

Understanding Teacher Safety in Schools in Kazakhstan

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Science in Educational Leadership

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Abstract

Teaching is an important and valuable profession that functions as the basis of every other profession. The status of the teaching profession is an important pillar of a quality educational system. One of the crucial components of teacher status in society is respect for teachers. Teachers, who are respected and feel safe in their workplace, can demonstrate a higher level of job satisfaction contributing to teaching quality and learning outcomes.

The present research sought to understand teacher safety and to explore to what extent and how often teachers in Kazakhstan experience intimidation or verbal abuse. To explain a particular phenomenon and determine the drivers of teacher safety issues, this study employed a quantitative approach, carrying out a secondary analysis of TALIS 2018 dataset on Kazakhstan.

The results of the study show that teachers in Kazakhstan experience intimidation or verbal abuse less frequently by students. Moreover, individual factors such as gender, age, years of work, and community factors such as school type and location have no statistically significant correlation with the frequency of teacher victimization. While workplace conditions, school climate, and relational aspects between teachers and students are found to be the main predictors of student behavior stress. The study contributes to understanding the factors behind teacher safety issues in Kazakhstan and suggests the possible ways for improving the predicting factors to reduce teacher victimization.

Аннотация

Профессия учителя – важная и ценная профессия, лежащая в основе любой другой профессии. Статус профессии учителя является важной опорой качественной образовательной системы. Одним из важнейших компонентов статуса учителя в обществе является уважение к учителям. Учителя, которых уважают и которые чувствуют себя в безопасности на своем рабочем месте, могут продемонстрировать более высокий уровень удовлетворенности работой, что способствует повышению качества преподавания и результатов обучения.

Целью настоящего исследования было понять безопасность учителей и выяснить, в какой степени и как часто учителя в Казахстане подвергаются запугиванию или словесным оскорблениям. Чтобы объяснить конкретное явление и определить факторы, влияющие на безопасность учителей, в этом исследовании использовался количественный подход, в ходе которого был проведен вторичный анализ данных TALIS 2018 по Казахстану.

Результаты исследования показывают, что учителя в Казахстане реже подвергаются запугиванию или словесным оскорблениям со стороны учеников. Более того, индивидуальные факторы, такие, как пол, возраст, годы работы, и факторы сообщества, такие, как тип и местоположение школы, не имеют статистически значимой корреляции с частотой виктимизации учителей. В то время как условия на рабочем месте, школьный климат и аспекты взаимоотношений между учителями и учениками оказываются главными предикторами стресса учителей из-за поведения учеников. Исследование способствует пониманию факторов, стоящих за проблемами безопасности учителей в Казахстане, и предлагает возможные пути улучшения прогнозирующих факторов, чтобы уменьшить виктимизацию учителей.

Аңдатпа

Ұстаздық - кез-келген мамандықтың негізін салушы маңызды және құнды мамандық. Ұстаз мәртебесі - сапалы білім беру жүйесінің маңызды тірегі. Қоғамдағы мұғалім мәртебесінің маңызды компоненттерінің бірі - мұғалімдерге құрмет көрсету. Құрметті және жұмыс орнында өзін қауіпсіз сезінетін мұғалімдер жұмыс сапасының жоғарылауына және оқу нәтижелерінің жақсаруына ықпал ететін жұмысқа қанағаттанудың жоғары деңгейін көрсете алады.

Осы зерттеудің мақсаты мұғалімдердің қауіпсіздігін түсіну және Қазақстандағы мұғалімдер қаншалықты және қаншалықты жиі қорқытуға немесе ауызша қорлауға ұшырайтынын анықтау болды. Нақты құбылысты түсіндіру және мұғалімдердің қауіпсіздігіне әсер ететін факторларды анықтау үшін бұл зерттеуде сандық тәсіл қолданылды, оның барысында Қазақстан бойынша TALIS 2018 деректер жиынына қайталама талдау жүргізілді.

Зерттеу нәтижелері көрсеткендей, Қазақстандағы мұғалімдер оқушылар тарапынан қорқытуға немесе сөз арқылы қорлауға сирек ұшырайды. Сонымен қатар, жынысы, жасы, жұмыс істеген жылдары және мектеп түрі мен орналасқан жері сияқты жеке факторлар мұғалімдердің құрбан болу жиілігімен статистикалық маңызды корреляцияға ие емес. Жұмыс орнындағы жағдайлар, мектеп климаты және мұғалімдер мен оқушылар арасындағы қарым-қатынас аспектілері оқушылардың мінез-құлқына байланысты мұғалімдердің күйзелісінің негізгі болжамшысы болып табылады. Зерттеу Қазақстандағы мұғалімдер қауіпсіздігінің проблемаларының артында тұрған факторларды түсінуге ықпал етеді және мұғалімдердің құрбан болуын азайту үшін болжамды факторларды жақсартудың ықтимал жолдарын ұсынады.

