probably reflecting the cultural differences between the countries and between their school systems. However, it also appears that improvement of students' perceptions of safety, achievement and teachers' support has the most substantial potential to improve their overall academic performance in most EU countries.

The study enables a better understanding of the composition of the specific quality of school life dimensions and better awareness of their impact on academic performance. It may help policymakers and educational practitioners in designing and monitoring targeted policies and interventions that could improve the subjective quality of students' experience at school and ultimately lead to better performance and achievement.

Executive summary

Quality of school life (QSL) is a multidimensional construct reflecting the attitudinal or emotional climate at school in terms of students' perceptions of well-being, determined by school-related factors and their experiences gained through their involvement in school life. Research has long suggested that it plays a vital role in improving students' motivation and effort, engagement with learning and academic achievement. There is growing evidence that students' perceptions of the quality of their school experiences could mitigate the influence of contextual factors on academic achievement and students' propensity to stay in school and to progress in education. Yet, there is little research offering consistent estimates of the quality of school life aspects across EU education systems and analysing their predictive value for different outcomes of schooling. This study aims to fill the existing gap by providing a research model for measuring the subjective quality of school life for EU students based on large-scale international assessments like the OECD's Programme for International Student Assessment (PISA).

Using individual data from 189 468 15-year-old EU students who participated in the PISA 2018 assessment cycle, the analytical model provides valid subjective measures for six specific QSL dimensions:

- 1) students' perceptions of the potential benefits of schoolwork for their future educational and employment opportunities;
- 2) their sense of self-efficacy in learning and of rewarding achievement;
- 3) the awareness of academic and socio-emotional support, attention, understanding, encouragement and inspiration received from their teachers, which can contribute to self-motivation in learning and instructional effectiveness;
- 4) students' sense of belongingness as part of their identity formation;
- 5) a cooperative learning spirit established at schools; and
- 6) students' experience of safety at their school, as associated with lower exposure to bullying.

The validity of the suggested QSL construct was confirmed by the means of exploratory factor analysis and reliability testing. Cronbach's alpha coefficients indicated good internal consistency of the instrument ($\alpha=0.85$) and the individual scales. Factor loadings indicated that the same latent structure emerged in each country, suggesting that certain QSL aspects could be considered universal across the EU. Following confirmation of construct validity, the mean of the item scores on each

scale was calculated to provide a measurement of the relevant QSL dimension for each country. Analysis of variance (ANOVA) with the Games-Howell post hoc test was applied to compare the scores of QSL scales between the EU educational systems. For each country, the statistical significance of the gender differences of the QSL perceptions was examined with t-tests. One-way ANOVAs were applied to study national variances in QSL scales in the four quartiles of the PISA index of economic, social and cultural status (ESCS). To investigate the QSL explanatory power for student academic achievement in each country, regression models were applied linking the QSL subscales with students' academic results when controlling for students' background characteristics (gender and ESCS). Acknowledging the need for further examination of how historical, socioeconomic, institutional and cultural differences between EU countries affect the quality of students' life at school, some initial comparative overview of the subjective quality of school life experienced by 15-year-old students across the EU has been provided.

Across EU countries between 50% and 78% of students perceive a high quality of school bonding, connectedness, attachment and acceptance, and feel like an important part of their school community. Also, between 70% and 90% of students across EU countries deem the relevance of school for their future lives to be high. At the same time, in some countries, the two QSL aspects related to interpersonal interactions – student-teacher relations and cooperation in learning – generate notable, negative subjective reactions and may be considered a source of concern that needs to be addressed.

In all countries, boys and girls seem to perceive their life at school differently. Other things being equal, girls tend to rate their life at school more positively than boys in most of the QSL dimensions. In most countries, advantaged students experience more positive subjective well-being at school than their peers coming from more disadvantaged families, with the most substantial differences seen in students' sense of being accepted and embedded in the classroom and school community, their feelings of being secure at school and their self-rated ability to cope with tasks and to achieve satisfactory results.

The quality of school life was found to have a substantial positive impact on the academic achievement of 15-year-old EU students even after controlling for student gender and socioeconomic background. In all six QSL dimensions, the higher values of the respective QSL scale are related to higher PISA test scores in reading.

In view of the significant impact of QSL elements on academic achievement, decision-makers might consider the promotion of quality of school life as part of educational policies at both the national and EU levels. Given the fact that the quality of school life dimensions covered by the analytical model are interrelated with a wide array of contextual factors and outcome variables, the study provides valuable input to inform different interventions that could enhance students' well-being at schools and bring lasting improvement in the effectiveness and efficiency of school education across Europe.

Aperçu des résultats

Le présent rapport fournit un cadre analytique permettant de mesurer la perception qu'ont les étudiants de l'Union européenne (UE) de leur qualité de vie à l'école. Pour y parvenir, des concepts et outils de mesure existants sont adaptés aux données relatives au bien-être à l'école recueillies dans le cadre du Programme international pour le suivi des acquis des élèves (PISA) en 2018. S'appuyant sur une approche socio-structurelle de la qualité de vie à l'école et sur les données individuelles de 189 468 étudiants européens de 15 ans issues du cycle d'évaluation PISA 2018, l'étude présente un modèle structuré de mesure de la qualité de vie à l'école, sous la forme d'un concept multidimensionnel. Ce modèle tient compte du sentiment d'opportunité et de réussite des étudiants, de la qualité de leurs relations interpersonnelles avec leurs enseignants, de leur exposition à un environnement d'apprentissage sûr et participatif, et de leur sentiment général d'appartenance à l'école et à la communauté scolaire.

L'étude englobe les aspects relatifs à la qualité de vie à l'école qui pourraient être considérés comme universels au sein des systèmes scolaires européens, malgré les particularités politiques, institutionnelles et socioculturelles nationales spécifiques, et démontre clairement l'importance de leur promotion dans les pays de l'UE. La qualité de vie à l'école s'est avérée avoir une incidence positive significative sur les résultats universitaires des étudiants de l'UE, même après avoir tenu compte du genre et du milieu économique des étudiants. Il apparaît clairement que les étudiants obtiennent de meilleurs résultats scolaires, indépendamment de leur genre et de leur situation familiale, s'ils ont le sentiment positif d'être acceptés et appréciés par le reste du groupe; s'ils font l'expérience de styles d'apprentissage plus constructifs, plus compréhensifs et plus motivants; s'ils sont exposés à un environnement d'apprentissage plus ouvert; s'ils trouvent l'école plus pertinente pour leur éducation et leur carrière à venir; s'ils se sentent en sécurité dans leur classe et s'ils croient en leur capacité à composer avec le travail scolaire. Différents modèles ont été observés dans différents pays, traduisant probablement les différences culturelles qui existent entre les pays et entre leurs systèmes scolaires. Cependant, il apparaît également que l'amélioration de la perception qu'ont les élèves en matière de sécurité, de réussite et de soutien de la part des enseignants offre le plus grand potentiel d'amélioration des performances scolaires globales dans la plupart des pays de l'UE.

L'étude permet de mieux comprendre la composition des dimensions spécifiques de la qualité de vie à l'école et leurs conséquences sur les performances scolaires. Elle peut

aider les décideurs politiques et les spécialistes de l'éducation à élaborer et suivre des politiques et interventions ciblées qui pourraient améliorer la qualité subjective de l'expérience scolaire des élèves et, en fin de compte, conduire à de meilleures performances et à de meilleurs résultats.

Résumé

La qualité de vie à l'école est un concept multidimensionnel qui reflète le climat comportemental ou émotionnel à l'école par le prisme de la perception qu'ont les étudiants du bien-être, qui est déterminé par des facteurs scolaires et par l'expérience acquise par les élèves dans le cadre de leur participation à la vie scolaire. Les recherches suggèrent depuis longtemps que la qualité de vie à l'école joue un rôle capital dans l'amélioration de la motivation et des efforts des élèves, de leur implication éducative et de leur réussite scolaire. Il apparaît de plus en plus clairement que la perception qu'ont les élèves de la qualité de leurs expériences scolaires atténue l'influence des facteurs contextuels sur les résultats scolaires et sur la propension des élèves à rester à l'école et à progresser dans leurs études. Cependant, peu d'études proposent des estimations cohérentes des aspects relatifs à la qualité de la vie à l'école dans les systèmes éducatifs de l'UE et analysent leurs valeurs prédictives pour différents résultats scolaires. La présente étude vise à combler les lacunes existantes en fournissant un modèle de recherche permettant de mesurer la qualité subjective de la vie à l'école des élèves de l'UE sur la base d'évaluations internationales à grande échelle, comme le Programme international pour le suivi des acquis des élèves (PISA) de l'Organisation de coopération et de développement économiques (OCDE).

S'appuyant sur les données individuelles de 189 468 étudiants européens de 15 ans qui ont participé au cycle d'évaluation PISA en 2018, le modèle analytique fournit des mesures subjectives valides de six dimensions spécifiques à la qualité de vie à l'école:

- 1) la perception qu'ont les étudiants des bénéfices potentiels du travail scolaire sur leurs futures possibilités d'éducation et d'emploi;
- 2) leur sentiment d'auto-efficacité dans l'apprentissage et de récompense de la réussite;
- 3) leur conscience du soutien scolaire et socioémotionnel, de l'attention, de la compréhension, des encouragements et de l'inspiration reçus de leurs enseignants, qui peuvent contribuer à l'automotivation de l'apprentissage et à l'efficacité de l'enseignement;
- 4) le sentiment d'appartenance des étudiants comme facteur de formation de leur identité;
- 5) l'esprit d'apprentissage participatif instauré dans les écoles; et

- 6) le sentiment de sécurité des élèves dans leur école, associé à un niveau moindre d'exposition au harcèlement.

La validité du concept suggéré de qualité de vie à l'école a été confirmée au moyen d'une analyse factorielle exploratoire et d'essais de fiabilité. Les coefficients alpha de Cronbach ont démontré la bonne cohérence interne de l'instrument ($\alpha=0,85$) et des échelles individuelles. Les saturations factorielles ont révélé l'émergence des mêmes structures latentes dans chaque pays, ce qui suggère que certains aspects de la qualité de la vie à l'école pourraient être considérés comme universels dans l'UE. Une fois la validité du concept confirmée, la moyenne des scores des éléments de chaque échelle a été calculée afin de fournir une mesure de la dimension pertinente de la qualité de la vie à l'école pour chaque pays. Une analyse de la variance et le test post-hoc de Games-Howell ont permis de comparer les scores des échelles de la qualité de vie à l'école entre les systèmes éducatifs de l'UE. Pour chaque pays, la signification statistique des différences de genre de la perception de la qualité de vie à l'école a été examinée par le biais de tests-t de Student. Des analyses de variance à un facteur ont été appliquées pour étudier les variances nationales des échelles de la qualité de vie à l'école dans les quatre quartiles de l'indice PISA de statut économique, social et culturel. Pour étudier le pouvoir explicatif de la qualité de vie à l'école sur les résultats scolaires des étudiants de chaque pays, des modèles de régression ont été appliqués en liant les sous-échelles de la qualité de vie à l'école aux résultats scolaires des étudiants lors du contrôle des facteurs contextuels des étudiants (genre et statut économique, social et culturel). Compte tenu de la nécessité d'examiner plus en avant la façon dont les différences historiques, socioéconomiques, institutionnelles et culturelles des pays de l'UE affectent la qualité de vie des élèves à l'école, un premier aperçu comparatif de la qualité subjective de la vie scolaire ressentie par les étudiants européens de 15 ans a été établi.

Parmi les pays de l'UE, entre 50 % et 78 % des élèves perçoivent un haut niveau de relation, de connexion, d'appartenance et d'acceptation à l'école et ont le sentiment de constituer une partie importante de leur communauté scolaire. De même, entre 70 % et 90 % des étudiants des pays de l'UE jugent que l'école a une grande importance sur leur vie future. Dans le même temps, dans certains pays, les deux aspects de la qualité de vie à l'école liés aux interactions interpersonnelles — relations élève-professeur et coopération dans l'apprentissage — suscitent des réactions subjectives négatives notables et peuvent être considérés comme une source de préoccupation à laquelle il convient de répondre.

Dans tous les pays, les garçons et les filles perçoivent leur vie à l'école différemment. À conditions égales, les filles ont tendance à évaluer leur vie à l'école plus positivement que les garçons dans la plupart des dimensions relatives à la qualité de vie à l'école. Dans la plupart des pays, les élèves de familles favorisées éprouvent un bien-être subjectif à l'école supérieur à celui de leurs camarades de classe issus de familles plus défavorisées. Les différences les plus significatives s'observent dans le sentiment qu'ont les élèves d'être acceptés et intégrés dans la classe et dans la communauté scolaire, dans leur sentiment de sécurité à l'école et dans l'auto-évaluation de leur capacité à accomplir des tâches et à obtenir des résultats satisfaisants.

La qualité de vie à l'école s'est avérée avoir une incidence positive substantielle sur les résultats scolaires des étudiants européens de 15 ans, même après avoir tenu compte du genre et du milieu économique des étudiants. Dans les six dimensions de la qualité de vie à l'école, les valeurs les plus élevées sur l'échelle de la qualité de vie à l'école sont liées à des résultats plus élevés aux tests PISA en lecture.

Au vu de l'incidence significative des éléments de la qualité de vie à l'école sur la réussite universitaire, les décideurs politiques pourraient envisager de promouvoir la qualité de vie à l'école dans le cadre des politiques éducatives aux niveaux national et européen. Étant donné que les dimensions de la qualité de vie à l'école couvertes par le modèle analytique sont étroitement liées à un large éventail de facteurs contextuels et de variables de résultats, l'étude fournit des données précieuses permettant de concevoir différentes interventions qui pourraient promouvoir le bien-être des élèves à l'école et améliorer durablement l'efficacité et l'efficience de l'enseignement en Europe.

Die Ergebnisse im Überblick

Dieser Bericht bietet einen Analyserahmen, anhand dessen ermittelt wird, wie Schüler in der EU die Qualität ihres Schullebens bewerten. Hierzu werden bestehende Konzepte und Messinstrumente mit den Daten zum schulischen Wohlbefinden in Einklang gebracht, die 2018 im Rahmen des OECD Programme for International Student Assessment (PISA) erfasst wurden. Die Studie basiert auf der soziostrukturellen Perspektive der Qualität des Schullebens und zieht individuelle Daten von 189 468 15-jährigen Schülern in der EU aus dem PISA-Bewertungszyklus 2018 heran. Dabei bietet sie ein strukturiertes Modell zur Messung der Qualität des Schullebens als multidimensionales Konstrukt. Dies schließt die schülerseitige Wahrnehmung von Chancen und Erfolg, die Qualität ihrer interpersonellen Beziehungen zu ihren Lehrern, ihre Einbindung in ein sicheres und kooperatives Lernumfeld und ihr allgemeines Gefühl der Zugehörigkeit zur Schule und der Schulgemeinschaft ein.

Im Rahmen der Studie werden Aspekte in Bezug auf die Qualität des Schullebens, die in europäischen Schulen trotz jeweils unterschiedlicher nationaler Politik als universell gelten könnten, sowie institutionelle und soziokulturelle Einflüsse behandelt. Ferner wird stichhaltig dargelegt, warum diese Aspekte in den EU-Mitgliedstaaten erhöhter Beachtung bedürfen. Die Qualität des Schullebens wirkt sich erwiesenermaßen erheblich positiv auf die Lernergebnisse von Schülern der EU aus – selbst nach Berücksichtigung von Geschlecht und sozioökonomischem Hintergrund der Schüler. Es liegt auf der Hand, dass Schüler in der Regel – ungeachtet ihres Geschlechts und ihrer familiären Umstände – bessere Leistungen zeigen, wenn sie sich vom Rest der Gruppe stärker akzeptiert und gemocht fühlen, einen stärker unterstützenden, entgegenkommenden und motivierenden Unterricht und ein kooperativeres Lernumfeld vorfinden, die Schule für ihre künftige Ausbildung und Karriere eher für wichtig erachten, sich in ihrer Klasse sicher fühlen und davon überzeugt sind, Schulaufgaben bewältigen zu können. In den einzelnen Ländern wurden verschiedene Muster beobachtet, in denen sich die kulturellen Unterschiede zwischen den Ländern und ihren Schulsystemen widerspiegeln dürften. Ebenso scheint es, als ob die positivere Wahrnehmung der Schüler von Sicherheit, Erfolg und Unterstützung durch Lehrer am meisten dazu beitragen kann, ihre allgemeinen schulischen Leistungen in den meisten EU-Mitgliedstaaten zu verbessern.

Die Studie ermöglicht, die Komponenten der spezifischen Qualität der Dimensionen des Schullebens besser zu verstehen, und schärft das Bewusstsein dafür, wie sich

diese Dimensionen auf die schulischen Leistungen auswirken. Politischen Entscheidungsträgern und Lehrkräften kann sie helfen, zielgerichtete Politiken und Maßnahmen auszuarbeiten und zu überwachen, die die subjektive Qualität der Erfahrungen der Schüler und damit letztlich Leistung und Erfolg verbessern könnten.

Zusammenfassung

Die Qualität des Schullebens (QSL) ist ein multidimensionales Konstrukt, in dem sich Einstellungen und Emotionen in der Schule anhand der schülerseitigen Wahrnehmung des Wohlbefindens widerspiegeln, und wird durch schulbezogene Faktoren und Erlebnisse im Laufe des Schullebens bestimmt. Seitens der Forschung wird seit Langem darauf hingewiesen, dass die Qualität des Schullebens entscheidend dazu beiträgt, Motivation und Aufwand, Lerneifer und die Leistungen der Schüler zu verbessern. Mehr und mehr zeigt sich, dass die schülerseitige Wahrnehmung der Qualität des Schulbesuchs den Einfluss kontextueller Faktoren auf schulischen Erfolg und die Wahrscheinlichkeit, dass Schüler die Schule beenden und ihr Bildungsziel erreichen, herabsetzen kann. Dennoch hat die Forschung bislang kaum konsistente Schätzungen zur Qualität von Aspekten in Bezug auf das Schulleben in den EU-Bildungssystem vorgelegt und untersucht, inwieweit sich damit der letztliche Lernerfolg prognostizieren lässt. Mit der Studie soll die bestehende Lücke gefüllt und ein Forschungsmodell geliefert werden, mit dem sich die subjektive Qualität des Schullebens von EU-Schülern auf Basis groß angelegter internationaler Bewertungen wie des OECD Programme for International Student Assessment (PISA) messen lässt. Das analytische Modell verwendet Einzeldaten von 189 468 15-jährigen Schülern in der EU, die am PISA-Bewertungszyklus 2018 teilgenommen haben, und liefert gültige subjektive Kennzahlen für sechs spezifische QSL-Dimensionen:

- 1) schülerseitige Wahrnehmung des potenziellen Nutzens von Schulaufgaben für künftige Bildungs- und Beschäftigungschancen;
- 2) schülerseitige Einschätzung der Selbstwirksamkeit des Lernens und der Belohnung für Erfolge;
- 3) Bewusstsein für schulische und sozio-emotionale Unterstützung, Aufmerksamkeit, Verständnis, Motivation und Inspiration, die Schüler von ihren Lehrkräften erhalten und zur eigenen Motivation beim Lernen und zu pädagogischer Effizienz beitragen können;
- 4) Zugehörigkeitsgefühl der Schüler als Teil ihrer Identitätsbildung;
- 5) kooperative Lerneinstellung in Schulen; und

- 6) die schülerseitige Wahrnehmung der Sicherheit in ihrer Schule, insofern dies eine geringere Wahrscheinlichkeit von Mobbing-Fällen betrifft.

