UNIVERSITÀ DI PARMA

UNIVERSITA' DEGLI STUDI DI PARMA

DOTTORATO DI RICERCA IN
"Psicologia"

CICLO XXXIII

School Climate in Middle Schools: A Multidimensional, Multi-informant and Longitudinal Perspective

Coordinatore:
Chiar.ma Prof.ssa Luisa Molinari

Tutore:
Chiar.ma Prof.ssa Luisa Molinari

Dottoranda: Valentina Grazia

Anni Accademici 2017/2018 – 2019/2020

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Introduction

For a long time, research in educational psychology has provided a vast repertoire of knowledge on how schools could innovate their educational, didactic and organizational practices in order to face a changing society; nonetheless, there is still a gap between research and practice (Cohen et al., 2009). Nowadays, the increasing demands of a complex society are making the need to innovate even more pressing, as schools are one of the main educational contexts where the future generations of citizens are grown. To be able to nurture competent, involved and responsible future citizens, schools need to face the challenge through a process of self-awareness and self-improvement. In order to accompany them in this process of progressive evolution, the gap between research and practice needs to be bridged, with constructs, perspectives and languages that can become a shared ground for communication.

In this direction, *school climate* research is a promising field. This construct, commonly defined as "the quality and character of school life" (Cohen et al., 2009, p. 182), is grounded in a systemic theoretical framework (Rudasill et al., 2018) and offers a comprehensive and multidimensional perspective on the school environment, including aspects related to everyday practices and the relational and educational environment (Wang & Degol, 2016). There is a vast literature providing evidence that a good school climate is associated with academic achievement and students and teachers' mental health (Aldridge & McChesney, 2018; Kutsyuruba et al., 2015) and can prevent problem behaviours or violence in school (Reaves et al., 2018). More importantly, researchers agree in considering school climate as a viable and fruitful way of intervention in schools (Voight and Nation, 2016) as research findings can help school managers and policy makers to design interventions aimed at improving school climate by promoting change and raising teachers' self-awareness (Thapa et al., 2013).

For all these reasons research on school climate appears as a constructive way to advance the current knowledge of educational processes in school. However, the literature still suffers from several weaknesses limiting the possibility to truly express the construct's potential, for both research and practice. While authors have long agreed that school climate's research greater strength is its potential to embrace the complexity of real school environments (Anderson, 1982), some elements of complexity, such as the comprehensive multidimensionality of the construct, the rigor in its measurement, the different perceptions of multiple actors and their evolution over time, were mostly overlooked. The general purpose of this project was then to address the main gaps of the literature to provide an innovative perspective on school climate making the most of the construct's potential to capture the nuanced complexity of the school environment.

To meet this general purpose, after a systematic review of the literature, the project was organized in four studies with specific aims and different methodologies, each addressing a specific weakness of the literature and contributing a piece of complexity to the general picture. The entire population (students, teachers and parents) of four middle schools was involved in the project from the beginning to the end, as raising awareness and building a sense of collaboration were implicit aims of the project. The choice to focus on middle schools was motivated by the far-reaching interest in the educational implications of research. In the Italian school system, the three years of middle school (6^{th}, 7^{th} and 8^{th} grade) constitute a self-contained stage of transition from primary to secondary school. In these years, students experience a stable environment (with the same classmates and mostly the same teachers) which helps them passing from the relational-centred approach of primary schools to the knowledge transmission approach of high school. The study of school climate perceptions at this educational level is thus an important tool for supporting this transition process (Kim et al., 2014).

The project started, in Study 1, with the development and validation of a measure of school climate addressing several limitations of the existing instruments (Kohl et al., 2013; Ramelow et al., 2015). The measure provided then the foundation for the other three studies, each based on a different methodology. Study 2 was based on a *multi-informant design* to provide a comparison of the

perspectives of students, teachers and parents. Study 3, was based on a *person-oriented approach* in order to identify student profiles with different patterns of engagement and burnout and to compare their school climate perceptions. Study 4, with a *longitudinal design*, inquired on the evolution over time and reciprocal effects of students' perceptions of several school climate dimensions, as well as on the reciprocal effects of school climate and students' engagement and burnout.

This thesis retraces the project's main steps: the first chapter provides an excursus of the history of the construct, from its many definitions and theoretical grounds to the main findings and limitations of the literature. In the second chapter I present a systematic review of the literature concerning measures and methods commonly adopted in the study of school climate. The third chapter details the rationale and structure of the research project. The following chapters are dedicated to the presentation of each study's background, methods and results. In the end, implications for research and practice are discussed.

Chapter 1 - School Climate

1.1 History of a Complex Construct: School Climate Definition, Theoretical Grounds and Measurement

Research on school climate goes back many years. We first find the term cited more than 100 years ago in a book by Arthur Perry (1908) while the topic became an object of empirical research in the 1960s (Halpin & Croft, 1963), when it was conceived as "organizational" climate in the school. Scholars soon realized that school climate as a construct is much more complex and from then forward, in all of its history, research on school climate was always challenged by the multifaceted nature of the construct. Anderson, in one of the first reviews on the topic, called it an "elusive Beast" (Anderson, 1982, p. 371) to represent its manifold nature, difficult to grasp and share. This difficulty is so widespread, that it touches even the definition of the construct: still today the term is used with very different meanings and refers to several different aspects of the school environment (Grazia & Molinari, 2020). Only in recent years, researchers have come to share a moderate agreement on a definition proposed by Cohen and colleagues (2009). These authors defined school climate as "the quality and character of school life. School climate is based on patterns of people's experiences of school life and reflects norms, goals, values, interpersonal relationships, teaching and learning practices, and organizational structures" (Cohen et al., 2009, p. 182). However, not discouraged by the challenge posed by its complexity, in the last few decades the interest toward the construct has constantly grown, first in the United States and more recently elsewhere (Cohen et al., 2009; Ramelow et al., 2015). Such interest led to the development of a vast literature on the topic.

The study of school climate is grounded in several theoretical frameworks. The fundamental pillar is commonly recognized in Bronfenbrenner's *bio-ecological theory*. By asserting that the proximal and distal environment can shape individual behaviour (Bronfenbrenner, 1979), this theory supports the importance of understanding how the school environment influences students'

and teachers' behaviour, well-being and development. According to Wang and Degol (2016), other relevant theoretical frameworks are the followings: the *attachment theor*y (Bowlby,1969), for the importance of positive attachment bonds in school with both teachers and peers; the *social cognitive theory* (Bandura, 1986), for the influence that the environment exerts on how students perceive the process of learning and feel themselves in that process; the *social control theory* (Hirschi, 1969), for the importance of a positive school climate in promoting students' commitment to and beliefs in shared moral codes, which can prevent negative outcomes related to deviant behaviour; the *stage-environment fit theory* (Eccles & Midgley, 1989), for the importance of finding the right fit between students' psychological needs and the school environment's characteristics to support student motivation and well-being. Lastly, according to Wang and Degol (2016), school climate can also be investigated through the lenses of the *risk and resilience perspective*, because schools are rich in risk and protective factors with powerful impacts on student's subsequent development and adjustment. This multitude of theoretical foundations undoubtedly contributed to the widespread interest in school climate research.

If different authors have yet to find a common ground on definitions and theoretical approaches, a point of agreement, at least on a theoretical level, is the multidimensionality of the construct. Indeed, recent reviews highlighted that most authors conceive school climate as a comprehensive and multidimensional construct comprising academic experience, relations, safety and institutional elements of the environment (Cohen et al., 2009; Thapa et al., 2013; Wang & Degol, 2016; Zullig et al., 2010). However, and beyond the consensus on a multidimensional view of the construct, authors only partially agree on the labels, the number and the specific dimensions of domains (see Table 1.1 for a synthesis of school climate domains and dimensions identified by existing reviews).

Authors	Year	n° of articles included	Identified domains (and dimensions for each domain)
Cohen, McCabe, Michelli, & Pickerall	2009	not specified	Safety (Physical, Socio-emotional); Teaching and learning (Quality of instruction, Social emotional ethical learning, Professional development, Leadership); Relationships (Respect for diversity, School community and collaboration, Morale and connectedness); Environmental-structural
Zullig, Koopman, Patton, & Ubbes	2010	not specified	Order, safety discipline (Perceived safety, Respect for peer and authority, Knowledge and fairness of disciplinary policies, Presence of gangs); Academic outcomes (Accomplishment and recognition, Sense of academic futility, Academic norms, Academic instruction, Overall satisfaction with classes, evaluations of performances); Social relationships (Teacher-relationships, Interpersonal relationships, Student-peer relationships, Helpfulness of school staff); School facilities (School temperature, Classroom arrangement, Ambient noise, School condition, School decorations); School connectedness (Engaged learners, Feelings about school, Students feel valued for their input)
Thapa, Cohen, Guffey, & Higgins-D'Alessandro	2013	206	Safety; Teaching and learning; Relationships; Institutional Environment; School Improvement Process
Wang & Degol	2016	327	Academic climate (Leadership, Teaching and Learning, Professional development); Community (Quality of interpersonal relationships, Connectedness, Respect for diversity, Community partnership); Safety (Physical, Emotional, Order and Discipline); Institutional Environment (Adequacy, Structural organization, Availability of resources)

Table 1.1. Summary of school climate domains and dimensions identified by recent reviews

The most recent of these reviews (Wang & Degol, 2016) has provided a thorough assessment of which domains and dimensions are currently included in the construct of school climate. Through a systematic literature review and coding, and after having consulted experts in the field, these authors reached a classification of school climate into four domains and 13 dimensions (see Table 1.1) : *Academic Climate* refers to the various ways in which learning and teaching processes are promoted in the classrooms; *Community* accounts for the quality of relationships between students and teachers and among various members of the personnel; *Safety* comprises both physical and emotional safety as well as the quality of discipline provided by the school; *Institutional Environment* refers to concrete aspects of the school setting, such as the

maintenance of the building and the allocation of educational resources. By basing on 327 reviewed literature sources, Wang and Degol (2016) provided a breakthrough in showing how these individual four domains and their related dimensions were defined, varied and overlapped in the various works. However, this review does not report whether and to what extent this multidimensional and comprehensive approach to school climate, with several domains and dimensions, is actually reflected in recent empirical research. In other words, it is not clear whether such conceptualization actually constitutes a shared basic ground for the empirical study of school climate or it is just a descriptive summary.

For such a complex construct, on which we still miss consensus in terms of definition and conceptualization, measurement is also an issue – a very important one, I would say. Across the years, research reports an incredibly vast amount of school climate measures that were developed and used. Three literature reviews (Kohl et al., 2013; Ramelow et al., 2013; Zullig et al., 2010) focused on the description of the currently available instruments, highlighting several limitations of the existing literature. In Table 1.2, I provide a synthesis of the measures described in each of these reviews.

Instrument name	Authors	Country	Dimensions
	Zullig et al. (2010)		
San Diego Effective Schools Student Survey (ESSS)	San Diego County (1984)	United States	Safety and order; academic outcomes; relationships; environmental-structural; school connectedness
National Education Longitudinal Study (NELS)	U.S Department of Education (1988)	United States	Safety and order; academic outcomes; relationships
California School Climate and Safety Survey (CSCS)	Furlong et al. (2005)	Unites States	Safety and order; relationships
Comprehensive Assessment of School Environment (CASE)	Not specified	Not specified	Safety and order; academic outcomes; relationships; environmental-structural; school connectedness
School Development Program (SDP)	Haynes et al. (2001)	Not specified	Safety and order; academic outcomes; relationships; environmental-structural; school connectedness
	Kohl et al. (2013)		
Adaptations from the School Climate Survey (SCS)	Various	Not specified	Not specified
School connectedness scales from the Add Health interview	Various	Not specified	School connectedness
Adaptations from the California School Climate Survey (CSCS)	Various	United States	Not specified
Adaptations from the Psychological Sense of School Membership Scale (PSSM)	Various	Not Specified	School connectedness
Adaptations from the Effective school Battery (ESB)	Various	Not specified	Various subscales
Adaptation from the Questionnaire sur l'Environment Socioeducatif (QES)	Pfetsch (2010)	Germany	Relationships among students; student-teacher relationships; support
School culture scales	Various	Not specified	Various subscales
Other school climate scales	Various	Not specified	Various subscales
	Ramelow et al. (2015)		
What is Happening In This school (WHITS)	Aldridge & Ala'i (2013)	Australia	Safety; relationships
Classroom Environment Scale (CES)	Boren et al. (2011)	Not specified	Safety; relationships
Inventory of School Climate (ISC-S)	Brand et al. (2003)	United States	Safety; Teaching and learning; relationships
Un-named	Cemalicilar (2010)	Turkey	Safety; relationships; environmental-structural
Questionnaire of School Climate Connected to Assessment (QSCCA)	Cocorada & Clinciu (2009)	Romania	Safety; teaching and learning; relationships
Health Behaviour in School-aged-Children - School relationship Questionnaire (HBSC-SRQ)	Dong et al. (2012)	China	Teaching and learning; relationships
California School Climate and Safety Survey_ Short Form (CSCSS-SF)	Furlong et al. (2005)	United States	Safety; relationships

School Violence Survey (SVS)	Hurford et al. (2010)	United States	Safety; relationships
Inviting School Survey-Revised (ISS)	Smith (2005)	Australia	Teaching and learning; relationships; environmental-structural
Unnamed	Soderstrom & Elrod (2006)	United States	Safety; relationships
Modified Delaware School Climate Survey. Student (M-DSCS-S)	Yang et al. (2013)	United States/China	Safety; relationships
School Climate Measure (SCM)	Zullig et al. (2010)	United States	Teaching and Learning; relationships; environmental. structural

Table 1.2. Summary of student-self report instruments described in literature reviews

The main purpose of the review by Zullig and colleagues (2010) was to develop a psychometrically sound measure of school climate. To this aim, they first reviewed five student self-report instruments that met the criteria of having been used consistently since their inception, and analysed whether each of these measures was reliable and able to account for the five school climate domains they considered essential (see Table 1.1). The authors concluded that the instruments were incomplete in this regard, and thus developed a new instrument by selecting items from the existing measures.

A few years later, Kohl and collaborators (2013) provided an overview of student self-report questionnaires to measure school climate, with a specific focus on research studying the link between school climate and aggression. They provided evidence that many authors created their own measure or adapted other instruments, and in both cases the items were often similar. They concluded that, even if adapting a measure may have advantages for developing a new approach or applying it in a specific school context, this practice should be avoided if there are adequate existing measures.

Finally, Ramelow and collaborators (2015) reviewed 12 articles presenting school climate instruments that were validated for students aged 11 years and older and published between 2003 and 2013. The questionnaires were described in terms of contents, psychometric and formal qualities. By and large, this review offered a useful synthesis of the currently available questionnaires, raised critical questions concerning the limitations of such measures, and concluded by stating that it is difficult to find an appropriate and well-validated tool able to capture this broad construct.

Overall, research on school climate has accumulated a vast literature and consolidated the interest toward the construct by school and educational psychology. However, while more and more studies are conducted, it has become clear that several blind areas still exist and need to be addressed to improve the quality of our understanding of such a complex construct and its possibility to be translated in concrete practices. More on this blindness will be discussed later on in

this chapter; now I will address the reasons why the interest toward such a complex construct has been constantly increasing in the last years.

1.2 Why Should We Try to Grasp the Beast? What We Know About School Climate

Already in the above cited early review on school climate, Anderson (1982) questioned the opportunity and feasibility of studying school climate. In this review, scholars were grouped in three categories. There were those who did not consider useful to study this topic: due to the impossibility to intentionally manipulate school climate, these scholars argued that research on school climate could not be translated into practical information for policy makers. Then, there were those who considered the study of school climate as a desirable but ultimately unachievable goal. For these scholars, the schoolwide, multidimensional, complex nature of the construct was not only a weakness but an insurmountable obstacle, making the construct impossible to capture. Lastly, Anderson referred to the more optimistic scholars, who considered the study of school climate both desirable and possible. These scholars viewed the difficulty in capturing the complexity of the construct as a necessary challenge to come closer to the complexity of the real school environment.

As seen in the first paragraph, after almost four decades such challenge has not been completely met. The good thing, however, is that in the meantime an extensive literature has accumulated evidence supporting the importance of studying school climate and its usefulness for research and practical intervention purposes. In this direction, various reviews have collected studies on the associations of school climate with several relevant outcomes in the school environment. A first and foremost element of interest emerging from this literature is its protective power with respect to bullying, violence and problem behaviours. Indeed, a large number of authors endeavoured to confirm this association. Recent meta-analyses (Reaves et al., 2018; Steffgen et al., 2013) compared many study results, finding a moderate negative association but also, as seen before, a great heterogeneity. Other reviews (Aldridge & McChenney, 2018; Kutsyuruba et al., 2015) highlighted the association of school climate with adolescent well-being and mental health,

considered as a present-day emerging public health issue, while Gray, Wilcox and Nordstokke (2017) reviewed studies supporting the association of a positive school climate with teachers' mental health. Another important association was found between a positive school climate and better academic achievement (Berkowitz et al., 2017; Kutsyuruba et al., 2015).

Beyond these interesting findings, I believe that the most important reason for addressing the issue of school climate rests in its implications for practical interventions in cooperation with schools. In a cornerstone work on school climate, Cohen and colleagues (2009) addressed the importance of this construct for policy makers and educators, and underlined the need to bridge the existing gap between a honeypot of research findings and the actual practice. In fact, and beyond the doubts raised by many authors in Anderson's review in 1982, there is today consensus on considering school climate as a malleable, viable, data-driven tool potentially changeable via interventions (Voight & Nation, 2016; Wang & Degol, 2016) and able to support both good and unsuccessful schools in promoting student success and wellbeing (Thapa et al., 2013).

From all these contributions, school climate emerges as a useful access route to better understand the school environment and promote students' and teachers' self-reflections that can eventually foster school change and improvement. It is indeed a promising direction of study but, to become truly useful for real change, several critical issues need to be considered.

1.3 Emerging Limitations of the Literature

As anticipated in the first paragraph of this chapter, there are various weaknesses in school climate research that should be addressed in order to go forward and to facilitate the translation of current knowledge in concrete directions for practical intervention.

On a theoretical level, even though school climate has routes in several well-established theories, many empirical studies missed the opportunity to ground their research into a theory, and focused instead on the here and now of their data. This is probably due to the difficulty of grasping the interplay among the multiple features of the construct, which is in itself a further challenge.

Another limit of the existing literature pertains to the purposes for studying school climate. Most scholars have conducted studies aimed at exploring the role of school climate in reducing bullying and victimization inside the school context. Other scholars focused instead on different behavioral negative correlates (like problem behavior, absenteeism, substance use, deviant peer affiliation), or on psychopathological correlates either in the area of internalizing disorders (such as depression), or in the bodily area (such as disordered eating behavior and psychosomatic complaints). What is common in the underlying purpose of all these studies, which together constitute a very large part of the literature, is considering school climate for its protective role toward undesirable outcomes. While this is undoubtedly a valid and important outlet for research on school climate, another perspective, anchored in a positive psychology framework, has not yet received the same attention but may prove to be of equal value. More on this in the following paragraph.

On a methodological level, other important limits emerge. First of all, along with a difficulty to define what school climate is, there is also a confusion on what is not school climate. As stated above, a severe weakness of school climate research is that, to this day, empirical studies adopt different definitions when referring to the same construct. A related issue is that when searching for school climate research, scholars easily bump into an abundance of similar constructs, such as school belongingness, school attachment, teacher support or school culture. The overlapping of these labels generates confusion and prevents a clear understanding of school climate. The lack of clarity on the distinction among these constructs is often reflected also in the measures adopted to assess them.

The last but arguably more urgent issue in the research on school climate concerns in broader terms the measurement of the construct. Indeed, notwithstanding the reviews cited in the first paragraph, the issue of measurement is far from being solved, and the limits and problems raised by the existing measures make research in the field a challenging task. While those reviews offered a useful synthesis of existing instruments, it is still not clear which measures are most

consistently adopted in empirical studies and whether or not there is any sort of homogeneity of measurement. Moreover, how to capture the multidimensional nature of school climate is still an open question for researchers: different measures include different dimensions and it is not clear if the current empirical research, with all its interesting findings, is based on a shared ground on which dimensions should be included when referring to "school climate".

To sum up, the limitations identified in this paragraph can be related to the need of: a) grounding in theoretical frameworks empirical research on school climate; b) expanding purposes to study this construct beyond its protective role against specific undesirable outcomes; c) shedding light on the confusion between school climate and neighboring constructs; d) addressing measurement issues. All these aspects need to be addressed in future studies on school climate.

1.4 The Way Forward: Theoretical and Methodological Suggestions for an Advancing Research Project

Beyond the above-mentioned issues that largely constitute "blind areas" in the study of school climate, in the literature we can also find, here and there, some cues as to how to address some of them. Together, these cues and suggestions can provide a fruitful starting ground to design new research capable of advancing in the field. I address below the four most important literature limits, that I try to overcome by relying on cues and implications of previous studies.

Concerning the *issue of theory grounding*, Rudasill and colleagues offered a very interesting theoretical effort in a recent work (Rudasill et al., 2018). These authors proposed a Systems View of School Climate able to provide a broad though applicable framework for school climate research. In this approach, students are placed at the center of a series of nested and interactive contexts that intertwine in order to promote or detract from students' experiences in school. The authors also made an effort to situate each domain of school climate within a specific level of those proposed by the Ecological Systems Theory (Bronfenbrenner, 1979). In accordance with this view, I believe that future research on school climate should start from the recognition that schools are complex systems, in which education and instruction processes involve the interdependent transactions and

relationships between and among individuals and groups. At the light of this, the ideas stemming from system theory principles can be useful in improving our understanding of the complexity of school climate and eventually grasping its malleable features on which creating and implementing interventions.

With regard to the *purpose* for studying school climate, as anticipated in the previous paragraph, a new direction may reside in considering it not only for its protective role with respect to undesirable outcomes, but also for its potential in promoting positive practices and desirable outcomes. Albeit very few, there are already some studies that considered school climate from a positive psychology perspective, suggesting that a good climate can indeed lead to positive outcomes, such as high academic achievement (Maxwell et al., 2017; Reynolds et al., 2017), student engagement (Fatou at al., 2017), satisfaction with the school both for students and teachers and emotional well-being for the entire school population (Aldridge & McChesney, 2018). This perspective appears to be an interesting and promising direction for future school climate research.

As seen in the previous paragraph, a third weakness of the field may be found in the unclear *boundaries among school climate and other similar constructs*. A pressing need in this direction is to provide a clarification and distinction in particular between two of these concepts, namely school climate and classroom climate. These concepts refer to intertwined though different aspects of students' and teachers' daily experience. The distinction as well as the synergic power of school and classroom climate has to be underlined, as these constructs refer to two structural and organizational entities, one including the other. However, the literature is not yet clear on such distinction. The two terms are used differently for referring to the level of interest (classroom or school), but there is neither a clear conceptualization, nor specific measures able to account for the differences between the two constructs. An effort to clarify this distinction is offered in the above-cited work by Rudasill and collaborators (2018). Drawing from system theories, the authors argue that classrooms constitute the proximal nanosystem in which the more distant school climate (microsystem) is created by means of the combined perceptions of its members. In the classroom,

students interact among them and with the teachers, are involved and participate in didactic practices. Through all these actions, they build their experience as members of the school community, and develop interpretations and perceptions that converge in their vision of school climate. This conceptualization of classroom and school climate is somewhat reflected, on a methodological level, in the approach by Janosz and colleagues (1998). In their questionnaire on the school environment (Janosz & Bouthillier, 2007) these authors considered as two separate areas the concrete everyday practices (i.e., what people do in daily exchanges mostly happening in the classroom) and the more abstract climate (i.e., how people feel in their school). Altogether, these reflections suggest to consider school and classroom climate as interdependent concrete and abstract features of the school environment, where changes in one aspect reverberate on the other. This is a promising direction for the study of school and classroom climate as it also allows to consider whether what individuals do in the classroom has an effect on how individuals feel at school, thus grasping the school environment in its complexity.

As for the fourth limitation in the literature on school climate, the *measurement issues*, differently from the previous limitations, I did not find in the literature any stable anchorage in the sea of different measures, dimensions and conceptualizations regarding the construct. Thus, to address this concern, I set out to conduct a systematic review of the literature focused on measurement and methodologies adopted in recent years, with the aim to create a detailed picture of the current practices in the study of school climate. I will present it in Chapter 2.

Chapter 2 - A Systematic Review of School Climate Literature[1]

The current knowledge on school climate features it as an interesting, potentially useful albeit challenging construct. Its multidimensional nature is at the same time a strength and a weakness. A strength, because it recognizes the complexity of the school environment, well beyond individual and isolated variables. A weakness, as school climate research struggles in finding a common ground for the definition and measurement of the construct.

The methodological difficulty in the study of school climate needs to be emphasized. Indeed, previous reviews focused on the validation of measures, but did not account for which measures are mostly used, and which are the most common practices for the operationalization in dimensions of the construct. Moreover, the considered measures were exclusively student self-report measures, while the possibility of multi-informant studies and instruments has been overlooked. Lastly, such reviews did not account for the longitudinal studies, even though they are considered as a necessary evolution in the study of school climate (Wang & Degol, 2016). In particular, no review has provided information on the prevalence of such studies and on the methodologies adopted. Filling in these gaps was the aim of the review I present in this chapter.

2.1 Aims

In this analysis of the literature I built on previous reviews and moved forward by analyzing the current state of the art concerning multidimensionality and quantitative measurement. This task was never addressed before, while I believe that it is essential for understanding what are the current most common practices in the assessment of such a complex construct, if there are any. This knowledge, in turn, can inform both future research and intervention.

To this aim, the current overview of empirical research carried out from 2010 and on addressed three issues (see Grazia & Molinari, 2020). First, to describe which measures were

[1] Part of this chapter's content is published in: Grazia, V., Molinari, L. (2020). School climate multidimensionality and measurement: A systematic literature review. *Research Papers in Education*. https://doi.org/10.1080/02671522.2019.1697735

actually used in the empirical studies. Second, to explore whether recent theoretical efforts to establish a common multidimensional ground (especially by Wang and Degol, 2016) were echoed by authors researching in the field. Third, to account for measures used in studies that were based on multiple informants and longitudinal data.

2.2 Method

Literature Research

The review was informed by the Preferred Reporting Items for Systematic Reviews and Meta-analysis (PRISMA) guidelines. PsychInfo and Scopus databases were used as primary information sources and cross-referenced the studies to find possible further articles to include in our review. Were included only articles from peer-reviewed journals written in English, Italian or French, reporting studies with participants from secondary schools (middle and high school, from grade 6th to 12th), either exclusively or as part of broader samples. Consequently, were excluded articles with samples composed only of pre-school, kindergarten, elementary or college students. The decision to focus on research in secondary schools was driven by the consideration that primary and secondary education differ in academic objectives and strategies, and as a consequence school climate dimensions such as relational quality and teaching and learning are intrinsically different. The only key word for the database search was 'school climate'. This was a deliberate choice driven by the specific intent to identify measures and instruments used to study this specific construct. This decision may have led to the exclusion of interesting studies on other related aspects of schools, but that was beyond the scope of the current review.

Inclusion Criteria

Some restrictions through the use of inclusion criteria were applied. Firstly, the search was limited to the years between 2010 and 2018, thus including all the studies published after the year of publication of the review by Cohen et al. (2009), which can be considered a milestone in the study of school climate as it provided a generally accepted comprehensive definition. Moreover, given the review focus on quantitative measures, which represent more than 90% of the studies in

the field (Wang & Degol, 2016), the few qualitative studies were excluded. Finally, studies that considered at least two dimensions of school climate were included. This choice was informed by an overarching interest toward a multidimensional approach to school climate. As a consequence, all the articles that accounted for only one dimension of school climate were excluded, together with the articles with a specific and limited definition of school climate (e.g. authoritative school climate, organizational climate, instructional climate, participative climate), and those focused on specific types of school (e.g., boarding schools). I also found a group of studies focused on climate as it is perceived by specific populations, such as sexual or ethnic minorities; as these studies did not correspond to the more general definition of school climate, for the purposes of this review they were excluded.

2.3 Results

The first search on PsychInfo and Scopus databases yielded 1410 results. Duplicates were eliminated, and all titles and abstracts were screened in order to identify which articles were consistent with our inclusion and exclusion criteria. After the screening, 158 articles to be assessed for eligibility were identified; of these, the full text was obtained and, after a further application of our inclusion and exclusion criteria, 111 articles to be included in the review were selected. Two more articles were then included after hand-searching and cross-referencing the articles, for a total of 113 articles included in the present review (Figure 2.1).