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Chapter 1. Introduction

1.1 Introduction

Teaching is an important and valuable profession that functions as the basis of every other profession. Teachers have a wide range of responsibilities with regards to their students. One of these responsibilities is to take care of students' safety while they are in school. However, recent studies have suggested that teachers are increasingly becoming victims of violence themselves (DeVoe, Peter, Kaufman, Miller, Noonan, Snyder, & Baum, 2004; McMahon et al., 2014; Gregory, Cornell, & Fan, 2012; Bang, 2018; Ofsted, 2019; Klassen & Anderson, 2009). Teachers might confront a range of different safety issues from physical violence to subtle emotional abuse and disrespect while carrying out employment activities. For example, an analysis of data collected by the American Psychological Association Classroom Violence Directed Against Teachers Task Force revealed that 80% of about 3,000 U.S. teachers sampled experienced victimization within one and a half academic years at least once (McMahon et al., 2014). Furthermore, when the frequency of student and teacher victimization was compared for all school crime safety indicators, it was revealed that incidents of teacher victimization were more than two times higher than students (14 incidents per 1000 teachers, as opposed to 6 incidents per 1,000 students) (DeVoe, et al., 2004). Assaulted, threatened with injury, harassed, and verbally abused educators may feel a mix of various emotions such as anger, frustration, anxiety, and guilt (Chang, 2009). These negative emotions can lead to impaired teaching performance. As a result, insights into teacher victimization in schools may go some way to eliminating the adverse consequences of abuse and result in the development of evidence-based policy solutions (Ricketts, 2007).

This chapter aims to provide background information on the teacher safety issue internationally and in Kazakhstan. The chapter is organized into six sections. The first section discusses teacher safety internationally and its impact on teaching performance. The second section focuses on issues in the teaching profession in Kazakhstan. In the third section, the problem statement and rationale for the current study are stated. The fourth section outlines the research

purpose and research questions. The next section summarizes the significance of the study. The final section outlines the thesis.

1.2 Background: Teacher Safety

In the context of education, the word “safety” is defined as the state of being free from emotional or physical threat or harm (Gregory, Cornell, & Fan, 2012, p. 401). Teachers can feel safe when colleagues and school leaders support them, and when relationships with parents are positive. However, teacher-student relationships play the most significant role when teacher safety is considered. Student-teacher interactions are the main linchpin driver of teacher motivation and teachers’ intention to stay in the profession (Hargreaves 1998; Hargreaves, 2000; O’Connor 2008). This means “personal relationships with children afford teachers internal rewards and give meaning to their work” (Spilt, Koomen, & Thijs, 2011, p. 460). However, recent studies have revealed that students are the main perpetrators of violence against teachers (Tiesman, Konda, Hendricks, Mercer, & Amandus, 2013; Gerberich et al., 2011; Turkum, 2011). Moreover, it is common for teachers to attempt to solve problems on the spot and forgive their students’ misbehavior (Turkum, 2011). In the CNN’s Schools of Thought blog, Goldberg (2013) mentioned as an example the words of an expert on social media and cyber-bullying, Professor Tynes. The professor admitted that the majority of victimized teachers are usually “very hesitant to report it to authorities or to the media”. According to Tynes, the main reason for the lack of reporting is that educators “want to protect their students, even though they are being victimized by them, and they are worried about the reputations of the schools they work at”. Mainly due to this, the majority of educational bodies and other state agencies lack reliable data concerning teacher safety in schools.

Additionally, research suggests that teacher safety might also be related to teacher-parent collaboration. When teachers and parents share timely information about student's experiences, capabilities, and gaps, they can provide better opportunities for the student to succeed in learning (Bang, 2018). However, some parents’ attitude towards the teaching profession might impede

teacher-parent collaboration. Generally, parents, by lobbying their children's teachers to change their children's grades or questioning their competence to teach and assess children hinder effective teacher-parent relations (Bang, 2018; Ofsted, 2019).

A variety of situations can emerge during the educational process which impact teacher safety. In many cases, it is necessary for teachers to receive the support of competent and concerned leaders. However, the outcomes of Ofsted (2019) highlight that teachers are sometimes "the last people to be considered. Incidents are investigated with pupils before teachers being asked for their opinions" (p. 37). Consequently, teachers might feel exposed because of their devalued status. Additionally, studies have revealed that teachers working in unsafe environments become estranged and strained with low motivation to make improvements to their craft (Allensworth, Ponisciak, & Mazzeo, 2009; Galand et al., 2007). Reflecting on the problems, the effectiveness of the school leadership plays a significant role in creating and maintaining a safe working environment.