Die Stichhaltigkeit des vorgeschlagenen QSL-Konstrukts wurde anhand einer Analyse exploratorischer Faktoren und eines Zuverlässigkeitstests bestätigt. Die Koeffizienten von Cronbachs Alpha belegten eine gute interne Konsistenz des Instruments ($\alpha=0,85$) und der individuellen Skalen. Faktorladungen zeigten, dass in jedem Land die gleiche latente Struktur entstand. Das legt den Schluss nahe, dass bestimmte QSL-Aspekte innerhalb der EU als universell betrachtet werden könnten. Nachdem die Stichhaltigkeit des Konstrukts bestätigt wurde, wurde der Median der Einzelwerte auf jeder Skala ermittelt, um eine Messung der relevanten QSL-Dimension für jedes Land zu erhalten. Um die Ergebnisse der QSL-Skalen der Bildungssysteme der EU zu vergleichen, wurde eine Varianzanalyse (ANOVA) anhand des Games-Howell-Post-hoc-Tests durchgeführt. Mit t-Tests wurde für jedes Land die statistische Signifikanz der geschlechtsspezifischen Unterschiede bei der QSL-Wahrnehmung untersucht. Einweg-Varianzanalysen wurden herangezogen, um nationale Varianzen der QSL-Skalen in den vier Quartilen des PISA-Index des wirtschaftlichen, sozialen und kulturellen Status (ESCS) zu untersuchen. Um zu ermitteln, inwieweit sich anhand von QSL der Erfolg der Schüler in jedem Land erklären lässt, wurden Regressionsmodelle angewendet, in deren Rahmen QSL-Unterskalen mit den schulischen Ergebnissen verknüpft wurden, wenn die Merkmale der Hintergründe der Schüler einbezogen wurden (Geschlecht und ESCS). Unter Berücksichtigung der Notwendigkeit, dass die Frage, wie sich historische, sozioökonomische, institutionelle und kulturelle Unterschiede zwischen den EU-Mitgliedstaaten auf die Qualität des Schullebens auswirken, weiterer Klärung bedarf, wurde zunächst ein vergleichender Überblick über die subjektive Qualität des Schullebens 15-jähriger Schüler in der EU vorgelegt.

In den EU-Mitgliedstaaten halten 50-78% der Schüler Schulverbundenheit, Vernetzung, Zugehörigkeit und Akzeptanz für hoch und fühlen sich als wichtiger Teil ihrer Schulgemeinschaft. Ebenso sind zwischen 70% und 90% der Schüler in EU-Mitgliedstaaten der Auffassung, dass die Schule für ihr künftiges Leben sehr relevant ist. Gleichzeitig rufen die beiden QSL-Aspekte in Verbindung mit interpersonellen Interaktionen – d. h. das Verhältnis zwischen Lehrern und Schülern und die Zusammenarbeit beim Lernen – beträchtliche negative subjektive Reaktionen hervor. Das könnte Anlass zur Sorge geben und Handlungsbedarf mit sich bringen.

Mädchen und Jungen nehmen ihr Schulleben in den einzelnen Ländern scheinbar unterschiedlich wahr. Unter ansonsten gleich bleibenden Bedingungen neigen Mädchen

dazu, ihr Schulleben mit Blick auf die meisten QSL-Dimensionen positiver einzuschätzen als Jungen. Bevorteilte Schüler beurteilen das Wohlbefinden an Schulen in den meisten Ländern subjektiv positiver als ihre Altersgenossen aus stärker benachteiligten Familien. Die größten Unterschiede zeigen sich bei der Frage, wie sehr sich die Schüler akzeptiert fühlen und in die Klasse und Schulgemeinschaft integriert sind, wie sie die Sicherheit in der Schule beurteilen und wie sie ihre eigene Fähigkeit einschätzen, Aufgaben ausführen und zufriedenstellende Ergebnisse erreichen zu können.

Die Qualität des Schullebens wirkt sich erwiesenermaßen erheblich positiv auf den Lernerfolg 15-jähriger Schüler in der EU aus – selbst nach Berücksichtigung von Geschlecht und sozioökonomischem Hintergrund der Schüler. Die höheren Werte der jeweiligen QSL-Skala hängen in allen sechs QSL-Dimensionen mit höheren PISA-Testergebnissen beim Lesen zusammen.

Angesichts der erheblichen Auswirkungen von QSL-Elementen auf den schulischen Erfolg könnten Entscheidungsträger erwägen, die Qualität des Schullebens im Rahmen der Bildungspolitik auf nationaler und EU-Ebene zu fördern. Da die Dimensionen in Bezug auf die Qualität des Schullebens, die vom Analysemodell abgedeckt werden, mit einem breiten Spektrum kontextueller Faktoren und Ergebnisvariablen zusammenhängen, bietet die Studie wertvollen Input zur Unterlegung verschiedener Maßnahmen, mit denen sich das Wohlbefinden der Schüler in der Schule und die Wirksamkeit und Effizienz der Schulbildung in ganz Europa dauerhaft verbessern ließen.

1. Introduction

School is more than an academic context. It is a dynamic learning, social and emotional environment in which students live and develop cognitively and affectively. Quality of school life reflects the attitudinal or emotional climate at school in terms of students' perceptions of well-being and satisfaction, determined by school-related factors and by their educational experiences.

The literature has long suggested that the quality of school life (QSL) plays a vital role in improving students' motivation and efforts, their emotional, behavioural and cognitive engagement, performance and achievement (Epstein & McPartland, 1976; Ainley et al., 1991; Linnakylä, 1996; Mok & Flynn, 2002a, 2002b; Appleton et al., 2006, 2008; Suldo et al., 2013; Wang & Degol, 2015; Havik & Westergård, 2019). However, research on the quality of school life with respect to the education systems in the European Union is still fragmented.

This study aims to fill the existing gap by developing and validating an analytical model for measuring the subjective quality of school life for EU students based on large-scale international assessments like the OECD's Programme for International Student Assessment (PISA), with these specific objectives:

- Outline the dimensional structure of school life to which students respond.
- Test the research model to provide a reliable, valid and useful measure for quality of school life in EU educational systems based on PISA 2018 data.
- Estimate the differences in students' perceptions of the quality of their life at school according to their socio-demographic characteristics.
- Explore how students' academic achievement is linked to different aspects of the quality of their life at school.

The main research questions addressed by the study are as follows:

- Is it possible to define and measure, based on PISA 2018 data, some aspects of the quality of school life that are universal across the EU education systems?
- Does PISA-based QSL model provide reliable and valid subjective measures in each of the EU countries?
- What is the assessment of EU students of their quality of life at school?
- Are the QSL results comparable across all EU countries given the cultural and policy diversity?
- Do EU students experience a different subjective quality of school life depending on their gender and economic, social and cultural background?

- What is the association between the quality of school life and academic performance?

2. Dimensions of the quality of school life

The literature seems to consider the quality of school life as an affective outcome of schooling that reflects 'students' general well-being and satisfaction, from the point of view of their positive and negative experiences, particularly in activities typical of school' (Malin & Linnakylä, 2001; Williams & Roey, 1997). It is affected by 'both the informal and formal aspects of school; social and task-related experience, and relationships with authority figures and peers' (Epstein & McPartland, 1976). In other words, QSL is a multidimensional construct examining the attitudinal or emotional climate at school in terms of students' perceptions of well-being and satisfaction, determined by school-related factors and by educational experiences gained through their involvement in school life and their engagement in the school climate (Johnson & Johnson, 1993; Karatzias, Power & Swanson, 2001; Weintraub & Bar-Haim, 2009; Wang & Degol, 2015).

The first structured measurement of the quality of school life as a multidimensional construct was offered by Epstein & McPartland in 1976, reflecting their belief that students' attitudinal reaction towards school should be considered a separate educational outcome. Their 27-item QSL instrument explores three dimensions of student reactions: general reactions to school ("*satisfaction with the school*"), level of students' interest in assignments and curricular activities ("*commitment to schoolwork*"); and students' evaluation of instructional and personal interactions with their teachers ("*attitudes towards teachers*").

Williams and Batten (1981) expanded the QSL concept by adapting some traditional quality of life measures to the context of schools to tap students' *general affect, positive affect and negative affect*. They developed specific measures for (i) the subjective sense of social significance and social integration (*identity*); (ii) significance attached by students to their work at school for their future lives ("*opportunity*"); (iii) students' sense of worth in the social context ("*status*"); and (iv) joyful learning experience, which makes learning interesting and intrinsically motivating ("*adventure*"). This initial model was tested extensively and modified additionally to reflect practical difficulties in distinguishing between general and positive affect, and in finding evidence of a latent variable for *adventure*. The process of modification resulted in a QSL measurement instrument involving six dimensions: *general affect*,

negative affect, opportunity, teachers, identity and status (Williams, 1984; Williams, & Roey, 1997).

The QSL measurement framework was further refined by Ainley et al. (1986) to one consisting of 40 items clustered in seven categories: students' enjoyment of school and learning ("*positive affect*"); negative feelings of depression, restlessness, worries, loneliness and upset ("*negative affect*"); students' perceptions of their teachers' attitudes, interest, support and fairness ("*teachers*"); students' sense of getting along and being accepted by other students ("*identity*"); students' sense of worth ("*status*"); students' perception of worthiness and importance of learning for their future career and adult lives ("*opportunity*"); and students' sense of being able to cope with work and being successful ("*achievement*"). Another QSL questionnaire was developed by Ainley et al. (1990) to be used specifically in primary schools.

Thereafter, different researchers attempted to shed light on the quality of students' school life experiences in different countries using hierarchical factor models involving students' general reactions to school and various specific dimensions, mostly related to social capital at school (Ainley, 2006; Mok & Flynn, 2002a). Pang (1999) adapted the QSL questionnaire developed by Ainley et al. (1990) to the context of Hong Kong primary schools. As a result, Pang offered a modified version accounting for one general concept of students' general positive feelings about school ("*general satisfaction*") and negative personal reactions to school ("*negative affect*"), and outlining five specific aspects of students' perceptions: of adequacy and the quality of their interactions with teachers ("*teacher-student relations*"); of worth within the school, of learning about other people and of getting along with other people ("*social integration*"); of the relevance of schooling for their future ("*opportunity*"); of being successful at school ("*achievement*"); and of self-motivation and enjoyment in learning ("*adventure*").

Weintraub & Bar-Haim Erez (2009) developed a quality of life at school questionnaire for primary school-age students, focusing on four dimensions of life at schools – student-teacher relations, school and classroom physical environment, positive feelings towards school, and negative feelings towards school. Erez et al. (2020) used this methodology to examine the subjective QSL of Canadian and Israeli students. Their study suggested that there are universal dimensions of quality of school life regardless of culture and highlighted the variability in students' perception of the quality of their life at school across different countries.

Karatzias, Power & Swanson (2001) used a different approach to shed light on the quality of school life at Scottish schools. They developed a QSL scale consisting of 56 items organised in 14 sub-scales that was based on school performance indicators that have been used to ensure the quality of the educational services provided at schools. Their QSL model considers both cognitive and non-cognitive aspects, such as *curriculum* (e.g. structure, number of subjects, timetable, activities); *attainment* (e.g. course work, performance, participation); *teaching methods*; *teaching style*; *learning* (e.g. motivation, interactions with others, progress, critical thinking); *personal needs* (e.g. choice, interests, personal learning needs, out-of-class activities); *assessment* (e.g. methods, grades, information); *school-level ethos* (e.g. welcoming environment, discipline, fairness, use of praise); *individual ethos* (e.g. sense of identity, pride, expectations, parental involvement); *support* (from teachers, friends, parents, external); *career* (e.g. self-awareness, skills, relevance for a future job); *relationships* (with teachers, other staff, peers, friends); *subjective*; and *objective environmental factors*. The same model was also tested and validated from a comparative perspective covering Greek and Scottish secondary schools (Karatzias, Papadioti-Athanasiou, Power & Swanson, 2001).

Some researchers have tested the applicability of the QSL theoretical framework to data collected within large-scale international assessments like the OECD's PISA and the International Association for the Evaluation of Education Achievement (IEA) Reading Literacy Study. In 1991 the IEA developed a sub-study based on Williams & Batten's 29-item QSL questionnaire. This sub-study was administered among 14-year-old students in the 30 countries taking part in the International Reading Literacy Study. Analysing the data for eight countries – the United States, Denmark, Finland, France, Germany, Italy, Spain and Switzerland – Williams & Roey (1997) provided strong evidence for the applicability of the instrument for cross-country comparative purposes. Also based on data from the IEA's 1991 Reading Literacy Study, Pirjo Linnakylä (1996) explored the quality of school life for Finnish students in comparison to students from other Nordic countries (Denmark, Iceland and Norway), Germany and the United States. In her study, a six-dimensional QSL construct emerged, consisting of *general satisfaction*, *negative affect*, *teacher-student relations*, student *status* in classroom, social *identity* formation and students' views of their chances of succeeding at school (*achievement*). Later on, Malin & Linnakylä (2001) confirmed the validity of this instrument in exploiting multilevel modelling for analysing QSL-related data gathered in Finnish comprehensive schools between 1991 and 1995.

Using PISA 2012 data, Yoon & Järvinen (2016) explored the quality of school life for Finnish and Korean students. In their study a three-dimensional QSL construct emerged, offering reliable measures for (i) *general satisfaction* (in terms of a sense of belonging, happiness at school and satisfaction with school life); (ii) *peer relations* (including making friends, closeness with other fellow students, feelings of alienation and loneliness); and (iii) *teacher-student relations* (involving students' perception of teachers' academic and emotional support, attention, fairness and friendliness).

3. Why is it important to measure the quality of school life?

Quality of school life is considered an important predictor of students' educational aspirations (Bourke & Smith, 1989). Research has provided consistent evidence that student perceptions of the quality of their life at school may

- 1) influence powerfully their motivation to learn;
- 2) improve their behaviour and self-regulation;
- 3) develop identity and positive attitudes towards success;
- 4) enhance their empathy and respect for diversity (of opinions, views, cultures, etc.);
- 5) contribute to better engagement in learning;
- 6) improve their academic performance and achievement; and
- 7) prevent dropout (Epstein & McPartland, 1976; Finn, 1989; Ainley et al., 1991; Linnakylä, 1996; Appleton et al., 2006, 2008; Suldo et al., 2013; Wang & Degol, 2015; Havik & Westergård, 2019).

There is strong evidence that higher satisfaction with school, better commitment to classwork and more favourable perceptions of the quality of interactions with teachers and peers are associated with a higher propensity of students to take responsibility for their success at school and progress in education (Wolf et al., 1980; Suldo et al., 2013; Havik & Westergård, 2019). Moreover, there is growing evidence that students' perceptions of the quality of their school experiences could mitigate the influence of contextual factors (such as socioeconomic status, gender, language spoken at home, etc.) on academic achievement and students' propensity to stay in school and to progress in further educational levels.

In a large-scale meta-analysis on the relationship between QSL and learning outcomes Barry Fraser (1986) explored 634 correlations from 12 studies involving 17 850 students in 823 classes, and found strong evidence that students' perceptions of

classroom cohesion are positively linked with their overall satisfaction with school, and negatively linked to their alienation from school. He concluded that the quality of classroom experiences significantly influences students' general attitudes towards learning and cognitive performance even when their characteristics are taken into account.

Mok & Flynn (1997) found strong evidence for the positive association between the quality of school life and academic achievement. In particular, their multilevel modelling shows that higher academic achievement can be expected of students who (1) are more satisfied with their life at school; (2) demonstrate a lower level of alienation; (3) have better relationships with teachers; (4) attribute higher importance of work at school for their future life and (5) have a stronger sense of achievement.

Although there is little evidence demonstrating that the sense of belonging to school is directly related to academic achievement, research studies suggest that students who experience a higher sense of belonging to school also have greater motivation and better engagement in learning, which in turn influence their academic performance and achievement (Osterman, 2000; Sari, 2012).

Building relationships and making the students feel safe and cared about in the classroom positively impact student learning (Barksdale et al., 2019). Using data from 11-, 13- and 15-year-old students from Finland, Latvia, Norway and Slovakia, Samdal et al. (1998) showed that the students' perceptions that they are treated fairly seemed to be most strongly related to the students' satisfaction with school, followed by feeling safe at school and supported by their teachers. Havik & Westergård (2019) documented the importance of students' perceptions of high-quality classroom interactions for their engagement in school, with teachers' emotional support showing the strongest association with students' emotional and behavioural engagement.

Goodenow (1993b) found that students' sense of belonging, relatedness and interpersonal support in the classroom were positively associated with students' motivation, effort and achievement. Her study also provided evidence that the perceived teacher support significantly affected students' assessment of the importance of the academic subject, their intrinsic interest in learning and the value they attach to their academic work. Based on a meta-analysis of 51 studies, Allen et al. (2018) concluded that teacher support and positive personal characteristics were the strongest predictors of school belonging. Hallinan (2008) also highlighted the importance of teachers' social and emotional support in shaping students' feelings about school and their academic performance.

Ultimately, students who feel rejected, excluded or ignored at school are more likely to experience intense anxiety, loneliness, depression and alienation from school (Osterman, 2000). Furthermore, Finn's 'participation-identification model' emphasises the importance of developing student identification with school (including the internalised conception of belongingness) to prevent absenteeism and truancy, disruptive behaviour, delinquency and dropout (Finn, 1986).

Research has long and consistently suggested that students' sense of safety at school may have a profound effect on their academic, behavioural, socio-emotional, and physical well-being (Brand et al., 2003). Bullying experiences in the classroom may have a widespread impact on school climate and the quality of students' life at school, and influence the way they commit, participate, learn and achieve. A school atmosphere characterised by bullying may result in a climate of fear and intimidation, leading to lower levels of school adjustment and school bonding (Brand et al., 2003; Haynie et al., 2001). Both bullies and victimised students tend to be less happy at school, to have fewer friends and to feel lonely at school (Forero et al., 1999; Haynie et al., 2001). Mehta et al. (2013) provided strong evidence that the impact of bullying may go far beyond the individual victims and have a detrimental effect on the school climate. Their study indicates that when students perceive the different aggressive behaviours typically associated with bullying as being widespread at their school, they feel less safe, and become less committed to school and less involved in school activities. Perceptions of a school climate characterised by bullying are also associated with poorer psychological and psychosomatic health (Forero et al., 1999). In a study exploring PISA 2015 data, Huang (2020) showed that both bullying victimisation and bullying climate had significant and negative correlations with students' performance in reading, maths and sciences.

Many factors defining the profiles of students at high risk of dropping out are more or less shaped by school climate and the quality of school life (Hristova et al., 2020). Various researchers have provided evidence that some of the most important factors for dropping out are related to social capital at schools, including the quality of support and care that students receive from their teachers (McDermott et al., 2017; McDermott et al., 2018); expectations attached to students and relationships between the students themselves (McDermott et al., 2018).

There is little research offering consistent estimates of the QSL dimensions across EU education systems and analysing their predictive value for different outcomes of schooling. Still, a study of quality of school life in Finland and South Korea using PISA

2012 data (Yoon & Järvinen, 2016) suggests that the QSL construct demands more attention in the era of 'rankings and benchmarked educational models'.

4. Method

4.1 Conceptual model for measuring the quality of school life in the EU

This study seeks to develop a multidimensional analytical model for measuring EU students' perceptions of the quality of their school life by adapting the concepts and measurement frameworks offered by Epstein & McPartland (1976), Williams & Batten (1981), Ainley et al. (1986), Williams & Roey (1997), Linnakylä (1996), Linnakylä & Brunell (1997) and Malin & Linnakylä (2001), and Mok & Flynn (1994, 1997, 2002 a, 2002 b) to the school-related well-being data gathered by the OECD's PISA 2018.

The PISA is the largest and the most representative international assessment in education, which provides opportunities for linking students' perceptions regarding different dimensions of their life at school to their educational achievement. In 2015, PISA introduced a special framework for examining student well-being. This framework has been applied in the PISA 2018 cycle as well. It distinguishes between various dimensions of well-being, including life as a whole, self-related well-being, school-related well-being, and well-being out of school (OECD, 2019). Our investigation and preliminary analytical work on conceptualising the QSL construct indicated that besides PISA, no other existing large-scale assessment offers promising potential to provide reliable and valid measures of all QSL dimensions targeted by our research model.