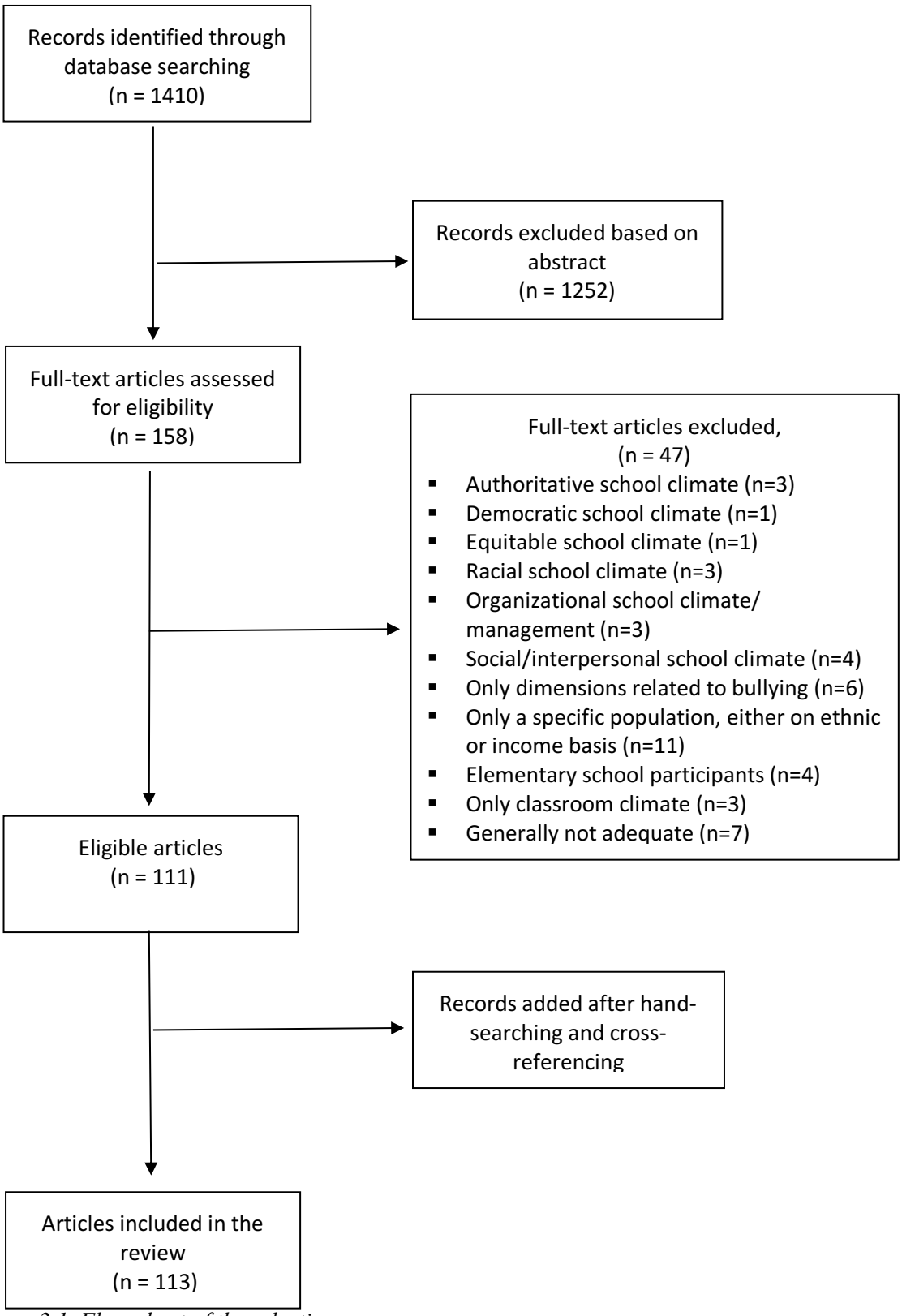

Figure 2.1. Flow chart of the selection process

By and large, the selected articles provided some general information on the diffusion of school climate research. Since 2010, the interest in the study of school climate has steadily increased, with the number of studies per year growing from the nine eligible articles in 2010 to the 26 eligible articles in 2017. The United States were the main center of research on the topic, with about 53% of studies conducted there. However, research was also active elsewhere, especially in Canada (about 9%) and Australia (about 8%). In Asia, the most active country was China with seven (about 6%) articles. Europe, as a whole, covered almost 19% of the studies, mostly conducted in Portugal, Spain and Germany; only three studies were conducted in Italy

2.3.1 Measures Used in School Climate Research

A substantial number of articles used data from national and international surveys (about 32% of the selected articles, with 11 studies based on international surveys and 25 based on national surveys). The mostly used international source of data was the *Health Behaviors in School-aged Children* (n=7 studies). This is an international survey conducted in several countries every four years, which encompasses many different aspects of adolescents' life. From this large survey, authors calculated variables related to school climate in two ways: two studies (Farhat et al., 2011; Saab & Klinger, 2010) computed only a general factor to measure school climate while the other five studies (Freeman et al., 2012; García-Moya et al., 2013; Larochette et al., 2010; Ottova et al., 2012; Whitehead et al., 2015) computed more than one domain. As the survey comprised the *School Relationships Questionnaire*, reviewed in Ramelow et al. (2015), all five studies included dimensions related to school relationships quality, even if the definitions varied. Other computed dimensions of school climate from this survey were school pressure (Freeman et al., 2012; Ottova et al., 2012), liking the school (Whitehead et al., 2015), school related stress (García-Moya et al., 2013) and safety (Larochette et al., 2010).

On a national level, many countries, especially the United States, used their own periodic survey to assess various aspects of school life. Such surveys usually involved many schools and large samples of students. The most cited validated national surveys were the *California Healthy*

Kids Survey (Benbenishty et al., 2016; De Pedro et al., 2016; Lenzi et al., 2017; O'Malley et al., 2015; Voight et al., 2015) and the *Maryland Safe and Supportive School Survey* (Bradshaw et al., 2014; Lindstrom Johnson et al., 2016; Lindstrom Johnson et al., 2017; Milam et al., 2017). The *California Healthy Kids Survey* comprised a specific scale for school climate, i.e. the California School Climate Scale developed by Furlong et al. (2005), which was described in previous reviews (Kohl et al., 2013; Ramelow et al., 2015; Zullig et al., 2010). From this scale, the reviewed articles quite consistently reported to have obtained the following dimensions of school climate: school connectedness, quality of teacher-students relationship, safety and student meaningful participation in the school decision processes. With regard to the *Maryland Safe and Supportive School Survey*, one of the selected articles (Bradshaw et al., 2014) identified a 3-factor model comprising safety, engagement and environment, while the other articles used different variables depending on the specific study aims: one focused on food environment in the school (Milam et al., 2017), one on delinquency and physical comfort (Lindstrom Johnson et al., 2017), one on parent engagement (Lindstrom Johnson et al., 2016). By and large, all these studies included a dimension related to the relational environment, even if defined in different ways. From my own assessment of the above-cited articles, a critical point in the use of national and international surveys is that variables and dimensions were often created by aggregating items, without using specific scales and subscales. As a consequence, even if different studies computed variables from the same survey, the comparison of results was not possible.

In addition to the difficulties for comparison, also studies that did not use national or international surveys reported a variety of methods and instruments to measure school climate. Many articles were based on existing and validated measures of school climate that nevertheless authors adapted to the specific aims or reduced to a shorter version (including a subscale or only a few items) of the original measures (see Grazia & Molinari, 2020). One study (Dymnicki & Multisite Violence Prevention Project, 2014) combined more than one existing measure to assess various dimensions of school climate, while 12 articles (Connell et al., 2015; Luengo Kanacri et al.,

2017, Marsh et al., 2014; Nickerson et al., 2014; Pössel et al., 2016; Reynolds et al., 2017; Richard et al., 2012; Sawyer et al., 2010; Segool et al., 2014; Tinsley & Spencer, 2010; Tomczyk et al., 2015; Van Beurden et al., 2017) reported the use of items created ad hoc or taken from other studies, without specifying from which measure they were originally from. Other six articles (Arastaman & Balci, 2013; Denny et al., 2011; Texeira & Alves-Pinto, 2015; Turner et al., 2014; Van Eck et al., 2017; Veiga Simão et al., 2017) were based on instruments specifically created or validated in the same research. Lastly, 27 studies, described in the following paragraph, made use of validated instruments.

2.3.2 Description of Validated Instruments

Eighteen existing validated measures that were used at least once in our selection of empirical studies were found (reported in Table 2.1). Out of these, only four appeared in more than one study, and no measure was used in more than four studies.

Only five of these validated measures were described in previous reviews. One reason for this is that some instruments were validated after the time-period considered by the authors (e.g. the SCASIM, developed by Lee et al. in 2017) while others were published earlier (it is the case, for example, of two of the most used instruments, that is, the *School climate survey* and *My class inventory*). Moreover, some measures were published in languages not considered in previous reviews (such as the *Social-educational Environment Questionnaire*, developed in French by Janosz & Bouthillier in 2007) and one was a teacher-report scale (e.g. the *School level environment questionnaire*).

By and large, all measures are multidimensional. Again, the labels of the dimensions differed to a great extent, even if it is reasonable to suppose (but data are not always available) that the items were similar. The questionnaires were mainly developed in the USA and Australia. Four of the instruments were developed in European countries, namely Spain, Sweden and Portugal. The mostly used questionnaire was the *School climate survey-revised*, previously described in the review by Kohl et al. (2013). Other three questionnaires, i.e. *My class inventory*, *Perceived school*

climate scale and *What is happening in this school*, were used in more than one study and were not described in previous reviews. The first (Fraser et al., 1982) is a multidimensional student-report measure mainly based on relational aspects of the school climate, with dimensions of Friction, Cohesion, Competition and Satisfaction related to life inside the classroom and the school. The second, in a short or extended version (respectively, Bao et al., 2013; Bao et al., 2015) is a student-report measure developed and used in China, based on the adaptation of the Inventory of school climate by Brand, Felner, Shim, Seitsinger and Dumas (2003). The extended version included three dimensions of school climate (Teacher support, Student support and Opportunities for autonomy), while the short version was used to calculate only one general variable of student perceptions concerning school climate. The third student-report measure, developed (Aldridge & Ala'l, 2013) and used in Australia, included dimensions of school climate that belong to the Community and Safety domains.

Among the other measures, a well-described and multi-informant questionnaire is the *Socio-educational Environment Questionnaire* (SEQ), validated in French by Janosz & Bouthillier (2007), which comprised three dimensions to be assessed by students and staff: Practices, School climate and Problems. Each of the first two dimensions included various sub-scales, while the Problems scale assessed the frequency of a series of single items describing behavioral problems in the school context.

Finally, the *School level environment questionnaire* (developed by Rentoul & Fraser, 1983, and later revised by Johnson et al., 2007) was the only teacher-report measure adopted either as whole or partially. In contrast with other measures, this questionnaire was focused on organizational and leadership aspects.

Instrument name	Study	Described in previous reviews	Informants	Creators	Country	Domains
My Class Inventory (MCI)	Batanova et al., 2016; Cance et al. 2015; Mucherah et al., 2018		Students	Fraser et al. (1982)	USA	Friction, cohesion, competition, satisfaction
Perceived School Climate Scale	Bao et al., 2015; Li, et al., 2016; Wang et al., 2017		Students	Bao et al. (2013); Bao et al. (2015)	China	Teacher support, student support, opportunities for autonomy
Social-educational Environment Questionnaire (SEQ)	Fatou & Kubiszewski, 2017		Students Staff	Janosz & Bouthillier (2007)	Canada	Practices (Rules clarity and enforcement, student support, participation, family-school communication, pedagogical practices), School climate (relational, safety, justice, educational, connectedness), Problems
What is Happening in This School (WHITS)	Aldridge et al., 2016; Aldridge & McChesney, 2018; Riekie et al., 2017	Ramelow et al.	Students	Aldridge & Ala'l (2013)	Australia	Teacher support, peer connectedness, school connectedness, affirming diversity, rule clarity, reporting and seeking help
Educational Vital Signs	Stillman et al. 2017		Students Teachers	Not specified	Not specified	Learning, Safety, involvement, thriving
School Climate and School Identification Measurement Scales (SCASIM)	Maxwell et al., 2017		Students staff	Lee et al. (2017)	Australia	Academic emphasis, staff-student relations, student-student relations, shared values
School Level Environment Questionnaire (SLEQ)	Aldridge, & Fraser, 2016		Teachers	Rentoul & Fraser (1983); revised by Johnson et al. (2007)	Australia	Affiliation, work pressure, staff freedom, resource adequacy, goal consensus, principal support
School Climate Survey-Revised (SCS)	Hendron et al. 2016; Holfeld et al., 2017; Suldo et al., 2012; Suldo et al., 2013	Kohl et al.	Students	Haynes et al. (1994); Haynes et al. (2001); Emmons et al. (2002)	USA	Fairness of rules, Sharing of resources, order and discipline, parent involvement, student-student relations, teacher-student relations
Pedagogical and Social Climate of a School (PESOC)	Galanti et al. 2016		Students Teachers	Not specified	Sweden	Not specified
Questionnaire to Assess School Social Climate	Zorza et al., 2015		Students	Trianes et al. (2006)	Spain	Helpful behaviour, safety and respect, teacher-student relations
Unnamed	Borges, 2015		Students	Texeira (2008)	Portugal	Relations (with peers, teachers class director); equity; safety; working conditions
Tool kit from CASEL	Hung et al. 2015		Students	Not specified	Not specified	Authoritative structure, student order, student support
School climate questionnaire	Gómez & Gaymard, 2014		Students teachers	Gaymard et al. (2002)	Spain	School level: student-student relations; student-teacher relations; teacher-teacher- relations; school-family relations; family-family relations Classroom level: student-student relations; student-teacher relations; rules and discipline
Delaware School Climate Survey Student (DSCS-S)	Bear et al., 2017	Ramelow et al.	Students	Bear et al. (2011)	USA	Teacher-student relationships, student-student relationships, fairness of rules, clarity of expectations, school safety, school-wide engagement, school wide bullying.

Modified Delaware School Climate Survey (M-DSCS-S)	Yang et al. 2013	Ramelow et al.	Students Teachers parents	Yang et al. (2013)	USA/China	Student-teacher relations; student–student relations; school liking; fairness of school Rules
Classroom Environment Scale (CES)	Fortin et al. 2013		Students	Moos & Trickett (1987)	USA	Engagement; affiliation; teacher support; task orientation; competition; order and organization; clarity of rules; teacher control; innovation
School Climate Measure (SCM)	Zullig et al. 2011	Ramelow et al.	Students	Zullig et al. (2010)	USA	Student-teacher relations; school connectedness; academic support; order and discipline; physical environment; social environment; perceived exclusion/privilege; academic satisfaction
Character in Action	Schneider & Duran, 2010		Students	Davidson & Khmelkov, personal communication (2006)	Not specified	Safety; adult support; acceptance of diversity; personal and collective responsibility; prosocial behaviour; experiences of character development

Table 2.1. Validated instruments used in at least one study

2.3.3 The Multidimensional Ground of School Climate Research

Wang and Degol (2016) provided sharp evidence that school climate is a multidimensional construct comprising four main domains and several dimensions (see Table 1.1). However, from my own reading of the literature, I found that research in the field is far from sharing a common ground for such multidimensionality. On the contrary, various authors referred to a multitude of domains, and even when the dimensions were similar, the definitions differed. In many cases, which dimensions to consider depended on the aims of the study: some authors, for example, decided to focus on the school climate dimensions that were more closely linked to the outcome variable. More than one study computed dimensions of school climate with a factor analysis after the administration of the survey, especially when data from national and international surveys were used. There were also substantial differences among studies whose respondents were teachers or students, with the first ones more focused on organizational aspects. In the end, what emerges is that, despite the various attempts to converge, school climate research remains a very fragmented field.

A further support to this claim is that no studies adopted the complete set of domains and dimensions proposed by Wang and Degol (2016). A few studies appeared to be more comprehensive than others, but even when the areas of interest represented the four domains, names and definitions differed. Moreover, some studies considered dimensions not explicitly accounted for in Wang and Degol's (2016) proposal. For example, some articles included a dimension related to parent involvement (Bradshaw et al, 2014; Hendron & Kearney, 2016; Holfeld & Leadbeater, 2017; Lee, 2011; Lindstrom Johnson et al., 2016; Suldo et al., 2012; Suldo et al., 2013; Van Eck et al., 2017), to school-family relations (Gómez & Gaymard, 2014) or to student support at home (Gage, et al., 2016; Gage et al., 2014). A number of studies (Arastaman & Balci, 2013; Bao et al., 2015; Benbenishty et al., 2016; De Pedro et al., 2016; Konishi et al., 2017; Låftman et al., 2017; O'Malley et al., 2015; Stillman et al., 2017; Voight et al., 2015; Wang et al., 2017) included a dimension on students' autonomy and meaningful participation in the school decision processes, which in Wang

and Degol (2016) was described as being part of the dimension Respect for diversity (in the Community domain). Out of these studies, most adopted either the *California School Climate Survey* in the USA, or the *Perceived School Climate Scale*, in China. Another dimension, i.e. student engagement, appeared to be a controversial element because in one study it was considered to be an outcome (Fatou & Kubiszewski, 2017), while in others as a dimension of school climate (Bear et al., 2017; Bradshaw et al., 2014; Fortin et al., 2013; Luengo Kanacri et al., 2017; Malone et al., 2017).

Again, in the validated instruments (see Table 2.1) there is little to no overlapping with the set of domains and dimensions proposed by Wang and Degol (2016). On the contrary, some instruments were based on completely different dimensions, such as *My class Inventory*, while others comprised few dimensions on a single domain (it is the case of the *School Level Environment Questionnaire*, focused on the Leadership and Professional Development dimensions from the Community domain).

The instrument that most closely represented Wang and Degol's proposal is the *School Climate Measure* (SCM), developed by Zullig et al (2010). Indeed, as described in the previous chapter, this measure was developed after a literature review that led the authors to identify five domains of school climate which were quite similar to the ones proposed by Wang and Degol. The main difference in the proposed set of domains is that School Connectedness was considered by Zullig and colleagues as a separate domain, while Wang and Degol incorporated it as a dimension of the Community domain. Also, the dimensions included in each domain were not always the same. Furthermore, Zullig et al. (2010) combined items from existing measures and tested them, ending up with an eight-domain scale covering all the five domains and further distinguishing some of them. Other two measures, i.e. the national survey *Maryland Safe and Supportive School* and the *Socio-educational Environment Questionnaire*, included many of the identified dimensions but were developed within a different theoretical approach.

The good side of the story is that, by and large, most instruments included at least one dimension from the Community domain and one from the Safety domain. As for Community, more than half of the studies reported a relational dimension, even if the definitions varied: some authors focused more on the general positive quality of relationships, others more specifically on the supportive and caring quality. Further differences were found as far as the subjects of the relationships were concerned: one third of the studies included both measures of student-student relationships and teacher-student relationships, while fewer focused only on student-student relationships and others only on teacher-student relations.

A significant number of studies measured if students felt connected or affiliated (the dimension defined as Connectedness by Wang and Degol) to their school community (Grazia & Molinari, 2020), and other studies also explored the dimension Respect for Diversity (Aldridge et al., 2016; Aldridge et al., 2018; Gage et al., 2016; Gage et al., 2014; Konishi et al., 2017; Nickerson et al., 2014; Riekie et al., 2017; Schneider & Duran, 2010), mostly with the *What's happening in this school* questionnaire (Aldridge et al., 2016; Aldridge et al., 2018; Riekie et al., 2017) or the *Meriden School Climate Survey* (Gage et al., 2016; Gage et al., 2014), a school district survey. Overall, and beyond the differences, the Community domain can be considered as the mostly shared ground in school climate research.

Dimensions comprised in the Safety domain were found less often but still consistently. However, while Wang and Degol (2016) proposed two different dimensions for Physical and Emotional Safety, these were generally not clearly distinguished and often appeared intertwined in the same dimension. In detail, there were studies that included a variable specifically related to the prevalence of bullying and aggression inside the school, to the order and discipline dimension, or more specifically declined as the perception of school rules fairness and clarity (Grazia & Molinari, 2020).

The other two domains were less represented. As for the Academic Climate domain, the considered dimensions varied to a great extent. Overall, many studies included a dimension at least

loosely related to the Teaching and Learning dimension of this domain, but with various nuances: some referred to a general learning or instructional climate (Buehler et al., 2015; Collie et al., 2011; Fatou & Kubiszewski, 2017; Gerard & Booth, 2015; Kotok et al., 2016; Malinen & Savolainen, 2016; Nickerson et al., 2014; Stillman et al., 2017; Van Eck et al., 2017), others investigated the value placed on academic success (Lee, 2011; Maxwell et al., 2017; Van Eck et al., 2017; Wang et al. 2010) or on academic support (Turner et al., 2014; Wang & Dishion, 2012; Wong & Siu, 2017; Zullig et al., 2011), and fewer considered academic self-regulation (Nickerson et al., 2014), school pressure (Freeman et al., 2012; Ottova et al., 2012, Richard et al., 2012), perceived competence and satisfaction (Wong & Siu, 2017; Zullig et al., 2011) and learning interests (Wong & Siu, 2017). As a result, even though all of these studies apparently measured the Teaching and Learning dimension of the Academic Climate domain, their scope, definitions and instruments varied to a great extent. The other two dimensions of the Academic Climate domain, i.e. Leadership and Professional development, were considered when teachers or administrators were involved in the research (Aldridge & Fraser, 2016; Collie et al., 2011; Collie et al., 2012; Dymnicki et al., 2014; Malinen & Savolainen, 2016; McLean et al., 2017; Richard et al., 2012; Skinner et al., 2014). For these dimensions, the mostly used instrument was the *School level environment questionnaire* (see paragraph above and Table 2.1 for a description).

A limited number of studies included a dimension for the Institutional Environment domain. Some considered the adequacy dimension, declined as the physical environment or building appearance (Bradshaw et al., 2014; Liu, 2012; Suldo et al., 2012; Texeira & Alves-Pinto, 2015; Van Eck et al., 2017; Zaykowski & Gunter, 2012; Zullig et al., 2011), others the availability of resources (Aldridge & Fraser, 2016; Collie et al., 2011; Collie et al., 2012; Liu, 2012; Van Eck et al., 2017) or the sharing of resources (Hendron et a., 2016; Suldo et al., 2012; Suldo et al., 2013), and a single study considered this domain in general (Martinez et al., 2016).

Lastly, in the selected empirical studies there were studies that, even if they considered multiple aspects of school climate (as required by one of the inclusion criterion), computed only

one general indicator of school climate (Grazia & Molinari, 2020). In these articles, school climate was often assessed through a small number of items.

2.3.4 Multiple Informant and Longitudinal Research

In more than 80% of the studies, students were the only respondents, while fewer studies involved exclusively teachers' perceptions of school climate (Aldridge & Fraser, 2016; Back et al., 2016; Brault et al., 2014; Collie et al., 2011; Collie et al., 2013; Dymnicki et al., 2014; Malinen & Savolainen, 2016; McLean et al., 2017; Pössel et al., 2016; Skinner et al., 2014; Van Beurden et al., 2017; Von der Embse et al., 2016) or parents' (Goldkind & Farmer, 2013; Whitaker & Hoover-Dempsey, 2013). The measure more commonly used to investigate teachers' perceptions was the *School Level Environment Questionnaire*, which in some studies was used in its complete version while in others reduced to a single scale or a few items. In other studies, items were taken from validated measures, such as the *Delaware School Climate Survey – Teacher/Staff* (Bear, Yang, Pell, & Gaskins, 2014) or the *Socio-educational Environment Questionnaire* (Janosz & Bouthillier, 2007), from national surveys, or developed ad hoc.

Only seven studies (Galanti et al., 2016; Gómez & Gaymard, 2014; Kotok et al., 2016; Maxwell et al., 2017; Richard et al., 2012; Sawyer et al., 2010; Stillman et al., 2017) considered multiple perspectives (students and staff), and out of these, three (Gómez & Gaymard, 2014; Maxwell et al., 2017; Stillman et al., 2017) collected data from different informants on the same measure of school climate, thus allowing the comparison of results. They all relied on validated measures, i.e. the *Educational Vital Signs*, the *School Climate and School Identification Measurement Scales* or the *School Climate Questionnaire* (see Table 2.1). Each of these measures focused on different objects of comparison: for example, the *School Climate Questionnaire*, developed in Spain by Gaymard, Andrés and Fernández (2002), allowed to compare students' and teachers' perceptions of the frequency and quality of conflict and aggression in the school and in the classroom. Instead, in the *School Climate and School Identification Measurement Scales*, developed in Australia by Lee and colleagues (2017), the mirroring dimensions for staff and

students were Academic emphasis, Student-staff relations, Student-student relations and Shared values and approach.

As far as the research design was concerned, the vast majority of the studies were cross-sectional, with participants asked to complete self-report surveys on their perceptions of school climate, along with many other variables, in a single point of time. Only 17 articles reported longitudinal data (Batanova & Loukas, 2016; Benbenishty et al., 2016; Gage et al., 2014; Gendron et al., 2011; Gerard & Booth, 2015; Guerra et al., 2011; Holfeld & Leadbeater, 2017; Kotok et al. 2016; Luengo Kanacri et al. 2017; Malinen & Savolainen, 2016; Pössel et al., 2016; Sawyer et al., 2010; Schneider & Duran, 2010; Tomczyk et al., 2015; Turner et al., 2014; Wang & Dishion, 2012; Wang et al., 2010). Among these, four studies (Gendron et al., 2011; Guerra et al., 2011; Holfeld & Leadbeater, 2017; Malinen & Savolainen, 2016) relied on data collected in two or more waves during the same academic year, while the others used data from two or more (with a maximum of six) academic years, in most cases consecutive.

In 13 of these studies, data on school climate were based on students' perceptions, in three teachers were the only respondents (Malinen & Savolainen, 2016; Pössel et al., 2016; Sawyer et al., 2010), and one study involved students and parents (Luengo Kanacri et al. 2017). No article provided a comparison of multiple points of view on the same dimensions of school climate.
As for the aims, five studies (Gage et al., 2014; Gendron et al., 2011; Guerra et al., 2011; Holfeld & Leadbeater, 2017; Wang & Dishion, 2012) investigated the predicting role of school climate dimensions on bullying, victimization, cyberbullying and aggression, and one study (Batanova & Loukas, 2016) considered school climate as a possible mediator between social awareness and self-management and aggression. Others (Kotok et al. 2016; Tomczyk et al., 2015; Wang & Dishion, 2012; Wang et al., 2010) focused on various developmental risks, such as problem behavior, substance abuse and dropping out of school, or investigated the association between school climate and depression (Gerard & Booth, 2015; Pössel et al., 2016; Sawyer et al., 2010). Only one study investigated the associations of school climate dimensions with a desirable outcome, i.e. positivity

and prosocial behaviors (Luengo Kanacri et al. 2017). A study investigated the impact of ethnicity, background, gender and age on school climate perceptions (Schneider & Duran, 2010) and another the role of academic achievement as a positive antecedent for school climate (Benbenishty et al., 2016). Lastly, while most studies focused on student outcomes, only one study included a teacher variable in the outcomes, namely job satisfaction (Malinen & Savolainen, 2016).

2.4 Discussion

The aim of this systematic review of the literature was to create a detailed picture of how research on school climate meets the challenges raised by the issues of multidimensionality and measurement of such a broad and complex construct, which was lacking.

More specifically, the first aim was to examine which quantitative instruments were actually used to study school climate. The review results show that scholars made use of a surprisingly wide array of instruments, ranging from surveys to validated measures. Unfortunately, with just a few exceptions, most validated measures were used only in a single study. In my view, this constitutes one of the most severe limits of research in the field, for at least two reasons. First, such a fragmentation in terms of instruments does not offer researchers willing to enter the field a coherent picture of the measures they could rely on for their data collection, with the consequence of somehow legitimating every single author to build their own measure or to select items from various scales. Secondly, it makes a comparison of results from different studies very difficult, if not impossible, while this should instead be a major goal for researchers as it could open multiple lines of reflection for intervention and prevention that are surely needed in the schools. This limitation is particularly striking because it highlights that, notwithstanding the vast number of studies that have been published on school climate in the last few decades, we still cannot base our data collection on reliable and widespread measures.

The same limit is further amplified by the results of the analysis on the multidimensionality of the construct. The second aim of this review was to explore whether and to what extent current research refers to the four domains clearly identified by Wang and Degol (2016). The review

findings reveal that authors hardly adhere to this multidimensional picture of school climate. On the contrary, after my overview of empirical works I can conclude that the operationalization of school climate is still as diversified as the instruments adopted to measure it. There were some commonalities among the studies in the interest concerning relationship quality and school connectedness, along with the reference to the dimensions of safety and order in school. All the other domains and dimensions described by Wang and Degol (2016) have actually appeared in a limited number of studies. In this regard, it should be pointed out that particularly the dimensions pertaining to the academic domain, albeit still overlooked by researchers, can be considered a promising area for future studies on school climate. By and large, these results highlight that, notwithstanding the fact that previous reviews have provided a solid theoretical base for the study of school climate, the many authors working in the field have not reached consensus on a common picture. Future studies should strive for converging toward a shared definition of the construct, in order to take full advantage of its multidimensional nature.