1.3 Context: Teaching Profession in Kazakhstan

Irsaliyev, Kamzoldayev, Tashibayev, and Kopeyeva (2019) conducted a study on the identification of factors that affect the motivations of youth to choose the teaching profession and the desire for teachers to continue in the profession. Results suggested that 51 percent of fourth-year students of teacher training institutions in Kazakhstan wish to join degree courses to study further in their specialist field of interest, as opposed to moving into the teaching profession (Irsaliyev, Kamzoldayev, Tashibayev, & Kopeyeva, 2019). However, the scholars based these findings on focus groups. Moreover, some students aspired to work as university teachers, while others, especially those who studied free of charge, just want to postpone or generally avoid compulsory work at schools. Moreover, six percent of respondents did not express any desire to work at school after any level of graduation. In addition, only 45 percent of these respondents entered the pre-service training due to the belief that the teaching profession provides a good opportunity for them

to contribute to the development of future generations and society. This reveals the low attractiveness of the profession in the country.

Since independence (October, 1990), the educational system of Kazakhstan has undergone in a series of reforms (Yakavets, 2014). During this short period of independence, thirteen policy officials were appointed to the post of the Minister of Education and Science. While teachers and school management were busy implementing reforms and fulfilling duties which were not related to educational process, the status of the teaching profession in Kazakhstan gradually decreased. Nevertheless, in the Strategic Plan of the Ministry of Education and Science for 2017-2021, it states that the number of teachers increased by 10 percent in comparison to the 2013-2014 period and it is claimed that this is closely linked to the annual republic teacher contests which recognize the “Best teacher” enabling teachers to gain general recognition.

However, other studies provide a different picture of the low status of the teaching profession in Kazakhstan (NUGSE, 2014; OECD, 2014; Kulakhmetova, McLaughlin, & Ayubayeva, 2014). Firstly, the profession of teaching is less popular among high-performing high school students. For example, according to the PISA 2015 survey, only 6 percent of 15-year-old Kazakhstani students indicated the desire to become a teacher and the results of the test have revealed that these particular respondents were generally not the high performing students (OECD, 2018). Secondly, policymakers have made it possible for low-performing students to apply for teacher training scholarships by decreasing the passing score for the Unified National Test (Koroleva, 2017). Thirdly, the pre-service teacher training content needs reforms because it “still echoes the Soviet model” (Kanayeva, 2019, p. 14) and its content does not coincide with current school curriculum. Finally, the main factor influencing the prestige of profession is the uncompetitive salary. For example, the official salary of an urban schoolteacher with an average qualification level and less than three years of experience in 2019, was 60,347 tenge which constituted a third of the average wage of 186,815 tenge in 2019 in the country (Markova, 2020).

In general, journal articles and papers on issues relating to the teaching profession and state programs of education and research development in the Republic of Kazakhstan are mostly linked to its uncompetitive income and workload (NUGSE, 2014; Koroleva, 2017; Kanayeva, 2019; MoES, 2010; MoES, 2016). However, international studies reveal that working conditions can have an essential effect on teachers' overall well-being (Roberts, Wilcox, May, & Clayton, 2007). According to Irsaliyev, Kamzoldayev, Tashibayev, and Kopeyeva (2019), *teacher's working condition* refers to the workload, the number of students in the class, student relationships and behavior, school leadership, the degree of autonomy, involvement in decision-making, possible career advancement, and the competitiveness of the salary. However, there are no reported nationwide statistics concerning teacher turnover in Kazakhstan; therefore, specifying these conditions as the main factors that drive teachers' wellbeing is not research based nor empirically based.

Policymakers have considered each point in the Law on the Status of Teachers in Kazakhstan (2019). For example, according to this law, disrespectful behavior towards teachers expressed by verbal abuse, indecency, or violent actions is punishable by an administrative fine of between 20 to 40 times the minimum wage, or administrative arrest. However, few, if any, empirical studies on teacher safety have been undertaken in Kazakhstan to inform the provision of these new regulations.