The analytical model advanced in this study consists of six specific QSL scales derived from Williams & Batten's social-structural perspective for quality of school life:

1/ *Opportunity* scale, measuring the perceived importance of schoolwork for future education and job prospects;

2/ *Achievement* scale, measuring students' perceptions of self-efficacy in learning and rewarding achievement;

3/ *Teachers* scale, measuring students' awareness of instructional and personal support, attention, understanding, encouragement and inspiration received from their teachers;

4/ *Belongingness* scale, measuring students' sense of social bonding, connectedness to school, of being part of and accepted by the school community; or alienation, isolation, loneliness;

5/ *Cooperation* scale, measuring cooperative spirit, perceived importance and value of the social learning interactions at school;

6/ *Safety* scale, measuring perceived emotional and physical safety of the school environment.

The underlying assumption of Williams & Batten's (1981) model, replicated in the later QSL research, is that schools are action systems that integrate and meet societal expectations about the purpose of schooling along with students' expectations of personal fulfilment. They argued that there are four major societal expectations about schooling that predefined relevant structures offered by schools and determined the students' expectations and perceptions related to the quality of their school life (Figure 1).

First, from the societal perspective, schools are expected to facilitate and certify the *achievement of technical competence*. Consistent with this expectation, schools develop and maintain certification structures and standards to certify that students achieve the expected competence. Students' reactions to these certification structures and standards depend on whether these structures are perceived to provide relevant competencies that offer *opportunities* for their future career and lives as adults (Williams & Batten, 1981; Williams & Roey, 1997; Linnakylä & Brunell, 1997). In line with this reasoning, we hypothesised an "*opportunity*" dimension based on a group of three questions from the PISA 2018 student questionnaire, reflecting the perceived importance of schoolwork and its potential benefits in terms of future educational and job opportunities ('trying hard at school will help me get a good job'; 'trying hard at school will help me get into a good <college>'; 'trying hard at school is important').

Second, societies expect schools to provide learning that facilitates and enhances the *personal development* of children. To meet this expectation, schools develop instructional structures and procedures. One way to evaluate their value for students is to look at their potential to ensure joyful and rewarding learning experiences that fuel students' intrinsic motivation and lead to valuable achievement. Thus, we hypothesised that instructional effectiveness in terms of students' experience of adventure in learning and rewarding achievement could be explored in two dimensions:

- students' perceptions of self-efficacy in learning and rewarding "*achievement*", measured by a set of three relevant statements from the PISA 2018 student questionnaire ('I usually manage one way or another'; 'I feel that I can handle many things at a time'; 'I feel proud that I have accomplished things'); and
- students' awareness of the academic and socio-emotional support, attention, understanding, encouragement and inspiration received by their teachers, which can contribute to self-motivation in learning and instructional effectiveness. For measuring the "*teachers*" aspect, we carefully selected and clustered seven relevant statements from PISA 2018 student questionnaire ('the teacher made me feel confident in my ability to do well in the course'; 'the teacher listened to my view on how to do things'; 'I felt that my teacher understood me'; 'the enthusiasm of the teacher inspired me'; 'the teacher showed enjoyment in teaching'; 'the teacher adapts the lesson to my class's needs and knowledge'; 'the teacher provides individual help when a student has difficulties').

Third, schools are expected to enhance *socialisation* and support the *social integration* of students. Schools meet this societal expectation by creating and maintaining socialisation structures to ensure students' integration and participation in the school's social life. From students' perspective, their socialisation is successful when they experience strong social ties, feel liked and accepted by their peers, and have a sense of belongingness to the school and the community. Successful social integration at school results in the development of students' self-awareness in their relationships with others, which is part of their *identity formation* (Williams & Batten, 1981). With this underlying theory and after exploring carefully the PISA methodological framework for measuring the social dimensions of students' well-being (Borgonovi & Pál, 2016), we hypothesised two QSL aspects related to socialisation and social integration at school:

- We propose to measure students' sense of "*belongingness*" as part of their identity formation by a set of six PISA questions exploring the social bonding at school, students' sense of being able to make friends, sense of being liked and accepted by the school community, and their connectedness to the school, as well as their feelings of alienation, isolation, and loneliness at school ('I make friends easily at school'; 'other students seem to like me'; 'I feel like I belong at school'; 'I feel awkward and out of place in my school'; 'I feel like an outsider (or left out of things) at school'; 'I feel lonely at school').

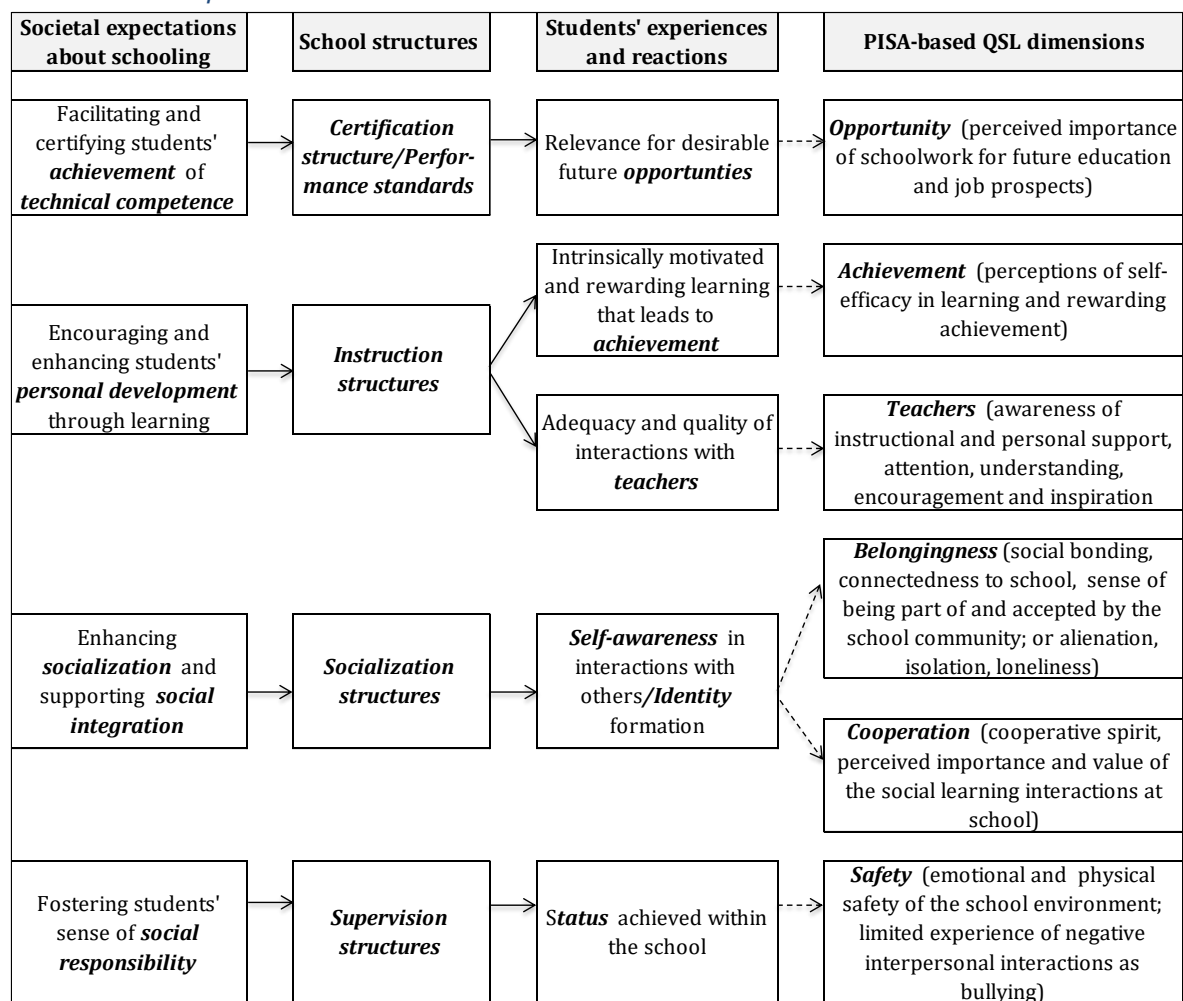
- The PISA methodological framework offers a good opportunity to explore the *cooperative learning spirit* established at schools and to evaluate the students' perceptions of the quality of social learning interactions within the socialisation structures at school. The underlying concept used in PISA is that the way students interact with each other and the value they attach to such interactions are important aspects of the social well-being they experience at school (Borgonovi and Pál, 2016). We use a combination of four items from the PISA 2018 student questionnaire to measure the extent to which schools encourage and enhance "cooperation" among peers, and teach young people to value cooperative interactions ('students feel that they are encouraged to cooperate with others'; 'it seems that students are cooperating with each other'; 'students seem to share the feeling that cooperating with each other is important'; 'students seem to value cooperation').

Fourth, schools are expected to nurture and foster each student's sense of *social responsibility* by establishing supervision structures that encourage students to learn and respect social norms and values. The original model of Williams and Batten (1981) considers this aspect of school life in the light of school effectiveness in promoting students' social responsibility and fostering their sense of self-worth and *status* in the group. Although the PISA methodology does not provide for direct indicators of status as measured by Williams & Batten, (1981), Ainley et al. (1986), Williams & Roey (1997), Linnakylä (1996), Linnakylä & Brunell (1997) and Malin & Linnakylä (2001), it offers a good opportunity to shed light on social responsibility at schools through the lenses of students' experience of bullying as opposed to the emotional and physical *safety* of the school environment.

Bullying at school is generally defined as chronic, intentional, unprovoked abuse of power and acts of aggression directed towards a student who has less *status* (Forero et al., 1999; Huang et al., 2018). Research generally supports the notion that bullying is (a) related to social norms, beliefs and values; and (b) could have a detrimental impact on students' concept of self-worth. Therefore, it could be argued that frequent incidence of bullying in the classroom is related to a school's lack of success in promoting social responsibility among students and is conducive to a climate of fear and intimidation, which negatively affects the students' perceptions of self-worth, the level of their school bonding and their adjustment to the school community. As part of the peer-relationships aspect of social well-being at schools, PISA 2018 investigates three forms of bullying at school from the victim's perspective: verbal, physical and relational bullying. We use the reversed values of six PISA 2018 indicators for the

frequency of bullying incidents to measure students' experience of "safety" school environment associated with lower exposure to bullying (during the past 12 months, how often have these statements applied: 'other students left me out of things on purpose'; 'other students made fun of me'; 'I was threatened by other students'; 'other students took away or destroyed things that belonged to me'; 'I got hit or pushed around by other students'; 'other students spread nasty rumours about me').

Figure 1. Conceptual model of the quality of school life construct based on the PISA 2018 student questionnaire



Source: Adapted from Williams & Batten (1981).

4.2 Data

Among the 26 EU countries¹ included in this research model, a total of 189 468 15-year-old students participated in PISA 2018 assessment cycle. More specifically, we

¹ Cyprus is not included in this study.

use the data from participating students in Austria (N=6 802), Belgium (N=8 475), Bulgaria (N=5 294), Croatia (N=6 609), the Czech Republic (N=7 019), Denmark (N=7 657), Estonia (N=5 316), Finland (N=5 649), France (N=6 308), Germany (N=5 451), Greece (N=6 403), Hungary (N=5 132), Ireland (N=5 577), Italy (N=11 785), Latvia (N=5 303), Lithuania (N=6 885), Luxembourg (N=5 230), Malta (N=3 362), the Netherlands (N=4 765), Poland (N=5 625), Portugal (N=5 932), Romania (N=5 075), the Slovak Republic (N=5 965), Slovenia (N=6 401), Spain (N=35 943) and Sweden (N=5 504).

4.3 Procedures and measures

After secondary conceptualisation of the QSL dimensions described above, we selected 29 items from the PISA 2018 student questionnaire that we consider relevant to this concept. All the identified questions used a 4-point Likert scale to obtain responses. Each of the selected items was intended to contribute towards one of the six predefined QSL scales measuring a specific QSL dimension. The validity of the suggested construct was confirmed by the means of exploratory factor analysis and reliability testing.

As a first stage of the exploratory analysis of the conceptualised QSL construct, we carried out a principal component analysis (PCA) using varimax rotation with Kaiser normalisation on the entire sample (N=189 468). This analysis was intended to ascertain whether all of the selected 29 individual items clustered consistently into the respective scale as predicted in the measurement model. Eigenvalue one criterion was used, with factor loadings equal to or above 0.40 considered to be substantial enough for the allocation of items. The internal consistency of the six scales was checked using Cronbach's alpha.

As demonstrated in Table 1, the PCA results fully confirmed the consistency of the conceptualised latent structure of the QSL construct. Six orthogonal factors with eigenvalues greater than one emerged, accounting for 59.7% of the variance. Items loading heavily on the first principal component (which explained 19% of variance) were related to students' perceptions of the adequacy and quality of their interactions with teachers (the *teachers* scale). The second factor explaining 12% of variance contained all the items expressing the incidence of bullying at schools (conceptualised as the *safety* scale). The third factor dealt exclusively with students' positive and negative reactions to school, their sense of belonging or alienation (conceptualised as the *belongingness* scale). All items tapping students' perceptions of cooperative culture at their school were loading as predicted for the *cooperation* scale. The last two

factor loadings also confirmed the expected item structure of the last two suggested QSL scales – *opportunity* and *achievement*. All individual items showed loadings in the range of 0.6-0.9 (far beyond the cutoff) on the appropriate scale (latent structure).

Cronbach's alpha coefficients indicated good internal consistency of the instrument ($\alpha=0.85$) and the individual scales (Table 1). The alpha coefficient for the entire construct is high at 0.847. The first five scales also demonstrated very good measures of internal consistency with Cronbach's alphas, varying between 0.79 and 0.90. Only the *achievement* scale showed an alpha of 0.62 which is slightly below the widely accepted cutoff value of 0.7. But given a small number of items (only three), we considered it appropriate to accept the lower alpha coefficient for this scale (Nunnally & Bernstein, 1994; Peterson, 1994; Van Griethuijsen et al., 2014). To confirm this appropriateness, we calculated the composite reliability (CR) based on standardised factor loadings and error variances, as it is deemed to offer a better estimate of the degree to which the measured variables are reflected by the underlying construct (Hair et al., 2010). The value of the composite reliability for the *achievement* scale is calculated at 0.78, which is above the recommended cutoff value of 0.7 (Nunnally & Bernstein, 1994).

Table 1. Theoretical and empirical structure of the quality of school life construct based on the PISA 2018 data

QSL scale	Theoretical clustering of PISA items	Empirical factor structure	Rotated factor loading	Internal consistency (Cronbach's alpha)
Teachers	I felt that my teacher understood me.	I felt that my teacher understood me.	0.80	0.84
	The teacher made me feel confident in my ability to do well in the course.	The teacher made me feel confident in my ability to do well in the course.	0.78	
	The teacher listened to my view on how to do things.	The teacher listened to my view on how to do things.	0.78	
	The enthusiasm of the teacher inspired me.	The enthusiasm of the teacher inspired me.	0.70	
	The teacher showed enjoyment in teaching.	The teacher showed enjoyment in teaching.	0.67	
	The teacher adapts the lesson to my class's needs and knowledge.	The teacher adapts the lesson to my class's needs and knowledge.	0.64	

	The teacher provides individual help when a student has difficulties.	The teacher provides individual help when a student has difficulties.	0.62	
Safety	I was threatened by other students. (R)	I was threatened by other students.	0.83	0.87
	I got hit or pushed around by other students. (R)	I got hit or pushed around by other students.	0.82	
	Other students took away or destroyed things that belonged to me. (R)	Other students took away or destroyed things that belonged to me.	0.80	
	Other students spread nasty rumours about me. (R)	Other students spread nasty rumours about me.	0.77	
	Other students made fun of me. (R)	Other students made fun of me.	0.72	
	Other students left me out of things on purpose. (R)	Other students left me out of things on purpose.	0.67	
Belongingness	I feel lonely at school. (R)	I feel lonely at school.	0.75	0.79
	I feel awkward and out of place in my school. (R)	I feel awkward and out of place in my school.	0.69	
	I feel like an outsider (or left out of things) at school. (R)	I feel like an outsider (or left out of things) at school.	0.69	
	I make friends easily at school	I make friends easily at school	0.68	
	Other students seem to like me.	Other students seem to like me.	0.64	
	I feel like I belong at school.	I feel like I belong at school.	0.61	
Cooperation	Students seem to share the feeling that cooperating with each other is important.	Students seem to share the feeling that cooperating with each other is important.	0.89	0.89
	It seems that students are cooperating with each other.	It seems that students are cooperating with each other.	0.88	
	Students seem to value cooperation.	Students seem to value cooperation.	0.84	

	Students feel that they are encouraged to cooperate with others.	Students feel that they are encouraged to cooperate with others.	0.82	
Opportunity	Trying hard at school will help me get a good job.	Trying hard at school will help me get a good job.	0.85	0.80
	Trying hard at school is important.	Trying hard at school is important.	0.84	
	Trying hard at school will help me get into a good <college>.	Trying hard at school will help me get into a good <college>.	0.81	
Achievement	I usually manage one way or another.	I usually manage one way or another.	0.75	0.62 (0.78 CR)
	I feel that I can handle many things at a time.	I feel that I can handle many things at a time.	0.73	
	I feel proud that I have accomplished things.	I feel proud that I have accomplished things.	0.72	

Source: Authors' own calculations.

At the second stage, factor analyses were undertaken for each of the national samples included in this study to investigate the stability of the six-dimensional latent structure in individual countries. We presumed that if the factor loadings indicated that the same latent structure emerged in each country, we would have grounds for claiming to have identified certain QSL aspects that could be considered universal across the EU (Williams & Roey, 1997). Since we already confirmed the predicted latent structure to be based on six constructs, this time we rotated six factors instead of using the eigenvalue one criterion. We found that the items in national samples indeed clustered into scales consistent with the latent structure of the measurement model². The rotated factor loadings after performing a varimax rotation on the national data ranged between 0.6 and 0.9, as detailed in Annex I. Such high factor loadings after

² In Bulgaria, items attributed to the belongingness dimension tend to fall into two distinctive clusters reflecting positive and negative reactions to school. Using a confirmatory factor analysis approach to the same data set, Hristova et al. (2020) confirmed two interrelated subscales within the *belongingness* aspect referring to the reactions of Bulgarian students to school: (i) positive reactions (identity, connection, status) and (ii) negative reactions (alienation, loneliness, awkwardness). These results are compatible with the models suggested by Williams & Batten (1981) and Ainley et al. (1986) distinguishing positive and negative affects in relation to school.

rotation are considered to give a solid definition for the six QSL scales. These results provided a reasonable ground for claiming that the identified measurement model captures aspects of the quality of school life that could be regarded as universal across European school systems, despite the specific national policy, institutional and socio-cultural influences.

At a national level, a high level of internal consistency based on Cronbach's alpha was demonstrated for five of the QSL scales – *teachers* ($\alpha=0.8-0.9$), *safety* ($\alpha=0.8-0.9$), *belongingness* ($\alpha=0.7-0.9$), *cooperation* ($\alpha=0.9$) and *opportunity* ($\alpha=0.7-0.9$) (Table 2). As discussed above, in some countries we see slightly lower Cronbach's alphas with regard to the *achievement* scale. However, as the values of CR calculated for all national samples exceeded the recommended cutoff value of 0.7 (Nunnally & Bernstein, 1994), we decided to keep this scale despite the slightly lower alphas. Its reliability could be further improved by increasing the number of items, but the PISA 2018 database does not offer such an opportunity.