The present review also investigated the state of the art of the literature concerning two methodological concerns that have never been addressed before in the reviews, namely the multi-informant nature of the studies and the use of a longitudinal approach. With regard to the first issue, besides confirming that the vast majority of the studies relied on a student-report measure, a limited number of studies that involved only teachers was found, together with two articles studying school climate in parents' perceptions. A major limitation in this field of study is thus that scholars turned out to be far more interested in collecting perceptions from a specific group of participants than to employ a multi-informant research design. Indeed, the review findings reveal that a minimal percentage of the considered articles (6.1%) accounted for multiple perspectives (students and teachers) and even less (2.6%) collected data from different informants on the same measure of school climate, a particularly important procedure that allows for comparison between students' and teachers' perspectives on the same variables. On a side note, I want to highlight that, among the validated measures for the study of school climate, the *Socio-educational Environment*

Questionnaire and the *Delaware School Climate Survey* comprise scales for students and teachers (and also parents, for the second measure) based on mirroring items. The adoption of such scales in different school contexts and countries would constitute an important step forward in research by fostering result comparisons capable of offering a multi-faceted picture of the climate in the schools. The very few studies pursuing the aim of mirroring students' and teachers' perspectives on the same dimensions confirm the importance of such an approach, which I believe should constitute an area of research development in the field. Hearing everyone's voice is necessary in order to accomplish the long-term aim of improving schools through interventions and to foster self-reflection. Students and teachers, as the main actors of the everyday school life, both offer privileged and interlocking perspectives to capture the reality of the school environment. Parents, with their being involved and at the same time being outside the school, presumably develop ideas on school climate that are complementary to those of students and teachers (Thapa et al., 2013). To be able to grasp a complete and nuanced picture, researchers need to rely on instruments that enable them to collect the perceptions of the various school actors on the same dimensions.

Finally, the review highlights that the adoption of a longitudinal approach was rarely found in empirical works and, in these cases, the authors were interested in the analysis of the role played by school climate in predicting negative outcomes, such as bullying and maladjustment. This is indeed another weakness for school climate research that needs to be remedied through studies tracking adolescents in time in order to understand not only the negative outcomes of school climate but also its antecedents and desirable outcomes. In this direction, longitudinal research would contribute to informing the interventions and to improving the school context, a purpose definitely aspired to by scholars.

Some gaps of the literature are reflected in limitations of the present review. As the vast majority of studies considered secondary school grades in aggregated forms, it was not possible to search for differences and distinctions among grades. Moreover, as discussed in the first chapter, one relevant limitation is that the literature is not yet clear on the distinction between school and

classroom climate. The current review was specifically focused on school climate, in order to create a clear and delimited picture of how this specific construct is measured and studied. However, tackling the important distinction between school and classroom climate remains an urgent need to be addressed.

In conclusion, with this review two main considerations emerged, which can launch new projects able to improve the current understanding of school climate. First, it became clearer that there is a call for a convergence on psychometrically sound measures that are comprehensive and allow for a comparison of results on the same dimensions. This would in turn provide results that respect the multidimensional nature of school climate, on one side, and the need for interventions aimed at improving schools, on the other. Only in this way research on school climate will be able to offer schools and teachers truly usable knowledge, eventually transferable to concrete actions and good practices. Second, the review highlighted the need for research designs capable of moving forward from the widespread single informant, cross-sectional studies in order to provide more complex and in-depth findings. Both these considerations, along with those already discussed in the first chapter, became core aspects in planning my doctoral research project.

Chapter 3 - The Research Project

The previously reviewed literature on school climate highlighted several relevant theoretical and methodological gaps that need to be filled in for strengthening the study designs in the field. The intent to address these gaps informed my research project.

3.1 Rationale of the Research Project

From the analysis of existing research on school climate discussed in the first chapter, I found three general aspects that I believe deserve consideration and should inform the design of new research on school climate. First, research should be *grounded in a theoretical framework* offering insights for the interpretation of results beyond the individual empirical research. In this regard, the work of Rudasill and colleagues (2018) provides some useful hints. Second, while most existing studies focused on the role of school climate in preventing undesirable outcomes (such as bullying and problem behaviors), an original approach to school climate could benefit by considering also its *role in promoting desirable outcomes*. In this direction, an interesting yet mostly unexplored aspect concerns the associations between school climate and students and teachers' positive involvement in the learning and teaching process. In this direction, the very few existing studies indicate that a good school climate relates positively to student engagement (Fatou & Kubiszewski, 2017) and negatively to teacher stress (Collie et al., 2012), but more evidence is needed. Third, school climate research should be able to account for the *distinction between school and classroom climate*.

Beyond these aspects, the systematic review of the literature highlighted that the main gaps in the literature on school climate to this day are overall related to the measures and methodologies adopted. First of all, there is a need for *validated, psychometrically sound, multidimensional and comprehensive instruments*, capable of assessing school climate in all its complexity. This is particularly true in the Italian context where, to the best of our knowledge, no measure with these characteristics has been validated and research on school climate is less developed than elsewhere

in the world. Second, with regard to study design, current knowledge on school climate could be improved by *multi-informant studies*. Such studies would allow to consider different points of view, to obtain composite perceptions of the same school environment, and also to make comparisons for finding points of agreement or disagreement among informants. Third, still regarding study design, researchers worldwide agree that *longitudinal projects* are definitely needed to deepen the understanding of school climate. Studies with a longitudinal approach would allow on the one hand to collect evidence on temporal causality when considering possible outcomes, and on the other hand to study trajectories of school climate perceptions. Each of these points is important not only for advancing the literature by addressing some of its most serious gaps, but also for its relevance in terms of translating research knowledge into practice through interventions. Findings obtained with reliable measures anchored to a shared multidimensional definition of school climate, with multi-informant and longitudinal designs, are essential in order to provide a solid basis on which to build concrete practices for future school improvement.

Lastly, an overview of the literature pointed out an additional direction of improvement in the field: none of the recent studies on school climate, to the best of our knowledge, employed a *person-oriented approach*. While the more widespread *variable-oriented approach* is focused on the investigation of general trends in the associations between variables, the person-oriented approach allows to identify profiles of individuals characterized by specific patterns and focus on their peculiarities. The two methodological approaches are based on different assumptions, informing research in complementary ways (Bergman & Wångby, 2014; Bergman & Trost, 2006; Von Eye & Bogat, 2006). Variable-oriented studies, searching for associations between variables, are theoretically based on the assumption that the population under investigation is homogeneous with respect to the considered variables (Von Eye & Bogat, 2006). Instead person-oriented studies assume that the considered population can be composed of different groups, based either on a priori categories (e.g., gender) or emerging from clustering data analysis on one or more variables (e.g., latent class analysis). Thus, conducting studies based on a person-oriented approach can be an

interesting direction of development in the study of school climate and its correlates, in order to enrich the understanding of the real scenario in the classrooms. As for multi-informant and longitudinal studies, adopting different approaches can contribute to create a more complex and nuanced knowledge on school climate.

All these considerations led me to identify the core features on which to build my research project for providing a meaningful contribution to the literature. These essential features can be summarized in the following five points. The project in the whole is based on a design able to: a) ground research design and result interpretation in the theoretical framework of the system theory; b) adopt a multidimensional and comprehensive view of school climate; c) develop and validate an instrument with good psychometric properties for the Italian context, capable of offering insights on the distinction between school and classroom climate; d) employ a variety of study designs (multi-informant, person-oriented and longitudinal) to provide additional evidence to the existing literature, which is mostly based on cross-sectional, variable-centered studies; e) include associations with relevant and desirable correlates of school climate related to the positive involvement of students in learning. These five essential features of the research project were then translated in specific aims and organized in four studies.

3.2 Research Design

The general purpose of my research project was to study school climate with a complex innovative approach, based on a clear theoretical framework of reference, a sound multidimensional measure, varied methodologies and novel objects of research. This general purpose was articulated in six aims, to be reached in four studies, described in Table 3.1. Sadly, a reduction in the available samples due to the Covid-19 pandemic (see the next paragraph for more details) forcibly limited the aims for Study 4, as teachers and parents' perspectives could not be collected.

Studies	Aims
Study 1	1. Developing and validating a multi-informant and comprehensively multidimensional school climate questionnaire, with student, teacher and parent versions.
Study 2	2. Adopting a multi-informant design to compare students, teachers and parents' perceptions of school climate.
Study 3	3. Adopting a person-oriented approach for identifying student profiles of their involvement in school and analyze their differences in school climate perceptions.
Study 4	Adopting a longitudinal design to: 4. Analyze changes in students' school climate perceptions over time 5. Analyze reciprocal effects of school and classroom-related dimensions of school climate 6. Analyze reciprocal effects of school climate dimensions and student positive involvement with school

Table 3.1. Study aims

3.3 Data Collection: Participants and Procedures

Overall, the data for the research project were gathered with four different data collections distributed over the span of two academic years, 2018/2019 and 2019/2020 (see Table 3.2 for an overview). Four middle schools in the Emilia Romagna region were involved in the project since its first stages. The participating schools were all mixed-gender, ranged from small (with about 230 students) to large-sizes (with about 750 students) and were located in the city of Modena and surrounding towns. Participants' socio-economic status (SES) was not assessed directly for the project; the MIUR (Italian Ministry of University and Research) provides information in its official website indicating that these schools are attended by students from a medium socio-economic context, with a relevant percentage (between about 10 and 20%) of immigrant students, coming mainly from Northern Africa and East-Europe and mostly second-generation.

The first data collection, involving the students, was conducted in November 2018. Students attending the last year of middle school (8^{th} grade) were chosen to participate in this first data collection because they would not be able to participate in the two-year longitudinal study. The second data collection, conducted between February and March 2019, involved students attending the first and second year of middle school (6^{th} and 7^{th} grade). A third data collection was conducted in April 2019, involving all teachers and parents on a voluntary basis. The fourth and fifth data collections were planned for February-March and April 2020, and were meant to involve the same samples of students, for the fourth, and teachers and parents, for the fifth, as in the second and third

data collections. Sadly, the Coronavirus emergency made it impossible to complete these last data collections: only a fraction of students and no teacher or parent could fill in the questionnaire before schools closed due to the emergency. As the project was inherently related to participants perceptions of their daily environment, which was gravely altered by the emergency, any data collected during the lockdown (from their homes through online platforms) would be too compromised to provide reliable results. This reduction required adjustments to be made in the aims and the distribution of participants in the four studies.

	First data collection November 2018	Second data collection February-March 2019	Third data collection April 2019	Fourth data collection February-March 2020	Fifth data collection April 2020
Students	575	1070	-	243 (reduced)	-
Teachers	-		105	-	(canceled)
Parents	-		320	-	(canceled)

Table 3.2 Data collections and number of participants

Overall, and despite this unfortunate event, 1645 students (out of which 243 for two times), 105 teachers and 320 parents participated in the research project. More detailed information about percentages of participants' gender, country of birth and mean age will be provided for each study. The distribution of participants in the various studies can be seen in Table 3.3. The development and validation of a multi-informant measure of school climate conducted in Study 1 involved the total samples of students, teachers and parents from the first, second and third data collections. The comparison of perspectives on school climate conducted in Study 2 involved randomly selected subsamples of students from the second data collection and the total samples of teachers and parents from the third data collection. Study 3's analysis of student profiles was based on the total sample of students from the second data collection. Lastly, the surviving sample of students completing the questionnaire both at the second and fourth data collection was used to conduct the longitudinal analysis required for Study 4.

	First data collection	Second data collection	Third data collection	Fourth data collection
Study 1	Total sample	Total sample	Total sample	-
Study 2	-	Random sub-samples	Total sample	-
Study 3	-	Total sample	-	-
Study 4	-	Surviving sub-sample	-	Total sample

Table 3.3 Distribution of participants in the four studies

Each data collection was conducted in agreement with the ethical norms defined by the Italian National Psychological Association. All participants were informed about the study's aims, confidentiality of their answers and voluntariness of participation, and gave their consent prior to completing the questionnaire; for students, informed consent of both parents was also collected (with about 1% of parents refusing). All questionnaires were completed by means of an online platform. Teachers and parents filled in the questionnaire individually, at a time of their choice during an allotted period, following written instructions. Students completed the questionnaire during school hours with me always present to give the same instructions to everyone and answer any question. For the first data collection students completed only the measure on school climate in course of development, which will be described in depth in the next Chapter. Detailed information about other measures employed in the second and third data collections will be provided for each study.

Chapter 4 - Study 1: Development and Validation of a Multidimensional and Multi-informant Measure of School Climate[2]

4.1 Introduction

As discussed in the first two chapters, the use of well-reasoned and comprehensive instruments is sorely needed in the study of school climate. Ramelow, Currie and Felder-Puig (2015), in a recent review on school climate measures, claimed that an important step forward for research in the field would be the adoption of *multidimensional* and *psychometrically sound* instruments. Moreover, from the systematic review of the literature presented in chapter 2, a third element can be added, that is, the need for measures able to collect *multiple points of view* on school climate, beyond the perceptions of students. The analysis of the literature also indicated the importance to adopt instruments *grounded in theoretical frameworks* offering a solid basis of interpretation as a further advancement in school climate measurement. Lastly, as argued in the first chapter, a fifth important requirement to consider in the development and adoption of school climate measures is their capability to contribute to the *distinction between school and classroom* settings. The analysis of the literature, however, highlighted that only very few instruments, among the many currently employed, satisfy all of these requirements.

Based on these considerations, the first purpose of the research project and the aim of Study 1 was to address this gap by developing a measure with the above-stated characteristics. I started by adapting an existing instrument with good psychometric properties and already in use in other countries, rather than creating a completely new measure. Previous reviews (Kohl et al., 2013) indicated that the creation of ad-hoc measures is a wide-spread practice in the study of school

[2] Parts of this chapter's content are published in Grazia, V., & Molinari, L. (2020). School climate research: Italian adaptation and validation of a multidimensional school climate questionnaire. *Journal of Psychoeducational Assessment*. https://doi.org/10.1177/0734282920967141; Grazia, V., & Molinari, L. (2020). The multidimensional school climate questionnaire (MSCQ) parent-version: Factorial structure and measurement invariance. *International Journal of School and Educational Psychology*. https://doi.org/10.1080/21683603.2020.1828205; Molinari, L., & Grazia, V. (2020). A multi-informant study of school climate: Student, parent and teacher perceptions. [Manuscript submitted for publication].

climate, but adds to the extreme variety (and confusion) in the existing measures of school climate; thus, the decision to start from an adaptation.

4.2 The Starting Point

The first step of my work was then finding an adequate measure to adapt. The systematic review of the literature provided information on the many existing instruments on school climate. Among them, I first identified those covering all the domains indicated as essential in the literature (Wang & Degol, 2016), and eventually selected the *Socio-educational Environment Questionnaire* (SEQ, Janosz & Bouthillier, 2007). The SEQ qualified as a good starting point for adaptation for several reasons, all related to the requirements listed at the beginning of this chapter: first, the questionnaire was multidimensional and comprehensive; secondly, it was already developed in two versions, one for students and one for teachers, and therefore could be a good starting point for multi-informant studies, with the addition of a parent version; lastly, it was supported by a theoretical foundation (Janosz, Georges, & Parent, 1998) consistent with a systemic view of school climate (Rudasill et al., 2018) which provides a solid theoretical framework.

The original student version questionnaire is a long protocol (78 items grouped in scales plus 63 single items), divided into three main sections: Practices, Climate and Problems. The first section (47 items) comprises items referring to what is actually done in everyday class activities, grouped in 9 scales: Rules Implementation and Clarity; Rules Application; Student Support; Student Involvement; After-school Activities; Home-school Relations; Teaching Time; Didactic Practices; Class Management. The Climate section includes 6 scales (30 items) and 5 single items. The scales refer to intangible and abstract features of the school environment that students are supposed to internalize through repeated experiences: Student Relations; Student-Teacher Relations; Educational Climate; Sense of Belonging; Safety; Justice. The single items describe the perception of Equal Treatment, without discrimination due to gender, nationality or academic abilities. Lastly, the section on Problems includes a series of single items (42 items) regarding the frequency of problematic events, such as bullying, disengaged behaviors, thefts and vandalism.

Additional single items (8) are dedicated to the evaluation of the perceived Safety of Places inside the school (i.e., gym, toilets, corridors), to the behavior of the respondent at school (8), and to the frequency of homework (1). See Table 4.1 for a synthesis of the main sections and features.

Main Sections	Description	Format
Practices	What is actually done in everyday class activities	47 items grouped in 9 scales: Rules Implementation and Clarity; Rules Application; Student Support; Student Involvement; After-School Activities; Home-School Relations; Teaching Time; Didactic Practices; Class Management.
Climate	Intangible and abstract features of the school environment that students are supposed to internalize through repeated experiences	30 items grouped in 6 scales: Student Relations; Student-Teacher Relations; Educational Climate; Sense of Belonging; Safety; Justice. 5 single items describing the perception of Equal Treatment (e.g., "Teachers treat student equally whether they are male or female").
Problems	Frequency of problematic events	42 single items on target behaviors such as bullying, disengaged behaviors, thefts and vandalism
Additional items	Items on additional areas of interest	8 single items on perceived Safety of Places (e.g., "How safe is the cafeteria in your school with regard to vandalism and risk of aggression?") 8 single items on the behavior of the respondent in school (e.g., "How often have you been suspended?") 1 single item on the frequency of homework ("How often do you have homework?")

Table 4.1. Organization and contents of the original student version of the SEQ (Janosz & Bouthillier, 2007)

As can be seen in the list of scales and subscales, the questionnaire did not completely overlap the domains and dimensions identified by Wang & Degol (2016). However, all domains and most dimensions were included, even if in a somewhat different frame, and the questionnaire also offered a useful theoretical approach underlying the measure, which could guide the interpretation of results. Its stronger and most important feature is the presence of the two scales Practices and Climate, which allow to address distinctive aspects of school climate separately, i.e., the characteristics of everyday concrete classroom activities (Practices), and the more abstract features of the larger school environment (Climate). This feature is important as it addresses one of the requirements mentioned at the beginning of the chapter, that is the importance to distinguish between proximal aspects related to *classroom* experiences and wider aspects related to the *school* level.

In the adaptation, I dealt with a series of challenges. First of all, the SEQ was developed in French for the Canadian school context, which is organized differently as compared to Italian schools. This was a starting point for the work of adaptation, aimed to make the questionnaire fitting the specific school environment. Moreover, I thought that a shorter questionnaire would be preferable. As one of the requirements listed at the beginning of the chapter was to obtain a measure with sound factorial structure, in the adaptation I excluded the single items and focused on the Practices and Climate scales, on which I conducted an in-depth factorial analysis, beyond what was done for the original instrument. Indeed, I also aimed to test the theoretical assumption, not statistically tested, that Practices and Climate represent different areas in the study of school climate, by considering them as second order factors. Lastly, beside the adaptation of the student and teacher versions of the instrument, I worked on the development of a completely new version for parents.

4.3 Aims

The general aim of Study 1 was to develop and validate a multi-informant Multidimensional School Climate Questionnaire (MSCQ). This general aim was broken down in eight specific aims organized in three Phases. Phase 1 was aimed to: a) translate and adapt the student-version of the original questionnaire for the Italian context, and b) conduct exploratory factor analyses to test the adaptation's factorial structure and evaluate each item. Phase 2 was aimed to: c) confirm, with a confirmatory analysis, the resulting student-version's factorial structure, d) test, with a second order confirmatory factor analysis, the assumption that Practices and Climate are two separate areas comprising several dimensions, and e) provide support for the predictive validity of the measure. Starting from the defined student-version of the questionnaire, Phase 3 was aimed to: f) develop mirroring versions for teachers and parents, g) test their factorial structure, and h) assess measurement invariance across groups. In each Phase, I also tested the reliability of each dimension of the questionnaire.

4.4 Phase 1: Translation, Adaptation and Exploratory Analysis of the Student Version

The first aim (a) of Phase 1 was to create a thoughtful adaptation of the student-version of the instrument for the Italian context, by paying attention to both linguistic and contextual features. I accomplished this aim by means of two steps: the first consisted in the translation and back-translation of all items comprised in the original questionnaire from French to Italian language, while the second step consisted of content evaluation and items selection done by considering the peculiarities of the Italian school context.

For content validity, two independent researchers evaluated each item with regard to its adequacy to the Italian school context, relevance, clarity and susceptibility to social desirability. At this stage, in the light of their lack of relevance to the Italian school system, a subscale of the questionnaire (After-school Activities) and a few items from some scales (i.e. those on surveillance at school in the Rules Implementation and Clarity scale, one from the Student Support scale and one from the Home-school Relations scale) were eliminated. On the contrary, in the light of their relevance it was decided to keep two items in the Didactic Practices scale that the authors of the original questionnaire instead removed. After the item selection, I addressed face validity by contacting two middle schools and asking teachers (two representatives for each school) and principals to evaluate the questionnaire with regard to its relevance to the Italian school context, clarity for students and completeness. As a whole, teachers and principals positively evaluated the selection on all aspects, and advanced only minor lexical adjustments that were promptly incorporated. Overall, both researchers and teachers noted that, in the translation, the label "climate" referring to both the measured construct (school climate) and one of the scales (Climate) could create some ambiguity. To improve clarity, different labels for the main scales were used: Classroom Practices (Practices in the original) and School Atmosphere (Climate in the original).

I eventually obtained a 66-item adaptation. It included 38 items for 8 scales for the Practices section and 28 items for 6 scales for the School Atmosphere section. I then conducted the first data collection to address the second aim (b) of Phase 1: testing the factorial structure of the measure

with an exploratory factorial analysis, along with the evaluation of the psychometric properties of the selected items and the general acceptance from the schools and the students.

4.4.1 Method

Participants and Procedure. Participants were 575 students (51% females, 94% born in Italy) aged between 12 and 16 years old (M=13.02, SD=.48). After obtaining parental consent (only 1% of parents refused), I administered the questionnaire during class hours, using computers and an online software that allowed the randomization of the item order for each participant. I was always present during administration, so that all students received the same instructions: they were briefed about the research and assured of the voluntariness of participation and anonymity of the data.

Measures. Participants were asked to complete the developed 66-item questionnaire. They responded on a 6-point Likert scale which ranged from "Completely disagree" to "Completely agree". Items were formulated so that higher scores indicate better school climate perceptions.

Data Analysis. To explore the factorial structure of the instrument and, if needed, to identify critical items, I carried out an exploratory factor analysis (EFA) using the SPSS software, version 24. As originally done by Janosz and Bouthillier (2007), at this stage the analysis was conducted separately for the *Classroom Practices* and *School Atmosphere* scales, adopting the method of principal axis factoring with oblimin rotation criteria because the factors were expected to correlate with each other. For each section, prior to the exploratory factors analysis I conducted a Kaiser-Meyer-Olkin (KMO) test for sampling adequacy and the Bartlett test of sphericity. I also conducted Horn's parallel analysis (Horn, 1965) with one thousand permutations of our data sets to provide further support for the number of factors identified. I then analyzed the psychometric properties of the identified factors by checking for normality of distribution and computing Cronbach's alphas and item-total correlations for each factor. Lastly, I calculated descriptive statistics and intercorrelations.

4.4.2 Results

For the *Classroom Practices* scale, the KMO was .91 and the Bartlett test was significant at $p < .001$, indicating that the sample was adequate for our analysis. The EFA showed that eight factors had an eigenvalue higher than one. Horn's parallel analysis consistently indicated that eight factors had higher eigenvalues in the real data set as compared with those in the simulated data sets. However, after going through the factor structure and factor loadings, I decided that a few changes were needed: (a) the Rules Implementation and Clarity and Rules Application subscales converged in a single factor, which I called Rules, while one item showed unclear loading and was eliminated; (b) I removed the Home-School Relations scale, whose items did not clearly load on one factor but were rather distributed in different factors; (c) two separate subscales, which I called Positive Teaching and Encouragement, were better fitting than the Didactic Practices subscale (originally composed of 10 items and longer than all other scales), as the items clearly loaded on two different factors. Two items with unclear loadings were eliminated from these subscales. After removing all critical items, I again ran the exploratory factorial analysis, which identified the expected 7 factors that explained 54% of the total variance. I kept two items with very low factor loadings due to their theoretical significance.

The results of the EFA conducted on the *School Atmosphere* scale were closer to the original model. The KMO was .94 and the Bartlett test was significant at $p < .001$, again indicating sample adequacy. As in the original questionnaire, I found six factors with eigenvalues higher than one and the parallel analysis indicated the same result. Two items were removed because of unclear loadings; I instead decided to keep one item with very low factor loading due to its theoretical significance. The identified factors explained 63% of the total variance.

As for the psychometric properties, all the 13 factors, with the exception of Rules, reported skewness and kurtosis values between + and – 2, considered acceptable to indicate normality of data distribution (Gravetter & Wallnau, 2014). As for internal reliability, Cronbach's alphas for each factor are reported in Table 4.2. At this stage, I found one factor (Safety) that did not show an

adequate internal reliability ($\alpha < .60$), thus I decided not to retain this factor. All the other factors reported values from moderate to good, acceptable when considering the small number of items for each factor (max. four or five items per factor). As for item-total correlations, all items reported values >.30, which are considered acceptable (Green & Lewis, 1986). Descriptive statistics and intercorrelations are reported in Table 4.2; factor loadings are reported in Table 4.3 and 4.4.

		1	2	3	4	5	6	7	8	9	10	11	12	M(SD)	α
	Classroom Practices														
1	Rules	-	.45**	43**	.03	.44**	.41**	.29**	.32**	.36**	.44**	.40**	.42**	4.90 (.69)	.72
2	Student Support		-	.49**	.09*	.51**	.52**	.35**	.33**	.55**	.49**	.41**	.43**	4.57 (.99)	.68
3	Student Involvement			-	.12**	.47**	.48**	.26**	.24**	.47**	.41**	.27**	.41**	3.80 (1.10)	.66
4	Teaching Time				-	.06	.06	.21**	.23**	.14**	-.01	.09*	.02	2.37 (.92)	.69
5	Positive Teaching					-	.63**	.54**	.37**	.68**	.68**	.51**	.56**	4.44 (.99)	.78
6	Encouragement						-	.47**	.38**	.60**	.66**	.46**	.51**	4.72 (1.06)	.73
7	Class Management							-	.23**	.51**	.51**	.44**	.48**	3.50 (1.10)	.72
	School Atmosphere														
8	Student Relations								-	.45**	.37**	.48**	.32**	4.45 (.99)	.83
9	Student-Teacher Rel.									-	.65**	.55**	.61**	3.99 (1.19)	.87
10	Educational Climate										-	.59**	.64**	4.71 (.87)	.76
11	Sense of Belonging											-	.52**	4.46 (1.24)	.88
12	Interpersonal Justice												-	4.28 (1.15)	.76

Table 4.2. Descriptive statistics, intercorrelations and Cronbach's alphas form Phase 1
Note. $*p < .05$. $** p < .01$.