Moreover, in 2019 provincial based departments of the Committee for Quality Assurance in Education and Science were created in Kazakhstan. One of the objectives of the committee is to control the implementation of the legislation of the Republic of Kazakhstan and its regulatory legal acts in the field of education, in addition to the state compulsory education standards in educational organizations regardless of the form of school ownership and departmental hierarchical subordination (Committee for Quality Assurance in Education and Science, 2019). Currently, teachers can use direct telephone hotlines to the committee to report violence committed against them. Nevertheless, the data on teacher victimization reports is publicly unavailable. Therefore, to

learn more about the frequency and types of violence against teachers in Kazakhstan, a request for data on criminal and administrative offenses against teachers was sent by this author to the Committee on Legal Statistics and Special Records of the Office of the Procurator-General of Kazakhstan (Appendix A). By way of letter received on the 13 of November 2020, the Committee replied that only two criminal offenses were registered in the Unified Register of Pre-trial Investigations in the last five years. Pre-trial investigations of these two cases were carried out under Article 107 (Intentional infliction of grievous harm to health), and Article 106 (Intentional infliction of average-gravity harm to health) of the Criminal Code of the Republic of Kazakhstan. Concerning the administrative cases, the Committee has no registered data (Appendix B).

In summary, despite multiple reforms since the early 1990s, little is known about the extent of poor and abusive student behavior in schools. Furthermore, little is known about what the drivers of such incidents in classrooms in Kazakhstan might be.

1.4 Statement of the Problem

The aim of this thesis is to identify potential corollaries and drivers of teacher safety in Kazakhstan. The study will use OECD's Teaching and Learning International Survey (TALIS) 2018 data. The survey was administered internationally to participating schoolteachers and principals. Kazakhstan was one of forty-eight countries which took part in this survey (OECD, 2019). Multiple questions addressed to teachers in the questionnaire pertained to the frequency with which they were abused and the extent to which they had to deal with parental/guardian concerns. In addition, questions addressed to principals pertained to perceived teacher-student relationships in schools and the frequency of verbal intimidation and abuse in each principal's school.

Studies often make the assumption that teachers, who it is assumed generally have positive relationships with students and their parents, and receive support from colleagues and school leaders, tend to feel less risk of victimization (Vettenburg, 2002). However, teachers' job satisfaction and instructional performance to some extent depend on their feelings of safety in

schools (Ricketts, 2007). An analysis of literature for the period from 1962 to 2007 on teacher job dissatisfaction suggests that students' behaviors and attitudes regarding the teaching profession had risen from the bottom to the top two positions of importance in 2007 (Klassen & Anderson, 2009). Moreover, teachers report that parents have power over school staff, and mass media gives parents the opportunity to openly communicate negative remarks about a school (Ofsted, 2019). Researchers have revealed the consequences of teacher victimization which mostly leads to negative emotions like depression, excessive worry, irritability, anxiety, stress, exhaustion, poor concentration, insomnia, burnout, and physical symptoms (Fox, & Stallworth, 2010; Gerberich et al., 2011). Therefore, it is essential to respond in a timely manner to challenges concerning teacher safety.

In this paper, secondary data analysis, including descriptive and regression-based analyses, will be undertaken on the Teaching and Leadership International Survey (TALIS) 2018 Kazakhstan dataset with the assistance of the open course R software program and associated packages (R Core Team, 2020; e.g., lme4, Bates, Maechler, Bolker, & Walker, 2015). It is intended that the findings will inform teaching and administrative policy and practice in Kazakhstan.

1.5 Purpose of the Study and Research Questions

The purpose of this quantitative focused study is to gain insights into the drivers of teacher safety (or lack thereof) in Kazakhstan. The study will make use of the TALIS 2018 Kazakhstan data to carry out this research. The following two main research questions are posed.

RQ1a: How frequently are middle-school teachers intimidated or verbally abused by students?

RQ1b: How much does teacher intimidation and verbal abuse vary within and between schools?

RQ2a: What measurement model best represents teacher safety in Kazakhstan?

RQ2b: What are the main student, workplace, and contextual drivers of teacher stress due to student behavior in Kazakhstan?

1.6 Significance of the Study

Research suggests that teacher safety affects teacher job satisfaction, teaching performance, and overall teacher well-being. Currently, there is a lack of investigations on teacher safety in Kazakhstan. This secondary analysis of data on Kazakhstan from the TALIS 2018 database will inform us if teachers feel safe in schools or not, and provide insight into the specific drivers of student behavioral stress for teachers. The findings of this thesis will benefit teaching and administrative policy and practice in developing or updating school regulations.

1.7 Outline of the Thesis

The introduction chapter provides a theoretical background of teacher safety issues and rationale for the current study. In Chapter 2, Cooper's taxonomy is applied to provide a frame for a comprehensive literature review of the previous studies on the issues of teacher safety, its drivers, and corollaries. The methodology of the current study is depicted in detail in Chapter 3. The results and discussion sections of the findings are presented in Chapters 4 and 5, respectively. Finally, Chapter 6 concludes this thesis.