Table 2. Reliability tests for quality of school life scales based on national samples

	Cronbach's alpha																										
	AT	BE	BG	CZ	DE	DK	ES	EE	FI	FR	EL	HR	HU	IE	IT	LV	LU	LT	MT	NL	PL	PT	RO	SK	SI	SE	
TEACHERS	0.84	0.82	0.87	0.84	0.84	0.83	0.86	0.84	0.86	0.85	0.83	0.85	0.86	0.85	0.83	0.82	0.85	0.85	0.89	0.85	0.84	0.85	0.82	0.82	0.84	0.86	
SAFETY	0.86	0.80	0.92	0.85	0.83	0.80	0.87	0.84	0.86	0.86	0.87	0.89	0.88	0.85	0.89	0.85	0.87	0.92	0.90	0.78	0.88	0.87	0.87	0.89	0.89	0.84	
BELONGINGNESS	0.85	0.79	0.71	0.78	0.80	0.83	0.85	0.81	0.85	0.68	0.80	0.83	0.83	0.83	0.79	0.82	0.78	0.77	0.78	0.80	0.79	0.81	0.81	0.78	0.80	0.86	
COOPERATION	0.92	0.88	0.89	0.89	0.91	0.90	0.92	0.89	0.92	0.89	0.88	0.93	0.92	0.89	0.87	0.87	0.91	0.93	0.89	0.88	0.89	0.91	0.87	0.89	0.91	0.93	
OPPORTUNITY	0.74	0.82	0.83	0.79	0.69	0.91	0.84	0.81	0.88	0.81	0.78	0.84	0.80	0.88	0.79	0.80	0.82	0.83	0.86	0.90	0.83	0.87	0.80	0.82	0.82	0.87	
ACHIEVEMENT	0.64	0.51	0.79	0.61	0.59	0.62	0.65	0.68	0.68	0.60	0.66	0.63	0.62	0.58	0.61	0.61	0.70	0.66	0.70	0.61	0.67	0.64	0.59	0.69	0.69	0.71	
	Composite Reliability																										
ACHIEVEMENT	0.77	0.74	0.66	0.77	0.76	0.77	0.80	0.79	0.79	0.78	0.78	0.79	0.78	0.76	0.77	0.77	0.80	0.78	0.80	0.77	0.80	0.79	0.75	0.79	0.81	0.81	

Source: Authors' own calculations.

Following confirmation of construct validity, the mean of the item scores on each scale was calculated to provide a measurement of the relevant QSL dimension for each country. The scale scores vary in the range of a minimum value of 1 and a maximum value of 4. The higher scale scores indicate more positive student perceptions of the quality of their experiences in the respective QSL aspect. When interpreting the results, we assume that scale scores higher than 3 indicate a high level of subjective quality, while results below 2 are interpreted as representing rather low quality. Descriptive statistics for national QSL scales are presented in Annex II. Analysis of variance (ANOVA) with a Games-Howell post hoc test was applied to compare the QSL scales scores between the EU educational systems. We found statistical significance in

the differences in the views of adolescents from the assorted national school systems with regard to all scales. Cohen's f was calculated to evaluate the effect size.

For each of the 26 countries, the statistical significance in the gender differences of the QSL perceptions was examined with t-tests. One-way ANOVAs were applied to study national variances in QSL scales in the four quartiles of the PISA index of economic, social and cultural status (ESCS). To investigate the QSL explanatory power for student academic achievement in each country, regression models were applied linking the QSL subscales with students' results in reading when controlling for students' background characteristics (gender and ESCS).

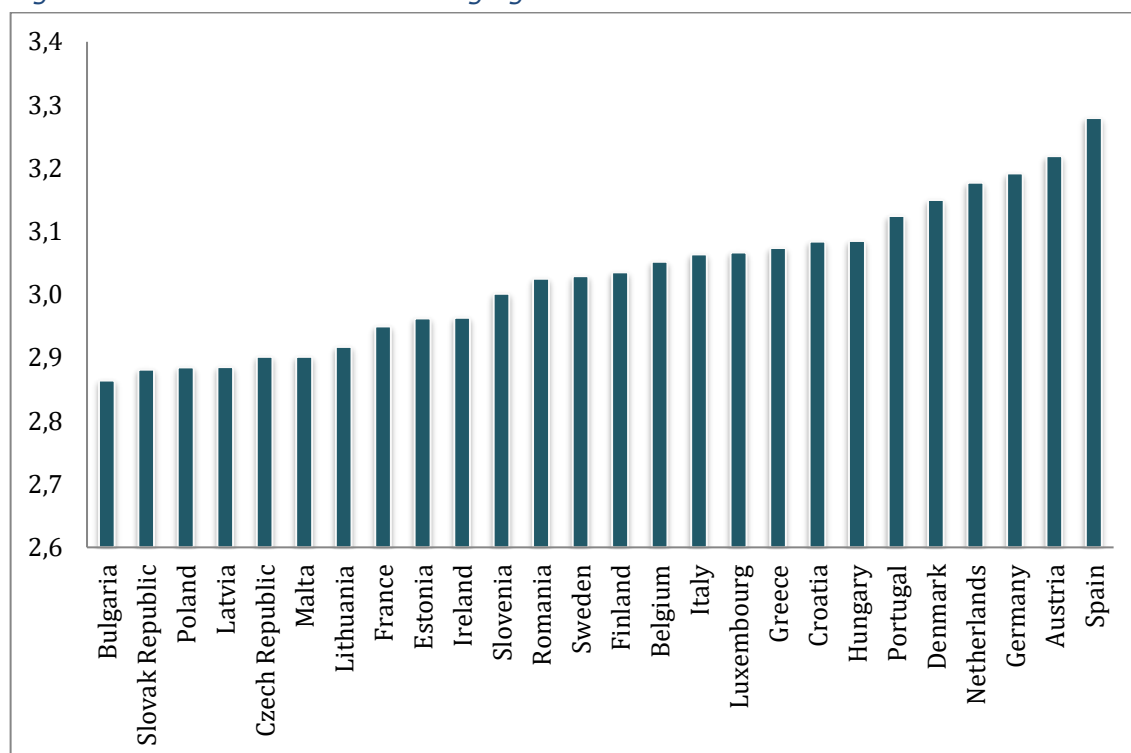
5. Analysis

5.1 How do 15-year-old EU students evaluate the quality of life at their schools?

The quality of school life model used in this study suggests that some QSL aspects are well captured by PISA and could be considered universal across European school systems, despite the specific national policy, institutional and socio-cultural influences. Acknowledging the need for further examination of how historical, socioeconomic, institutional and cultural differences between EU countries affect the quality of student's life at school, in this section we provide an initial comparative overview of the quality of school life experienced by 15-year-old students across the EU.

Figure 2 presents the distribution of students' sense of *belongingness* to their school across EU countries. This scale reflects adolescents' general satisfaction with school, their awareness of their place in the school environment and their ability to connect with others as part of their identity formation. Among EU countries, the highest level of belongingness is demonstrated by students in the Netherlands, Germany, Austria and Spain, while in Bulgaria, Slovakia, Poland and Latvia students seem to have less positive experiences of being accepted, respected and included in their school communities.

Figure 2. Students' sense of belongingness to their school in EU countries

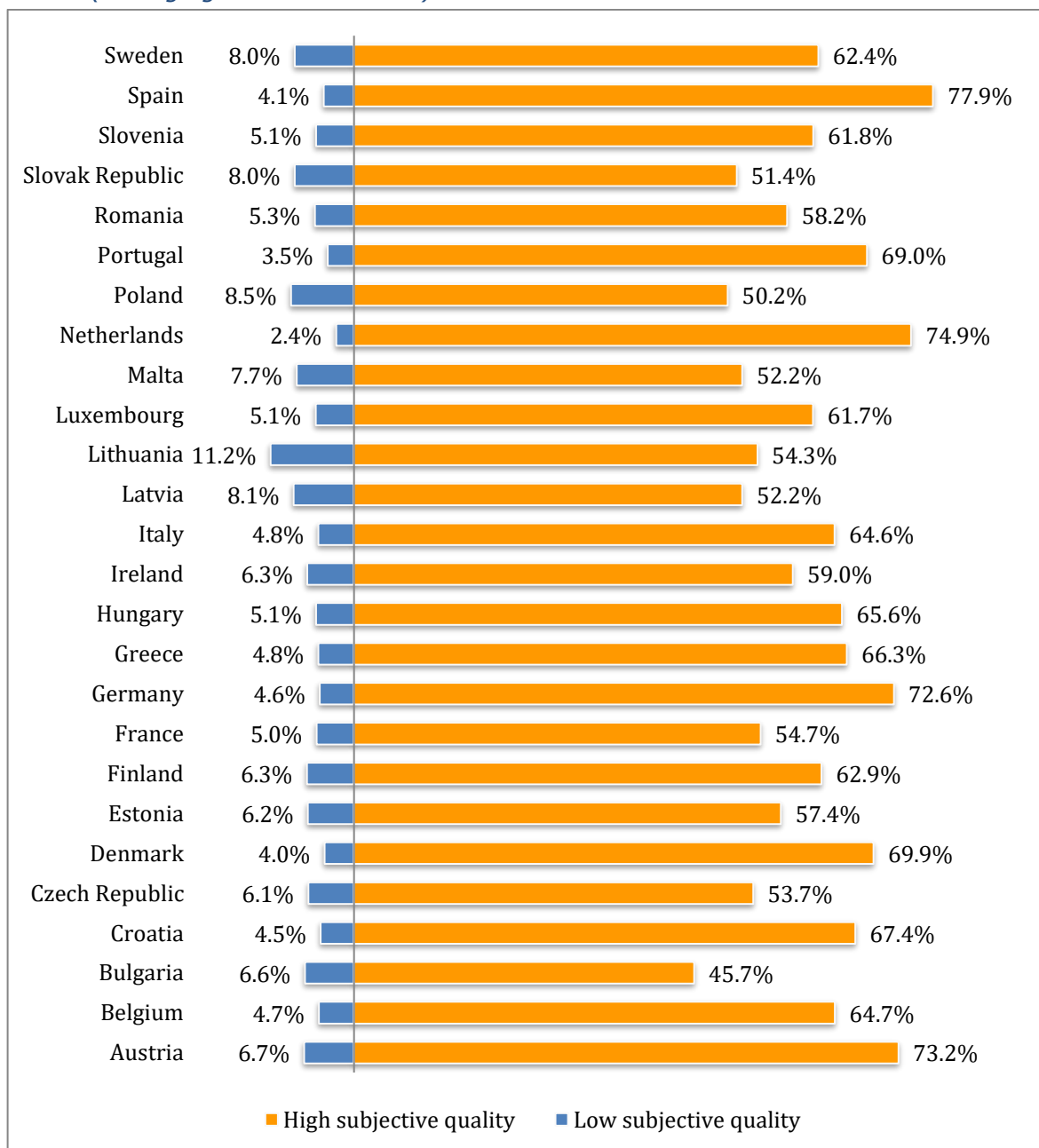


Source: Authors' own calculations.

Another way to look at the data is to consider the distribution of students experiencing a weak and strong sense of belongingness to school. As explained above, the scores for each scale vary within the range of 1-4, with higher scores indicating more positive student perceptions of the quality of their experiences related to the respective QSL dimension. Scale scores higher than 3 are assumed to indicate a high level of domain-specific subjective quality, while results below 2 are interpreted as representing a rather low quality of school life related to this aspect.

Across the EU countries, between 50% and 78% of students perceive a high degree of school bonding, connectedness, attachment and acceptance, and feel like an important part of their school community (Figure 3). Only in Bulgaria do less than half of the students report positive feelings of being accepted, included and welcomed at school. In most countries, less than 10% of students demonstrate low psychological embeddedness in the school environment, with the leading shares registered in Lithuania (11.2%), Poland (8.5%) and Latvia (8.1%). However, having substantially different cultures and schooling systems in the EU, those results are not straightforward or easy to interpret.

Figure 3. Percentage of students with a low or high degree of belongingness to their school (belongingness scale scores)

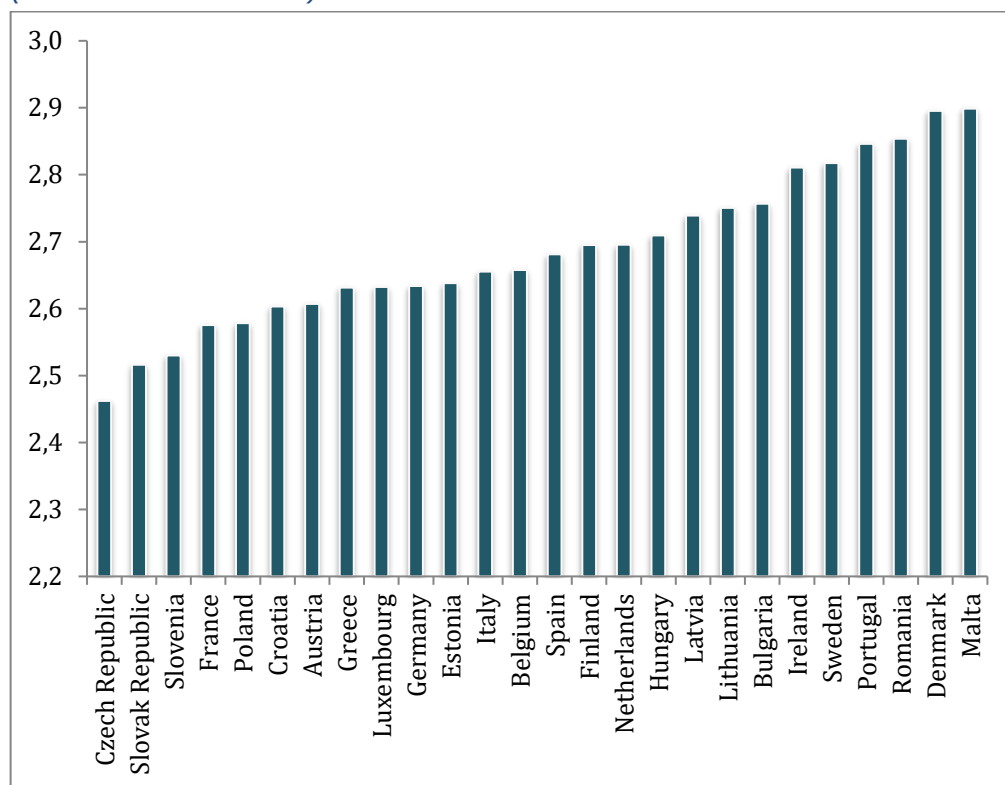


Source: Authors' own calculations.

Figure 4 presents the results of the *teachers* scale, capturing students' perceptions of teachers' attitudes, support, empathy and warmth. There are indications that students in some countries (like the Czech Republic, Slovakia and Slovenia, for example) have less positive experiences with teaching styles in providing individual help and lesson adaptation, as well as the focus on listening to students' opinions and nurturing their

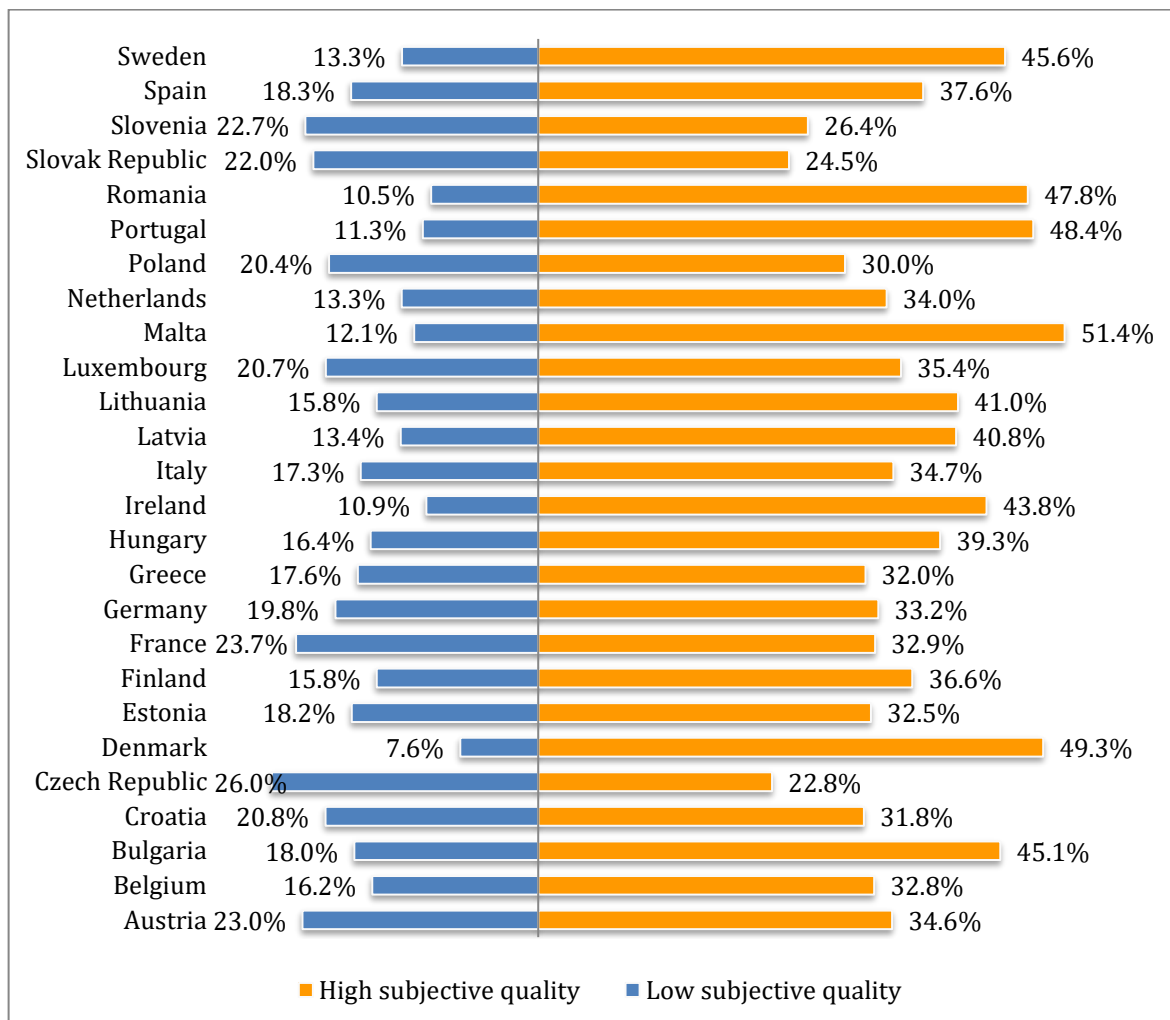
confidence and inspiration. At the same time, adolescents from countries like Romania, Denmark and Malta demonstrate higher ratings of the quality of their interpersonal relations with teachers and the support, attention, understanding and encouragement received. When considering distributions of student perceptions of the low or high quality of their relations with teachers, it appears that with the exception of Czech, Slovak and Slovenian students, between 30% and 50% of adolescents across the EU demonstrate give a positive assessment of the instructional and personal support, attention, understanding, encouragement and inspiration received from their teachers (Figure 5). Nonetheless, almost every fourth student from the Czech Republic and France, and every fifth student from Austria, Slovenia, Slovakia, Poland and Luxembourg, give rather low subjective assessment of the quality of their interactions with teachers.

Figure 4. Students' self-assessment of the quality of their interactions with teachers (teachers scale scores)



Source: Authors' own calculations.