	Factors						
	S	TT	CM	R	PT	I	E
SS3. If students have personal problems, they can easily get help from adults in the school	**.72**	-.01	-.07	-.09	-.03	-.04	-.05
SS2. When they have problems, students seek the help of adults in the school	**.56**	.03	.04	.02	.13	.06	.01
SS4. If students have academic problems, they can easily get help from teachers	**.46**	.03	-.05	.09	.00	.08	-.14
SS1. There are professionals meant to help students with academic or personal problems	**.37**	.03	.00	.09	.02	.12	.04
TT3. Students create disruption during classes	-.04	**.64**	-.02	-.05	-.00	.03	-.02
TT4. We waste a lot of time because of disruptive students	-.01	**.62**	-.02	-.11	-.08	-.02	.02
TT2. Teachers often have to stop their lessons to ask students to be quiet	.08	**.62**	-.07	.09	-.08	.02	.18
TT1. Students are mostly calm and attentive	.00	**.56**	.12	.06	.22	.02	-.20
CM1. Most teachers give the impression they don't like teaching anymore	.04	-.11	**-.65**	.04	.19	-.00	.07
CM2. Most teachers seem demoralized	.05	.08	**-.57**	.16	.09	-.13	.00
CM4. Teachers spend more time punishing students than complimenting them	-.05	.12	**-.54**	-.01	-.08	.17	-.26
CM3. Teachers lose their temper easily	.10	.15	**-.41**	-.09	-.04	.13	-.20
R2. Most people know the school rules	-.09	-.03	-.02	**.56**	.06	.11	.12
R6. Teachers enforce the rules	-.10	.07	-.06	**.54**	.15	.04	-.15
R4. It is easy to obtain information about the school rules	.11	-.07	.01	**.51**	-.18	.08	-.15
R1. Students know the consequences for breaking the rules	-.01	-.03	-.02	**.47**	-.07	.06	-.02
R5. The rules are clear and easy to understand	.17	-.01	.01	**.45**	.02	-.16	.01
R7. Teachers intervene when a student doesn't keep to the rules	.12	.09	-.06	**.41**	.13	-.12	-.05
R3. At school, some time is spent to explain the rules clearly to students	.19	.00	.07	**.32**	.07	.28	-.09
PT2. Most teachers appear to love their job	.08	.01	-.23	-.00	**.62**	-.02	-.09
PT1. Most teachers appear to draw pleasure from teaching	.07	.03	-.32	-.01	**.54**	.00	-.10
PT3. Teachers explain what we are about to learn	.08	-.13	-.00	.09	**.40**	.14	-.07
PT4. Teachers explain why what we study is important	.19	-.05	-.05	.01	**.34**	.19	-.02
PT5. Teachers use methods that make their subject interesting	.08	-.01	-.17	-.00	**.27**	.19	-.26
SI1. Students are asked their opinion on the school functioning	.06	.02	-.12	-.01	.03	**.71**	.07
SI3. There are moments or situations when students can express their opinion on the school	.15	-.02	.02	.11	.01	**.42**	-.13
SI4. Students participate to define rules	.06	.11	.17	.04	.15	**.36**	-.09
SI2. When it is important, teachers ask students' opinions before making decisions for them	.19	.00	-.01	.18	-.02	**.30**	-.09
E1. Teachers tell us that we can do it	.08	.01	-.06	.11	.07	-.05	**-.63**
E3. Teachers compliment us when we work hard to learn	.09	-.07	-.12	.02	.06	.06	**-.60**
E2. Teachers encourage students to do their best	.28	-.11	-.06	-.04	.15	.09	**-.29**

Table 4.3. Factor loadings for the Classroom Practices scale

Note. R = Rules; SS = Student Support; SI= Student Involvement; TT = Teaching Time; PT = Positive Teaching; E = Encouragement; CM = Class Management.

	Factors				
	STR	SR	SB	J	EC
STR1. Students and teachers feel good together	**.78**	.06	-.05	.13	-.09
STR4. In general, relations between students and teachers are friendly	**.76**	-.04	-.01	.13	-.02
STR2. In general, students and teachers get along with each other	**.71**	.06	.01	.03	.10
STR3. Students feel close to most of their teachers and they trust them	**.68**	.03	-.06	-.02	.11
SR2. In general, students get along with one another	.01	**.75**	.05	.08	-.08
SR4. Students can count on each other	-.03	**.74**	-.03	-.05	.07
SR1. Students help each other	-.04	**.69**	-.07	-.01	.03
SR5. In general, relations among students are friendly	-.04	**.62**	-.09	.10	.04
SR3. Students treat one another with respect	.21	**.60**	.02	-.03	-.06
SB3. I am proud to be a student of this school	.03	.04	**-.82**	.01	.03
SB4. This school is important for me	.09	.04	**-.76**	-.05	.06
SB5. I love my school	.14	.04	**-.74**	-.02	.03
SB1. I would rather be in a different school	-.12	.01	**-.69**	.11	-.05
SB2. At my school, I feel at ease	.07	.25	**-.47**	.10	.06
IJ3. The rules are fair	.04	.05	-.04	**.78**	-.02
IJ1. Punishment is fair	.08	.01	.00	**.54**	.14
IJ2. Students are treated with justice	.33	.05	-.02	**.34**	.15
EC4. At my school, we are expected to do our best	.05	.02	.03	-.01	**.54**
EC3. At my school, you can feel that studying is important	-.02	.00	-.09	.11	**.51**
EC1. At my school, you can really learn and get a good education	.06	.10	-.11	.23	**.43**
EC5. In general, what we learn is interesting	.23	-.08	-.28	.03	**.33**
EC2. At my school, you can feel that students' success is the priority for teachers	.21	.06	-.13	.22	**.26**

Table 4.4. Factor loadings for the School Atmosphere scale
Note. SR = Student Relations; STR = Student-Teacher Relations; EC = Educational Climate; SB = Sense of Belonging; IJ = Interpersonal Justice.

In the end, after an accurate examination of the factorial structure and psychometric properties, I obtained a 53-item questionnaire: 31 items for the *Classroom Practices* scale distributed in seven factors (Rules; Student Support; Student Involvement; Teaching Time; Positive Teaching; Encouragement; Class Management) and 22 items for the *School Atmosphere* scale distributed in five factors (Student Relations; Student-Teacher Relations; Educational Climate; Sense of Belonging; Interpersonal Justice).

4.4.3 Discussion

As a whole, the exploratory factor analysis revealed that the adaptation was only partially overlapping with the original questionnaire. The few changes concerned the Practices section in particular, which represents what happens in everyday classes and as such it is more easily subject

to the contextual features. This is consistent with a systemic approach to the study of school climate, which supports the importance of grounding the construct in the school system.

The decision to remove two whole factors, Home-School Relations and Safety was based on two considerations. First, the psychometric properties of these scales were not satisfactory. Second, a thoughtful consideration of the items and the reaction of the respondents revealed that these scales were easily misunderstood. I concluded that these scales did not suit Italian students, one (Safety) because they perceive safety problems differently (for example, as a safety problem they may think of an earthquake more than of violent behavior), the other (Home-School Relations) because they are generally unaware of such a topic. Interestingly, the authors of the original questionnaire also found items from the latter scale to be critical.

Overall, the removal of some items was motivated both by their low or unclear factor loadings and by the need to shorten the questionnaire. However, some cross-loadings still remained and our factor structure did not always perfectly align with a simple structure. Phase 2 was meant to overcome this limitation by confirming the factorial structure of the questionnaire.

4.5 Phase 2: Validation of the Student Version

In this Phase, I conducted a second data collection aimed to confirm the 53-item questionnaire's factorial structure (aim c) and to verify the theoretical assumption that *Classroom Practices* and *School Atmosphere* scales can be considered as second order factors (aim d). To provide support for predictive validity (aim e), I analyzed the correlations between school climate scales and other two previously validated scales, that is, student engagement and school burnout. I expected both scales to be correlated with school climate factors, one in a positive and the other in a negative direction.

4.5.1 Method

Participants and Procedure. Participants were 1070 students (49% females, 93% born in Italy), aged from 10 to 16 years old (M = 11.77, SD = .72). The administration of the questionnaire was conducted with the same procedure as in Phase 1.

Measures. Participants were asked to complete the 53-item version of the questionnaire emerged from Phase 1. To measure *student engagement*, which refers to student's involvement in learning activities, I used a scale already validated on an Italian population (Mameli & Passini, 2017). In agreement with the authors, I used a short 12-item version comprising affective, behavioral and cognitive engagement (sample item: "I enjoy learning new things in class"). *School burnout* was assessed with the 9-item Italian adaptation of the School Burnout Inventory (Fiorilli et al., 2014), comprising three dimensions of psychological discomfort, namely emotional exhaustion, cynicism and sense of inadequacy toward school activities (sample item: "I feel that I am losing interest toward school"). For both scales, the students answered on a 6-point Likert Scale from Completely disagree to Completely agree, so that higher scores indicate higher engagement and higher burnout. I then computed a general score for each scale (respectively $\alpha = .87$ and .83).

Data Analysis. Using the Mplus software version 8 (Muthén & Muthén, 1998-2010), I conducted a first order confirmatory factor analysis (CFA) on the 12 factors identified in Study 1. While specifying the model, I allowed factors to correlate with each other, as expected in the theoretical model. To test the theoretical assumption that the *Classroom Practices* and *School Atmosphere* scales can be considered as two separate superordinate areas, I conducted a second order confirmatory factor analysis, with them as second order factors. For the overall evaluation of the model fit, I relied on several fit indices: the comparative fit index (CFI), the standardized root-mean-square residual (SRMR), and the root-mean-square error of approximation (RMSEA), for which we included 90% confidence interval. Consistently with the recommendation of Hu and Bentler (1999), cut-offs were used to indicate acceptable (CFI > 0.90, SRMR < 0.10, RMSEA < 0.08) and excellent fit (CFI > 0.95, SRMR < 0.08, RMSEA < 0.06). I also tested a model with one second order factor (comprising both *Classroom Practices* and *School Atmosphere*) to exclude the possibility that one second order factor would provide a better fit to the data than two. For the comparison of these non-nested models I used Akaike information criterion (AIC) and Bayesian information criterion (BIC); for both indices, smaller values indicate better fit. For all models I used

the robust maximum likelihood estimator (MLR) and employed the full information likelihood method (FIML) to deal with missing data.

As in Phase 1, I then analyzed the psychometric properties of the 12 factors: I checked for normality of distribution and computed Cronbach's alphas, item-total correlations, descriptive statistics and intercorrelations for each factor. For predictive validity I tested whether the 12 factors correlated to scores of *student engagement* and *school burnout* using a two-tailed Pearson coefficient.

4.5.2 Results

The first order confirmatory factor analysis showed good or acceptable indices of fit to our data (MLR $\chi^2(1259) = 2507.56$, $p < .001$, RMSEA = .030, 90% CI [.029, .032], CFI = .92, SRMR =.05), AIC was 174629.83 and BIC 175748.66. The second order model yielded acceptable fit indices (MLR $\chi^2(1313) = 2963.31$, $p < .001$, RMSEA = .034, 90% CI [.033, .036], CFI = .90, SRMR =.06) but higher AIC and BIC values (respectively 175121.77 and 175972.09. Moreover, the Teaching Time factor reported non-significant loading on *Classroom Practices*. Given this and previous critical findings on this factor (i.e., the absence of correlations with many other factors found in Study 1), I decided to remove it. After removal, the model obtained better fit indices (MLR $\chi^2(1115) = 2337.06$, $p < .001$, RMSEA = .032, 90% CI [.030, .034], CFI = .92, SRMR =.04) and lower AIC and BIC values (respectively 161143.03 and 161933). Lastly, I tested the model with only one second order factor, for which fit indices were still good or acceptable (MLR $\chi^2(1116) = 2402.60$, $p < .001$, RMSEA = .033, 90% CI [.031, .035], CFI = .91, SRMR =.05) but AIC and BIC values were higher (respectively 161229.21 and 162014.88), supporting the choice of the model with two second order factors. This complete model, with factor loadings, is reported in Figure 4.1.

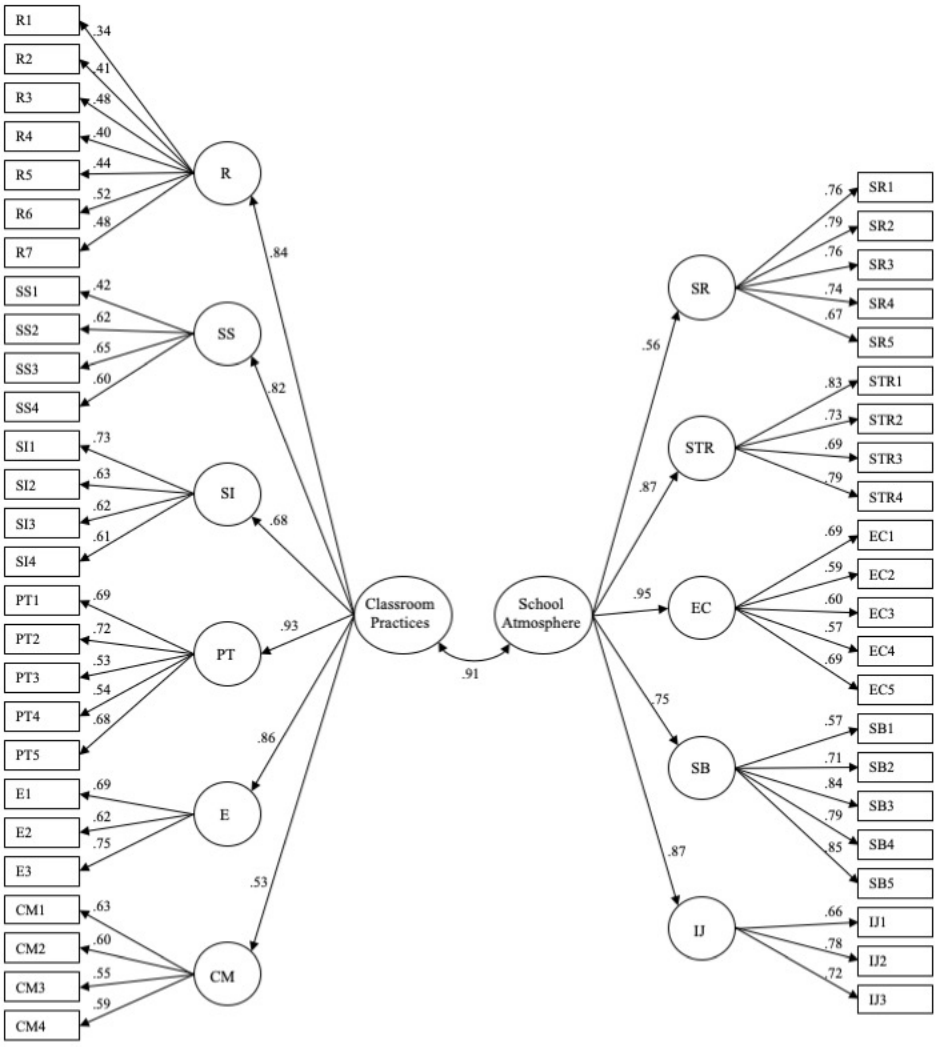

Figure 4.1. Second order CFA
Note. R = Rules; SS = Student Support; SI= Student Involvement; PT = Positive Teaching; E = Encouragement; CM = Class Management; SR = Student Relations; STR = Student-Teacher Relations; EC = Educational Climate; SB = Sense of Belonging; IJ = Interpersonal Justice.

As in Phase 1, all factors except Rules reported skewness and kurtosis scores indicating normality of distribution. Cronbach's alphas for each factor can be found in Table 4.5: they varied from acceptable to good, indicating reliability of the scale. Again, item-total correlations were all > .30. Descriptive statistics and intercorrelations can be found in Table 4.5.

		1	2	3	4	5	6	7	8	9	10	11	M(SD)	α
	Classroom Practices													
1	Rules	-											5.06 (.61)	.63
2	Student Support	.49**	-										4.88 (.93)	.66
3	Student Involvement	.45**	.50**	-									4.13 (1.19)	.74
4	Positive Teaching	.51**	.53**	.46**	-								4.73 (.95)	.76
5	Encouragement	.44**	.50**	.46**	.63**	-							4.98 (1.02)	.72
6	Class Management	.24**	.22**	.19**	.41**	.26**	-						3.57 (1.16)	.68
	School Atmosphere													
7	Student Relations	.37**	.32**	.33**	.31**	.33**	.14**	-					4.49 (1.08)	.86
8	Student-Teacher Rel.	.45**	.48**	.44**	.66**	.56**	.38**	.45**	-				4.21 (1.16)	.85
9	Educational Climate	.52**	.48**	.36**	.67**	.59**	.33**	.39**	.64**	-			4.90 (.89)	.76
10	Sense of Belonging	.40**	.40**	.33**	.48**	.41**	.32**	.50**	.54**	.55**	-		4.70 (1.21)	.86
11	Interpersonal Justice	.50**	.42**	.38**	.54**	.47**	.35**	.34**	.59**	.63**	.54**	-	4.55 (1.21)	.76

Table 4.5. Descriptive statistics, intercorrelations and Cronbach's alphas form Phase 2
Note. $*p < .05$. $** p < .01$.

Correlations with student engagement and school burnout were as expected: almost all the factors were positively correlated to the former and negatively correlated to the latter (Table 4.6), thus supporting predictive validity.

	Student engagement	School burnout
Classroom Practices		
Rules	.45**	-.21**
Student Support	.44**	-.13**
Student Involvement	.38**	-.04
Positive Teaching	.57**	-.19**
Encouragement	.45**	-.13**
Class Management	.25**	-.40**
School Atmosphere		
Student Relations	.38**	-.12**
Student-Teacher Rel.	.59**	-.21**
Educational Climate	.66**	-.25**
Sense of Belonging	.58**	-.40**
Interpersonal Justice	.54**	-.32**

Table 4.6. Two-tailed Persons' Correlations for predictive validity
Note. ** $p < .01$.

4.5.3 Discussion

In Phase 2 I was able to confirm the factorial structure of the questionnaire. The Teaching Time factor was removed because it was critical in several ways. I interpret this result by looking at the items, which were presumably misinterpreted. Future research will address this issue by re-thinking the items in order to reintroduce this important dimension of the *Classroom Practices.* More importantly, I was able to validate a questionnaire composed of *Classroom Practices* and *School Atmosphere* as separate second order factors. This finding is significant, as it supports the theoretical assumption that they are two facets of school climate, capturing different aspects: the scale on *Classroom Practices* includes factors related to everyday choices and behaviors during classroom activities while the *School Atmosphere* scale concerns the quality of the individual's general experience in school.

Finally, I found that better perceptions of all school climate factors were related to higher student engagement, while worse perceptions of almost all school climate factors, with the

exception of Student involvement, were related to higher school burnout. This finding supports the predictive validity of the questionnaire on important outcomes of the school environment.

4.6 Phase 3. Development and Factor analyses of Teacher and Parent Versions

The aims of this last Phase were to develop mirroring teacher and parent versions of the questionnaire (aim f), test their factorial structure (aim g) and measurement invariance across groups (aim h). In the development of the new versions, the first issue to address was which scales should be included in each version. For teachers, all dimensions of the student-version were maintained, as students and teachers experience the same everyday environment (even if from different points of view). For the parent-version, I excluded the dimensions of which parents have only an indirect experience and kept five dimensions, one concerning the practices (i.e., Student Support) and four concerning the atmosphere (i.e., Student Relations, Student-Teacher Relations, Educational Climate, Interpersonal Justice). Items from the student version were carefully reformulated to capture the different perspectives (for example, the student-version item: "In my school students help each other" for parents was changed to: "In my child's school students help each other"). I then tested the factorial structure of these versions, their psychometric properties and measurement invariance across students, teachers and parents, a necessary step to allow the future use of the questionnaire for comparing these different points of view.

4.6.1 Method

Participants and Procedure. 105 teachers participated in the study; 85% of them were female and all were of Italian origins. 3% had an age comprised between 20 and 30 years old, 14% between 31 and 40, 37 % between 41 and 50, 46% were older. As for parents, 320 participated in the study, completing the questionnaire during the second data collection. Of these, 90% were females and 92% of Italian origins. Most of them were between 41 and 50 years old (75%), were married or had partners (86%) and had more than one child (69%). 35% had a university degree, 49% a high school degree, 16% a middle school degree. To test measurement invariance, I randomly selected a sample of 206 students for the comparison with teachers and 339 students for

the comparison with parents from our bigger sample of students described in Phase 2. The randomly selected samples were balanced for gender, age and nationality.

Teachers and parents were informed about the study's aims, confidentiality of their answers and voluntariness of participation, and gave their consent prior to completing the questionnaire. They filled in the questionnaire individually by means of an online platform, at a time of their choice during an allotted period, following written instructions.

Measures. Teachers and parents completed their respective version of the questionnaire. They answered on a 6-point Likert scale ranging from "Completely disagree" to "Completely agree", so that higher scores indicate better perceptions of school climate.

Data Analysis. I started by analysing the factorial structure and the psychometric properties of the teacher and parent versions of the questionnaire. In order to test whether the 11-dimension factorial structure of the student-version would fit also the teacher-version, I conducted confirmatory factor analyses with the maximum likelihood with robust standard error estimator (MLR). As the sample of teachers was relatively small, I conducted the analysis on the Classroom practices (six-dimensions model) and School atmosphere (five-dimensions model) sections separately. For parents, I conducted the CFA on the expected five-dimension factorial structure. I considered the following indices of goodness of fit and cut offs criteria: root mean square error of approximation (RMSEA < .08), comparative fit index (CFI > .90) and standardized root mean squared residual (SRMR <.08) (Hu & Bentler, 1999; Lai & Green, 2016). For both versions I then tested the internal consistency by computing Cronbach's alphas for each dimension.

I then tested measurement invariance among the three versions of the MSCQ (for students, for teachers and for parents). Configural, metric and scalar invariance were tested in pairs (students and parents, students and teachers, teachers and parents) by comparing nested multigroup models: I sequentially constrained model structure, factor loadings and item intercepts to be equal across groups and compared model fit indices. Cut offs criteria to keep the more constrained model were $\Delta CFI \leq -.010$ and $\Delta RMSEA < .015$ (Chen, 2007; Cheung & Rensvold, 2002). I also tested the

Satorra-Bentler chi square difference but, given its higher sensitivity to sample size, in case of disagreement among indices of fit, I considered the others sufficient (Cheung & Rensvold, 2002).

4.6.2 Results

Factorial Structure of the Teacher-Version. The CFA on the six-dimensions model for the *Classroom practices* section brought to a few thoughtful adjustments. Modification indexes suggested correlating a few residual errors. Some authors (Beckstead, 2002; Gerbing & Anderson, 1984) advanced that when correlations between error terms are theoretically plausible they can be included in CFAs without undermining the factorial validity of the model. In my case, items with correlated residuals tended to have similar formulations and meanings, which makes correlations plausible (e.g., "Most teachers appear to draw pleasure from teaching" and "Most teachers appear to love their job"). One dimension (Class Management) and one item from the student-version (SS1, see Table 4.7) showed unacceptable psychometric properties and largely worsened the model fit, thus they were removed from the model. This five-dimensions model reported acceptable fit indexes: MLR χ^2 (190) = 279.38, p = .000; RMSEA = .07; CFI = .91; SRMR = .08. Factor loadings were all significant and are reported in Table 4.7.

	λ
Classroom Practices	
Rules (R)	
R1. Students know the consequences for breaking the rules	.59
R2. Most people know the school rules	.53
R3. At school, some time is spent to explain the rules clearly to students	.76
R4. It is easy to obtain information about the school rules	.64
R5. The rules are clear and easy to understand	.75
R6. Teachers enforce the rules	.68
R7. Teachers intervene when a student doesn't keep to the rules	.70
Student Support (SS)	
SS1. There are professionals meant to help students with academic or personal problems	-
SS2. When they have problems, students seek the help of adults in the school	.55
SS3. If students have personal problems, they can easily get help from adults in the school	.65
SS4. If students have academic problems, they can easily get help from teachers	.87
Student Involvement (SI)	
SI1. Students are asked their opinion on the school functioning	.69
SI2. When it is important, teachers ask students' opinions before making decisions for them	.72
SI3. There are moments or situations when students can express their opinion on the school	.79
SI4. Students participate to define rules	.54
Positive Teaching (PT)	
PT1. Most teachers appear to draw pleasure from teaching	.65
PT2. Most teachers appear to love their job	.61
PT3. Teachers explain what we are about to learn	.58
PT4. Teachers explain why what we study is important	.58
PT5. Teachers use methods that make their subject interesting	.66
Encouragement (E)	
E1. Teachers tell us that we can do it	.60
E2. Teachers encourage students to do their best	.70
E3. Teachers compliment us when we work hard to learn	.78

Table 4.7. Items and factor loadings of the Classroom Practices scale of the teacher-version.
Note. R = Rules; SS = Student Support; SI = Student Involvement; PT = Positive Teaching; E= Encouragement; as detailed in the text item SS1 was removed from the final model.

Also for the *School atmosphere* section, after consulting the modification indexes and theoretical reflection, I correlated a few error terms (e.g., "In general, students get along with one another" and "In general, relations among students are friendly"). The expected five-dimensions model obtained good fit indexes: MLR χ^2 (193) = 264.88, p = .001; RMSEA = .06; CFI = .93; SRMR = .07. Factor loadings were all significant and are reported in Table 4.8.

School Atmosphere	λ
Student Relations (SR)	
SR1. Students help each other	.70
SR2. In general, students get along with one another	.61
SR3. Students treat one another respectfully	.69
SR4. Students can count on each other	.65
SR5. In general, relations among students are friendly	.63
Student-Teacher Relations (STR)	
STR1. Students and teachers feel good together	.84
STR2. In general, students and teachers get along with each other	.53
STR3. Students feel close to most of their teachers and they trust them	.74
STR4. In general, relations between students and teachers are friendly	.83
Educational Climate (EC)	
EC1. At my school, you can really learn and get a good education	.51
EC2. At my school, you can feel that students' success is the priority for teachers	.57
EC3. At my school, you can feel that studying is important	.66
EC4. At my school, we are expected to do our best	.63
EC5. In general, what we learn is interesting	.51
Sense of Belonging (SB)	
SB1. I would rather be in a different school	.76
SB2. At my school, I feel at ease	.85
SB3. I am proud to be a teacher of this school	.88
SB4. This school is important for me	.66
SB5. I love my school	.90
Interpersonal Justice (IJ)	
IJ1. Punishments are fair	.63
IJ2. Students are treated with justice	.45
IJ3. Rules are fair	.90

Table 4.8. Items and factor loadings of the School Atmosphere scale of the teacher-version
Note. SR = Student Relations; STR = Student-Teacher Relations; EC = Educational Climate; SB = Sense of Belonging; IJ = Interpersonal Justice.

Cronbach's alphas (Table 4.9) were all above .70, indicating good internal consistency.

Pearson's bivariate correlations (Table 4.9) showed that all dimensions were positively correlated.

	Classroom Practices	1	2	3	4	5	6	7	8	9	10	11	M (SD)	α
1	Rules	-											5.12 (.67)	.87
2	Student Support	.46**	-										5.11 (.63)	.72
3	Student Involvement	.41**	.53**	-									4.56 (.86)	.78
4	Positive Teaching	.54**	.68**	.45**	-								5.01 (.58)	.77
5	Encouragement	.35**	.63**	.56**	.65**	-							5.28 (.63)	.71
	School Atmosphere													
7	Student Relations	.35**	.36**	.43**	.36**	.34**	.29**	-					4.58 (.58)	.81
8	Student-Teacher Rel.	.57**	.39**	.47**	.46**	.43**	.35**	.63**	-				4.88 (.59)	.82
9	Educational Climate	.64**	.49**	.45**	.61**	.48**	.36**	.51**	.72**	-			5.15 (.54)	.71
10	Sense of Belonging	.50**	.23*	.25*	.40**	.30**	.41**	.40**	.58**	.64**	-		5.11 (.90)	.90
11	Interpersonal Justice	.60**	.28**	.38**	.49**	.42**	.29**	.29**	.50**	.63**	.51**	-	5.09 (.69)	.67

Table 4.9. *Descriptive statistics, intercorrelations and Cronbach's alphas for the MSCQ teacher-version*

Factorial Structure of the Parent-Version. I conducted a CFA on the expected five-factor model, allowing all factors to covary, consistently with the theoretical model. The model reported good fit indices: MLR $\chi^2(179) = 269.83$, $p = .000$; RMSEA = .04; CFI = .97; SRMR =.04. Factor loadings, reported in Table 4.10, were all significant and ranged from $\lambda = .43$ to $\lambda = .89$.

In my child's school…	CFA (λ)
SS1. There are professionals meant to help students with academic or personal problems	.43
SS2. When they have problems, students seek the help of adults in the school	.66
SS3. If students have personal problems, they can easily get help from adults in the school	.84
SS4. If students have academic problems, they can easily get help from teachers	.76
SR1. Students help each other	.88
SR2. In general, students get along with one another	.87
SR3. Students treat one another with respect	.86
SR4. Students can count on each other	.88
SR5. In general, relations among students are friendly	.89
STR1. Students and teachers feel good together	.89
STR2. In general, students and teachers get along with each other	.80
STR3. Students feel close to most of their teachers and they trust them	.82
STR4. In general, relations between students and teachers are friendly	.83
EC1. You can really learn and get a good education	.74
EC2. You can feel that students' success is the priority for teachers	.86
EC3. You can feel that studying is important	.60
EC4. Students are expected to do their best	.54
EC5. In general, what students learn is interesting	.70
IJ1. Punishment is fair	.70
IJ2. Students are treated with justice	.85
IJ3. The rules are fair	.74

Table 4.10 Items and factor loadings of the parent-version
Note. SS = Student Support; SR = Student Relations; STR = Student-Teacher Relations; EC = Educational Climate; IJ = Interpersonal Justice; λ = factor loading.

Cronbach's alphas were good, supporting the internal consistency of the factors. Bivariate two-tailed Pearson's correlations indicated that all factors were positively correlated. These values and descriptive statistics for each factor were reported in Table 4.11.