Chapter 2. Literature Review

2.1 Introduction

This chapter examines and synthesizes available literature on key factors of teacher safety issues and their corollaries. This chapter also includes a theoretical framework for the current study and is divided into the following four sections: framing the literature review, theoretical framework, the importance of teacher safety, and conclusion.

2.2 Framing the Literature Review

Cooper’s taxonomy was applied as a guide in this chapter to determine the focus, goal, perspective, coverage, organization, and audience of the literature review categories (Randolph, 2009). Table 1 organizes all categories chosen for all six characteristics of this literature review.

Table 1
Selection of Literature Review Categories Applied in the Current Literature Review

Characteristic	Selected categories
Focus	Research outcomes
Goal	Integration: (a) Generalization
Perspective	Neutral Representation
Coverage	Central or Pivotal
Organization	Conceptual
Audience	General Scholars; Practitioners or Policy Makers

Note. Adapted from “Organizing Knowledge Synthesis: A Taxonomy of Literature Reviews,” by H. M. Cooper, 1988, *Knowledge in Society*, 1, p. 109. Copyright by Springer Science + Business Media. Adapted with permission of Springer Science + Business Media. As cited in J. Randolph “A Guide to Writing the Dissertation Literature Review,” 2009, *Practical Assessment, Research and Evaluation*, 14, p. 3.

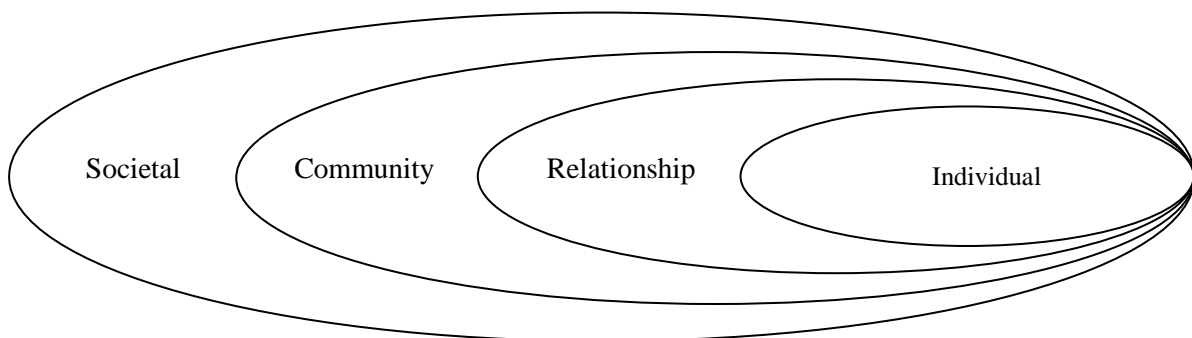
Research pertaining to teacher victimization and its association with the teaching profession overall will be analyzed and synthesized in this literature review by focusing on previous research outcomes. As cited in Randolph (2009) “the Educational Resources Information Center suggests that, in terms of a developing a research rationale, an outcomes-oriented review may help identify a lack of information on a particular research outcome, thus establishing a justifiable need for an outcome study” (p. 2). Consequently, the goal of this chapter is to integrate and generalize findings across entities, results, and settings. Since teacher safety is one of the understudied topics in the educational field, the central or pivotal articles in the field of teacher victimization and its corollaries will be examined to gain insights into teacher safety. Randolph (2009) in his Guide to

Writing the Dissertation Literature Review claims that “the perspective taken depends largely on whether the review is conducted in quantitative or qualitative traditions” (p. 4). This paper follows the quantitative tradition and, can, therefore, claim that it maintains a neutral position. Finally, the main audience of the thesis is general scholars, practitioners or policy makers.

2.3 Theoretical Framework

This study uses the four-level social-ecological model (Krug, Dahlberg, Mercy, Zwi, & Lozano, 2002) which was developed on the basis of Bronfenbrenner’s (1977) Social Ecological Theory of Violence. The model allows for and addresses the drivers that put teachers at risk, and also accounts for some preventative strategies for the experience of violence (Figure 1).

Figure1
Ecological Model for Understanding Violence



Note. Ecological model for understanding violence. From “World report on violence and health,” edited by E.G. Krug, L.L. Dahlberg, J.A. Mercy, A.B. Zwi, & R. Lozano, 2002, 12, World Health Organization. Copyright 2002 by Universal Copyright Convention.