Figure 5. Percentage of students perceiving the quality of teacher-student relations as low or high

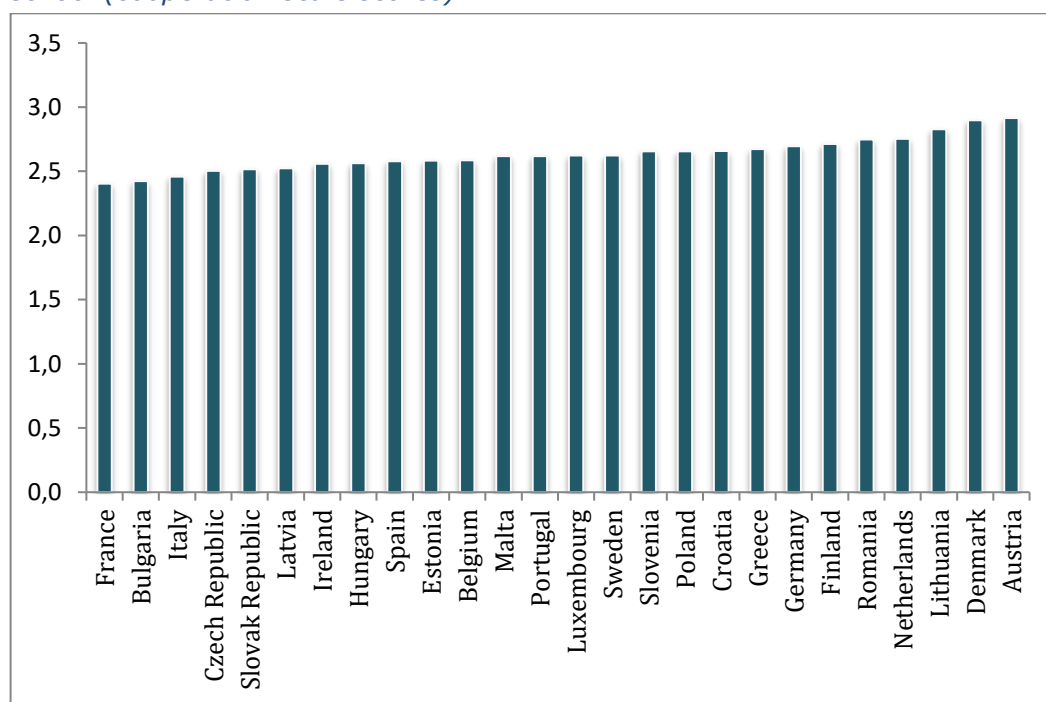


Source: Authors' own calculations.

The results for the *cooperation* scale as seen in Figure 6 indicate an almost uniform self-assessment by 15-year-olds across Europe of the quality of the cooperative spirit at their schools, with scale scoring varying between 2.4 (in France and Bulgaria) and 2.9 (in Denmark and Austria). A more diverse and detailed picture emerges when we look at the distribution of adolescents' perceptions across the low-high quality scoring spectrum shown in Figure 7. Some 62.8% of Danish and 62.4% of Austrian students perceive a high-quality approach to cooperative learning at their schools that encourages students to understand the importance of cooperative efforts, to work together and to value cooperation. A similarly positive subjective assessment is

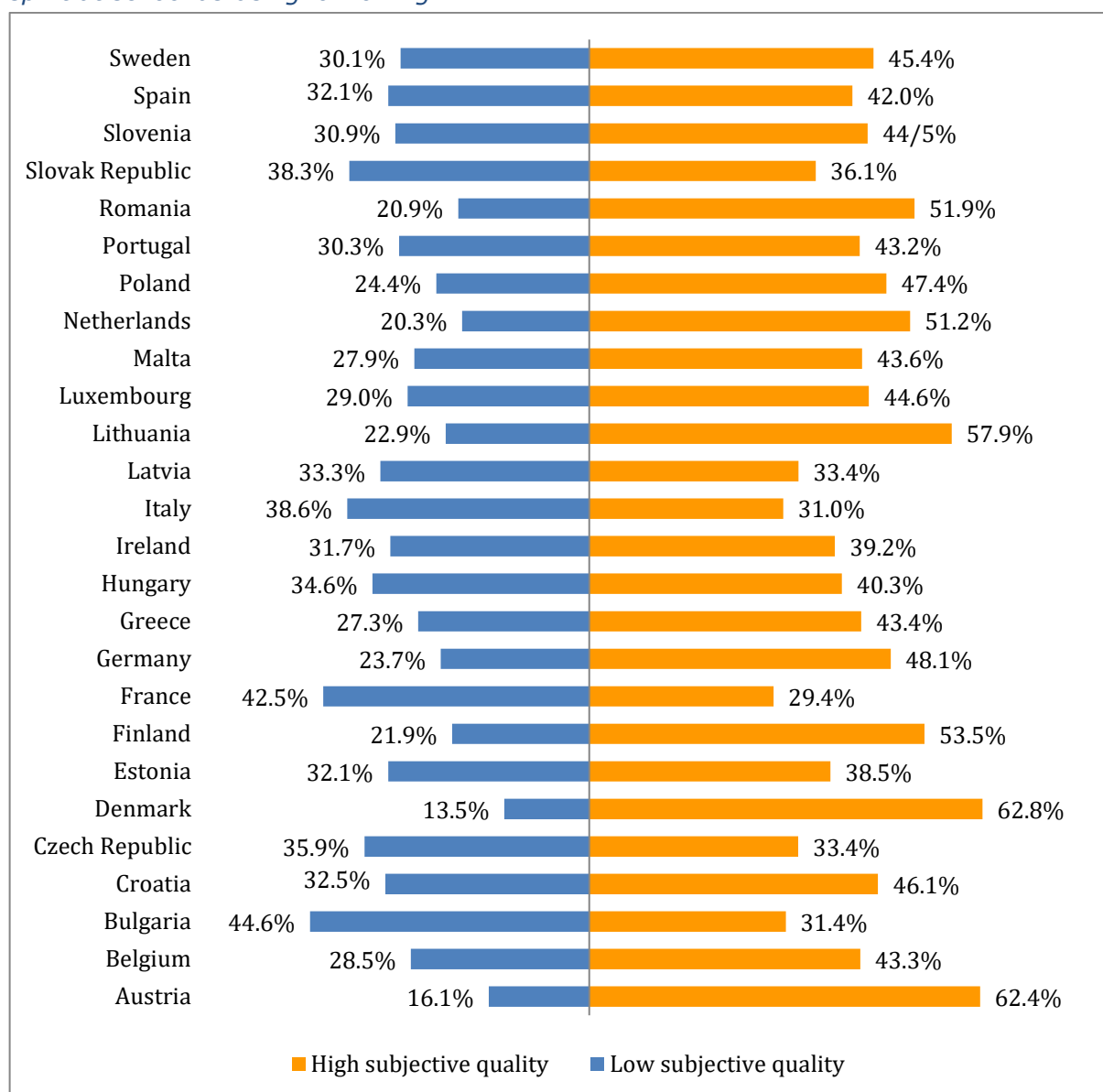
provided by every second student in Lithuania, the Netherlands and Romania. Yet, in some countries like Bulgaria, France, the Czech Republic, Italy and Slovakia, negative subjective assessments of the quality of the cooperative learning spirit at schools are more common than positive ones (Figure 7). On the low end of the spectrum, 44.6% of Bulgarian and 42.5% of French adolescents perceive a low level of acknowledgement of the importance and value of cooperation and limited cooperative learning practices at their schools.

Figure 6. Students' self-assessment of the quality of the cooperative learning spirit at school (cooperation scale scores)



Source: Authors' own calculations.

Figure 7. Percentage of students perceiving the quality of the cooperative learning spirit at school as being low or high



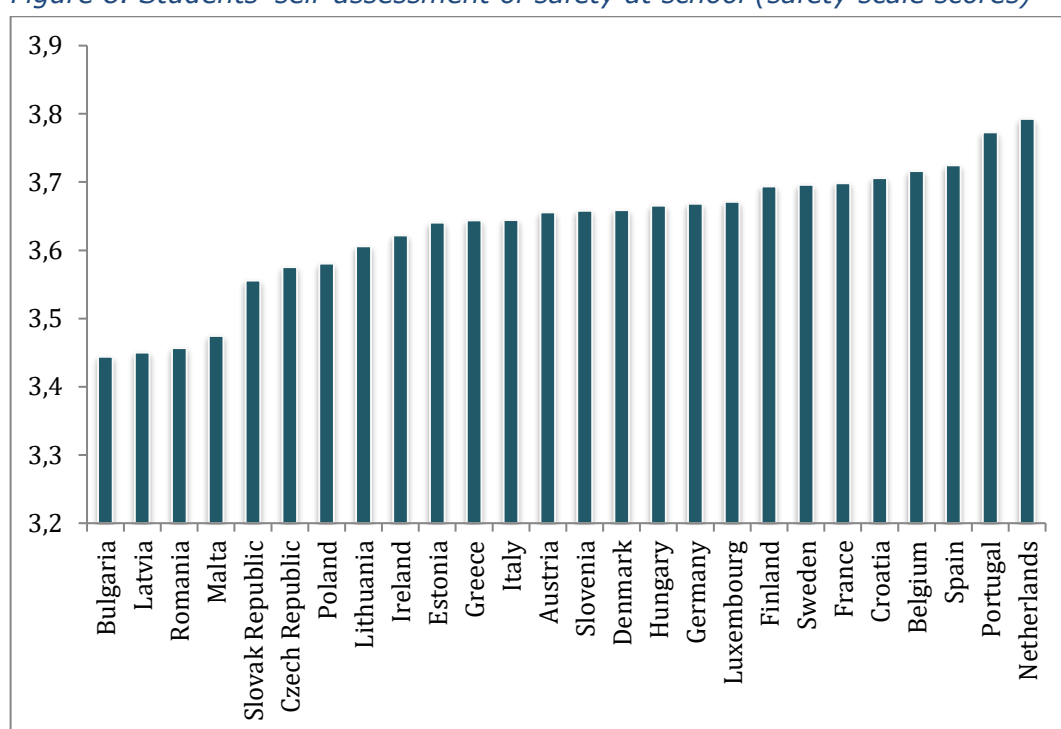
Source: Authors' own calculations.

The feeling of being secure is a typical quality of life measure which we apply to the school environment. The students across Europe perceive their safety at school, associated with lower exposure to bullying, as rather high. As shown in Figure 8, the *safety* scale scores vary between 3.4 in Bulgaria to some 3.8 (out of 4 points) in Portugal and the Netherlands. The descriptive statistics reported in Annex II provide for a more detailed analysis of the relative stance of the safety dimension within the

quality of school life construct in individual countries. This is the highest-scoring scale in QSL construct in all 26 countries.

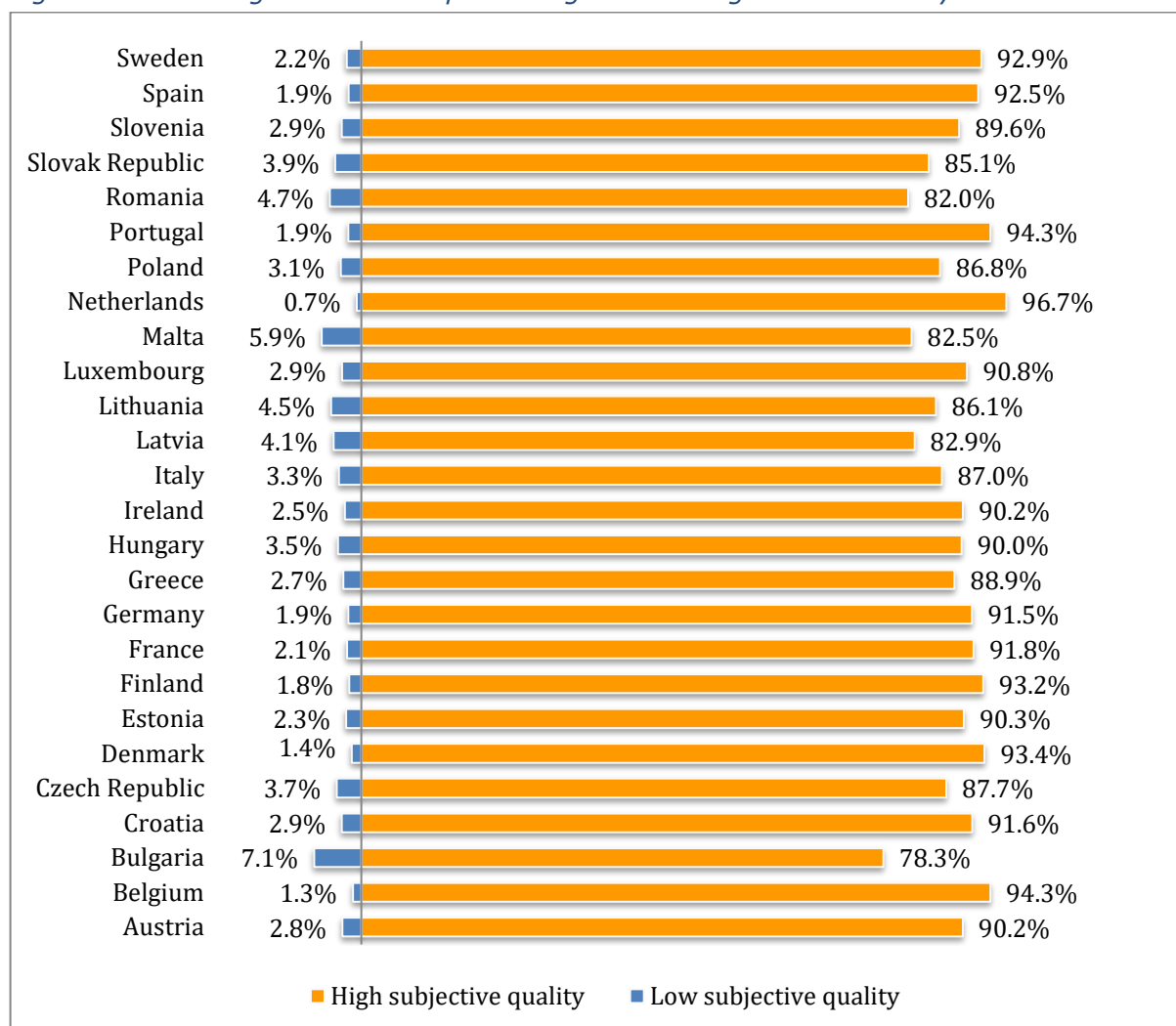
To capture a more detailed picture of personal experiences, we look at the distribution of students experiencing low and high subjective degree of *safety*. As evidenced in Figure 9, in 15 out of 26 EU countries, more than 90% of 15-year-old students experience a rather safe school environment and never or rarely encounter bullying-related behaviour at school. The highest percentage of students experiencing systemic exposure to some form of physical, verbal or relational aggression or harassment is observed in Bulgaria (7.1%), Malta (5.9%) and Romania (4.7%). At the same time, in relation to safety, Bulgaria is the country with the lowest percentage of students (78.3%) who experience a safe environment conducive to their quality of life at school, with the remaining 14.6% of Bulgarian 15-year-olds experiencing some modest exposure to bullying behaviour at school. In the next section of the report, we will try to shed light on whether these subjective experiences vary according to students' socio-demographic background.

Figure 8. Students' self-assessment of safety at school (safety scale scores)



Source: Authors' own calculations.

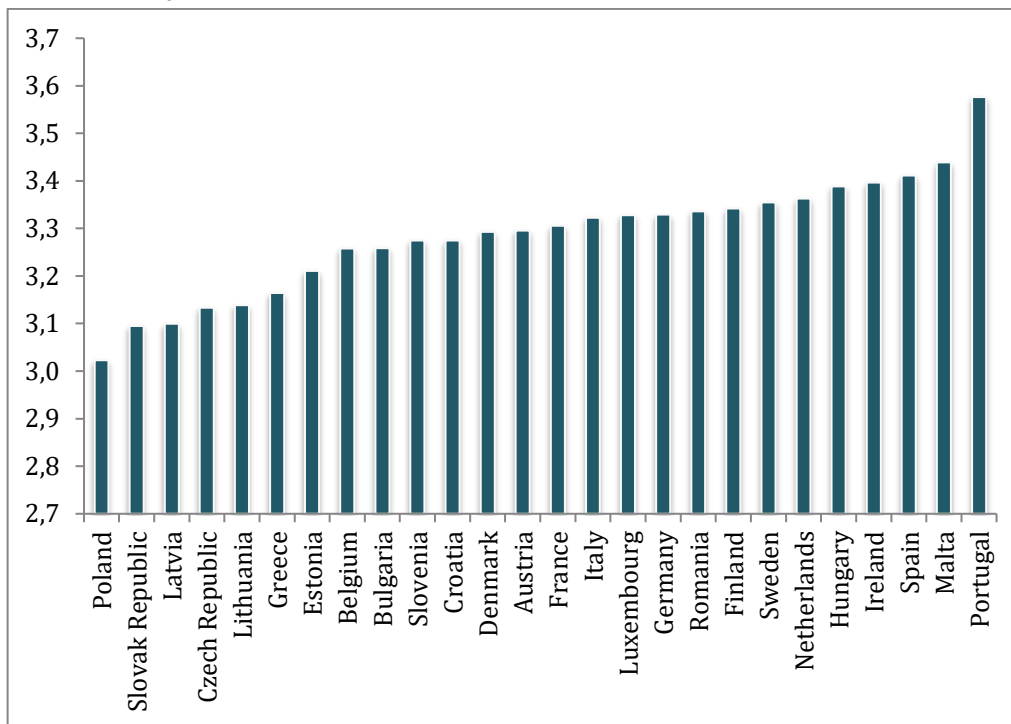
Figure 9. Percentage of students perceiving a low or high level of safety at school



Source: Authors' own calculations.

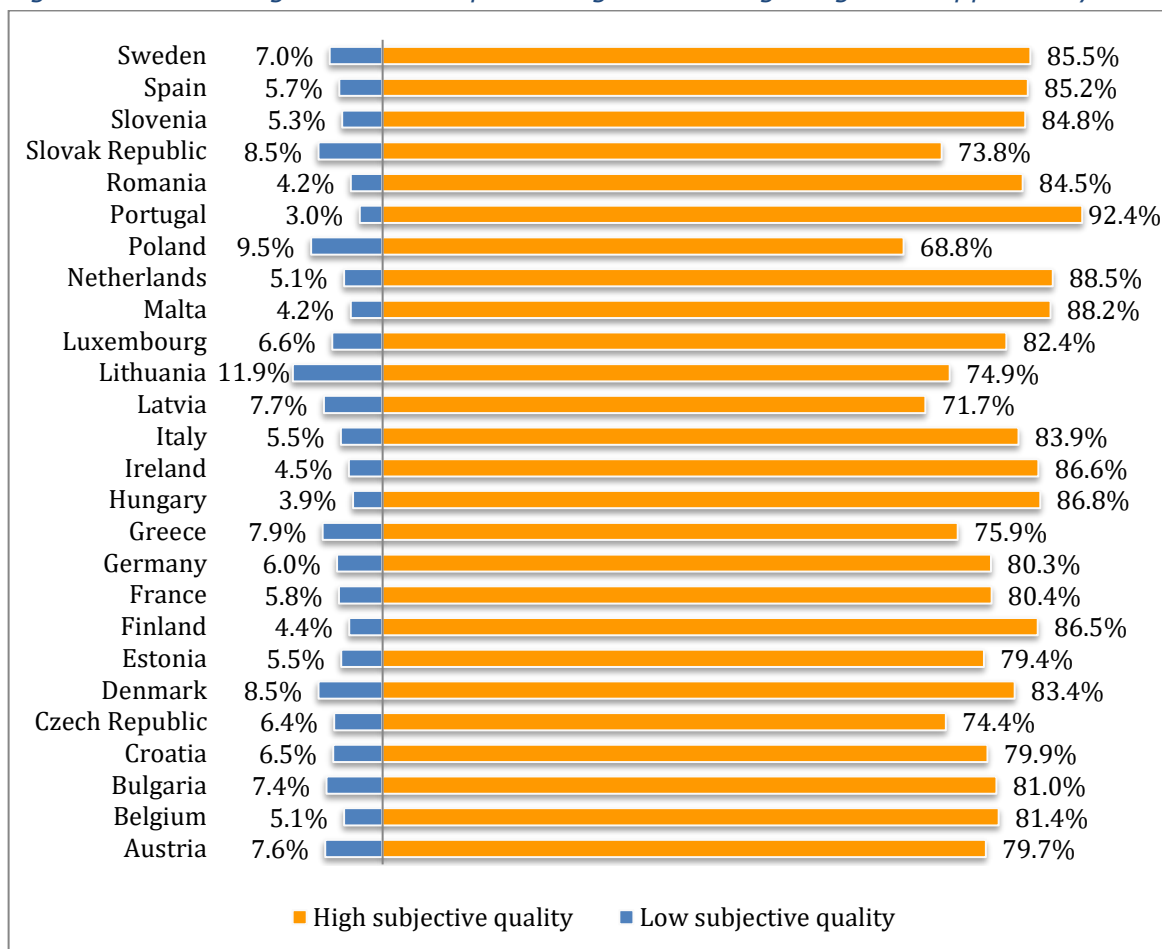
Figure 10 shows students understanding and beliefs about how important their efforts at school are for their future life and educational and career prospects. Across all 26 EU countries, the "opportunity" scale mean scores are above the level of 3, which signals a rather high rating of quality in this QSL dimension. Indeed, as seen in Figure 11, between 70% and 90% of students across the EU perceive the school as highly relevant to their future lives.