		1	2	3	4	5	6	M (SD)	α
1	Student Support	-						4.64 (.88)	.76
2	Student Relations	.48**	.47**	-				4.48 (1.05)	.94
3	Student-Teacher Rel.	.67**	.66**	.68**	-			4.71 (.90)	.90
4	Educational Climate	.69**	.73**	.58**	.78**	-		5.10 (.72)	.82
5	Interpersonal Justice	.58**	.54**	.51**	.71**	.68**	-	4.87 (1.05)	.80

Table 4.11 Descriptive statistics, correlations and Cronbach's alpha for the MSCQ parent-version

Measurement Invariance Across Students, Teachers and Parents. Each step in the analysis of measurement invariance is reported in Table 4.12. The teacher-version questionnaire achieved full configural and metric invariance with both student and parent-versions. Full scalar invariance was also obtained between teachers and parents. With students, however, some items appeared to have non-invariant thresholds. After consulting the modification indexes and a theoretical evaluation, they were freed from constraints, obtaining a partial scalar invariance.

When testing for measurement invariance between students and parents, configural and metric invariance were achieved for all items. Full scalar invariance could not be reached due to an excessive worsening of the fit indices. After the examination of the modification indices and theoretical reflection, one item was freed (EC5) and partial scalar invariance was reached. Overall, the findings support the conclusion of measurement invariance among the different informants.

Model tested (model compared with)	χ^2	*df*	*p*	CFI	RMSEA	SRMR	$\Delta\chi^2$	Δdf	*p*	ΔCFI	ΔRMSEA
Invariance between teachers and students											
Section 1. Classroom Practices											
Configural	460.211	380	.000	.953	.037	.060	-	-	-	-	-
Metric (vs configural)	487.292	397	.001	.947	.038	.069	26.226	17	.070	-.006	.001
Scalar (vs metric)	550.838	414	.000	.920	.046	.073	62.249	17	.000	-.027	.008
Less I4	537.912	413	.000	.927	.044	.072	55,326	16	.000	-.020	.006
Less PT3	528.697	412	.000	.931	.043	.072	44.113	15	.000	-.016	.005
Less R7	522.132	411	.000	.935	.042	.072	36.918	14	.001	-.012	.004
Less R6	505.528	410	.001	.944	.039	.070	18.512	13	.139	-.003	.001
Section 2. School Atmosphere											
Configural	527.254	387	.000	.944	.049	.057	-	-	-	-	-
Metric (vs configural)	562.882	403	.000	.936	.051	.072	32.225	16	.009	-.008	.002
Scalar (vs metric)	637.202	420	.000	.913	.058	.074	87.970	17	.000	-.023	.007
Less EC5	620.670	419	.000	.919	.056	.073	68.640	16	.000	-.017	.005
Less SR3	608.838	418	.000	.924	.055	.073	54.192	15	.000	-.012	.004
Less SB5	598.936	417	.000	.927	.053	.072	42.245	14	.000	-.009	.002
Invariance between teachers and parents											
Configural	537.841	320	.000	.945	.057	.052	-	-	-	-	-
Metric (vs configural)	571.746	335	.000	.940	.058	.066	31.631	15	.007	-.005	.001
Scalar (vs metric)	612.858	350	.000	.933	.059	.066	47.462	15	.000	-.007	.001
Invariance between students and parents											
Configural	528.971	358	.000	.964	.038	.043	-	-	-	-	-
Metric (vs configural)	558.692	374	.000	.961	.039	.050	29.008	16	.024	-.003	.001
Scalar (vs metric)	644.638	390	.000	.946	.045	.053	105.887	16	.000	-.015	.006
- Less EC5	592.959	389	.000	.957	.040	.051	38.227	15	.001	-.004	.001

Table 4.12. Model comparison indices for measurement invariance across students, teachers and parents.

4.6.3 Discussion

Despite the large number of studies on school climate, teachers' perceptions have been largely overlooked while parents' perceptions have almost completely been neglected (Wang & Degol, 2016). Accordingly, there is a lack of psychometrically sound multi-informant measures capable of capturing the parents' perceptions and of making comparisons between different populations of school actors. Thus, I aimed to address this weakness by developing mirroring versions of the multidimensional school climate questionnaire for both groups and collecting evidence of their validity and psychometric properties. This allowed me to obtain a multi-informant and multidimensional measure of school climate apt for comprehensive comparison studies.

The confirmatory factor analyses revealed that the factorial structure of the student version is mostly reflected in the teacher and parent versions, with one main exception. The Class Management dimension could not be maintained in the teacher version: this result should be addressed in future studies, trying to understand how to correct items and restore this useful dimension. However, with the exception of this dimension, the factorial structure held for all groups, supporting the stability of MSCQ as a multi-informant measure. Moreover, Cronbach's alphas indicated good internal consistency for all the dimensions. Even more importantly, the findings supported measurement invariance across groups.

Full configural and metric invariance was achieved for all items across all groups; this result indicates that both the student, parent and teacher versions of the instrument share the same general factorial structure and factor loadings for each item. Teachers and parents also obtained a full scalar invariance, indicating that all items intercepts were also invariant. In the comparison with students, partial scalar invariance was achieved both for teachers and parents after freeing a few items, but they were scattered in different dimensions so that, in the end, no dimension had less than three fully invariant items. I considered this an acceptable result as it is reasonable that a preadolescent population may show a few differences with respect to an adult population (teachers and parents alike). For example, one item that needed to be freed was the item EC5 ("In general, what students

learn is interesting"). The freeing of this item, after consulting the modification indices, was considered acceptable at a theoretical level because it is reasonable that preadolescent students and adults (teachers and parents) have different opinions about what is considered to be "interesting," thus influencing the invariance of the item intercept. By and large, findings from Phase 3 supported measurement invariance of the instrument across groups. This is a very important achievement and a necessary step for making the Multidimensional School Climate Questionnaire a measure capable of making comparisons between the various informants' points of view.

Some limitations of Phase 3 need to be recognized. First of all, the teacher sample was relatively small and this warrants caution in the interpretation of the findings. However, such a limitation is intrinsically related to the aim of comparing different points of views within the same schools, as the student-teacher ratio is necessarily and strongly unbalanced in favour of the former group. Secondly, with regard to the parent sample, participants were mostly female, thus limiting the heterogeneity of our sample. As for the gender composition, however, it should also be considered that mothers, in Italy but also elsewhere, are more involved in the school lives of their children as compared to fathers (Tan & Goldberg, 2009). This makes them more likely to take part in school surveys and overall to offer more informed perceptions on the school climate at their children's schools. Future studies may address both these limitations: a repeated use of the instrument, with different samples may undoubtedly provide more information on group differences and the general stability of the data.

4.7 General Discussion

The overall purpose of Study 1 was to develop a multidimensional and multi-informant measure of school climate. This general aim was achieved through several specific aims in three work Phases: in Phase 1, I developed a student-version of the questionnaire starting from the adaptation of an existing measure and conducted an exploratory factory analysis to evaluate the structure of the developed questionnaire. In Phase 2, I confirmed the factorial structure of the questionnaire with a confirmatory factor analysis, statistically supported the assumption that

Classroom Practices and School Atmosphere are two separate second order factors and provided evidence supporting the predictive validity of the measure. Lastly, in Phase 3, I developed mirroring versions of the questionnaire for teachers and parents, confirmed their factorial structure and tested measurement invariance across groups. Overall, the results provide good evidence that the validated Multidimensional School Climate Questionnaire is a psychometrically sound instrument based on an articulate theoretical model that could be used not only by researchers but also by teachers and educators. In the research field of educational psychology, this questionnaire fills in the current lack of a multidimensional and multi-informant measure on school climate with psychometrically sound properties in the Italian context. For school workers and managers, the availability of a valid school climate measure accounting for students as well as for teachers and parents' perceptions guarantees the possibility to consider and compare the multiple voices, and to foster collaborations between schools, families and educational psychologists that can contribute to improve schools, develop interventions and foster greater achievement.

Another characteristic to be emphasized is that, as for the original measure I chose for the adaptation, the questionnaire articulation in two scales, i.e., Classroom Practices and School Atmosphere, is an element of strength. This represents an effort to tackle the distinction between classroom and school climate, by distinguishing between the concrete practices experienced in the classroom nanosystem (Rudasill et al., 2018) and the more abstract dimensions at the microsystem school level. The issue is vast and will need future work, but this may be a useful starting point in the process of clarification.

The study as a whole is not without limitations. First, all participants to the research project were from a convenience sample recruited in four schools located in the same geographical area; future research could include different populations in order to improve the possibility to generalize results. Moreover, while the questionnaire has elements of novelty relevant for the international literature, it was developed for and tailored on the Italian school context. Given the peculiarities of each national school system, it is possible that, for a wider use, adjustments would be needed to fit

the specific context where the questionnaire is employed. Secondly, I could not collect data on test-retest reliability: the involved schools deemed a second administration of the questionnaire during school hours too invasive, even if restricted to a smaller sample. Lastly, it should always be remembered that the questionnaire is of self-report nature, so it can only provide individuals' perceptions of school climate. Future studies may offer further insights by combining its use with observational methods. Notwithstanding these limits, I believe that owing to its characteristics this questionnaire can contribute to fill in most of the main weaknesses in the literature identified in the first chapters and to build new knowledge on school climate. Some of these contributions will be presented in the next chapters.

Chapter 5 – Study 2: A Comparison of Different Points of View on School Climate[3]

5.1 Introduction

As discussed in previous chapters, the paucity of research based on multiple informants is one of the main shortcomings of the existing literature on school climate. The few studies that have investigated multiple groups' perceptions of school climate have come to the conclusion that students' and teachers' perceptions do differ, with teachers typically rating classroom practices and teacher-student relations more positively than students do (Mameli et al., 2020; Raviv et al.,1990). Other authors have integrated multiple perspectives for studying the relationship between school climate dimensions and some students' outcomes. For example, Kotoc, Ikoma and Bodovski (2016) have considered data on students, teachers, parents and staff, even though with an emphasis on students, to investigate whether school climate influences students' dropout. Maxwell and collaborators (2017) examined the impact of student and staff school climate perceptions on students' achievement. The results of these studies converge in highlighting the importance for scholars to conduct multi-informant studies that allow understanding whether the various viewpoints on school climate differ or integrate. However, a rigorous comparison between students', teachers' and parents' views of school climate was never done so far. This constitutes the first purpose of Study 2.

This weakness in the literature is also intertwined with another, namely the scarce clarity between *classroom* and *school* climate. To my best knowledge, no previous study has investigated multiple informant perceptions of school climate intended as complex ensemble of dimensions clearly distinguishing between the more proximal classroom and more distal school level. A study combining these two characteristics, that is, a multiple informant design and a multidimensional conceptualization of school climate striving to distinguish between classroom and school level,

[3] Parts of this chapter's content are published in Molinari, L., & Grazia, V. (2020). A multi-informant study of school climate: Student, parent and teacher perceptions. [Manuscript submitted for publication].

would constitute an important advance in the literature, as it would allow a better understanding of the complex nature of school climate. Indeed, beyond the comparison of perspectives, such a study would make it possible to compare different informant views on the associations between perceptions of classroom and school climate. At the light of a system view of school climate (Rudasill et al., 2018), it can be expected that proximal experiences in the classroom context may be associated with perceptions of the wider school climate. It is also possible that such associations differ for the various informants. These theoretical speculations have never been investigated before, thus this study second aim was to fill this gap.

5.2 Aims

The peculiar properties of the developed Multidimensional School Climate Questionnaire, with its mirroring, invariant dimensions for multiple informants and its two scales (Classroom Practices and School Atmosphere) accounting for the classroom and school level, allowed me to address the above-mentioned gaps in the literature, distilled in two main aims.

First, I compared students', teachers' and parents' perceptions of the various dimensions of school climate. Based on the results of previous studies (Mameli et al., 2020), I expected to find that the various actors have significantly different perceptions. Second, I examined in students and teachers the associations between concrete classroom practices and the more abstract dimensions of school atmosphere, first for teachers and students combined, and then comparing the associations for the two groups. Parents were not included in this second aim as their version of the questionnaire only included one dimension of the Classroom Practices scale (see Chapter 4 for more details). Consistently with a systemic view of school climate, which emphasizes the interplay between nested contexts (Rudasill et al., 2018), I expected that concrete and proximal classroom practices would be associated with wider aspects of school atmosphere, when considering the whole sample. As the comparison of these associations separately for students and teachers was never done before, I advanced no specific hypotheses.

5.3 Method

Participants and Procedure

All teachers and parents participating on a voluntary basis to the third data collection were involved in this study (respectively N=105 and 320; see Phase 3 in chapter 4 for detailed information on socio-demographic characteristics). As for students, given the great difference in numbers for the three participant groups, I followed a procedure for balancing the group numbers while making the most of the total sample, by randomly selecting students from the larger sample from the second data collection (N=1070; see Phase 2 in chapter for detailed information on socio-demographic characteristics). The same samples of students involved in Phase 3 of Study 1 was used for the first aim (206 randomly selected students for the comparison with teachers and 339 for the comparison with parents). A random sample of 117 students was instead selected to achieve the second aim. All randomly selected samples of students were balanced for gender, age and nationality.

Measures

All participants completed the Multidimensional School Climate Questionnaire developed and described in detail in Study 1.

Data Analysis

To reach the first aim, I conducted latent means comparisons. These were computed in the scalar invariance model described in the previous chapter by constraining one group's latent means to be zero and leaving the other's latent means free to be estimated. The first group could then be considered the comparison group while the latent mean of the second group was the difference between groups' means. Then I computed the critical ratio (CR, parameter estimate divided by its standard error) to assess whether the differences were significant and Cohen's *d* (parameter estimate divided by the standard deviation) as a measure of effect size.

As for the second aim, I started with a path analysis with latent variables to test whether Classroom Practices dimensions' scores would predict School Atmosphere dimensions' scores for

the sample of students and teachers together. I first tested a model with all dimensions of both sections, and then eliminated non-significant paths to obtain a final model. Afterwards, I performed a multigroup analysis with this model to evaluate differences in path coefficients between students and teachers. In a first model no constraints were specified, then path coefficients were constrained to be equal across groups and changes in model fit indices were compared. Cut offs criteria to keep the more constrained model were $\Delta CFI \leq -.010$ and $\Delta RMSEA < .015$ (Chen, 2007; Cheung & Rensvold, 2002). If differences in the indices exceed the cutoffs criteria, there is a deterioration in model fit, indicating that path coefficients are not invariant across groups.

5.4 Results

A Comparison of Students', Parents' and Teachers' Perceptions of School Climate

The latent means comparisons (Table 5.1) highlighted many significant differences across groups. With regard to the comparison between students and teachers, I found that, as expected and in line with previous research, teachers reported significantly higher scores in almost all dimensions, with the exception of Student Relations and Educational Climate. In the Student-Teacher Relations and Interpersonal Justice dimensions the difference reported a large effect size, while in the remaining dimensions effects sizes were medium or small. When comparing students and parents, I also found significant differences. Parents reported lower scores in Student Support and higher scores in Interpersonal Justice and Student-Teacher Relations; however, effect sizes were small for the first two differences and medium for the third. Teachers and parents also differed significantly in Student Support, Student-teacher Relations and Interpersonal Justice, with parents reporting worse perceptions on all dimensions. Effect sizes were small except for the difference in the perception of Student Support, which reported a medium effect size.

	CR	Cohen's *d*
Differences between students (comparison group) and teachers		
Section 1. Classroom Practices		
Rules	2.20*	.29
Student Support	5.03***	.75
Student Involvement	2.22*	.34
Positive Teaching	3.89***	.70
Encouragement	4.68***	.78
Section 2. School Atmosphere		
Student Relations	.01	.00
Student-Teacher Relations	6.32***	1.03
Educational Climate	1.51	.30
Sense of Belonging	2.38*	.35
Interpersonal Justice	4.11***	.76
Differences between students (comparison group) and parents		
Section 1. Classroom Practices		
Student Support	- 3.53***	.27
Section 2. School Atmosphere		
Student Relations	-.30	.02
Student-Teacher Relations	8.31***	.58
Educational Climate	1.37	.11
Interpersonal Justice	4.02***	.30
Differences between teachers (comparison group) and parents		
Section 1. Classroom Practices		
Student Support	-3.57***	.66
Section 2. School Atmosphere		
Student Relations	-1.45	.13
Student-Teacher Relations	-2.02*	.22
Educational Climate	-1.24	.13
Interpersonal Justice	-2.23*	.29

Table 5.1 Latent means comparisons.
Note. *$p < .05$. ** $p < .01$. *** $p < .001$.

Associations Between Classroom Practices and School Atmosphere Dimensions for Students and Teachers

After exploring the associations between all Classroom Practices dimensions and all School Atmosphere dimensions, I removed non-significant paths to obtain a final simpler model. This model showed good fit to the data: MLR$\chi^2(17) = 24.621$, $p = .104$; RMSEA = .05; CFI = .99; SRMR = .05. The dimensions Rules and Positive Teaching emerged to be significant in predicting School Atmosphere dimensions (path coefficients for the full sample are reported in Table 5). Then I tested a multigroup unconstrained model separating students and teachers, which reported good fit to the data (MLR$c^2(34) = 53.049$, $p = .020$; RMSEA = .07; CFI = .99; SRMR = .06), even though path coefficients appeared to vary greatly. In fact, when we fixed them to be equal in a constrained multigroup model, the model fit reported an unacceptable deterioration (MLR$\chi^2(51) = 130.024$, *p*

=.000; RMSEA = .12; CFI = .97; SRMR = .19). Therefore, as the model indicated that the associations between Classroom Practices and School Atmosphere were not invariant between teachers and students, it was rejected. Path coefficients for both groups from the unconstrained model are reported in Table 5.2.

		Path Analysis	Multigroup Path Analysis (unconstrained)	
		Full sample	Students	Teachers
Independent variable	Dependent variable	Coefficient (SE)	Coefficient (SE)	Coefficient (SE)
Rules	Student Relations	.40 (.09) ***	.56 (.11) ***	.08 (.07)
Positive Teaching	Student-Teacher Rel.	.62 (.07) ***	.76 (.06) ***	.15 (.10)
Rules	Educational Climate	.24 (.07) ***	.35 (.08) ***	.08 (.09)
Positive Teaching	Educational Climate	.45 (.08) ***	.51 (.08) ***	.15 (.13)
Rules	Sense of Belonging	.32 (.08) ***	.43 (.11) ***	.13 (.11)
Positive Teaching	Sense of Belonging	.21 (.09) *	.25 (.11) *	-.03 (.15)
Rules	Interpersonal Justice	.36 (.09) ***	.63 (.10) ***	.02 (.07)
Positive Teaching	Interpersonal Justice	.25 (.09) **	.21 (.09) *	.07 (.12)

Table 5. Unstandardized multigroup path coefficients with latent variables.
Note. *$p < .05$. ** $p < .01$. *** $p < .001$.

5.5 Discussion

This study aimed to advance the literature on school climate in two ways. First, I compared students, teachers and parents' perceptions on an extensive set of school climate dimensions, finding several important differences. Second, by exploring in students and teachers the associations between concrete classroom practices and the more abstract dimensions of school atmosphere, I reached a deeper understanding on school climate, based on different perspectives and consistent with a system view of school climate (Rudasill et al., 2018) capturing the entwining between the classroom and the school levels. Key findings and educational implications are discussed in the following sections.

Students', Parents' and Teachers' School Climate Perceptions

Thanks to the properties of the developed Multidimensional School Climate Questionnaire in its three versions, in this Study I was able to make rigorous comparisons among different points of view on the same dimensions, thus addressing a severe limitation of the literature. The findings are interesting and have multiple implications for research and practice. In the comparison between students and teachers, I found differences in their perception of Student-Teacher Relations and

Interpersonal Justice, both showing large effect sizes, with teachers scoring higher. Overall, even if with smaller effect sizes, teachers overestimated almost every dimension. This finding is consistent with previous studies (Mameli et al., 2020) and has relevant practical implications. In fact, teachers' perceptions of classroom climate and school atmosphere as basically favorable learning contexts may make them blind in front of the more negative perceptions of students, thus limiting their capacity to respond to the students' needs and requests.

Students also showed a more negative view of Student-Teacher Relations and Interpersonal Justice in the comparison with their parents. This finding suggests that parents' perceptions, which were mostly overlooked (Bear et al., 2015), instead offer a unique point of view. In this respect, we shall consider that in school parents are mostly outsiders and this may explain the more optimistic perception of what happens in that context. Instead, parents appeared more negative as far as Student Support was concerned, showing worse perceptions in the comparison with students and with teachers. This finding is to be considered in particular for their impact on home-school relations: the planning of interventions aimed at helping parents and teachers to share common views and understand each other's position may improve their collaborative skills.

Overall, these findings confirm the need to account for a heterogeneous picture in the study of school climate (Wang & Degol, 2016), and the importance to develop interventions capable of considering and recomposing the different perceptions. In accordance with a systemic view of school life (Rudasill et al., 2018), all actors' voices should be heard, and all points of view concur to the overall perception of the school environment. Developing awareness on the multiple views is certainly a useful step for promoting change and improvement of the learning context.

Associations Between the Classroom Practices and School Atmosphere Dimensions

A further novel element of the present study lies in the consideration of two aspects of school climate, namely Classroom Practices and School Atmosphere, as distinct and yet interrelated. This way of conceiving school climate has brought about a step forward in the understanding of the dynamics between these two structural and organizational school entities.

In line with the system theory principles (Rudasill et al., 2018), due to the complex interplay at work in school systems, what individuals do in the classroom should reverberate on how individuals feel at school. Indeed, my findings supported the prediction that Classroom Practices dimensions are associated with School Atmosphere dimensions. More specifically, I found that the classroom practices concerning Rules and Positive Teaching were significantly associated with some atmosphere dimensions. Participants (students and teachers together) who perceived better practices in relation to the clarity of rules and to a positive teaching approach also perceived a more stimulating educational environment, a higher sense of belonging and more positive feelings of interpersonal justice. While previous studies found that rules fairness plays a role in diminishing bullying and violent behaviours (Aldridge et al., 2018; Lindstrom Johnson et al., 2017), these findings add that this dimension is also important in building the school atmosphere. As for positive teaching, consistently with the present findings, previous research linked different but related dimensions (i.e., academic emphasis and academic support) with better achievement (Maxwell et el., 2017) and a general school satisfaction (Zullig et al., 2011). In the present study, an interesting distinction between the two practices was that higher scores in the Rules dimension were related to the perception of better relations among students, while Positive Teaching was related to the perception of better relations with teachers. These findings are crucial, as the perceptions of relationships within the school are a central aspect of the school climate (Fraser & Walberg, 2005). In particular, the study results highlight that, on the one hand, having clear and consistently enforced rules contributes to the creation of a learning environment in which good relations among students can thrive. On the other hand, teachers' enthusiasm seems to spread out among students, thus fostering good student-teacher relations.

These findings are again useful for practical interventions in middle schools (Kim et al., 2014), as they show that various abstract features of the school environment, such as the relational quality or the sense of belonging, are linked to and depend on specific and concrete everyday practices. Knowing this, it is possible to support a single school in setting up its own goals at the

school level for improving the atmosphere, and then concretely act at classroom level to achieve those goals. For example, in a school in which students' relations are weak or troubled, a teacher training aimed at creating awareness on the importance of establishing clear and shared rules can be a positive intervention able to eventually change the relational quality.

In the end, through the analysis of the different paths for students and teachers, the use of the multi-informant Multidimensional School Climate Questionnaire has made possible to go one step further in the understanding of the associations between practices and atmosphere. A multigroup path analysis (on students and teachers separately) from the Classroom Practices to the School Atmosphere dimensions showed that the above-discussed model was not invariant across both groups. In particular, for the teacher sample, none of the associations emerged as significant. I interpret this result by considering that teachers, most of whom can count on many years of teaching experience, may perceive the activities to carry out in the classroom as more crystallized and static, and thus unchangeable. If this result would be confirmed in future studies, it would raise a serious problem that can have negative effects. In fact, if teachers are convinced that changing practices cannot lead to any improvement, they may not make the effort to reconsider such practices in order to exploit their potential for improving the school environment. Reflecting on the differences in perceptions might be an important leverage that informs intervention, and a starting point to unblock what, according to these findings, seems a static situation.

The study is not without limitations. First, as for Study 1, the data collection in four schools located in the same geographical area can be considered a limit, along with the focus on the Italian school context. To overcome this limit in future research, cross-cultural studies might offer important cues on the links between school contexts and climate. Secondly, as the adult participants responded anonymously using an online platform (procedure employed for encouraging participation), I was not able to match parents, students and teachers' answers. This is certainly an important limitation that I hope will be addressed by future studies. Lastly, this is a correlational

and cross-sectional study that seeks to understand processes which operate over time in schools. Therefore, longitudinal data are definitely needed to confirm the direction of the effects.

Notwithstanding the limitations, the present study offers interesting insights for research and practice. For research, as the multi-informant nature of the study, together with its systemic oriented approach, constitutes a crucial step forwards in school climate research that can inform future studies, preferably based on a longitudinal design. For practice, because by underlining specific elements that can become a leverage for change, the rich and composite picture emerging from this study offers multiple insights for the promotion of a positive school environment.

Chapter 6 – Study 3: Associations of School Climate Perceptions with Different Student Profiles of Engagement and Burnout[4]

6.1 Introduction

As discussed in the first two chapters, the correlates of school climate were searched mostly in school aggression and violence, while less is known about the associations between school climate and the way students feel and act in school. To bridge this gap, the present study addressed the following question: do students who are positively engaged in school activities and daily practices perceive their school climate differently from students who feel distant and less engaged in school? To answer this question, I adopted a person-oriented approach for identifying student profiles on the basis of their levels of school involvement, in terms of engagement and burnout, and then verified whether school climate perceptions differed for the various profiles, while still keeping distinct the two aspects of Classroom Practices and School Atmosphere.

Student engagement in school activities is generally described as a positive, flourishing experience (Fredricks et al. 2004; Reschly et al., 2008). The construct is multidimensional, comprising four aspects. Emotional engagement is defined as the student's reaction to teachers, classmates and school-related experiences. Behavioural engagement refers to the student's involvement in school activities. Cognitive engagement indicates the processes and strategies that students use to elaborate learning contents. The fourth component, which was added more recently (Mameli & Passini, 2017), is called agentic engagement and considers the students' active role and transformative contributions provided to the ongoing flow of the education they receive.

Overall, the concept of student engagement is considered crucial for ameliorating the educational paths of young generations (Appleton et al., 2008; Jelas et al., 2016; Lawson &

[4] Parts of this chapter's content are published in Molinari L., & Grazia, V. (2020). Students' school climate perceptions: Do engagement and burnout matter? [Manuscript submitted for publication].

Lawson, 2013). Moreover, it has been claimed that student engagement is associated with the feeling that learning in school is important as means for achieving personal goals (Voelkl, 1997).

However, this is only one side of the coin. Fewer studies have actually shown that in some cases the experience of energy, dedication and absorption entailed by student engagement goes together with negative feelings, such as those of exhaustion or inadequacy, which are typical symptoms of *student burnout* (Salmela-Aro et al., 2009). In studies conducted on high school students, Salmela-Aro and collaborators (Salmela-Aro et al., 2016; Salmela-Aro & Read, 2017) combined emotional engagement and burnout with a person-oriented approach, and found various students' profiles with different levels of the two variables. As predicted, there were students who felt emotionally engaged in school activities and perceived no burnout, and other students who experienced high levels of burnout and no engagement. However, the central and most interesting finding of the study regarded a group of students, labelled 'engaged-exhausted', who experienced what the authors called the "dark side of student engagement" (Salmela-Aro et al., 2016, p. 68), characterised by simultaneously high levels of emotional engagement and exhaustion. This result, which contrasts with the common definition of engagement as a definitely positive experience, has many clinical implications, as the engaged-exhausted students are at risk of developing symptoms of depression in the long run (Tuominen-Soini & Salmela-Aro, 2014).

Drawing on the interesting insights provided by this line of research, in this study I decided to adopt a person-oriented approach (see chapter 3 for more information on this approach) to explore the associations between school climate perceptions and students' involvement in school in terms of engagement and burnout. More specifically, this approach allowed me to identify student profiles characterized by different patterns of engagement and burnout, and then to analyse school climate perceptions for each profile, thus drawing a nuanced picture of school climate views for students who act and feel differently in school.

As anticipated, previous research on the associations between students' engagement and school climate perceptions is limited. However, the few existing studies in the field have provided

some interesting results. Fatou and colleagues (2017) found that several dimensions of school climate were positively associated with student engagement, especially as far as its affective component was concerned. Other studies supported the positive role of school climate in the promotion of student engagement (Yang et al., 2020), but also found interesting cultural differences. For example, the results of a cross-cultural study comparing American and Chinese students (Bear et al., 2018) showed that the relation between school climate and engagement was significant only for the American students. These results indicate that the association between school climate and student engagement is a promising field of study, but more research is needed. Even more so as far as the association between school climate and student burnout is concerned, which to my best knowledge has never been investigated so far. Research in this direction has important educational implications, as knowing whether the way young students feel and act in school relates to school climate can inform interventions for improving the school experience.