Conceptually, the inner concentric circle represents the individual teacher surrounded by immediate and broader relationships and connections. Consequently, this chapter reviews the relationship between individual factors such as teachers' age, gender, work experience and the frequency of intimidation and associated risk of experiencing teacher safety issues. The chapter then focuses on teacher relationships as the next set of factors that research suggests are associated with the frequency of interactions with the main perpetrators of violence against teachers. Further, a

review of community factors explores schools and their neighborhoods as settings that influence teacher safety. Finally, teacher wellbeing, job satisfaction, attrition, professional development and social policies are observed as societal factors that create safe or unsafe workplace climate.

2.4 The Importance of Teacher Safety

Promoting feelings of safety in schools is one of the essential pillars of the educational system. A safe school environment is a basic element for both teachers to provide quality classes and students to succeed academically (Espelage et al., 2013; Galand, Lecocq, & Philippot, 2007). The meta-analytic study by Clarke (2010) introduces an integrative model of safety climate. The model posits that employees' psychological climate contributes to a generalized safety climate in an organization, and, in turn, this general safety climate contributes to commitment, wellbeing, safety behavior, and satisfaction.

Regarding teacher safety in schools, it is considered to be one of the key aspects which affects teachers' status in society. For example, China, Malaysia, Taiwan and Indonesia led in the Global Teacher Status Index in 2018, because teachers are highly respected in these communities. Moreover, this survey reveals that parents in these countries probably or definitely encourage their children to become a teacher. "This indicates that the higher the respect for teachers, the more likely a person is to encourage their child to enter the profession" (Dolton, Marcenaro, De Vries, & She, 2018, p. 54). Contrasting the aforementioned East Asian countries, more respondents of European countries believe that students disrespect teachers rather than respect them. In addition, the findings of this study identified "a clear positive relationship between teacher status and PISA scores" which means that the higher the status of the teacher in the country, the higher the students' academic outcomes in PISA (Dolton, Marcenaro, De Vries, & She, 2018, p. 125).

However, international studies have presented concerning evidence of violence against teachers. The School Crime and Safety Report for the 2015-16 school years found that 10 percent of US public school teachers experienced threats of injury or physical attack by students (Musu,

Zhang, Wang, Zhang, Oudekerk, 2019). In these studies, the students themselves do not deny the fact that they often instigate teacher-target violence. For example, approximately 30 percent of Taiwanese students reported acting aggressively against their teachers at least once in the previous year and most of them aimed to cause psychological harm (Chen, & Astor, 2009). Despite student-violators, the list of perpetrators of teacher-targeted violence includes administrators, colleagues, and parents (Espelage et al., 2013). Additionally, studies list verbal harassment, physical attacks, damage to teacher property, social intimidation, and manipulative behavior with the intent to cause emotional and psychological harm as the types of violence against teachers (Dzuka & Dalbert, 2007; Johnson & Barton-Bellessa, 2014).

International studies suggest that the frequency of teacher victimization and types of violence against educators vary depending on the socioeconomic and demographic predictors (Gottfredson, et al., 2005; Kondrasuk, Greene, Waggoner, Edwards, & Nayak-Rhodes, 2005). Moreover, school climate, disciplinary standards, and school resources might be significant drivers of teacher safety issues (Gottfredson, et al., 2005). The Social Ecological Theory of Violence (Bronfenbrenner, 1977) indicates that investigating the background of teacher-directed aggression allows people to better comprehend how and why violence against teachers happens (McMahon, et al., 2014). Further, in this chapter, four factors identified as specific to teacher safety will be addressed separately.

2.4.1 Individual Factors

Individual factors such as gender, age, and teachers' work experience have been proposed as defining factors contributing to teacher abuse on the grounds that female teachers reported experiencing more attacks, while male teachers reported mostly experiencing threats. In addition, teachers with master's degrees and teachers with regular state certifications were less likely to report being attacked and threatened (Curran, Viano & Fisher, 2019). Although findings are not entirely consistent in this regard.

A Croatian study which aimed to study the incidences of violence against teachers by students, revealed that female teachers are less frequently subjected to violence in comparison with male teachers (Lokmić, Opić, & Bilić, 2013). In contrast female teachers in Canada reported higher levels of physical symptoms compared to men (Wilson, Douglas, & Lyon, 2011). In addition, Wills (2018) also revealed that female teachers were more likely to be victimized. However, the latter study takes into account socio-demographic factors such as race and socio-economic status indicating that female teachers in high-poverty non-White schools were more likely to be victimized. So, research suggests that there may be mediating effects in some instances.