Figure 10. Students' self-assessment of the importance of schoolwork (opportunity scale scores)



Source: Authors' own calculations.

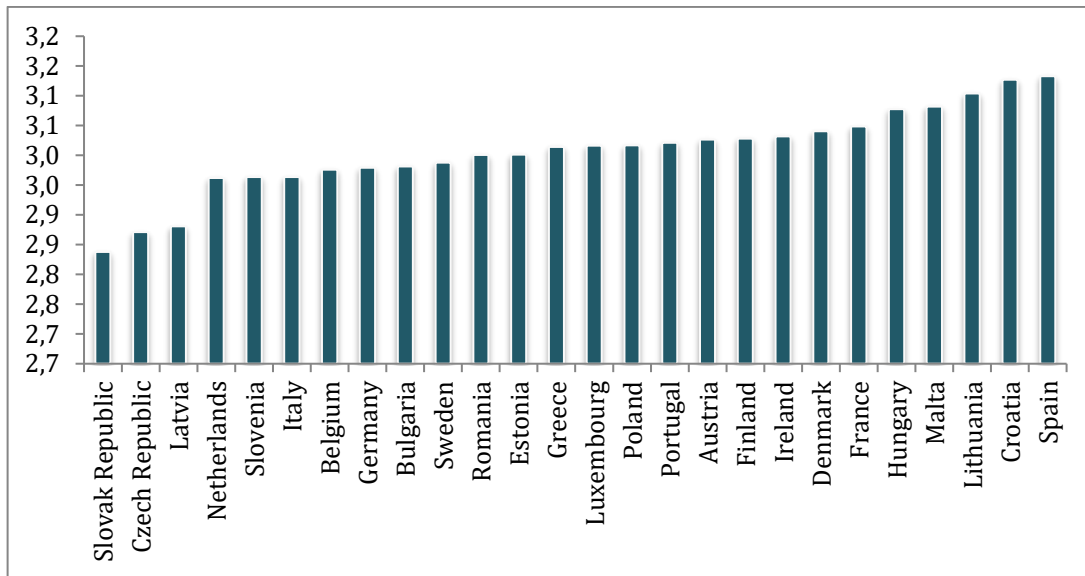
Figure 11. Percentage of students perceiving a low or high degree of opportunity



Source: Authors' own calculations.

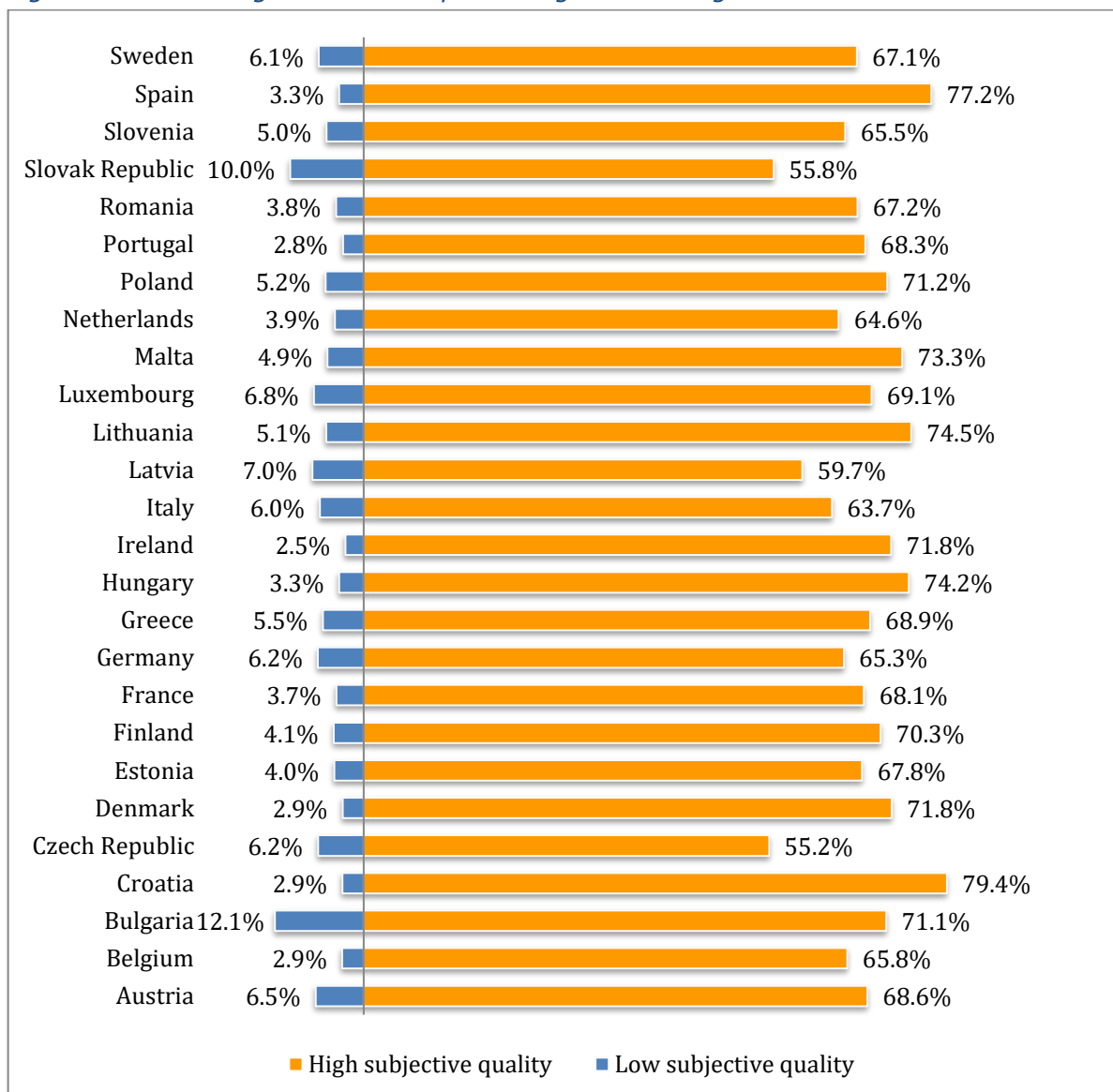
From the perspective of the *achievement* dimension, between 55% and 80% of students across the EU have a high self-rated ability to cope with tasks at school, and high satisfaction and pride with it (Figure 13). Yet, 12% of students in Bulgaria and 10% of students in Slovakia share rather low beliefs in self-efficacy.

Figure 12. Students' self-rated ability to cope with schoolwork (achievement scale scores)



Source: Authors' own calculations.

Figure 13. Percentage of students perceiving a low or high level of achievement

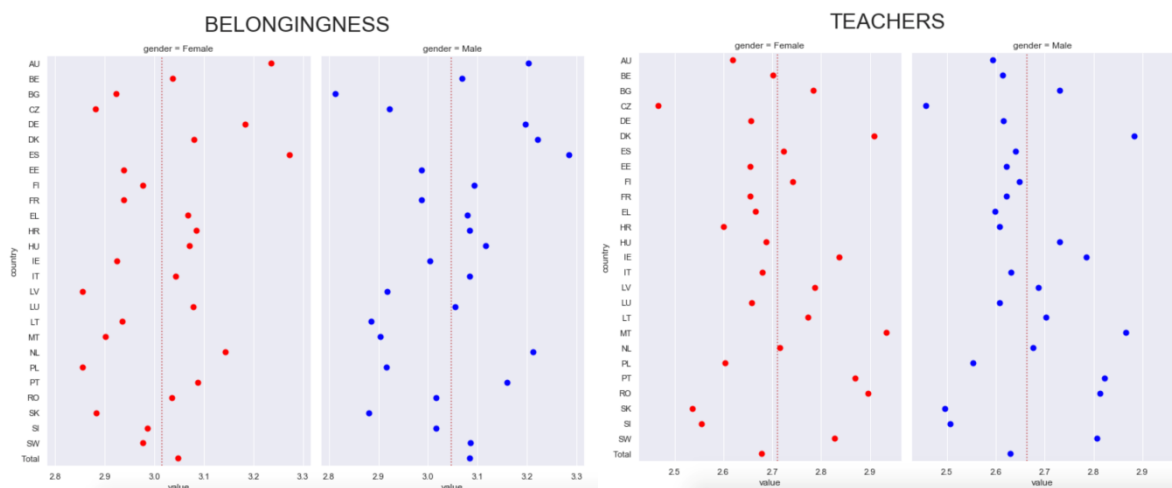


Source: Authors' own calculations.

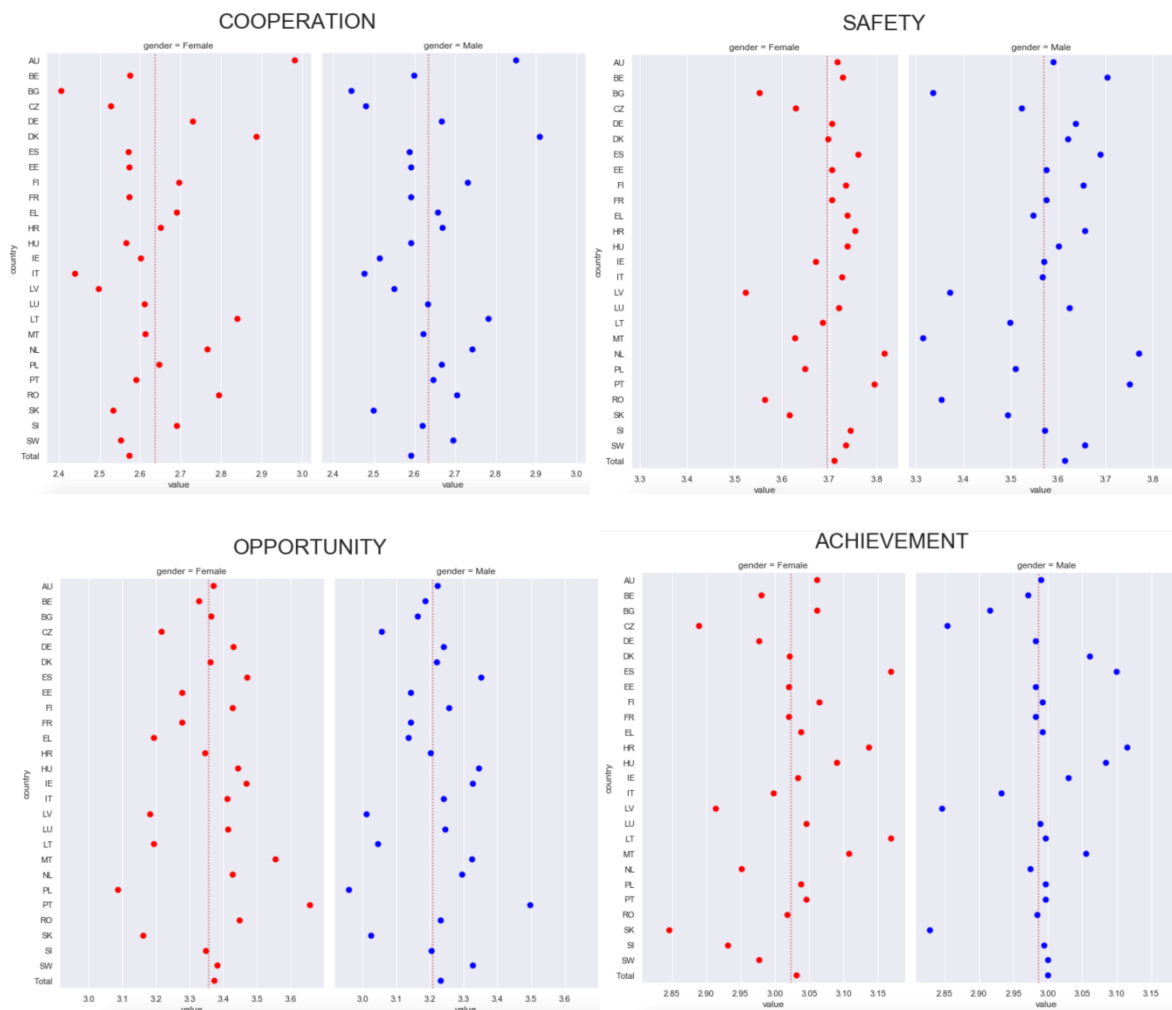
5.2 How do students in the EU experience the quality of school life according to their gender and socioeconomic background?

In all countries included in this study boys and girls seem to perceive their life at school differently (Figure 14)³. Other things being equal, girls tend to rate their life at school more positively than do boys in most of the QSL aspects. Across Europe, girls experience a higher subjective sense of *opportunity* and *achievement*. In every country, boys are more likely to become victims of bullying at school. Almost the same picture emerged with respect to students' perceptions of their interactions with *teachers*, with girls rating higher the quality of teachers' emotional and academic support, empathy, acceptance and respect almost everywhere (with exception of Croatia and Hungary). Boys tend to experience a stronger sense of *belongingness* to their school than girls. The only exception to this pattern is seen in Bulgaria, Lithuania and Luxembourg, where girls demonstrate higher sense of embeddedness in the classroom.

Figure 14. Quality of school life perceptions by gender (scale score range 1-4)



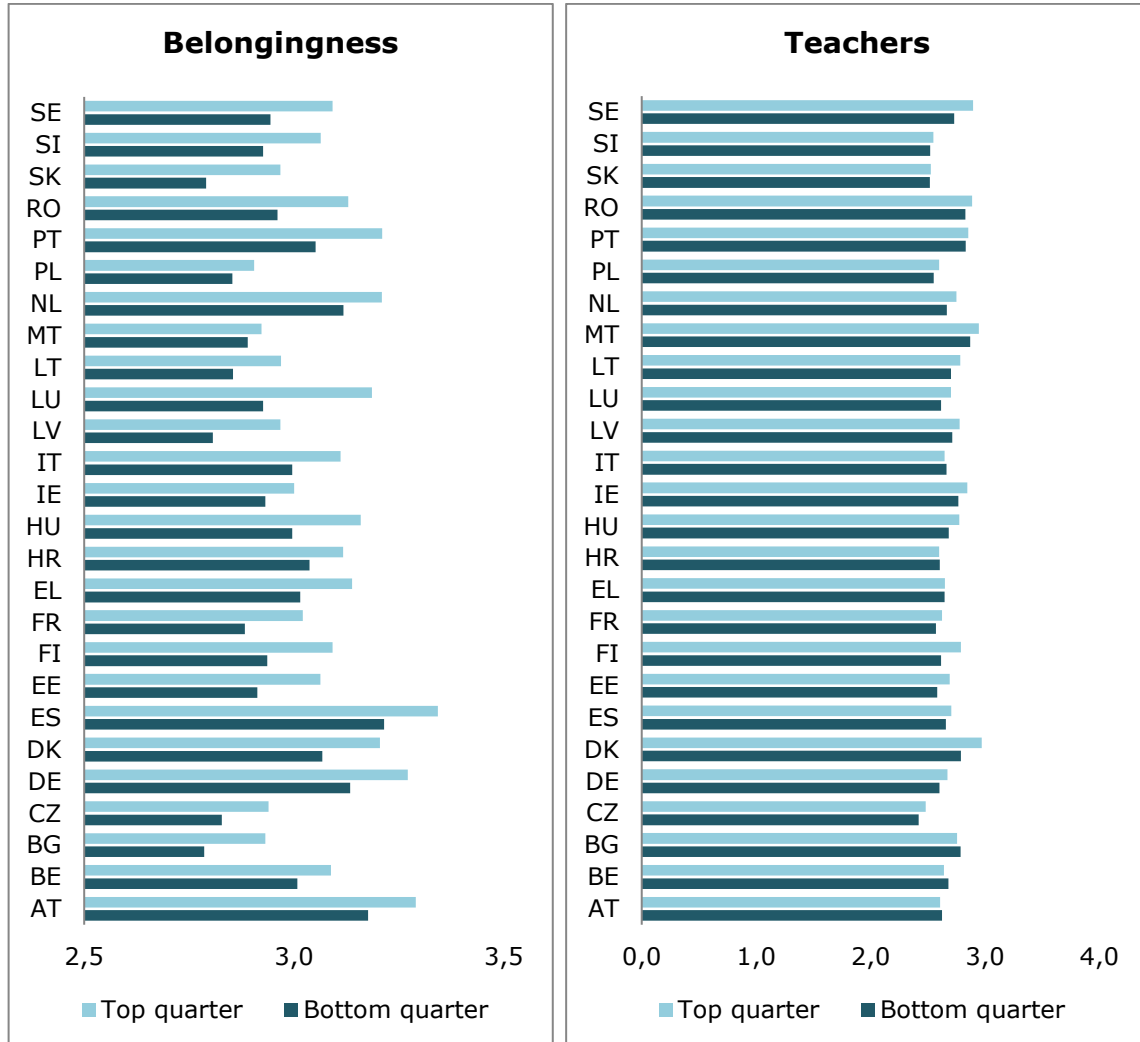
³ The only exceptions are the perceptions of *cooperation* in Estonia and Hungary and of *belonging* in Slovakia and Malta, where gender differences are not statistically significant.