6.2 Aims

The general aim of Study 3 was to explore the associations between school climate perceptions and students' involvement in school in terms of engagement and burnout. Previous literature on student engagement and burnout highlighted that these variables, with their multiple dimensions, tend to combine in complex patterns. Thus, rather than testing associations between mean levels of the variables in the whole population with a variable-oriented analysis, I decided to adopt a person-oriented approach and explore instead how perceptions of school climate differed between students characterized by different patterns of engagement and burnout.

Two were the specific research aims. First, I identified student profiles based on their levels of engagement and burnout. Drawing from the results of previous studies (Salmela-Aro et al., 2016), I expected to find a group of students who were highly engaged and showed low levels of burnout, a group of students with high levels of burnout and low engagement, and a group of students with mixed levels of engagement and burnout. At this stage, I also controlled for the role of gender and school grade in predicting the likelihood profile belonging. The second aim was to

explore whether students belonging to the identified profiles showed different school climate perceptions, assessed in the multidimensional features of Classroom Practices and School Atmosphere.

6.3 Method

Participants

Study 3 included the same sample of students participating in the second data collection conducted in 2019 (N= 1070). For detailed information on the sample, see Phase 2 in Study 1.

Measures

For each of the following scales, participants answered on a 6-point Likert Scale ranging from "Completely disagree" to "Completely agree", so that higher scores indicate higher engagement, higher burnout and better school climate perceptions. Cronbach's alphas for each measure and dimension, along with descriptive statistics and intercorrelations, are reported in Table 6.1.

School Climate. Participants completed the 49-item student-version of the Multidimensional School Climate Questionnaire (see Chapter 4 for more information).

Student Engagement. I used an instrument already validated on an Italian population (Mameli & Passini, 2017). The measure comprised four dimensions of engagement: Emotional (item sample: "I have fun learning something new"), Behavioural (item sample: "In class I work as hard as I can"), Cognitive (item sample: "When I study I try to find links between topics") and Agentic (item sample: "In class I express my preferences and opinions"). In agreement with the authors, I used an abbreviated 16-item version, which comprised items reporting the highest factor loadings in the validation of the instrument for each dimension. To test the goodness of fit of this abbreviated version of the questionnaire in my population, I conducted a preliminary confirmatory factor analysis (CFA). The expected four factor model obtained good indices of fit: RMSEA= .047 [.042-.053], CFI= .943, SRMR= .054.

School Burnout. I used the 9-item Italian adaptation (Fiorilli et al., 2014) of the School Burnout Inventory (Salmela-Aro et al., 2009). The measure comprised three dimensions: Exhaustion (item sample: "I feel overwhelmed by schoolwork"), Cynicism (item sample: "I often wonder whether school has any meaning") and Inadequacy (item sample: "In the past I had better expectations toward school than I have now"). As the students involved in this study were younger as compared to the ones involved in the original Italian adaptation of the measure, I first explored the psychometric properties of the inventory and then conducted a CFA on my population. These analyses showed that the Inadequacy dimension was not adequate (Cronbach's alpha = .58), perhaps because it was misunderstood by a population of early adolescent students. Thus, I excluded such dimension, with its two indicators, and tested the goodness of fit of a two-factor (Exhaustion and Cynicism) scale with a CFA, which yielded good fit indices: RMSEA= .047 [.032-.063], CFI= .980, SRMR= .028.

Data Analysis

To achieve the study aims, I conducted a Latent Profile Analysis (LPA) with the 3-step approach (Asparouhov & Muthen, 2014), which allowed me to identify student profiles based on engagement and burnout, and then to analyse their associations with school climate dimensions, while controlling for measurement errors in the identification of latent classes.

More specifically, for the *first aim*, I used the four dimensions of student engagement and the two dimensions of school burnout to test models with two to five latent classes. Models were then compared through several fit indices: the Bayesian Information Criterion (BIC), the Vuong-Lo-Mendell-Rubin Likelihood Ratio Test (VLMR-LRT), the Bootstrapped Likelihood Ratio Test (BLRT), and the entropy value (Nylund et al., 2007). In the comparison of indices, lower BIC values and entropy values closer to 1 are preferred as they indicate better fit and clearer distinction of classes. Moreover, both likelihood ratio tests (VLM-LRT and BLRT) should be significant, indicating that, in the comparison of nested models, adding one class improves the fit. Beside fit indices I also considered interpretability and parsimony to select the best fitting model. Finally, I

controlled for the role of gender and school grade in predicting the likelihood of profile membership by conducting a multinomial logistic regression. For my *second aim*, in line with the 3-step approach, I conducted t-tests to compare profiles on the mean perceptions of all school climate dimensions.

	Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Student engagement																		
1	Affective	-	.55**	.57**	.37**	-.21**	-.46**	.41**	.40**	.32**	.58**	.43**	.32**	.36**	.60**	.68**	.68**	.56**
2	Behavioural		-	.57**	.31**	-.12**	-.39**	.41**	.34**	.23**	.39**	.34**	.20**	.29**	.41**	.50**	.38**	.42**
3	Cognitive			-	.45**	-.03	-.27**	.36**	.35**	.32**	.43**	.35**	.17**	.29**	.43**	.48**	.39**	.39**
4	Agentic				-	.02	-.11**	.22**	.25**	.27**	.30**	.30**	.04	.26**	.29**	.29**	.25**	.19**
School burnout																		
5	Exhaustion					-	.56**	-.15**	-.10**	-.03	-.12**	-.09**	-.34**	-.07*	-.14**	-.15**	-.26**	-.23**
6	Cynicism						-	-.24**	-.15**	-.07*	-.26**	-.17**	-.36**	-.14**	-.27**	-.35**	-.41**	-.37**
School climate																		
	Classroom Practices																	
7	Rules							-	.49**	.45**	.51**	.44**	.24**	.37**	.45**	.56**	.40**	.50**
8	Student Support								-	.50**	.53**	.50**	.22**	.32**	.48**	.48**	.40**	.42**
9	Student Involvement									-	.46**	.46**	.19**	.33**	.44**	.36**	.33**	.38**
10	Positive Teaching										-	.63**	.41**	.31**	.64**	.67**	.48**	.54**
11	Encouragement											-	.26**	.33**	.56**	.59**	.41**	.47**
12	Class Management												-	-.14**	.38**	.33**	.32**	.35**
	School Atmosphere																	
13	Student Relations													-	.45**	.39**	.50**	.34**
14	Student-Teacher Rel.														-	.64**	.54**	.59**
15	Educational Climate															-	.55**	.63**
16	Sense of Belonging																-	.54**
17	Interpersonal Justice																	-
	M	4.48	4.90	4.55	3.88	3.39	3.17	5.06	4.88	4.13	4.73	4.98	3.57	4.49	4.21	4.90	4.70	4.55
	SD	1.18	.96	1.13	1.13	1.34	1.50	.61	.93	1.19	.95	1.02	1.16	1.08	1.16	.89	1.22	1.21
	Cronbach's alpha	.85	.68	.84	.71	.75	.74	.63	.66	.74	.76	.72	.68	.86	.85	.76	.86	.76

Table 6.1 Descriptive statistics, Cronbach's alphas and intercorrelations for all variables' dimensions
Note. $*p < .05$. $** p < .01$. $*** p < .001$.

6.4 Results

Student profiles

The fit indices for two to five class Latent Profile Models are reported in Table 6.2. The BIC values and BLRT did not distinguish among these models, suggesting that a larger number of classes might be best fitting. However, interpretability and parsimony of the model are also important and a number of classes higher than five would have been difficult to interpret. Thus, we considered the other likelihood ratio test, the VLM-LRT, which suggested that it was not necessary to have more than four classes. The best loglikelihood value for the four-classes model was replicated in more than one final stage solution, supporting this as a good solution. Consistently, the entropy value, decreasing with the addition of more classes, supported the choice of this model. Overall, the fit indices indicated a four-classes solution as the best-fitting model. The four resulting profiles are represented in Figure 6.1, where 0 corresponds to the mean score. Each profile was labelled for improving legibility.

Number of classes	loglikelihood	VLMR-LRT	BLRT	BIC	Entropy
2	-9542.024	$p = .000$	$p = .000$	19216.492	.863
3	-9305.491	$p = .000$	$p = .000$	18792.221	.793
4	-9205.424	$p = .042$	$p = .000$	18640.883	.787
5	-9126.079	$p = .057$	$p = .000$	18530.988	.762

Table 6.2. Fit indices for the 2-5 classes models in the Latent Profile Analysis

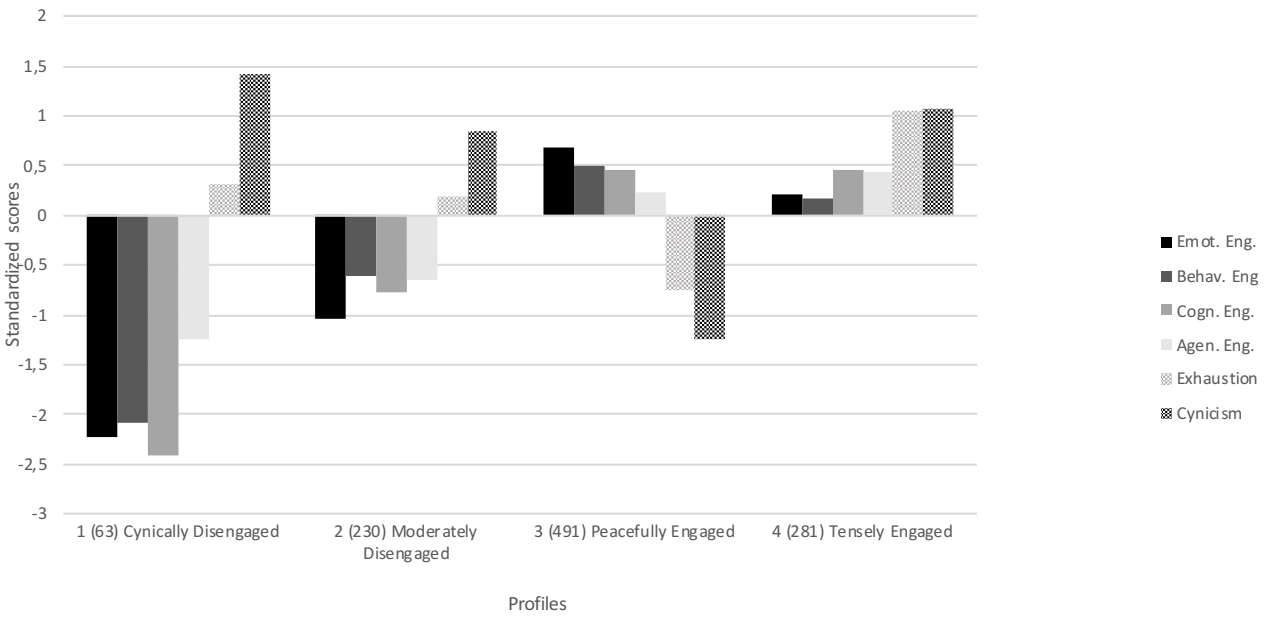

Figure 6.1. Standardized mean scores of engagement and burnout dimensions for each profile

The first profile (including 5.9% of the sample), which I labelled *Cynically disengaged,* included students reporting the lowest levels of all dimensions of engagement, alongside a score in exhaustion close to the average and a very high score in cynicism. A similar tendency, with weaker scores, characterised the second profile, comprising a higher number of students (21.6%) that I called *Moderately disengaged*. They reported low levels in all engagement dimensions and a rather high level of cynicism. The *Peacefully engaged* profile included a larger number of students (46.1%) who reported the highest scores in emotional and behavioural engagement, and the lowest scores in both burnout dimensions, well below the mean. The fourth profile, labelled *Tensely engaged*, comprised the remaining students (26.4%), who reported scores close to the average in the emotional and behavioural dimensions of engagement, scores above the mean in cognitive engagement, the highest score, as compared to the other profiles, in agentic engagement, and high scores in both dimensions of burnout.

When checking for the role of gender, I found that female students were less likely to belong to the *Cynically disengaged* profile as compared to the *Moderately disengaged* and to the *Peacefully engaged* profiles (respectively B (SE) = 1.00(.37) p = .007 and B (SE) = 1.53(.34) p =

.000), and more likely to belong to the *Peacefully engaged* profile than to the *Moderately disengaged* (B (SE) = .53(.20) p = .007) and to the *Tensely engaged* profiles (B (SE) = .98(.20) p = .000). There was no significant gender difference between *Cynically disengaged* and *Tensely engaged* profiles.

School grade was significant in the comparison of the *Cynically disengaged* profile with the *Peacefully engaged* and *Tensely engaged* profiles: in both cases, older students (7^{th} grade) were more likely to belong to the first profile (respectively B (SE) = .96 (.30), p = .002 and B (SE)= .62 (.31), p = .046). Lastly, in the comparison between the *Moderately disengaged* and *Peacefully engaged* profiles, older students were more likely to belong to the former (B (SE) = .74(.20) p = .000).

Associations with school climate perceptions

The paired t-tests (Figures 6.2 and 6.3) revealed that students in the different profiles reported significant differences in most dimensions of school climate. Starting with Classroom Practices dimensions (Figure 6.2), the two disengaged profiles, i.e., *Cynically* and *Moderately*, reported scores well below the mean for all dimensions, and significantly lower with respect to the two engaged profiles with the exception of the perception of Class Management, which was on level with the *Tensely engaged* profile. In the comparison between the two disengaged profiles, the *Cynically disengaged* reported significantly lower scores in Positive Teaching and Encouragement. As far as the two engaged profiles were concerned, the overall picture was more positive. In the comparison between them, the *Tensely engaged* students reported higher scores in Student Support and Student Involvement, lower scores in Positive Teaching and much lower scores in Class Management.

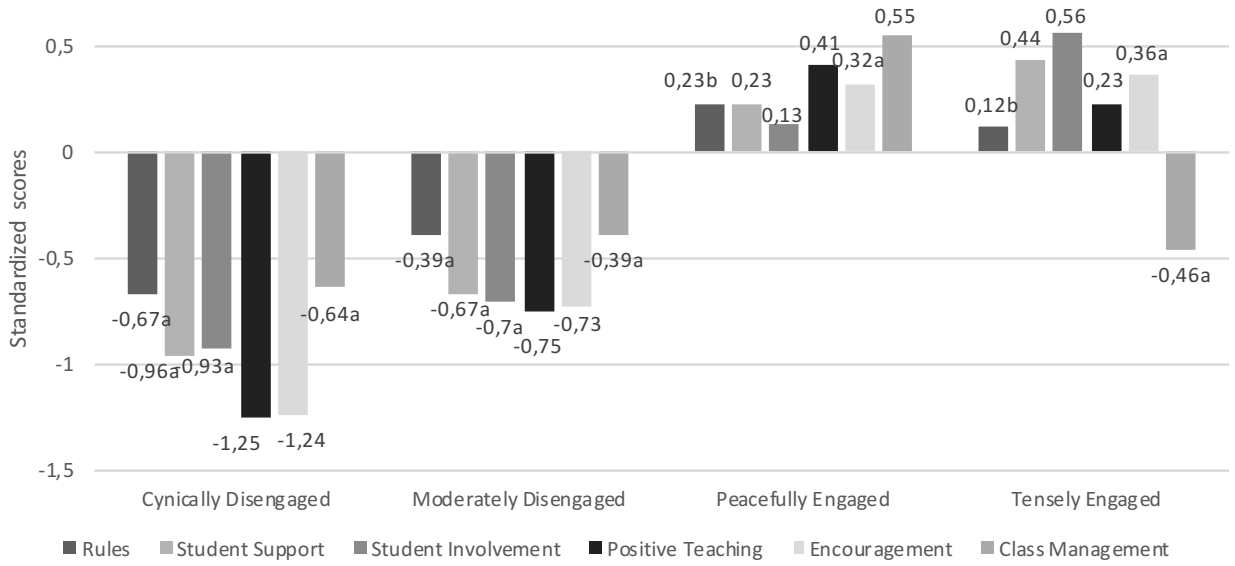

Figure 6.2. Comparisons between profiles' perceptions of Classroom Practices
Note. The scores on the same dimension of Classroom Practices across profiles were all statistically different at $p < .05$ except the ones indicated with the same subscript for each dimension.

With regard to the School Atmosphere dimensions (Figure 6.3), the four groups reported significant differences in most dimensions, with the *Cynically disengaged* profile scoring the lowest, followed by the *Moderately disengaged*. The *Peacefully* and *Tensely engaged* profiles scored higher than the disengaged ones, with few differences between them. Notably, the *Tensely engaged* students reported higher scores in Student Relations, lower scores in Educational Climate and much lower scores in Sense of Belonging and Interpersonal Justice.

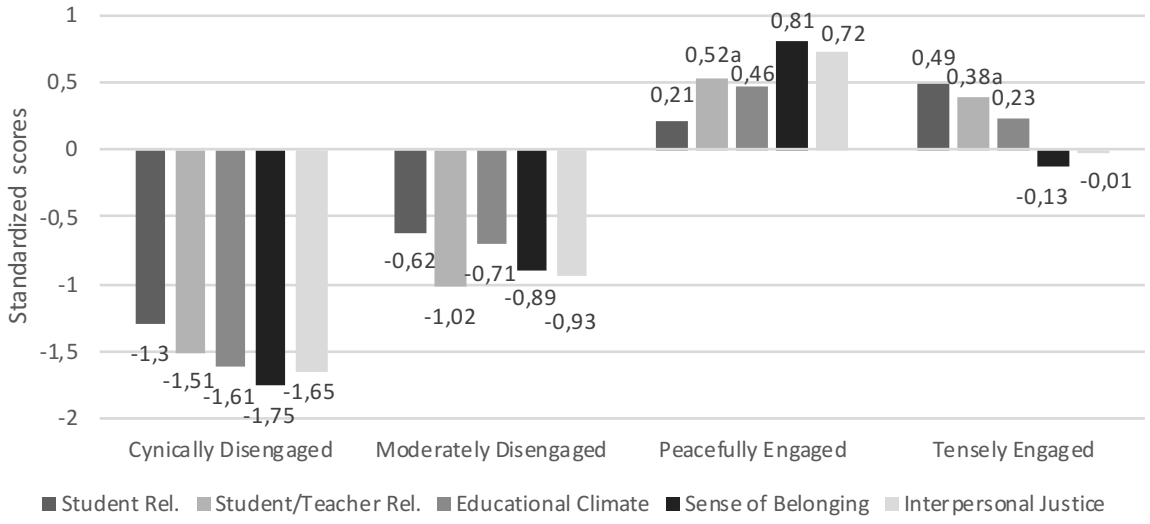

Figure 6.3. *Comparisons between profiles' perceptions of School Atmosphere*
Note. The scores on the same dimension of School atmosphere across profiles were all statistically different at $p < .05$ except the ones indicated with the same subscript for each dimension.

6.5 Discussion

The aim of this study was to analyse differences in school climate perceptions of secondary school students who reported different levels of engagement and burnout. To achieve this aim, I adopted a person-oriented approach that allowed me to identify four student profiles, and then compared school climate views in the various profiles. Key findings and educational implications are discussed in the following sections.

Student Profiles: Pictures of Early Adolescent Students

The results from the Latent Profile Analysis largely supported my general expectations and were consistent those of previous studies (Salmela-Aro et al., 2016; Salmela-Aro & Read, 2017). In addition to previous works, the use in this study of a multidimensional measure of engagement offered further interesting insights into the different profiles. As expected, I found two groups of students reporting low levels of engagement and high levels of burnout. This critical picture, which on the whole concerns more than one student out of four, was more extreme for the *Cynically disengaged* profile and cooler for the *Moderately disengaged* students, whose pattern was similar to the "inefficacious" one, found by Salmela-Aro and colleagues (2017). Still in line with a previous study (Tuominen-Soini & Salmela-Aro, 2014), students belonging to these two profiles reported feelings of burnout strongly steering toward a cynical attitude in school, while the perception of exhaustion was less intense. By relying on the multidimensional measure of engagement, I also found that disengagement in these students concerned in particular the emotional and cognitive manifestations, while it was less marked in the behavioural and especially in the agentic dimensions. Trying to figure out who the disengaged students are, I can imagine early adolescents who really do not like school, see no sense in what they do in school, and avoid thinking and reflecting on school matters. These students are less negative, although certainly not positive, about disengaging in their school actions, especially as far as agency is concerned. This result is interesting as it recalls the debate about the twofold face of agency (Mameli et al., 2019), one basically aligned with the teacher's directions and another taking the form of resistance and challenge vis-à-vis the teacher's power, especially in situations perceived to be unsatisfactory. Having found that agentic engagement is higher as compared to the other dimensions of engagement in the present population of disengaged students, it is possible to suggest that in critical situations early adolescents make the effort to shyly raise their voice, presumably to contrast a school situation that they do not like. This result opens reflections on the importance for teachers to care for these students, to listen and try to catch up with them, so to avoid their complete separation from school matters. Among the two disengaged profiles, the most critical is undoubtedly the

Cynically disengaged one, which fortunately regards only a minority of students who see no meaning in their school life and feel detached from it, especially on the emotional level that such an important role plays in the school context. Teachers should be helped to 'detect' these adolescents, who run the risk of remaining marginal and perhaps eventually being 'thrown out' from school, for disciplinary or academic reasons.

Very encouraging is, on the contrary, the picture emerging from the *Peacefully engaged* profile, which describes the most adaptive pattern of engagement and burnout. These students, who were almost half of the total sample, did not report burnout symptoms, thus declaring that they feel energy for their school work and that going to school makes sense to them. They also perceived high levels of involvement in their school tasks, especially as far as the emotional level is concerned. The identification of an engaged and well-adapted profile is consistent with previous findings (Tuominen-Soini & Salmela-Aro, 2014), even if in other studies it was not so numerically substantial (Salmela-Aro et al., 2016). Notably, the lowest score in engagement reported by these students concerned agency, that is, actions aimed at transforming the learning environment. This suggests that the *Peacefully engaged* profile comprises the "good students", who are involved in school and happy about what they do and learn, but tend to remain passive and follow the teachers' directions instead of letting their voice heard by teachers with a view to changing and improving their environment.

The last profile shows a particularly interesting pattern, revealing that, as expected, not all engaged students report an "idyllic" vision of the school environment. Indeed, the *Tensely engaged* profile included students who are relatively involved in school but at the same time experience high levels of burnout. More in detail, and contrary to the disengaged students whose burnout was almost completely of a cynical type, the *Tensely engaged* students, who reported high levels of both cynicism and exhaustion, can be viewed as highly stressed and disillusioned students, who are engaged especially in the cognitive and agentic dimensions. These students embodied in my sample the dark side of student engagement as described by Salmela-Aro and collaborators (2016), for they

seem to struggle and make an effort to participate and be involved by means of cognitive strategies in their learning and agentic behaviours in classroom interactions, at the cost of a high level of pressure and disenchantment with school.

As for the control variables, the results concerning gender were consistent with the literature, showing that girls tend overall to follow more adaptive trajectories of engagement (Janosz et al., 2008). Some interesting reflections emerge from the results concerning the role of school grade in predicting profile membership, with older students likelier to belong to the less adaptive profiles. While acknowledging that these analyses were cross-sectional and as such they could not inform on change over time, these findings, indicating a tendency toward an increase with age in detachment and disillusion, may open several paths to future explorations with longitudinal research.

Associations of Student Profiles with School Climate Perceptions

The second and more central aim of the present study was to explore associations between profile belonging and school climate perceptions. With regard to everyday Classroom Practices, as predictable, both disengaged profiles shared the most negative perceptions of the school environment, with the difference that *Cynically disengaged* students felt significantly less enthusiasm and encouragement from their teachers as compared to the *Moderately disengaged* students. I interpret this result by considering the higher level of separation and distance from school that was experienced by the *Cynically disengaged* students, while the other group of disengaged students seems to strive for the teacher's attention. The most positive perception of Class Management was a strong characterising feature of the adaptive *Peacefully Engaged* profile, while all the other profiles turned out to be more critical as regards the teachers' ability to effectively manage everyday classroom activities without losing their patience. Other interesting differences concerned the two engaged profiles, with the *Tensely engaged* students perceiving more personal involvement and more support from their teachers. These results, along with these students' higher scores in agentic engagement, seem to suggest that tensely engaged students handle

their feelings of stress and cynicism by first asking for and then accepting the teacher's help. On their part, the *Peacefully engaged* students were more prone to perceive their teachers as enthusiastic and engaging, aspects that probably further sustain their adaptive profile.

As regards the School Atmosphere, the *Cynically disengaged* students were the most negative on all dimensions, with the Sense of Belonging touching the lowest point. These findings confirm that this profile is the most critical one, characterised by severe student malaise. More in general, students in both disengaged profiles perceived school atmosphere to be less satisfying as compared with the engaged profiles. Interestingly, negative feelings were reported, especially by the *Cynically disengaged* students, also with respect to peer relationships, showing that their discomfort is not restricted to learning aspects but invades the relational sphere. The *Peacefully* and *Tensely engaged* students shared a better general perception of the school atmosphere, but also outlined different aspects of satisfaction or discontent. They both reported similar perceptions of their relations with teachers, while the *Tensely engaged* students perceived better relations with peers. This indicates that their higher levels of exhaustion and cynicism toward school were not accompanied by discontent with their relational environment. However, these students reported worse perceptions of the Educational Climate, thus revealing their difficulty in grasping the importance and beauty of learning in their school, a lower sense of belonging, and the feeling that teachers treat their students unfairly. By and large, these results offer a nuanced picture of students who experience their school engagement with negative and stressful feelings.

While more research is needed to study in greater depth the above-reported associations, some of these findings pinpoint several aspects that can be translated into practical suggestions for teachers. For instance, the finding that the *Cynically disengaged* students, which can be imagined as the most critical profile, were the most negative on Positive Teaching and Encouragement highlights their feeling of distance and isolation that, together with the low level of relationships with their peers, make up the picture of early adolescents perceiving a generalized serious school maladjustment. For the *Tensely engaged* students, who are putting a lot of effort into their learning

but are burned-out, dimensions pertaining the management of class activities with fairness and the conveyance of enthusiasm for learning were of great importance. Teachers wanting to address this form of distress could start by addressing these aspects in their everyday practice.

In conclusion, Study 3 provided the first results on scarcely investigated correlates of school climate, pertaining to the way students perceive and express their involvement in school, with relevant implications for teachers and educators. The main limitation of this study was that its cross-sectional and person-oriented approach, while providing innovative insights into different groups of students, did not allow to infer the directional associations of school climate with student engagement and burnout. Thus, to complement these findings, the next chapter will be dedicated to the longitudinal study of this association, which was the purpose of the fourth and last study.

Chapter 7 – Study 4: Longitudinal Associations Between Classroom Practices, School Atmosphere, Student Engagement and School Burnout

7.1 Introduction

The first three studies of the present research project aimed to provide several advancements to the national and international literature with cross-sectional data. This fourth and last study's purpose was to address the remaining most relevant gap discussed in chapters 1 and 2, corresponding to the need for longitudinal studies capable of providing information on the evolution over time of school climate perceptions, and longitudinal associations with learning outcomes. Given the main features of this research project, based on (a) a multidimensional and comprehensive conceptualization of school climate, (b) a distinction between Classroom Practices and School Atmosphere, and (c) the search for student involvement correlates of school climate, there were *three* main innovative research questions that could be addressed with a longitudinal design.

First, a longitudinal study considering several dimensions of school climate can provide information on the changes in students' perceptions over two school years. Most of the very few existing longitudinal studies on school climate (see chapter 2 for more detailed information) covering the span of more than one school year (Batanova et al., 2016; Gage et al., 2014; Kotok et al.,2016; Tomczyk et al., 2015) did not provide explicit information and commentary on students' school climate perceptions trends. Only three previous studies analyzed changes of student perceptions of some school climate dimensions. Wang and collaborators (2010) found that, throughout the three years of middle school, student perceptions of *academic focus*, *discipline and order*, *peer relations* and *student-teacher relations* steadily deteriorated, while Wang and Dishion (2012) found a similar trend for student perceptions of *academic support*, *school behavior management*, *teacher social support* and *peer social support*. Consistently, Schneider and collaborators (2010) found that student perceptions of their schools' *prosocial attitudes* and *social*

climate (referring in this case to the safety component of the social environment) decreased over two school years for a sample of middle schoolers. These findings, albeit limited in number, suggest that, with the passing of time, students' discontent with their school climate tends to increase.