Regarding age and years of work Martinez, McMahon, Espelage, Anderman, Reddy and Sanchez (2016) found that the older educators with more years of teaching experienced less violence from their students. However, the outcome of Casteel, Peek-Asa, and Limbos's (2007) study shows that more experienced teachers reported more violent attacks. Again, it appears that that the broader socio-cultural context may be important.

According to the developers of the four-level social-ecological model (Krug, Dahlberg, Mercy, Zwi, & Lozano, 2002), a teacher's history of abuse is often related to individual and broader school-related factors. Depending on individual and school demographics teachers experience one of the following eleven forms of victimization: obscene remarks, obscene gestures, verbal threats, intimidation, cyber violence, theft of personal property, damage to personal property, objects thrown, physical attack not resulting or resulting in a visit to physician, and weapon pulled (McMahon et. al, 2014) in a daily, weekly, monthly basis or during one academic year (Ofsted, 2019; Dinkes et al. 2009; Battle & Gruber, 2010). Understanding the source and drivers of violence against teachers might enable the enactment of policies that function to eliminate teacher safety problems. As part of a broader discussion about relational factors, the perpetrators of teacher victimization will now be discussed.

2.4.2 Relationship Factors

Relational factors are associated with teacher relationships that may increase the risk of experiencing violence as a victim. Surveys such as that conducted by Mooij (2011) suggest that, compared to students, teachers reported more incidents in which they were victims of verbal and mild physical violence. Additionally, scholars have revealed that the main perpetrators of teacher victimization are students in “first” place, then parents (Gerberich et al., 2011; Tiesman et al., 2013, Ofsted, 2019), and verbal attacks happen more often than other types of violence against teachers (Gregory, Cornell, & Fan, 2012). For example, the results of Gerberich and other scholars’ (2011) survey found that 95% of physical assaults and non-physical violence against educators were perpetuated by students.

However, school violence is not perceived as a major problem by many teachers (Zeira, Astor, & Benbenishty 2004) and research has suggested that teachers and staff are sometimes hesitant to report incidents to the authorities (Turkum, 2011). The reason might be connected to teachers’ misconduct as professionals. For example, Taiwanese students reported that they are mostly engaged in violent behavior due to teachers’ unreasonable requirements (Chen, & Astor, 2009).

Some parents’ attitude towards the teaching profession might impede teacher-parent collaboration. For instance, teachers involved in the study conducted by a non-ministerial department, the Office for Standards in Education, Children's Services and Skills (Ofsted) 2019 in the UK reported that the most frequent disrespectful and abusive parental behavior concerns parents’ unreasonable expectations. The unreasonable expectations are more often expecting ‘unrealistic’, and ‘unfair’ high grades for their children (Bang, 2018; Ofsted, 2019). Furthermore, by raising concerns straight to the highest authorities, parents usually make matters worse. As a result, the study established that “relationships with some parents appear among the top causes of moderate or high undue stress at work” (Ofsted, 2019, p. 37).

2.4.3 Community Factors

Community factors can be defined as the settings in which social relationships happen and the features of these settings that are associated with instances of victimhood. The main setting for teacher interaction is a school, its type and location.

The National Center for Education Statistics has reported that in the 2003-2004 school year, 12.7% of public school teachers and 3.3% of private school teachers experience verbal abuse on a daily basis. Additionally, about 20% of public school educators and 6.5% of private school teachers reported students' disrespectful behavior on a daily basis (DeVoe et. al., 2004). Therefore, it would appear that the frequency of such behavior is associated with socio-economic status of the school.

According to Gottfredson, Gottfredson, Payne, and Gottfredson (2005), violence against teachers occurs more often in overcrowded urban schools; whereas, schools with more positive psychosocial climates have lower rates of teacher victimization. In addition, Dinkes, Kemp, Baum, and Snyder (2009) found that teachers in suburban, town, or rural schools reported being threatened with injury less frequently than teachers in urban schools. Therefore, the location and characteristics of the school appear to be associated with instances of violence toward teachers. A discussion of the societal factors that are associated with instances of violence toward teachers will be now discussed.

2.4.4 Societal Factors

This section of the literature review covers the sources of societal factors which can help create a climate in which violence is inhibited. School climate, disciplinary standards, and school resources might be significant drivers of teacher safety (Gottfredson, et al., 2005). Similarly, Steffgen and Ewen (2007) revealed that teacher workload, time pressure, and the quality of school climate considerably contributed to instances of victimization.

The analysis of the Schools and Staffing survey from the 2011-2012, administered by the National Center for Education Statistics for the United States Department of Education, found that teachers who experienced violence are less satisfied with their jobs and more eager to leave the

profession (Kapa & Gimbert, 2018). Additionally, the outcomes of study conducted in Belgium suggested that teachers who had been victimized reported increased feelings as anxiety and depression (Galand, Lecocq, & Philippot, 2007). As a result, 14% of the 487 teachers surveyed intended to leave the profession. This suggests that the management of violence toward teachers is important to teacher retention.