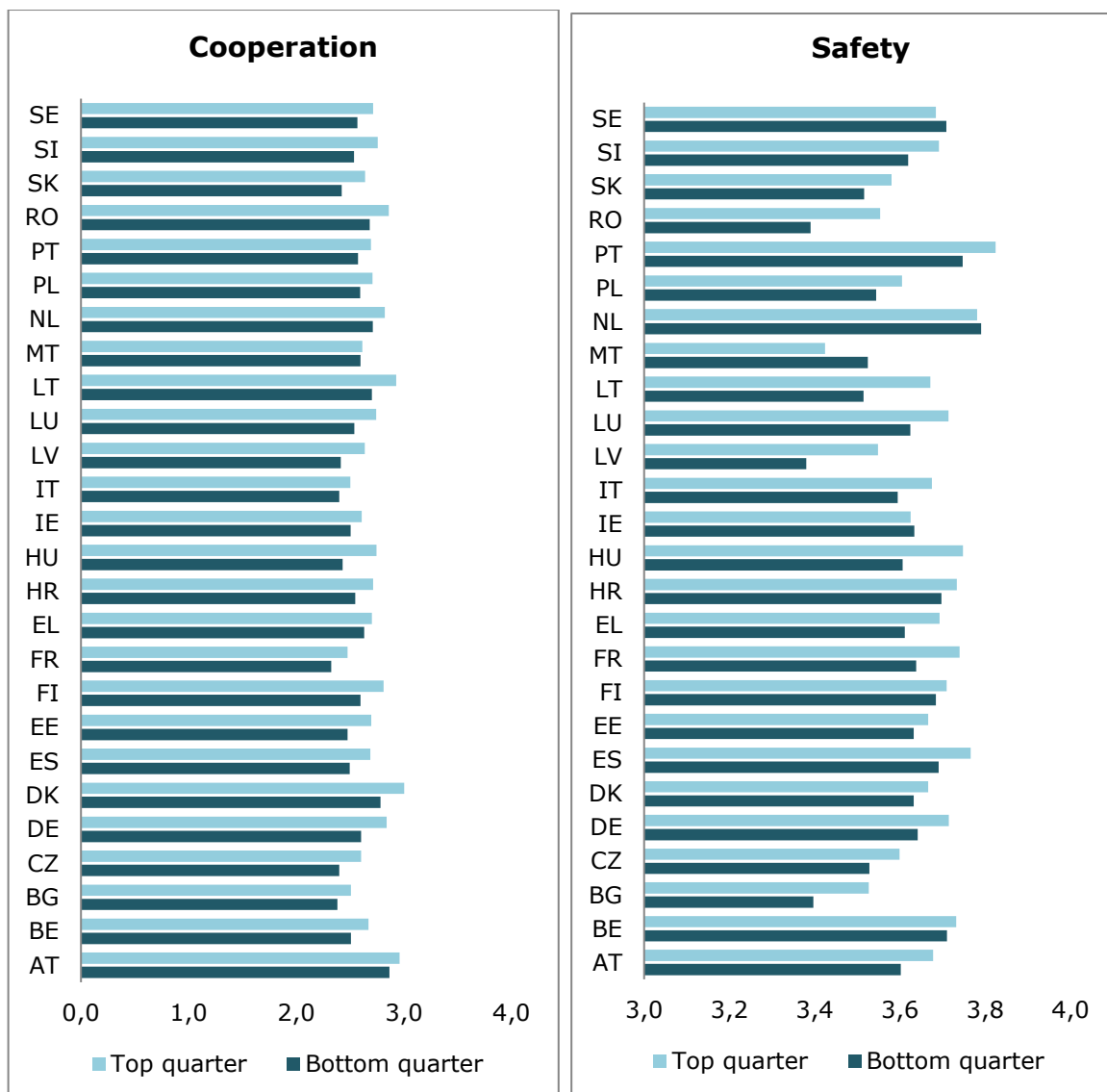


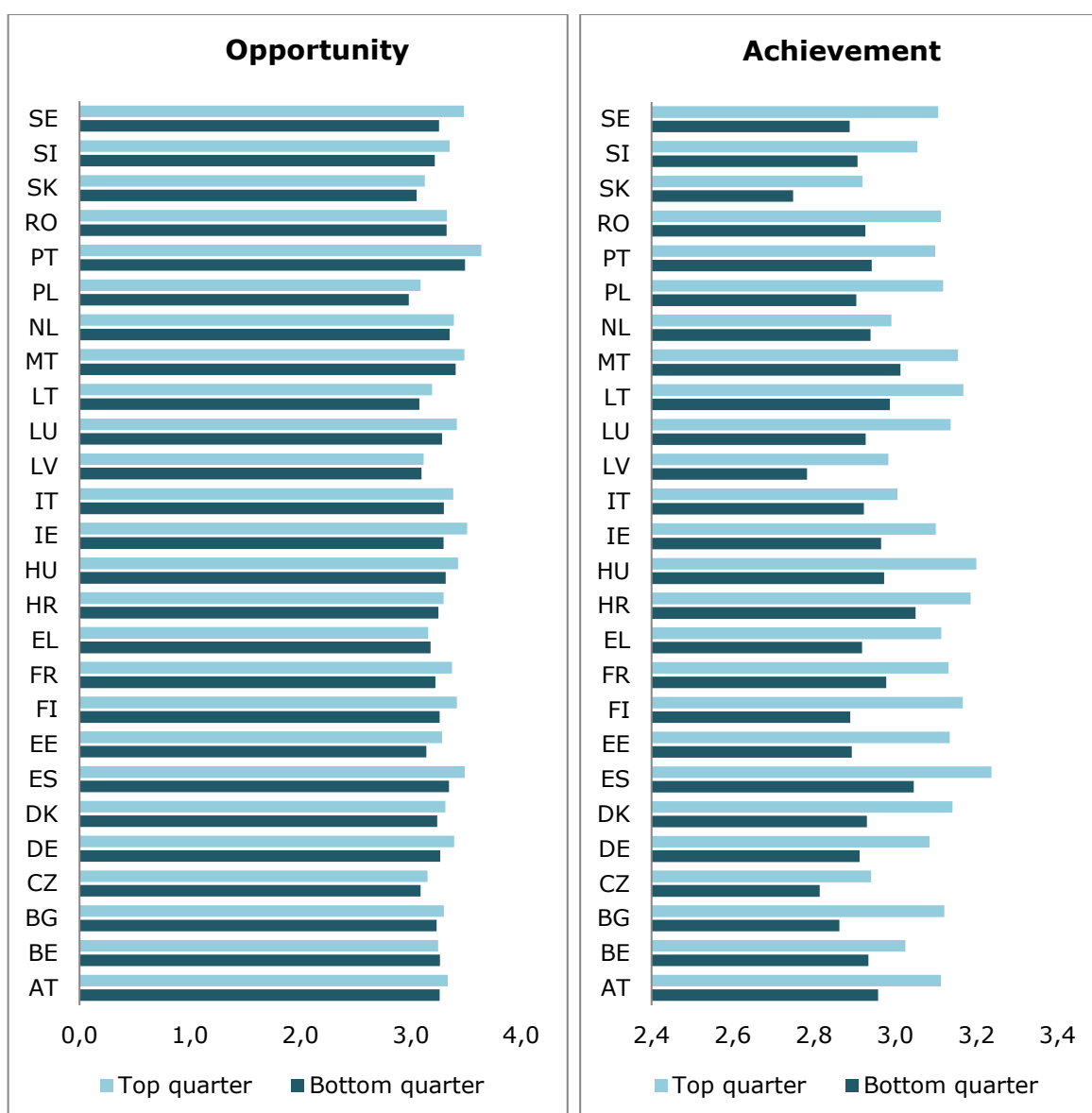
Source: Authors' own calculations.

In this study, we use the PISA index of economic, social and cultural status to investigate whether students' subjective view of quality of school life differs according to the socioeconomic circumstances of their families. More specifically, we compare the reactions of the most advantaged and most disadvantaged students, defined as those belonging to the top and bottom quarters of ESCS. The results presented in Figure 15 indicate that in most countries advantaged students generally experience more positive subjective well-being at school than their peers coming from more disadvantaged families. In many countries, the most substantial differences have been registered with regard to students' sense of being accepted and embedded in the classroom and school community, their feelings of being secure at school and their self-rated ability to cope with tasks and to achieve satisfactory results.

Figure 15. Quality of school life perceptions of the most advantaged and most disadvantaged students (scale score range 1-4)







Source: Authors' own calculations.

5.3 Quality of school life and academic achievement

To investigate the possible relationship between the quality of school life construct and students' academic achievement, regression analyses were conducted for each of the 26 countries included in this study. Student gender and socioeconomic status as measured by the PISA index of ESCS were used as individual-level control variables. As a dependent variable, we used PISA results in reading (as the main subject assessed in PISA 2018 assessment cycle).

For estimating the QSL impact on academic achievement on individual level we tested the impact of each of the QSL scales separately when controlling for the influence of the students' sociodemographic characteristics. The models applied at this stage were as follows:

$$\hat{Y}_i = b_0 + b_1 X_i + \sum_{p=1}^2 c_p Z_{pi}$$

where X_i is the value of the corresponding scale (belongingness, teachers, cooperation, safety, opportunity and achievement), Z_{pi} is socio-demographic variables (gender and the index of economic, social and cultural status from OECD PISA 2018 database), and \hat{Y}_i is the estimated value of the results in reading.

The quality of school life was found to have a substantial positive impact on the academic results of 15-year-old EU students even after controlling for student gender and socioeconomic background. In all six QSL dimensions, the higher values of the respective QSL scale are related to higher test scores. The regression results for the impact of each dimension of the quality of school life construct are presented in Annex III.

Students who have more positive feelings of being accepted and liked by the rest of the group, who experience more supportive, understanding and encouraging teaching styles, who are exposed to a more cooperative learning environment, who find school more relevant for their future education and career, who feel safe in their classrooms and believe in their ability to cope with schoolwork, tend to have higher academic achievement, irrespective of their gender and family circumstances. Different patterns of these influences have been observed in different countries, and this probably reflects the considerable cultural differences between the countries and between their school systems. But it also appears that improvement of students' perceptions of safety, achievement and teachers' support has the most significant potential to improve their overall academic performance in most EU countries.

6. Discussion

6.1 Main findings and limitations

The measurement instrument developed and operationalised in this study provides opportunities to increase both country-specific and EU-level understanding of 15-year-olds' subjective assessment of different aspects of their life at school. At a national level, the instrument offers the possibility to capture the QSL aspects that are perceived by students as providing important development opportunities and quality

experiences in their interactions with teachers and peers and/or nurturing social responsibility and identity formation, as well as to identify those areas that need to be improved and strengthened. Given the fact that the quality of school life dimensions covered by the instrument are interrelated with a wide array of contextual factors and outcome variables, it could provide valuable in-depth input to inform different interventions that could improve students' well-being at school. Such detailed national-level analyses are beyond the scope of this study, as it concentrates on analysing certain aspects of the diagnostic potential of the proposed QSL model at the EU level.

Given the significant cultural and institutional differences across countries and education systems, researchers often argue that such subjective constructs are culture-bound and hard to compare. At the same time, we were able to identify remarkably consistent latent structures, thus providing an opportunity to measure certain aspects of schooling to which students seem to respond more or less uniformly everywhere. Although the need to further examine how historical, socioeconomic, institutional and cultural differences between EU countries affect the quality of student life at school is beyond any doubt, some initial comparative overview is possible.

One limitation of the proposed approach to study students' perceived quality of their life at school could be found in the predefined methodology of the PISA, which does not allow for specific adaptations to capture some aspects of the quality of school life in more detail. In addition, the potential for future application of the same model and for achieving comparable results to monitor changes in QSL aspects over time depends on whether PISA will keep the respective student questionnaire items intact in its future assessment cycles.

6.2 Policy recommendations

Overall, this study provides evidence of the importance of promoting the quality of school life in EU countries. It enables a better understanding of the composition of the specific quality of school life dimensions and better awareness of their impact on academic performance. It may help policymakers and educational practitioners in designing and monitoring targeted policies and interventions that could improve the subjective quality of students' experience at school.

Results from the application of the developed measurement model to the national data from 26 EU countries indicate that across Europe, satisfaction with the quality of school life appears to be generally more common than dissatisfaction. However, in

some countries participating in the study, the two QSL aspects related to interpersonal interactions – student-teacher relations and cooperation in learning – generate substantial negative subjective reactions that could be considered a source for concern that needs to be addressed.

Measures promoting the use of cooperative-learning instructional practices at schools seem important for fostering students' communication and students' interactions through shared activities, building better relationships between students, developing crucial social and emotional skills and improving the subjectively viewed quality of school life. In line with the self-determination theory (Ryan & Deci, 2000; 2017) and achievement-goal theory (Nicholls, 1989), cooperative learning could be useful in fostering students' intrinsic motivation since it creates opportunities for satisfying basic psychological needs of competence, relatedness and autonomy.

Educators may also consider different formative assessment strategies to reinforce the quality of teacher-student interactions and to improve students' sense of achievement. Fostering students' sense of achievement may require the implementation of comprehensive support systems addressing learning difficulties, supporting students with special learning needs, establishing support centres, etc.

Motivating students to get involved in cooperative extracurricular activities is another possibility to nurture a sense of belongingness and better interpersonal relationships.

Policy initiatives aiming at enhancing civic knowledge and developing citizenship skills – such as social responsibility, conflict resolution, collaboration, problem-solving, speaking and active listening – could contribute significantly to creating a school ethos of mutual respect and collaboration. In turn, that ethos could foster students' sense of belonging and perceptions of social and emotional security, facilitate the exchange of open views, and improve interpersonal relationships and an overall sense of cohesion of school community. Supporting initiatives that encourage students' participation in the decision-making process at their schools could also contribute to addressing alienation at school, enhancing students' sense of relatedness to school and improving teacher-student relationships.

Provision of adequate pre-service and in-service training for teachers in monitoring student emotions, identifying and addressing destructive behavioural patterns, and promoting constructive interactions between students could contribute to a better subjective view of the quality of school life. More specifically, educators and decision-makers might consider introducing well-structured measures, including various

programmes for teachers' initial and continuous professional development, aimed at improving teacher self-efficacy in the following areas:

- 1) classroom management, including developing teachers' ability to create a positive classroom environment supportive to learning, to boost students' positive emotions and to successfully manage students' behaviour. This also involves cultivating teachers' abilities in conceptualising, recognising and responding to bullying and other destructive behaviours;
- 2) teaching, including building up teacher confidence in using a variety of instructional and assessment practices and strategies that contribute to progress in learning;
- 3) engaging students, including the development of teacher competencies to provide effective emotional and cognitive support to their students, to increase their motivation and to encourage their engagement in learning; and
- 4) working in a multicultural environment, including the development of teacher competencies to adopt and successfully implement inclusive and participatory education practices.

Given the positive impact of QSL on academic achievement, it seems necessary for decision-makers to consider promoting the quality of school life as part of educational policies at both the national and EU levels. Well-designed and implemented policy interventions to enhance different QSL aspects could bring lasting improvement in the effectiveness and efficiency of school education across Europe. Implementation of various interventions – notably those aimed at building a strong sense of identity and belonging to the school, offering a supportive and stimulating learning environment that fosters discussions and cooperative learning practices, empowering and actively involving students in the regulation of their learning behaviour and increasing their sense of ownership, providing support mechanisms to improve students' self-beliefs in their ability to cope at school, reducing bullying and violence at school – could have substantial added value for school retention and educational achievement. National policies focusing on quality of school life improvements need to be complemented by comprehensive school-level strategies and structured measures, as well as by collecting reliable information to support the ongoing monitoring and improvement efforts.

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Annex I. Rotated factor loadings for items on the quality of school life scales in EU countries

	Factor loadings after varimax rotation																											
	AT	BE	BG	CZ	DE	DK	EE	EL	ES	FI	FR	HR	HU	IE	IT	LV	LU	LT	MT	NL	PL	PT	RO	SE	SI	SK		
Teachers																												
I felt that my teacher understood me.	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.7	0.8	0.8	0.8	0.8	0.8		
The teacher made me feel confident in my ability to do well in the course.	0.8	0.7	0.7	0.8	0.8	0.7	0.8	0.7	0.8	0.8	0.8	0.7	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.7	0.8	0.8	0.8		
The teacher listened to my view on how to do things.	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.7	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.7	0.8	0.8	0.8		
The enthusiasm of the teacher inspired me.	0.6	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.6	0.7	0.8	0.8	0.7	0.7	0.6	0.7	0.7	0.8	0.7	0.7	0.7	0.7	0.6	0.7	0.7		
The teacher showed enjoyment in teaching.	0.7	0.7	0.7	0.6	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.6	0.7	0.6	0.7	0.7	0.7	0.7	0.7	0.6	0.6	0.6		
The teacher adapts the lesson to my class’s needs and knowledge.	0.7	0.6	0.7	0.6	0.6	0.6	0.6	0.6	0.7	0.7	0.6	0.6	0.7	0.6	0.6	0.6	0.7	0.6	0.7	0.7	0.7	0.6	0.6	0.7	0.6	0.6		
The teacher provides individual help when a student has difficulties.	0.7	0.6	0.7	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.7	0.7	0.6	0.6	0.6	0.7	0.7	0.7	0.6	0.6	0.6	0.6	0.7	0.6	0.6		
Safety																												
I was threatened by other students. (R)	0.8	0.8	0.9	0.8	0.8	0.8	0.8	0.9	0.8	0.8	0.8	0.8	0.9	0.8	0.9	0.8	0.8	0.9	0.9	0.7	0.8	0.9	0.8	0.8	0.8	0.9		
I got hit or pushed around by other students. (R)	0.8	0.8	0.8	0.8	0.8	0.7	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.9	0.8	0.8	0.9	0.8	0.7	0.8	0.9	0.8	0.8	0.8	0.8		
Other students took away or destroyed things that belonged to me. (R)	0.8	0.7	0.8	0.8	0.8	0.7	0.8	0.8	0.8	0.8	0.8	0.8	0.9	0.8	0.8	0.8	0.8	0.9	0.8	0.7	0.8	0.8	0.8	0.8	0.8	0.8		
Other students spread nasty rumours about me. (R)	0.8	0.7	0.8	0.7	0.7	0.7	0.7	0.8	0.8	0.8	0.8	0.8	0.8	0.7	0.8	0.8	0.8	0.8	0.8	0.7	0.8	0.8	0.8	0.8	0.8	0.8		
Other students made fun of me. (R)	0.7	0.7	0.8	0.8	0.6	0.7	0.7	0.6	0.8	0.7	0.7	0.8	0.8	0.7	0.8	0.7	0.7	0.8	0.7	0.7	0.8	0.7	0.8	0.7	0.8	0.8		
Other students left me out of things on purpose. (R)	0.7	0.6	0.8	0.6	0.6	0.6	0.6	0.7	0.7	0.6	0.7	0.7	0.6	0.6	0.6	0.6	0.7	0.8	0.6	0.7	0.7	0.7	0.7	0.6	0.7	0.6		

Belongingness																										
I feel lonely at school. (R)	0.8	0.8	0.7	0.7	0.8	0.8	0.7	0.7	0.8	0.8	0.7	0.8	0.7	0.8	0.7	0.7	0.6	0.8	0.7	0.8	0.8	0.8	0.7	0.8	0.7	0.7
I feel awkward and out of place at my school. (R)	0.7	0.7	0.7	0.7	0.7	0.8	0.7	0.7	0.7	0.7	0.6	0.7	0.7	0.8	0.6	0.7	0.6	0.8	0.6	0.7	0.7	0.6	0.7	0.8	0.7	0.7
I feel like an outsider (or left out of things) at school. (R)	0.7	0.7	0.7	0.6	0.7	0.8	0.7	0.6	0.7	0.8	0.3	0.7	0.7	0.8	0.7	0.7	0.6	0.8	0.6	0.8	0.8	0.8	0.7	0.7	0.7	0.6
I make friends easily at school.	0.8	0.7	0.8	0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.7	0.7
Other students seem to like me.	0.8	0.6	0.7	0.6	0.7	0.6	0.7	0.6	0.7	0.7	0.6	0.7	0.7	0.6	0.7	0.7	0.7	0.6	0.6	0.6	0.5	0.7	0.6	0.8	0.7	0.6
I feel like I belong at school.	0.7	0.5	0.7	0.6	0.6	0.6	0.7	0.8	0.8	0.7	0.5	0.7	0.7	0.6	0.6	0.8	0.7		0.6	0.6	0.6	0.7	0.7	0.7	0.5	0.6
Cooperation																										
Students seem to share the feeling that cooperating with each other is important.	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.8	0.9	0.9	0.9
It seems that students are cooperating with each other.	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.8	0.9	0.9	0.9
Students seem to value cooperation.	0.9	0.8	0.8	0.8	0.9	0.8	0.8	0.8	0.8	0.9	0.8	0.9	0.9	0.8	0.8	0.8	0.8	0.9	0.8	0.8	0.8	0.8	0.8	0.9	0.8	0.8
Students feel that they are encouraged to cooperate with others.	0.9	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.9	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.9	0.8	0.8	0.8	0.8	0.8	0.9	0.9	0.8
Opportunity																										
Trying hard at school will help me get a good job.	0.8	0.9	0.8	0.9	0.8	0.9	0.9	0.8	0.9	0.9	0.8	0.9	0.8	0.9	0.8	0.9	0.8	0.9	0.9	0.9	0.9	0.9	0.8	0.9	0.9	0.8
Trying hard at school is important.	0.8	0.9	0.8	0.8	0.8	0.9	0.8	0.8	0.9	0.9	0.9	0.9	0.8	0.9	0.8	0.8	0.9	0.8	0.9	0.9	0.9	0.9	0.8	0.8	0.9	0.8
Trying hard at school will help me get into a good <college>.	0.8	0.8	0.8	0.8	0.7	0.9	0.8	0.8	0.8	0.9	0.8	0.8	0.8	0.9	0.8	0.8	0.8	0.9	0.9	0.9	0.8	0.9	0.8	0.9	0.9	0.8
Achievement																										
I usually manage one way or another.	0.7	0.7	0.7	0.8	0.7	0.7	0.8	0.8	0.7	0.8	0.8	0.8	0.8	0.8	0.8	0.7	0.8	0.8	0.8	0.7	0.8	0.8	0.8	0.8	0.8	0.8
I feel that I can handle many things at a time.	0.7	0.7	0.6	0.7	0.7	0.7	0.7	0.7	0.8	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.7	0.7	0.8	0.8	0.8	0.7	0.8	0.8	0.7
I feel proud that I have accomplished things.	0.7	0.7	0.7	0.7	0.7	0.8	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.6	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.7	0.8

Source: Authors' own calculations.