However, all of these previous studies were affected by some of the weaknesses of school climate research already discussed in chapter 2, as each of them provided information only on a limited number of school climate dimensions, which were chosen for the wider study aims, and none offered a distinction between classroom and school-related levels. These gaps deserve to be filled because, besides studying the many correlates of a positive school climate, it is important to develop a solid understanding of how perceptions of school climate evolve over time and, eventually, how to best intervene.

A second research question that can be addressed by combining a longitudinal design with the proposed school climate conceptualization, capable of distinguishing between classroom and school-related levels, concerned the relations between these two distinct yet related areas of school climate. Indeed, the novel approach developed with this research project, which distinguishes students' perceptions pertaining to practices situated in the classroom, on one hand, and to the wider school atmosphere, on the other, makes it possible to explore the associations between these areas. With the use of a longitudinal design it is furthermore possible to assess not only associations, but also reciprocal predictive effects.

According to a system view of school climate (Rudasill et al., 2018), these two interrelated settings influence each other. School climate is a characteristic of the microsystem (school) and has the power to shape individual experiences in its nanosystems (such as the classroom); however, as classrooms are also the more proximal contexts of interaction for the individuals, it is also true that their experiences at this level contribute to the aggregated perceptions of school climate. This is consistent with the approach inspiring the school climate conceptualization adopted in the present research (Janosz et al., 1998). The atmosphere at school level is considered the more abstract component of school climate, which is progressively internalized through repeated experiences of

everyday practices and interactions. In turn, the school atmosphere, once it starts to settle, can then characterize individuals' perceptions of their proximal classroom environment. However, while theoretical reflection posited these associations between school climate dimensions at the school and classroom levels, no study, to the best of my knowledge, set out to explore them with a longitudinal design. This is needed in order to understand the specific associations between different dimensions and the direction of effects.

A third and last research question to be addressed with a longitudinal study was related to the association between school climate and two correlates capturing students' positive and negative involvement with school, i.e., engagement and burnout, already introduced in Study 3. As discussed in the previous chapters, there are indications that better perceptions of school climate may be associated with a more positive student involvement in learning (Bear et al., 2018; Fatou et al., 2017; Yang et al., 2020), as supported by the findings from Study 3. However, no previous research investigated these associations with a longitudinal design, leaving a major limitation in the existing literature. While the above-mentioned studies with cross-sectional design showed an association between school climate and student engagement and burnout, none provided information on the direction of influences among these variables. Within the conceptualization of school climate developed in this research project, it is possible to hypothesize that School Atmosphere, as the more abstract and internalized component of school climate, might have long-term effects on students' positive involvement with school work. While Classroom Practices are strongly anchored to the daily flow of activity, it is possible that the School Atmosphere, consisting in the wider relational and educational atmosphere permeating students' experiences at school, may accompany them in their schooling, positively affecting their subsequent levels of engagement and burnout. However, it would also be possible to hypothesize that students' levels of engagement and burnout would affect their school climate perceptions, as previous longitudinal studies found that higher levels of engagement had a positive effect on students' perceptions of their learning environment (Jang et al.

2012; Jang et al., 2016). A longitudinal study was thus needed in order to assess the existence and direction of associations between school climate and student engagement and burnout.

7.2 Aims

With Study 4, longitudinal, the complex picture of school climate provided throughout the whole research project is further strengthened. Three were the specific aims. The first was to apply the multidimensional conceptualization of school climate, developed throughout the research project, in order to assess over two school years the changes in students' perceptions with regard to several school climate dimensions, distinguished in the Classroom practices and School atmosphere areas. Based on previous literature (Wang et al., 2010; Wang & Dishion, 2012), I expected that perceptions of all school climate dimensions worsened from one school year to the following. The second aim was to explore the reciprocal longitudinal effects of Classroom Practices and School Atmosphere dimensions. As theoretical contributions on school climate posited that influence could be in both directions and no previous study specifically addressed this topic, I advanced no hypotheses and adopted a data analysis strategy capable of clarifying the issue (see the Data analysis section for more information). The third aim was to explore the reciprocal effects of student perceptions of School atmosphere and their levels of engagement and burnout. Based on previous studies (Fatou et al., 2017) and on findings from Study 1 and 3, I hypothesized that the association of School Atmosphere with student engagement dimensions was positive, while it was negative with burnout dimensions. For the reasons discussed in the introduction, I did not advance hypotheses on the direction of influence and again opted for a data analysis strategy capable of clarifying the issue. For each aim, I also controlled for the role of gender.

7.3 Method

Participants and procedures

As anticipated in chapter 3, due to the Covid-19 pandemic I was able to recruit a smaller sample as compared to what I planned. In the end, 243 students completed the questionnaire two times, in 2019 (T1) and in 2020 (T2). Participants were aged from 11 to 14 years old, with a mean

age of 11.68 (SD = .65), they were equally distributed by gender (male students were 51.4% of the total sample) and were mostly born in Italy (with only 6.6 % of students reporting a different country of birth). In both waves, data were collected at the same time of the school year (between February and March), so that possible confounding variables, such as students and teachers' weariness in proximity to the end of the school year or increased anxiety during testing periods, were controlled for.

Measures

Measures for *school climate*, *student engagement* and *school burnout* were the same described in Study 3, see chapter 6 for details on the measures and information on psychometric properties of each measure at T1. For this Study, I computed Cronbach's alphas for each dimension at T2. For *school climate* dimensions alphas were: Rules .80, Student Support .73, Student Involvement .76, Positive Teaching .82, Encouragement .79, Class Management .70, Student Relations .87, Student-Teacher Relations .90, Educational Climate .83, Sense of Belonging .90, Interpersonal Justice .76. For *student engagement* alphas were: affective .85, behavioral .74, cognitive .90, agentic .75. Lastly, for *school burnout* alphas were .77 for the cynicism dimension and .75 for the exhaustion dimension. CFAs for each measure are described in the Results section of this chapter.

Data Analysis

To reach the first aim, I used the SPSS software version 24 to conduct a univariate analysis of variance (ANOVA) between mean scores reported at T1 and T2 for each school climate dimension. To assess the effect size of differences between T1 and T2 I computed eta squared scores. To control the role of gender in changes of school climate perceptions, I tested for possible interactions between this variable and time.

For the second aim, I used SEM with the Mplus software version 8 (Muthen & Muthen, 1998-2017) to test cross-lagged longitudinal models with latent variables. As the sample was relatively small and the measurement models very complex, rather than testing a complete

measurement model together with the structural model, I proceeded in two steps in order to reduce the number of parameters to be estimated simultaneously. First, I conducted a confirmatory factor analysis (CFA) separately for T1 and T2, to obtain latent variables for each dimension of school climate, using the 49 observed indicators described in chapter 4. For these and all the following SEM, I used the robust maximum likelihood estimator (MLR) and employed the full information likelihood method (FIML) to deal with missing data. For the overall evaluation of these and other models' fit, I relied on the chi-square test and the following indices: the comparative fit index (CFI), the Tucker-Lewis index (TLI), the standardized root-mean-square residual (SRMR), and the root-mean-square error of approximation (RMSEA). In line with the recommendation of Hu and Bentler (1999), goodness-of-fit criteria were used in order to quantify acceptable (CFI and TLI > 0.90, SRMR < 0.10, RMSEA < 0.08) and excellent fit (CFI and TLI > 0.95, SRMR < 0.08, RMSEA < 0.06). Then I saved the latent variables using the SAVEDATA option provided by the Mplus software and ultimately tested the cross-lagged models with the saved latent variables. Five separate cross-lagged models were estimated (Figure 7.1), one for each dimension of School Atmosphere (Student Relations, Student-Teacher Relations, Educational Climate, Sense of Belonging, Interpersonal Justice). Consistently with the cross-lagged format, each model included seven autoregressive effects accounting for effects of a variable at T1 on the same variable at T2, the six effects of the School Atmosphere dimension at T1 on all Classroom Practices dimensions at T2 and the six reciprocal effects of all Classroom Practices dimensions at T1 on the School Atmosphere dimension at T2. For clarity of presentation, synchronous correlations among variables at the same time were not drawn in the figure but were included in the model. Gender was included in the model as a control variable.

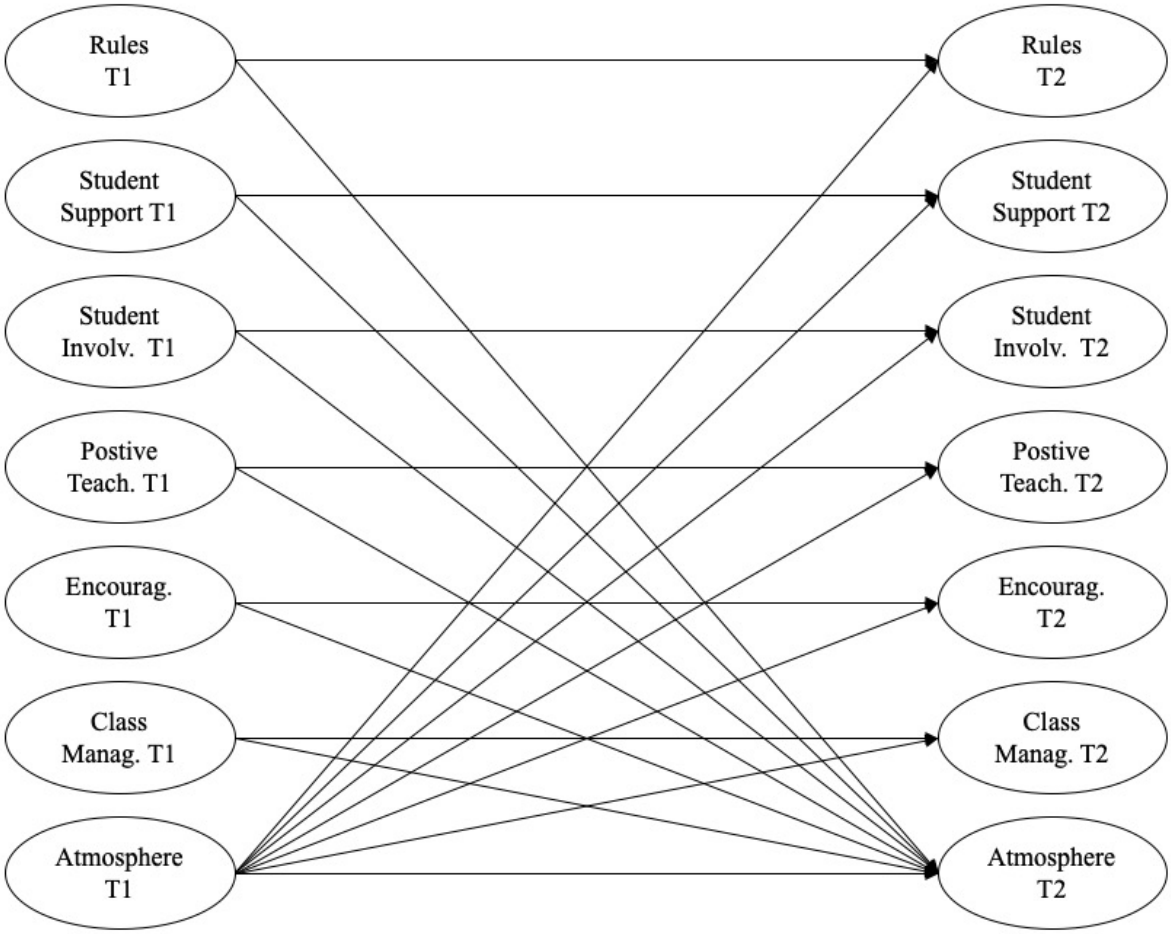

Figure 7.1. Cross-lagged model with latent variables tested to study the effects between Classroom Practices and School Atmosphere dimensions. The model was tested separately for each School atmosphere dimension.

To reach the third aim, I similarly used the Mplus software version 8 (Muthen & Muthen, 1998-2017) to test cross-lagged models with latent variables. As for the second aim, measurement models were conducted in a separate step and latent variables for each dimension of engagement and burnout were saved, in addition to the latent variables for school climate already obtained for the second aim. Latent scores for the five School Atmosphere dimensions were averaged using the DEFINE command provided by the Mplus software in order to include in the model only the integrative score as a second order factor (tested in the validation of the measure in chapter 4). With the resulting latent variables, I then estimated the cross-lagged model presented in Figure 7.2. The model included seven autoregressive effects, the six effects of School Atmosphere perceptions at T1 on engagement and burnout dimensions at T2 and the six reciprocal effects of engagement and burnout dimensions at T1 on School Atmosphere perceptions at T2. For clarity of presentation

synchronous correlations among variables at the same time were not drawn in the figure but were included in the model. Gender was included in the model as a control variable.

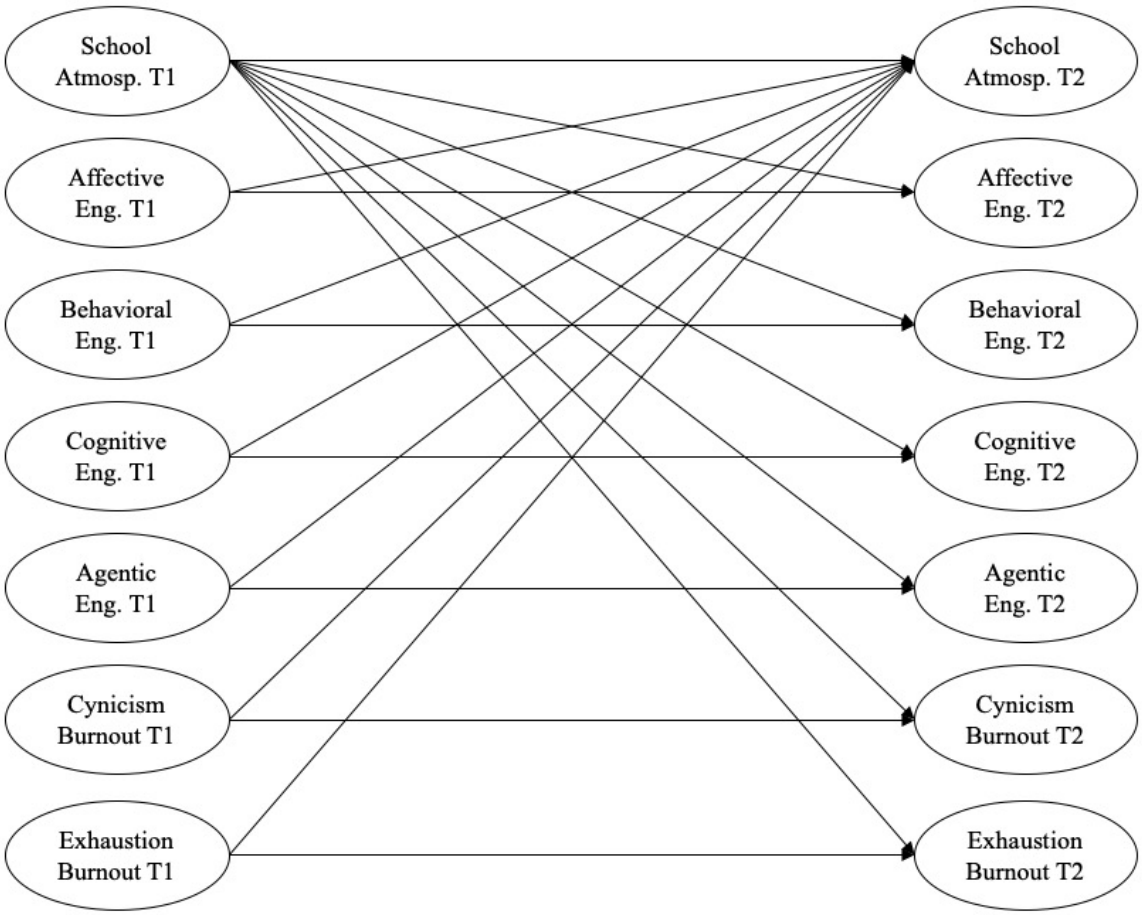

Figure 7.2. Cross-lagged model with latent variables tested to study the effects between second order School Atmosphere perceptions and student engagement and burnout.

7.4 Results

Changes of School Climate Perceptions Over Time

Results from the ANOVA are reported in Table 7.1, along with descriptive statistics for each school climate dimension. As expected, most dimensions of school climate reported a significant decrease from T1 to T2 even though the percentage of variance explained (η^2) was always small. Notably, even the dimensions non-significantly decreasing reported lower means at T2 than at T1. There was no significant interaction with gender.

	Variable	T1		T2				
		M	SD	M	SD	F (1,484)	p	η^2
	Classroom practices							
7	Rules	5.10	.58	4.92	.74	8.86	.003	.02
8	Student Support	4.83	.90	4.59	1.03	6.98	.007	.02
9	Student Involvement	4.26	1.10	3.97	1.17	8.07	.005	.02
10	Positive Teaching	4.67	.98	4.45	1.05	6.05	.014	.01
11	Encouragement	4.93	1.06	4.73	1.14	3.69	.055	.01
12	Class Management	3.56	1.09	3.43	1.10	1.67	.197	.00
	School atmosphere							
13	Student Relations	4.56	1.00	4.40	1.02	2.92	.088	.01
14	Student-Teacher Rel.	4.23	1.11	4.09	1.20	3.35	.068	.01
15	Educational Climate	4.87	.90	4.70	.99	4.56	.033	.01
16	Sense of Belonging	4.83	1.14	4.67	1.22	2.20	.139	.01
17	Interpersonal Justice	4.63	1.08	4.42	1.13	4.88	.028	.01

Table 7.1. Descriptive statistics for all observed dimensions of school climate at T1 and T2 and ANOVA results.

Reciprocal Longitudinal Effects of Classroom Practices and School Atmosphere

CFAs conducted separately for T1 and T2 to obtain latent variables (with 49 observed indicators and 11 factors) reported good fit to the data (respectively MLR $\chi^2(1000) = 1350.73$, $p = .000$, RMSEA = .038, CFI = .91, SRMR =.06 and MLR $\chi^2(1063) = 1613.28$, $p = .000$, RMSEA = .046, CFI = .91, SRMR =.05) with all indicators significantly loading ($p < .001$) on the expected factors. Fit indices for each of the five cross-lagged models estimated with the resulting latent variables are reported in Table 7.2. Most models obtained good or excellent fit, with the exception of the Student relations model, still reporting acceptable fit.

	χ^2	df	p	RMSEA	CFI	SRMR
Student Relations model	67.19	37	.002	.058	.982	.089
Student-Teacher Relations model	56.40	37	.021	.047	.990	.048
Educational Climate model	61.07	37	.008	.052	.990	.047
Sense of Belonging model	59.85	37	.010	.051	.987	.055
Interpersonal Justice model	47.57	37	.114	.034	.995	.046

Table 7.2. Fit indices for each School Atmosphere dimension model

All standardized path coefficients for each model are presented in Table 7.3. The Educational climate model was the only one where the autoregressive effect of the School Atmosphere dimension at T1 on itself at T2 was not significant ($p = .071$). Four models – Student-Teacher Relations, Educational Climate, Sense of Belonging and Interpersonal Justice – reported

similar overall results, with most significant effects going from the School Atmosphere dimension at T1 to Classroom Practices dimensions at T2 and very few significant paths in the opposite direction. In all four models there was no significant effect of the School Atmosphere dimension at T1 on perceptions of Class Management the following year. Only the Educational Climate and Sense of Belonging models reported significant effects of Classroom Practices dimensions at T1 on the School Atmosphere dimension at T2: Educational Climate was positively predicted both by Rules and Positive Teaching, while Sense of Belonging was positively predicted by Student Support. There was also an unexpected small negative effect of Student Involvement on Educational Climate. The Student Relations model reported different results: contrary to the other four models, there was no significant effect of this School Atmosphere dimension at T1 on Classroom Practices dimensions at T2. There were instead two significant paths in the opposite direction: a positive effect of Student Support perceptions at T1 and a negative effect of Positive Teaching perceptions at T1. Gender, included in the model as a control variable, reported no significant effect in all models.

	Student Relations model	Stud-Teac. Relations model	Educational Climate model	Sense of Belonging model	Interpersonal Justice model
Autoregressive effects (T1on T2)					
Atmosphere dimension	.33***	.47***	.19	.58***	.48***
Rules	.31***	.30***	.30***	.32***	.33***
Student Support	.29***	.32***	.26***	.25***	.26***
Student Involvement	.25***	.19***	.21***	.23***	.23***
Positive Teaching	.31***	.28***	.30***	.33***	.36***
Encouragement	.31***	.28***	.29***	.31***	.28***
Class Management	.34***	.33***	.34***	.34***	.33***
School Atmosph. dim. on Classroom Practices					
T1 Atmosph dim. on T2 Rules	.04	.18**	.19*	.16*	.19*
T1 Atmosph dim. on T2 St. Support	.10	.17*	.25***	.28***	.28***
T1 Atmosph dim. on T2 St. Involvement	.04	.26***	.26***	.22**	.27***
T1 Atmosph dim. on T2 Positive Teaching	.10	.24**	.23**	.19*	.19*
T1 Atmosph dim. on T2 Encouragement	.11	.22**	.21*	.21**	.25**
T1 Atmosph dim. on T2 Class Management	.02	.11	.10	.13	.15
Classroom Practices on School Atmosph. dim.					
T1 Rules on T2 Atmosph dim.	.09	.03	.13*	-.13	-.01
T1 St. Support on T2 Atmosph. dim.	.35*	-.14	.07	.32*	.06
T1 St. Involvement on T2 Atmosph. dim.	-.08	.07	-.14*	.03	.08
T1 Positive Teaching on T2 Atmosph. dim.	-.54*	-.13	.33**	-.34	-.10
T1 Encouragement on T2 Atmosph. dim.	.01	.16	-.01	-.04	.00
T1 Class Management on T2 Atmosph. dim.	.26	.04	-.04	.21	.08
R^2					
T2 Atmosphere dimension	.12	.22	.29	.31	.28
T2 Rules	.12	.20	.22	.21	.24
T2 Student Support	.12	.21	.23	.23	.25
T2 Student Involvement	.08	.17	.18	.15	.19
T2 Positive Teaching	.13	.25	.26	.24	.28
T2 Encouragement	.14	.22	.24	.22	.25
T2 Class Management	.12	.17	.17	.17	.19

Table 7.3. Standardized path coefficients for each model.

Note. *$p < .05$. ** $p < .01$. *** $p < .001$. Synchronous correlations among latent variables at each wave, not reported in the table, were all significant at $p < .001$ and positive.

Reciprocal Longitudinal Effects of School Atmosphere, Student Engagement and Burnout

Descriptive statistics for School Atmosphere, engagement and burnout dimensions and the intercorrelations among all observed variables are presented in Table 7.4. CFAs conducted separately for T1 and T2 to obtain latent variables for engagement and burnout dimensions reported acceptable fit to the data, with all indicators significantly loading ($p < .005$) on the expected factors. More specifically, the indices of fit for the expected four-dimensions model for student engagement were MLR $\chi^2(112) = 181.34$, $p = .000$, RMSEA = .050, CFI = .94, SRMR =.06 at T1 and MLR $\chi^2(111) = 194.04$, $p = .000$, RMSEA = .056, CFI = .95, SRMR =.08 at T2. The indices of fit for the expected two-dimensions model for school burnout were MLR $\chi^2(12) = 20.78$, $p = .054$, RMSEA = .055, CFI = .97, SRMR =.04 at T1 and MLR $\chi^2(12) = 18.39$, $p = .104$, RMSEA = .047, CFI = .98, SRMR =.04 at T2. The cross-lagged model estimated with the resulting latent variables and the average score of all five School Atmosphere latent dimensions obtained acceptable model fit: MLR $\chi^2(35) = 69.45$, $p = .001$, RMSEA = .064, CFI = .97, SRMR =.03. Path coefficients are presented in Figure 7.3. Synchronous correlations among variables, not represented in the figure for clarity of presentation, are reported in Table 7.5. As expected, School Atmosphere perceptions at T1 had a positive effect on the affective dimension of student engagement at T2 and a negative effect on the exhaustion dimensions of burnout at T2. Paths in the opposite direction were not significant. Gender, included in the model as a control variable, had no significant effect on any of the model variables.

Variable		1	2	3	4	5	6	7	8	9	10	11	12	13	14
School Climate															
1	School Atmosphere T1	-	.50**	.78**	.48**	.46**	.36**	.43**	.31**	.35**	.11	-.41**	-.26**	-.17**	-.22**
2	School Atmosphere T2		-	.45**	.78**	.32**	.46**	.24**	.46**	.12	.31**	-.31**	-.44**	-.22**	-.40**
Student engagement															
3	Affective Eng. T1			-	.56**	.56**	.48**	.58**	.34**	.40**	.14*	-.52**	-.33**	-.19**	-.21**
4	Affective Eng. T2				-	.40**	.59**	.30**	.56**	.20**	.34**	-.29**	-.47**	-.14*	-.31**
5	Behavioural Eng. T1					-	.63**	.52**	.42**	.32**	.21**	-.47**	-.34**	-.13	-.18**
6	Behavioural Eng. T2						-	.39**	.57**	.15*	.25**	-.43**	-.52**	-.10	-.23**
7	Cognitive Eng. T1							-	.50**	.46**	.25**	-.27**	-.21**	.01	-.03
8	Cognitive Eng. T2								-	.29**	.43**	-.28**	-.31**	.05	.04
9	Agentic Eng. T1									-	.47**	-.18**	-.11	.05	-.02
10	Agentic Eng. T2										-	-.10	-.11	-.01	-.01
Student Burnout															
11	Cynicism T1											-	-51**	.47**	.31**
12	Cynicism T2												-	.31**	.55**
13	Exhaustion T1													-	.49**
14	Exhaustion T2														-
M		4.63	4.45	4.65	4.49	4.75	4.61	4.62	4.50	4.00	3.97	2.94	3.03	3.24	3.29
SD		.83	.87	1.09	1.12	.90	1.03	1.05	1.23	1.07	1.14	1.37	1.40	1.29	1.37

Table 7.4. Descriptive statistics and intercorrelations for observed dimensions of School Atmosphere, engagement and burnout at T1 and T2.

Note. The five dimensions of School atmosphere were averaged to obtain a single second order variable.

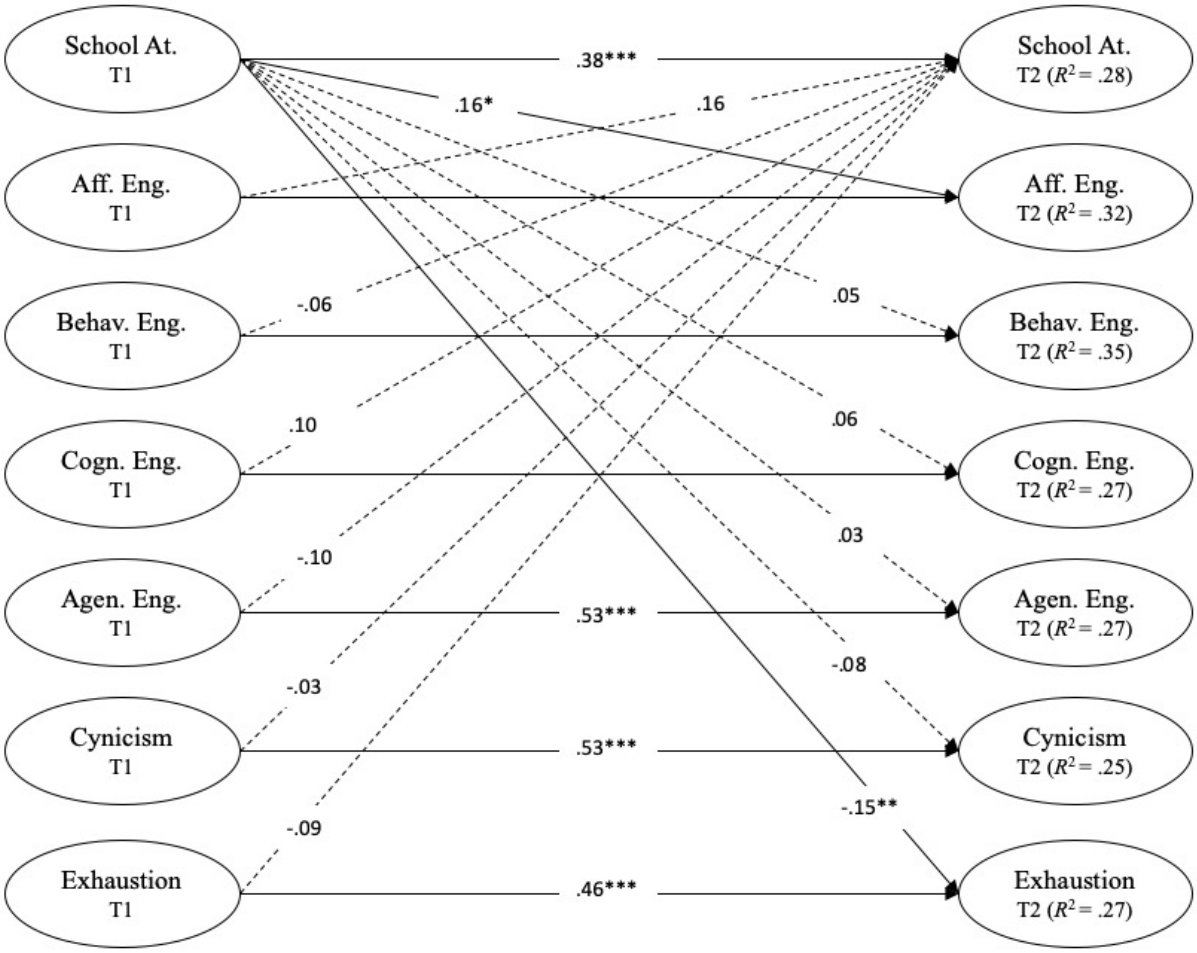

Figure 7.3. Standardized parameter estimates for the cross-lagged model.
Note. Dashed lines represent non-significant paths. Autoregressive effects for Affective, Behavioral and Cognitive engagement, not reported in the figure for clarity of representation, were respectively .44, .55, and .54, all significant at $p < .001$.

	Time 1						Time 2					
Measures	1	2	3	4	5	6	1	2	3	4	5	6
1. School atmosphere	-						-					
2. Affective Eng.	.73***	-					.64***	-				
3. Behavioural Eng.	.62***	.86***	-				.42***	.65***	-			
4. Cognitive Eng.	.51***	.74***	.81***	-			.44***	.64***	.72***	-		
5. Agentic Eng.	.51***	.67***	.76***	.84***	-		.43***	.50***	.58***	.65***	-	
6. Cynicism	-.38***	-.47***	-.41***	-.27***	-.27***	-	-.36***	-.35***	-.31**	-.18**	-.16*	-
7. Exhaustion	-.26***	-.29***	-.21***	-.09	-.11	.83***	-.36***	-.24***	-.18*	-.01	-.11	.82***

Table 7.5. Synchronous correlations among latent variables in the cross-lagged model for each wave.

7.5 Discussion

In this study, with the use of a longitudinal study design and a multidimensional approach to school climate attentive to the distinction of classroom and school levels, I provided an advance that had been long called for in the literature (Wang & Degol 2016). In particular, the present study's results shed light on the decreasing trend for most school climate dimensions' perceptions over time, on the reciprocal effects between classroom and school-related dimensions of the construct and on the reciprocal effects between the overall perception of the school atmosphere and students' engagement and burnout. Key findings and their implications for research and practice are discussed in the following sections.

Changes of School Climate Perceptions Over Time

The first aim of Study 4 was to assess whether students' perceptions of several school climate dimensions changed over time and in which direction. As expected, the results showed that indeed the perceptions of several dimensions of school climate, both in the Classroom Practices and School Atmosphere domains, suffered a negative trend over the two considered school years. More specifically, with regard to practices in everyday classes, after a year, students were significantly less satisfied with the way rules were explained and enforced, with the levels of support provided by their teachers, their involvement in class-related decisions and with the capacity of their teachers to communicate the beauty and importance of the study material. These findings are consistent with previous studies (Wang et al., 2010; Wang & Dishion, 2012). As for School Atmosphere, contrary to previous studies (Wang et al., 2010), perceptions of the relational-oriented dimensions – Student Relations, Student-Teacher Relations and Sense of Belonging – did not register a significant decrease. Instead, at T2 students reported less satisfaction with the Educational Climate of their school, that is, the capacity of the school to cultivate value and enthusiasm for learning, and with the perceived fairness in student treatment. A possible explanation for this discrepancy with previous results is that the comprehensive approach I adopted allowed to more clearly distinguish among the various aspects of school climate. It is possible that previous studies, investigating only a

small number of school climate dimensions, considered “relations” as a general feature of school climate, especially with regard for student-teacher relations. In this study, I distinguished between general relations (i.e., levels of friendliness and capacity to get along) from other interpersonal elements, such as the interpersonal fairness. This may have allowed the emergence of more specific critical issues. Of course, this is only a hypothesis but, if it will be confirmed in future research, it would further support the importance of adopting a consistent, multidimensional and comprehensive approach when referring to school climate.

It should be noted that all the discussed effects were small in size, accounting for limited changes in school climate perceptions. Still, it is clear that, after a year, students were overall less satisfied with their environment. Indeed, even those dimensions not showing a significant decrease still registered lower means at the second year of data collection, while no dimension reported even the slightest increase. Of course, these findings do not allow to clarify whether these worsening perceptions are due to an increased critical insight on the part of the students, on the actual deterioration of the school climate, or on an inability of the school environment to adapt to students’ changing needs and requirements. Further studies will be needed to shed light on this very important distinction, especially through the inclusion of teachers’ perspectives, as their inputs could provide important information to compose a more complex picture of changes in learning environment perceptions (Wang & Degol, 2016). However, notwithstanding the possible improvements, the study findings provided evidence that, while progressing with their schooling, students experience disillusion rather than a growing sense of satisfaction and communion with their school. These findings should be an alarm bell for developing interventions able to trigger a reversal of this detrimental trend, especially at the light of the extensive literature linking school climate with many desirable outcomes (Aldridge & McChesney, 2018; Kutsyuruba et al., 2015) and the findings on the association between School Atmosphere and student engagement and burnout that are going to be discussed below.

Reciprocal Longitudinal Effects of Classroom Practices and School Atmosphere

The adoption of a multidimensional approach to school climate capable of differentiating between classroom and school-related dimensions and the use of cross-lagged models clarifying directions of influence between variables, allowed me to address the second aim of this study, that is, exploring the reciprocal effects between Classroom Practices and School Atmosphere dimensions of school climate. The results clearly distinguished two different pictures. On one hand, there was the quality of relations among students. On the other hand, there were the other four dimensions describing the relational and educational atmosphere of the school, comprising the quality of relations between students and teachers, the educational values in the schools, the sense of belonging to the school community and the fairness of student treatment.

The first-wave perceptions of all four these latter dimensions of School Atmosphere showed significant positive effects on students' satisfaction with most Classroom Practices in the second wave, with the exception of perceptions of the teacher's ability to satisfactorily manage class activities with calm and control (Class Management). Moreover, the reversed paths (from Classroom Practices dimensions to School Atmosphere dimensions) were almost never significant, suggesting that, over the span of two school years, the main direction of influence is from the perceptions of the atmosphere to the perception of everyday practices. This finding is important as it suggests that the positive relational and educational atmosphere built during a school year does not exhaust with the same year ending, but positively influences students' satisfaction with everyday practices also the following year.

The few effects in the opposite direction speak about the importance of some everyday practices not only for building the current atmosphere, as seen in Study 2, but for their far-reaching impact on the students' educational path. In particular, the results showed that perceiving support by teachers at one year positively predicted students' sense of belonging to the school community the following year. The multidimensional approach adopted also allowed me to assess how different practices influenced different atmosphere dimensions. Indeed, other Classroom Practices, namely

the clarity of rules explanation and enforcement and positive didactic strategies, had instead a positive effect on students' later perceptions of the Educational Climate in the school. These findings have relevant practical implications for teachers aiming for long-term improvement of different atmosphere elements, as they suggest different areas of intervention. For example, teachers might work on establishing clear and shared rules and conveying with conviction the importance of the study material in order to improve the perceptions of the value of learning in their school, or they might convey more support to their students if they wish to increase their sense of belonging to the school community.

With regard for the remaining School Atmosphere dimension, i.e., the quality of relations among students, the picture emerging from the cross-lagged model was completely different. Indeed, contrary to the previous four School Atmosphere dimensions, perceptions of student relations at T1 had no effect on students' satisfaction with any Classroom Practices dimension at T2, while at T2 it was positively affected by perceptions of support from their teachers the previous year. This different dynamic can be explained by considering the object of this dimension: as it is focused on the quality of relations among peers, it is understandable that it showed less power to influence later satisfaction with everyday practices mostly initiated and directed by teachers. However, it was interesting, and not trivial, to find that supporting practices from teachers could influence students' satisfaction with their peer-related relational environment one year later. This finding, consistently with the positive effect of Student Support on students' sense of belonging to the school community discussed above, indicates that everyday practices capable of creating a supportive environment can indeed nourish a better long-term relational climate.

Reciprocal Longitudinal Effects of School Atmosphere, Student Engagement and Burnout

The last aim of this longitudinal study was to assess the reciprocal associations between the School Atmosphere and students' involvement in terms of engagement and burnout. Again, the use of a cross-lagged model for addressing this aim allowed to clarify a very important issue in the literature: while previous studies, and Study 3 of the present work, showed various associations

between school climate perceptions and student engagement (Bear et al., 2018; Fatou et al. 2017; Jang et al., 2020), none provided information on the direction of effects between these variables.

In the present study, I found two significant effects of School Atmosphere perceptions on student involvement variables and none in the other direction. More specifically, I found that School Atmosphere perceptions positively predicted students' levels of affective engagement and negatively predicted exhaustion the following year, even when controlling for previous levels of engagement and burnout. This means that, even after accounting for each student individual tendencies, perceiving a better atmosphere in school still leads to more feelings of enthusiasm and interest toward learning activities and less feelings of being overwhelmed by school work. While noting that results from this study should be interpreted with caution due to the limited size of the sample, they suggest that the direction of influence is indeed from school climate perceptions to student engagement and burnout. This is an innovative and relevant finding as it supports the importance of reflecting and intervening on school climate not only for preventing undesirable outcomes, such as bullying and aggression (Reaves et al., 2018; Steffgen et al., 2013), but also for promoting better learning.

In conclusion, the present study has some limitations, mostly due to the intervening Covid-19 pandemic. The sample size was relatively small for the complex analyses needed to address these research questions. In consideration to this, the sample had been planned to be at least three times larger than it ultimately was. Sadly, the national school closure in February 2020 and the continued altered circumstances due to the sanitary emergency made it impossible to complete the planned data collection at T2. For the same reason, no data were collected from teachers at T2 as originally planned, thus excluding any possibility to include their perspectives in the longitudinal study of school climate and its correlates. Future studies could provide further important advancements to school climate research by including their perspectives in multi-informant longitudinal studies. Beside the restrictions caused by the Covid-19 pandemic, as for the previous studies, it must again be noted that these findings are related to the collection of individuals self-

reported perceptions of school climate, which do not necessarily correspond to the actual climate. Lastly, while this study's length was limited by the duration of a doctoral course, future studies may move forward this line of inquiry by planning more waves of data collection, spanning several school years, in order to draw an even clearer picture of school climate perceptions' evolution and effects over time. Notwithstanding these limitations, the present study provided innovative findings to the literature on school climate, inquiring into the evolution over time of student perceptions, the reciprocal effects of classroom and school-related components and the long-term positive effects of better school climate perceptions on student involvement with learning. These findings, together with those from the previous three studies, offered an in-depth new look on school climate, addressing the main limitations of the previous literature and advancing a more complex understanding of the construct, with several implications for research and practice that will be discussed in the Conclusion.

Conclusion

With this research project, I adopted a complex and innovative approach to the study of school climate, a construct receiving growing attention in the literature for its many associations with learning outcomes (Wang & Degol, 2016) and for its importance as a viable tool to support schools in a process of change and improvement (Thapa et al., 2013; Voight & Nation, 2016). The core features of the project emerged from a thoughtful analysis of the vast literature on the topic. Despite the abundance of evidence supporting the importance of a positive school climate for students' academic success and well-being (Aldridge & McChesney, 2018; Kutsyuruba et al., 2015), some relevant gaps limited the strength of the existing knowledge on the construct. This project was planned to be able, in its entirety, to address these weaknesses, by way of a clear theoretical framework of reference, a sound and prolific instrument for the measurement of school climate, novel objects of research enriching the field with new questions, and complex methodologies capable of capturing a nuanced picture. The theoretical framework of reference, the system view of school climate developed by Rudasill and colleagues (2018), with an accurate systematization of the different, nested settings contributing to the creation of a school's climate, offered the terrain for the development of a measure capable of differentiating and capturing different levels (school and classroom) and perspectives (student, teacher and parent's), and enhanced the novel possibility to explore the relations among them. A second element of novelty in the research field was introduced by exploring a relatively overlooked correlate of school climate, namely, the way students feel and act in school with respect to their learning, identified in their levels of engagement and burnout. Finally, complex methodologies scarcely used in previous literature (Wang & Degol, 2016), namely multi-informant, person-oriented and longitudinal designs, were included in different studies to provide rich and nuanced new perspectives on school climate.

Each of the four studies included in the research project contributed a piece to this complex picture. Study 1 was dedicated to the development and validation of an instrument with several elements of strength long called for in the literature (Kohl et al., 2013; Ramelow et al., 2015), but not available, together, in any previously existing measure. This measure provided the foundation for the other three studies, each contributing with a different methodology. Study 2's main element of novelty was the *multi-informant design* that provided a comparison of the perspectives of students, teachers and parents on a shared array of school climate dimensions. In Study 3, the adoption of a *person-oriented approach* allowed me to identify different student profiles based on their levels of engagement and burnout and to compare their school climate perceptions, in order to explore if and how they differed and to better understand their varied experiences at school. Study 4, with a *longitudinal design,* inquired on the evolution over time and reciprocal effects of students' perceptions of several school climate dimensions, as well as on the reciprocal effects of school climate and students' engagement and burnout.

The main contribution to the existing literature of this research project rests precisely in its effort to capture the complexity of the school environment in many possible ways, with different informants, multiple dimensions comprised in different areas and varied methodologies. School climate is intrinsically an inclusive construct (Cohen et al. 2009) whose greater strength is its potential to embrace the complexity of real school environments (Anderson, 1982). While previous research provided consistent evidence of its relevance, several layers of that complexity, such as the difference in perceptions of multiple actors or their evolution over time, were often overlooked. With this research project's findings, I provided novel insights in this direction, with implications both for research and for practice, raising many open questions.

As discussed in the first chapter, one of the most important reasons to embark in the study of this complex construct rests in its potential for school intervention. To work in this direction, the long-term goal in planning research on school climate should be the translation of research findings in concrete suggestions for practical intervention, in order to bridge the gap between research and

practice (Cohen et al., 2009). Consistently, while this project's main purpose was to address several weaknesses in the research field, its findings also have relevant implications for school intervention. In particular, they provide an instrument, a starting point and a purpose for intervention on school climate. The Multidimensional School Climate Questionnaire, with its many dimensions, can be a useful tool for helping schools to identify their points of strength and areas of weakness that may be improved. Moreover, the inclusion of different informants' perspectives allows not only to obtain a more complete assessment of school climate, but also to make all school actors feel heard and valued in their respective points of view, laying a good foundation for collaboration. The awareness that different informants have different perceptions of their school's climate may also be a starting point for practical intervention. Indeed, a first step for school climate improvement is to help all informants to acknowledge and understand each other's views. Finally, the findings on the associations between school climate and students' engagement and burnout offer a new purpose for school climate intervention. While improving school climate has mostly been valued in the last decades as an important way to prevent violence and bullying among students (Reaves et al., 2018; Steffgen et al., 2013), these findings suggest that it has an untapped potential to also become a way to actively promote students' involvement and interest in learning. Considering these implications for practice, this project's findings can become the groundwork for the next step in school climate research: the development and testing of intervention methodologies with solid theoretical and methodological bases.

Besides the main elements of strength discussed above, the project certainly has some limitations. On a general level, it should be noted that research on school climate is intrinsically anchored to the school system of the country where the research is conducted. As the project involved Italian middle schools, these findings may not be readily generalized to schools worldwide. However, beyond school system specificities, the insights on the importance of including multiple informants and distinguishing between proximal practices and wider atmosphere along with the longitudinal findings remain relevant contributions to the international literature.

Moreover, the project focused on individuals' school climate perceptions, which do not necessarily correspond to the actual school climate. In the future, research including observational methods may provide further information in this direction. Lastly, and independently from my intentions, the project was impaired by the occurrence of the Covid-19 pandemic, which impacted the data collection and required several adjustments. Notwithstanding these limitations, this research project offered a new look on school climate, attentive to several layers of complexity overlooked in previous literature, providing innovative findings and capable of opening many new questions and research trails.

As a concluding comment, I would like to offer a personal reflection on the study of school climate. The main merit of the construct is that it offers the lenses to look at the school as a complex environment, where all elements are inextricably interlocked and need to be seen together to be truly understood. As such, it offers a way of studying the school not in its individual, specific elements, but as a whole. This translates in a great potential both for research and policy, making it an attractive and rich research field, receiving growing attention in the world. However, while its wide and complex perspective is the main point of attraction, the evidence shows that maintaining it when faced with concrete research needs remains to this day a struggle. The literature, while vast, is often fragmented, with diversified conceptualizations, partial approaches and restricted findings. At the light of these difficulties, school climate really does seem to be best described as an "elusive Beast", as suggested by Anderson (1982, p.371) many years ago. This elusiveness, however, should not discourage. On the contrary, it should increase determination in facing it with complex and in-depth methodologies: their application can provide great advancements to the field and really tap into the unexpressed potential of school climate. I think the effort is worthwhile as the evidence shows that school climate could truly become an instrument for change and improvement in school. This is needed, especially as schools are faced with the demands of the present and near future: with the challenging society awaiting humanity just beyond the corner, schools need to be able to nurture

competent, involved and participating citizens. In turn, supporting schools with concrete and viable answers is today a great responsibility for educational and school psychologists.

Appendix A: MSCQ student-version[5]

Classroom Practices

Rules (R)
Pensando alle regole della tua scuola, diresti che…

R1	Gli alunni conoscono le conseguenze per chi non le rispetta
R2	La maggior parte delle persone (alunni, insegnanti, altri adulti) le conosce
R3	A scuola si dedica del tempo per spiegarle bene agli alunni
R4	È facile ottenere informazioni sulle regole di questa scuola
R5	Sono chiare e facili da capire
R6	Gli insegnanti le fanno rispettare
R7	Gli insegnanti intervengono quando si accorgono che un alunno non le rispetta

Student Support (SS)
Nella tua scuola…

SS1	Ci sono delle persone (educatori, psicologi e pedagogisti) apposta per aiutare gli alunni che sono in difficoltà scolastica o personale
SS2	Quando ci sono delle difficoltà, gli alunni si rivolgono ad un adulto della scuola per avere sostegno
SS3	Se gli alunni hanno difficoltà personali trovano facilmente aiuto dagli adulti della scuola
SS4	Se gli alunni vanno male a scuola ricevono facilmente aiuto dagli insegnanti

Student Involvement (SI)
Nella tua scuola…

SI1	Viene chiesto il parere degli alunni sul buon funzionamento della scuola
SI2	Quando è importante, gli insegnanti chiedono il parere degli alunni prima di prendere delle decisioni che li riguardano
SI3	Ci sono momenti o situazioni in cui gli studenti possono esprimere la loro opinione sulla scuola
SI4	Gli alunni partecipano a definire le regole

Positive Teaching (PT)
Pensando alle ore di lezione diresti che…

PT1	La maggior parte degli insegnanti sembra insegnare con piacere
PT2	La maggior parte degli insegnanti sembra amare davvero il proprio mestiere
PT3	Gli insegnanti ci spiegano cosa stiamo per imparare di nuovo
PT4	Gli insegnanti spiegano perché gli argomenti che studiamo sono importanti
PT5	Gli insegnanti usano metodi di insegnamento che rendono la materia interessante

Encouragement (E)
Pensando alle ore di lezione diresti che…

E1	Gli insegnanti ci dicono che siamo in grado di farcela
E2	Gli insegnanti ci incoraggiano a fare del nostro meglio
E3	Gli insegnanti ci fanno i complimenti quando ci impegniamo per imparare

Class Management (CM)
Pensando alle ore di lezione diresti che…

CM1	La maggior parte degli insegnanti non sembra più apprezzare l'insegnamento
CM2	La maggior parte degli insegnanti ha l'aria scoraggiata
CM3	Gli insegnanti si arrabbiano facilmente
CM4	Gli insegnanti passano più tempo a punire gli alunni che a mostrare approvazione

School Atmosphere

Students Relations (SR)
In questa scuola…

SR1	Gli alunni si aiutano a vicenda
SR2	In generale, gli alunni vanno d'accordo tra loro
SR3	Gli alunni si trattano con rispetto tra di loro
SR4	Gli alunni possono contare gli uni sugli altri

[5] As published in Grazia, V., & Molinari, L. (2020). School climate research: Italian adaptation and validation of a multidimensional school climate questionnaire. *Journal of Psychoeducational Assessment*. https://doi.org/10.1177/0734282920967141

SR5 In generale, le relazioni tra studenti sono amichevoli

Student-teacher Relations (STR)

In questa scuola…

STR1 Gli alunni e gli insegnanti stanno bene insieme

STR2 In generale, le relazioni tra gli alunni e gli insegnanti sono amichevoli

STR3 Gli alunni si sentono vicini alla maggior parte degli insegnanti e si fidano di loro

STR4 In generale, gli alunni e gli insegnanti vanno d'accordo tra loro

Educational Climate (EC)

In questa scuola…

EC1 Si può davvero imparare e ricevere una buona educazione

EC2 Si sente che la buona riuscita degli studenti è il primo pensiero degli insegnanti

EC3 Si sente che studiare è importante

EC4 Ci si aspetta che gli alunni diano il meglio di sé

EC5 In generale, quello che si impara è interessante

Sense of Belonging (SB)

In questa scuola…

SB1 Preferirei essere in un'altra scuola

SB2 Mi sento davvero a mio agio

SB3 Sono orgoglioso di essere un alunno di questa scuola

SB4 Questa scuola è importante per me

SB5 Amo la mia scuola

Interpersonal Justice (IJ)

In questa scuola…

IJ1 Le punizioni sono giuste

IJ2 Gli alunni sono trattati in modo giusto

IJ3 Le regole sono giuste

Appendix B: MSCQ teacher-version[6]

Classroom Practices

Rules (R)

Pensando alle regole della sua scuola, direbbe che…

R1	Gli alunni conoscono le conseguenze per chi non le rispetta
R2	La maggior parte delle persone (alunni, insegnanti, altri adulti) le conosce
R3	A scuola si dedica del tempo per spiegarle bene agli alunni
R4	È facile ottenere informazioni sulle regole di questa scuola
R5	Sono chiare e facili da capire
R6	Gli insegnanti le fanno rispettare
R7	Gli insegnanti intervengono quando si accorgono che un alunno non le rispetta

Student Support (SS)

Nella sua scuola…

SS1	Ci sono delle persone (educatori, psicologi e pedagogisti) apposta per aiutare gli alunni che sono in difficoltà scolastica o personale
SS2	Quando ci sono delle difficoltà, gli alunni si rivolgono ad un adulto della scuola per avere sostegno
SS3	Se gli alunni hanno difficoltà personali trovano facilmente aiuto dagli adulti della scuola
SS4	Se gli alunni vanno male a scuola ricevono facilmente aiuto dagli insegnanti

Student Involvement (SI)

Nella sua scuola…

SI1	Viene chiesto il parere degli alunni sul buon funzionamento della scuola
SI2	Quando è importante, gli insegnanti chiedono il parere degli alunni prima di prendere delle decisioni che li riguardano
SI3	Ci sono momenti o situazioni in cui gli studenti possono esprimere la loro opinione sulla scuola
SI4	Gli alunni partecipano a definire le regole

Positive Teaching (PT)

Pensando alle ore di lezione direbbe che…

PT1	La maggior parte degli insegnanti sembra insegnare con piacere
PT2	La maggior parte degli insegnanti sembra amare davvero il proprio mestiere
PT3	Gli insegnanti spiegano cosa si sta per imparare di nuovo
PT4	Gli insegnanti spiegano perché gli argomenti che si studiano sono importanti
PT5	Gli insegnanti usano metodi di insegnamento che rendono la materia interessante

Encouragement (E)

Pensando alle ore di lezione direbbe che…

E1	Gli insegnanti dicono agli studenti che sono in grado di farcela
E2	Gli insegnanti incoraggiano gli studenti a fare del proprio meglio
E3	Gli insegnanti fanno i complimenti agli studenti quando si impegniamo per imparare

Class Management (CM)

Pensando alle ore di lezione direbbe che…

CM1	La maggior parte degli insegnanti non sembra più apprezzare l'insegnamento
CM2	La maggior parte degli insegnanti ha l'aria scoraggiata
CM3	Gli insegnanti si arrabbiano facilmente
CM4	Gli insegnanti passano più tempo a punire gli alunni che a mostrare approvazione

School Atmosphere

Students Relations (SR)

In questa scuola…

SR1	Gli alunni si aiutano a vicenda
SR2	In generale, gli alunni vanno d'accordo tra loro
SR3	Gli alunni si trattano con rispetto tra di loro
SR4	Gli alunni possono contare gli uni sugli altri
SR5	In generale, le relazioni tra studenti sono amichevoli

[6] As published in Molinari, L., & Grazia, V. (2020). A multi-informant study of school climate: Student, parent and teacher perceptions. [Manuscript submitted for publication].

Student-teacher Relations (STR)

In questa scuola…

STR1 Gli alunni e gli insegnanti stanno bene insieme
STR2 In generale, le relazioni tra gli alunni e gli insegnanti sono amichevoli
STR3 Gli alunni si sentono vicini alla maggior parte degli insegnanti e si fidano di loro
STR4 In generale, gli alunni e gli insegnanti vanno d'accordo tra loro

Educational Climate (EC)

In questa scuola…

EC1 Si può davvero imparare e ricevere una buona educazione
EC2 Si sente che la buona riuscita degli studenti è il primo pensiero degli insegnanti
EC3 Si sente che studiare è importante
EC4 Ci si aspetta che gli alunni diano il meglio di sé
EC5 In generale, quello che si impara è interessante

Sense of Belonging (SB)

In questa scuola…

SB1 Preferirei essere in un'altra scuola
SB2 Mi sento davvero a mio agio
SB3 Sono orgoglioso di essere un insegnante di questa scuola
SB4 Questa scuola è importante per me
SB5 Amo la mia scuola

Interpersonal Justice (IJ)

In questa scuola…

IJ1 Le punizioni sono giuste
IJ2 Gli alunni sono trattati in modo giusto
IJ3 Le regole sono giuste

Appendix C: MSCQ parent-version[7]

Classroom Practices

Student Support (SS)
Nella scuola che frequenta suo/a figlio/a…

SS1	Ci sono delle persone (educatori, psicologi e pedagogisti) apposta per aiutare gli alunni che sono in difficoltà scolastica o personale
SS2	Quando ci sono delle difficoltà, gli alunni si rivolgono ad un adulto della scuola per avere sostegno
SS3	Se gli alunni hanno difficoltà personali trovano facilmente aiuto dagli adulti della scuola
SS4	Se gli alunni vanno male a scuola ricevono facilmente aiuto dagli insegnanti

School Atmosphere

Students Relations (SR)
In questa scuola…

SR1	Gli alunni si aiutano a vicenda
SR2	In generale, gli alunni vanno d'accordo tra loro
SR3	Gli alunni si trattano con rispetto tra di loro
SR4	Gli alunni possono contare gli uni sugli altri
SR5	In generale, le relazioni tra studenti sono amichevoli

Student-teacher Relations (STR)
In questa scuola…

STR1	Gli alunni e gli insegnanti stanno bene insieme
STR2	In generale, le relazioni tra gli alunni e gli insegnanti sono amichevoli
STR3	Gli alunni si sentono vicini alla maggior parte degli insegnanti e si fidano di loro
STR4	In generale, gli alunni e gli insegnanti vanno d'accordo tra loro

Educational Climate (EC)
In questa scuola…

EC1	Si può davvero imparare e ricevere una buona educazione
EC2	Si sente che la buona riuscita degli studenti è il primo pensiero degli insegnanti
EC3	Si sente che studiare è importante
EC4	Ci si aspetta che gli alunni diano il meglio di sé
EC5	In generale, quello che si impara è interessante

Interpersonal Justice (IJ)
In questa scuola…

IJ1	Le punizioni sono giuste
IJ2	Gli alunni sono trattati in modo giusto
IJ3	Le regole sono giuste

[7] As published in Grazia, V., & Molinari, L. (2020). The multidimensional school climate questionnaire (MSCQ) parent-version: Factorial structure and measurement invariance. *International Journal of School and Educational Psychology*. https://doi.org/10.1080/21683603.2020.1828205

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Acknowledgements

A heartfelt thank you to my supervisor Prof. Luisa Molinari, for her invaluable insights and knowledge and the constant guidance and encouragement. To the participants, for sharing their time and precious experiences. To all the people I met during this journey, as each one was an inspiration. Finally, to my family, for their unfailing unconditional support.