Annex II. Quality of school life measures in the EU

	Belongingness		Teachers		Opportunity		Cooperation		Safety		Achievement	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Austria	3.2	0.7	2.6	0.7	3.3	0.7	2.9	0.7	3.7	0.5	3.0	0.6
Belgium	3.1	0.5	2.7	0.6	3.3	0.6	2.6	0.7	3.7	0.4	3.0	0.4
Bulgaria	2.9	0.6	2.8	0.7	3.3	0.7	2.4	0.8	3.4	0.7	3.0	0.7
Croatia	3.1	0.6	2.6	0.7	3.3	0.7	2.7	0.7	3.7	0.5	3.1	0.5
Czech Republic	2.9	0.5	2.5	0.6	3.1	0.6	2.5	0.7	3.6	0.6	2.9	0.5
Denmark	3.1	0.6	2.9	0.6	3.3	0.8	2.9	0.6	3.7	0.5	3.0	0.5
Estonia	3.0	0.5	2.6	0.6	3.2	0.6	2.6	0.7	3.6	0.5	3.0	0.5
Finland	3.0	0.6	2.7	0.6	3.3	0.6	2.7	0.6	3.7	0.5	3.0	0.5
France	2.9	0.5	2.6	0.7	3.3	0.7	2.4	0.7	3.7	0.5	3.0	0.5
Germany	3.2	0.6	2.6	0.7	3.3	0.7	2.7	0.7	3.7	0.5	3.0	0.5
Greece	3.1	0.5	2.6	0.6	3.2	0.7	2.7	0.7	3.6	0.6	3.0	0.5
Hungary	3.1	0.6	2.7	0.7	3.4	0.6	2.6	0.7	3.7	0.6	3.1	0.5
Ireland	3.0	0.5	2.8	0.6	3.4	0.7	2.6	0.6	3.6	0.5	3.0	0.4
Italy	3.1	0.5	2.7	0.6	3.3	0.7	2.5	0.7	3.6	0.6	3.0	0.5
Latvia	2.9	0.6	2.7	0.6	3.1	0.7	2.5	0.6	3.5	0.6	2.9	0.5
Lithuania	2.9	0.7	2.8	0.7	3.1	0.8	2.8	0.8	3.6	0.6	3.1	0.6
Luxembourg	3.1	0.6	2.6	0.7	3.3	0.7	2.6	0.7	3.7	0.5	3.0	0.6
Malta	2.9	0.6	2.9	0.7	3.4	0.7	2.6	0.7	3.5	0.7	3.1	0.5
Netherlands	3.2	0.5	2.7	0.6	3.4	0.7	2.8	0.6	3.8	0.4	3.0	0.5
Poland	2.9	0.6	2.6	0.6	3.0	0.7	2.7	0.7	3.6	0.6	3.0	0.5
Portugal	3.1	0.5	2.8	0.6	3.6	0.6	2.6	0.7	3.8	0.5	3.0	0.5
Romania	3.0	0.6	2.9	0.6	3.3	0.6	2.7	0.7	3.5	0.7	3.0	0.5
Slovak Republic	2.9	0.6	2.5	0.6	3.1	0.7	2.5	0.7	3.6	0.6	2.8	0.6

Slovenia	3.0	0.5	2.5	0.6	3.3	0.6	2.7	0.7	3.7	0.6	3.0	0.5
Spain	3.3	0.6	2.7	0.7	3.4	0.7	2.6	0.7	3.7	0.5	3.1	0.5
Sweden	3.0	0.6	2.8	0.7	3.4	0.7	2.6	0.7	3.7	0.5	3.0	0.5

Source: Authors' own calculations.

Annex III. Estimates of effects of the quality of school life dimensions on reading results in PISA 2018

Country	AU	BE	BG	CZ	DE	DK	ES	EE	FI	FR	EL	HR	HU
	B	B	B	B	B	B	B	B	B	B	B	B	B
Intersept	480.22	526.65	390.48	513.31	513.37	510.13	493.15	486.31	520.53	504.29	432.07	471.97	488.16
baseline													
Gender													
male													
female	21.65	19.65	32.57	31.75	20.30	27.08	24.43	29.84	50.01	19.43	37.19	30.94	26.15
4 Q													
ESCS (index) 1 Q	-91.04	-98.44	-105.74	-96.68	-102.59	-76.76	-69.12	-56.76	-76.32	-99.48	-81.23	-61.94	-103.05
2 Q	-55.62	-68.69	-66.86	-62.03	-67.04	-49.92	-52.54	-46.38	-53.44	-75.65	-56.00	-52.88	-70.55
3 Q	-37.05	-37.65	-34.21	-40.43	-44.38	-29.16	-29.45	-25.28	-30.96	-41.19	-34.26	-35.13	-39.51
Belongingness	14.91*	6.27*	28.08*	7.17*	15.46*	6.31*	5.23*	19.43*	6.89*	14.10*	18.26*	11.02*	12.69*

Country	IE	IT	LV	LU	LT	MT	NL	PL	PT	RO	SK	SI	SW
	B	B	B	B	B	B	B	B	B	B	B	B	B
Intersept	543.42	467.61	469.09	463.47	441.80	447.01	494.03	539.77	506.91	475.65	450.09	462.61	498.47
baseline													
Gender													
male													
female	21.60	24.46	32.84	26.63	34.32	37.12	28.67	29.85	23.06	32.98	34.54	39.32	30.77
4 Q													
ESCS (index) 1 Q	-70.06	-69.28	-66.62	-112.15	-81.41	-80.35	-78.13	-87.67	-92.44	-99.15	-88.62	-74.37	-82.08
2 Q	-42.98	-35.44	-43.05	-86.18	-53.90	-50.32	-56.50	-54.27	-60.88	-65.48	-58.86	-61.79	-48.05
3 Q	-24.33	-23.43	-19.85	-43.56	-30.53	-32.45	-34.36	-40.31	-40.97	-38.43	-40.70	-35.36	-25.41
Belongingness	0.78	11.70*	9.79*	20.00*	19.74*	12.92*	10.99*	2.31*	8.76*	2.46*	16.52*	19.85*	13.28*

Notes: Standard errors are not reported due to limited space. * $p < 0.01$; ** $p < 0.05$

Source: Authors' own calculations.

Country	AU	BE	BG	CZ	DE	DK	ES	EE	FI	FR	EL	HR	HU
	B	B	B	B	B	B	B	B	B	B	B	B	B
Intersept	496.13	525.80	425.54	504.59	528.41	441.71	470.38	489.49	477.51	520.93	452.53	483.79	499.64
baseline													
Gender													
male	21.60	19.66	34.53	29.65	21.21	25.51	23.23	29.21	48.29	19.03	36.54	32.41	27.34
female													
4 Q													
ESCS													
(index)													
1 Q	-92.61	-99.58	-107.24	-97.13	-103.38	-70.88	-71.99	-56.76	-72.21	-102.02	-82.41	-62.88	-106.60
2 Q	-58.87	-69.31	-66.73	-61.02	-66.79	-47.23	-53.54	-46.97	-48.07	-74.82	-57.03	-53.98	-71.01
3 Q	-38.06	-38.36	-32.13	-40.40	-44.51	-26.66	-30.41	-25.53	-27.37	-40.37	-33.57	-36.07	-39.46
Teachers	12.23*	7.40*	14.51*	11.92*	11.19*	29.65*	14.47*	20.66*	22.42*	8.04*	13.27*	7.59*	9.56*

Country	IE	IT	LV	LU	LT	MT	NL	PL	PT	RO	SK	SI	SW
	B	B	B	B	B	B	B	B	B	B	B	B	B
Intersept	503.32	470.54	438.73	482.44	459.04	392.65	452.01	507.80	518.94	463.53	479.28	496.74	448.46
baseline													
Gender													
male	20.80	23.13	31.26	25.72	34.14	41.13	26.97	29.61	23.20	31.45	35.59	37.90	28.36
female													
4 Q													
ESCS													
(index)													
1 Q	-69.95	-70.32	-64.16	-116.31	-83.50	-80.93	-76.40	-87.88	-93.06	-99.86	-91.64	-77.33	-78.83
2 Q	-42.85	-37.29	-42.46	-88.81	-55.38	-48.21	-54.52	-54.13	-61.92	-65.46	-58.99	-63.53	-43.81
3 Q	-24.26	-23.53	-19.18	-44.98	-30.07	-29.95	-30.87	-40.24	-42.02	-40.42	-39.86	-37.27	-21.63
Teachers	14.94*	12.30*	20.92*	16.39*	14.66*	29.47*	27.86*	14.55*	5.06*	7.03*	6.32*	10.28*	30.44*

Notes: Standard errors are not reported due to limited space. * $p < 0.01$; ** $p < 0.05$

Source: Authors' own calculations.

Country	AU	BE	BG	CZ	DE	DK	ES	EE	FI	FR	EL	HR	HU
	B	B	B	B	B	B	B	B	B	B	B	B	B
Intersept	491.43	540.61	427.98	503.74	527.79	494.08	473.39	512.25	478.70	521.34	469.95	482.89	487.55
baseline													
Gender male													
female	20.38	20.23	33.48	32.74	20.40	25.07	24.00	28.64	46.58	19.69	37.52	31.65	25.54
4 Q													
ESCS (index) 1 Q	-92.38	-100.56	-107.67	-94.13	-106.53	-77.45	-69.61	-58.86	-74.93	-102.33	-82.16	-63.14	-105.96
2 Q	-57.50	-70.91	-69.34	-61.81	-68.73	-50.67	-52.68	-48.62	-50.49	-75.76	-56.30	-54.14	-72.60
3 Q	-37.51	-39.02	-33.15	-39.16	-41.96	-28.78	-29.16	-26.64	-28.64	-41.83	-33.49	-36.87	-41.32
Opportunity	10.84*	1.51*	11.85*	11.41**	9.30*	10.99*	10.16*	10.14*	18.16*	6.04*	5.02*	6.48*	11.61*

Country	IE	IT	LV	LU	LT	MT	NL	PL	PT	RO	SK	SI	SW
	B	B	B	B	B	B	B	B	B	B	B	B	B
Intersept	509.93	475.66	483.38	477.85	469.55	383.68	517.58	525.01	453.20	474.07	477.25	464.57	465.79
baseline													
Gender male													
female	20.98	23.29	33.05	23.58	33.52	34.71	27.88	29.59	19.42	32.40	34.88	36.60	27.88
4 Q													
ESCS (index) 1 Q	-70.23	-71.12	-65.89	-117.00	-84.64	-80.87	-78.99	-88.45	-90.43	-101.43	-93.97	-74.46	-83.29
2 Q	-42.37	-37.07	-42.57	-87.13	-55.05	-46.98	-56.07	-54.10	-60.59	-66.21	-59.35	-61.61	-45.39
3 Q	-23.84	-23.76	-18.88	-43.48	-31.36	-28.87	-34.44	-40.29	-41.48	-40.64	-40.38	-34.49	-22.64
Opportunity	9.95*	7.86*	3.84*	14.18*	9.58*	28.29*	3.14*	6.69*	22.50*	2.72*	5.99*	17.41*	20.71*

Notes: Standard errors are not reported due to limited space. * $p < 0.01$; ** $p < 0.05$

Source: Authors' own calculations.

Country	AU	BE	BG	CZ	DE	DK	ES	EE	FI	FR	EL	HR	HU
	B	B	B	B	B	B	B	B	B	B	B	B	B
Intersept	476.15	525.59	437.11	503.74	529.61	494.83	487.72	503.92	502.89	537.16	467.45	475.53	479.70
baseline													
Gender													
male													
female	21.81	19.77	39.91	32.74	24.86	26.68	26.91	31.76	50.60	20.98	36.14	33.15	27.71
4 Q													
ESCS (index)													
1 Q	-91.88	-96.95	-108.69	-94.13	-101.31	-71.23	-67.54	-57.39	-75.78	-98.01	-79.16	-62.03	-98.46
2 Q	-57.46	-68.17	-70.52	-61.81	-67.11	-48.92	-54.00	-46.27	-51.28	-76.47	-55.49	-53.25	-69.74
3 Q	-39.20	-38.06	-32.17	-39.16	-42.14	-26.47	-29.35	-27.54	-30.38	-37.18	-34.42	-36.65	-40.48
Cooperation	18.02*	7.84*	12.05*	11.41*	11.00*	11.70*	8.89*	15.41*	13.72*	3.33*	7.98*	11.64*	17.70*
Country	IE	IT	LV	LU	LT	MT	NL	PL	PT	RO	SK	SI	SW
	B	B	B	B	B	B	B	B	B	B	B	B	B
Intersept	544.03	493.99	464.75	504.88	442.37	472.87	504.16	528.35	516.46	448.52	453.58	463.50	529.62
baseline													
Gender													
male													
female	23.32	27.14	34.55	28.42	34.52	37.37	26.90	30.33	24.38	34.51	35.60	42.60	30.21
4 Q													
ESCS (index)													
1 Q	-69.47	-70.74	-64.53	-115.54	-78.27	-80.16	-79.11	-85.66	-90.32	-100.97	-87.05	-73.27	-81.55
2 Q	-42.80	-40.48	-44.08	-87.58	-50.60	-49.33	-55.10	-53.35	-60.99	-67.27	-58.14	-62.12	-47.68
3 Q	-26.88	-26.04	-20.04	-44.49	-29.80	-34.14	-32.99	-41.27	-41.27	-39.34	-39.63	-34.35	-24.36
Cooperation	2.01*	3.91*	12.34*	8.16*	19.15*	6.16**	9.15*	6.96*	6.88*	12.63*	15.79*	20.67*	3.19*

Notes: Standard errors are not reported due to limited space. * $p < 0.01$; ** $p < 0.05$

Source: Authors' own calculations.

Country	AU	BE	BG	CZ	DE	DK	ES	EE	FI	FR	EL	HR	HU
	B	B	B	B	B	B	B	B	B	B	B	B	B
Intersept	433.19	468.36	395.24	503.74	434.86	450.01	407.46	463.80	494.42	458.96	365.55	426.28	424.13
baseline													
Gender male													
female	18.53	19.09	35.58	32.74	23.29	24.87	23.89	27.12	49.43	18.31	31.62	31.47	23.39
4 Q													
ESCS (index) 1 Q	-91.27	-98.63	-108.29	-94.13	-96.81	-76.93	-66.40	-58.44	-77.28	-97.50	-78.14	-62.14	-100.71
2 Q	-58.33	-69.41	-66.66	-61.81	-64.74	-51.05	-52.40	-46.02	-52.87	-76.67	-53.25	-54.05	-71.39
3 Q	-40.62	-38.39	-30.89	-39.16	-38.13	-29.34	-29.18	-25.41	-30.42	-36.85	-31.07	-35.03	-39.93
Safety	26.84*	20.98*	21.15*	11.41*	33.07*	22.38*	27.88*	22.70*	12.70*	23.30*	34.00*	21.92*	28.48*
Country	IE	IT	LV	LU	LT	MT	NL	PL	PT	RO	SK	SI	SW
	B	B	B	B	B	B	B	B	B	B	B	B	B
Intersept	492.84	371.34	391.43	390.28	371.26	391.90	444.74	456.64	388.61	406.52	396.40	407.28	435.79
baseline													
Gender male													
female	23.03	22.11	27.48	25.28	27.38	28.40	27.63	25.80	21.89	30.24	32.35	37.36	26.89
4 Q													
ESCS (index) 1 Q	-68.83	-67.68	-61.64	-111.29	-76.73	-82.72	-79.70	-85.84	-88.11	-97.48	-87.44	-75.35	-83.34
2 Q	-42.87	-40.59	-41.99	-84.49	-50.59	-49.83	-56.62	-53.73	-58.93	-65.30	-60.11	-64.18	-49.62
3 Q	-26.23	-24.52	-19.05	-43.86	-28.71	-34.48	-32.85	-42.09	-41.72	-38.61	-39.92	-37.30	-25.27
Safety	15.44*	36.83*	31.30*	37.05*	35.86*	29.47*	22.21*	25.87*	38.65*	22.20*	28.36*	31.73*	28.55*

Notes: Standard errors are not reported due to limited space. * $p < 0.01$; ** $p < 0.05$

Source: Authors' own calculations.

Country	AU	BE	BG	CZ	DE	DK	ES	EE	FI	FR	EL	HR	HU
	B	B	B	B	B	B	B	B	B	B	B	B	B
Intersept	446.13	495.61	380.77	497.89	495.08	454.38	442.77	428.21	429.06	506.87	400.47	440.99	452.02
baseline													
Gender male													
female	22.74	19.95	30.61	30.95	18.29	22.25	21.36	31.36	46.34	18.43	34.91	32.44	26.19
4 Q													
ESCS (index) 1 Q	-84.47	-100.42	-101.68	-107.07	-99.38	-78.17	-61.72	-54.63	-65.82	-109.67	-73.46	-59.72	-100.62
2 Q	-50.53	-71.27	-65.96	-66.26	-65.25	-51.58	-44.98	-42.85	-45.39	-78.50	-50.93	-51.64	-68.40
3 Q	-30.13	-38.97	-30.66	-40.70	-38.13	-26.68	-24.35	-24.29	-26.27	-39.49	-32.49	-35.03	-38.95
Achievement	25.54*	18.72*	29.09*	17.34*	22.32*	23.55*	21.57*	37.63*	35.52*	11.82*	28.99*	19.56*	23.49*
Country	IE	IT	LV	LU	LT	MT	NL	PL	PT	RO	SK	SI	SW
	B	B	B	B	B	B	B	B	B	B	B	B	B
Intersept	478.83	443.68	414.85	440.25	417.45	359.26	479.26	462.15	470.42	429.57	438.03	427.61	455.59
baseline													
Gender male													
female	21.32	23.17	31.91	25.34	31.34	35.14	28.59	30.09	23.98	31.60	33.75	45.96	28.94
4 Q													
ESCS (index) 1 Q	-67.97	-62.54	-53.12	-112.44	-80.35	-76.88	-78.79	-81.79	-87.14	-92.81	-92.17	-70.56	-78.82
2 Q	-40.84	-34.38	-36.54	-84.33	-53.34	-45.78	-56.12	-53.26	-57.75	-63.90	-59.26	-55.65	-45.40
3 Q	-22.72	-20.61	-15.45	-42.39	-30.35	-30.00	-34.48	-39.44	-41.26	-37.60	-41.00	-30.95	-24.57
Achievement	21.24*	20.34*	25.80*	27.98*	26.61*	39.94*	16.45*	27.12*	19.53*	16.95*	21.23*	25.25*	27.04*

Notes: Standard errors are not reported due to limited space. * $p < 0.01$; ** $p < 0.05$

Source: Authors' own calculations.

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