Scholars listed the common symptoms and feelings among teachers who experienced violence are antagonism, fear, anxiety, stress, frustration, sadness, fatigue, difficulty sleeping, depression, and irritability (Gerberich et al. 2011; Galand, Lecocq, & Philippot, 2007). These adverse consequences of teacher victimization might impact on teachers' well-being and the quality of teaching pedagogy and practice. One of the solutions suggested by researchers to maintain educators' psychological and professional well-being and performance is the capacity to provide support services and training on classroom behavioral and stress management (Daniels, Bradley, & Hays, 2007; Dominguez Alonso, López-Castedo, & Pino Juste, 2009; Shernoff et al., 2011). While Gregory and his colleagues (2012) claim that authoritative school leadership can create a safe school climate with fewer incidents of violence.

To sum the management of more broad factors such as school climate, discipline, and teacher workload might have positive influence in preventing teacher attrition and in fostering their job commitment (Split, Koomen, & Thijs, 2011).

2.5 Conclusion

This chapter provided a literature review based on Cooper's taxonomy for each of drivers that put teachers at risk for experiencing violence. According to the studies, students are the main perpetrators of teacher victimization and verbal abuse is the common type of student aggression. Parents also violate teachers by expecting high grades for their kids and concerning physiological problems. Individual factors such as gender, age, work experience and history of intimidation differ depending on the violence type and location of the schools. However, urban teachers experience victimization more frequently in comparison with other locations and school socio-economic status

also appears to be involved. The acts of violence cause teachers light physiological problems to physical harm. Scholars argue that support services and training on classroom management will help teachers to cope with the consequences or avoid conflict situations. To sum up, there is a need to study how these factors impact teacher safety in schools in Kazakhstan. In the next chapter of this thesis, the methodology for measuring those drivers are presented and described.

Chapter 3. Methodology

3.1 Introduction

This chapter presents and justifies the methodology that was implemented in this thesis to explore the drivers of teacher safety (or lack thereof) in Kazakhstan. This chapter also provides a detailed description of the research instrument and models applied to the data to answer the research questions.

This research covers the following questions:

RQ1a: In Kazakhstan, how frequently are middle-school teachers intimidated or verbally abused by students?

RQ1b: How much does teacher intimidation and verbal abuse vary within and between schools?

RQ2a: What measurement model best represents teacher safety in Kazakhstan?

RQ2b: What are the main student, workplace, and contextual drivers of teacher stress due to student behavior in Kazakhstan?

3.2 Research Design and Rationale

3.2.1 Sample and Secondary Data Analysis

The data in this study was taken from the publicly available TALIS dataset (OECD, 2019). That data was based on a multi-stage cluster sampling design and makes an attempt to provide a representative sample of teachers in schools in Kazakhstan (OECD, 2019). Therefore, this study makes use of secondary analysis of the stated data. Secondary analysis is common with quantitative studies rather than with qualitative studies because it can be easily standardized, anonymized, and coordinated (MacInnes, 2020). According to Johnston (2014) “secondary analysis is an empirical exercise that applies the same basic research principles as studies utilizing primary data and has steps to be followed just as any research method” (p. 619). The following sub-sections provide details as to the sample size and description of participants in the study (3.2.2), the classification of

the items and instruments in the study (3.2.3), the instruments in the study (3.2.4), the procedures utilized to answer the research questions (3.2.5), and ethical considerations (3.2.6).

3.2.2 Sample Size and Description of Participants

The TALIS 2018 dataset involved 6,566 middle-school teachers and 331 associated principals (from 331 schools) in Kazakhstan. The dataset in SPSS (.sav) format used in this study was obtained from the official website of the OECD and imported into the R software program with the haven package (Wickham & Miller, 2020). Data were subset from the international dataset based on the unique Kazakhstan identifier, 398, under the “IDCOUNTRY” variable (see Appendix C).

The procedure started from merging teacher and principal datasets with the assistance of the R merge function. Further, only 49 variables of interest concerning teacher safety were drawn out from the broader Kazakhstan dataset. Missing data were dealt with likewise with the percentage of complete cases constituted 88.4 percent. With the assistance of the tidyr R package (Wickham, 2014) 5805 cases were retained. Thereafter, measures of central tendency (*means*) and variation (*SDs*) for each variable were explored with the assistance of the R base tapply function (Becker, Chambers, & Wilks, 1988). In order to explore RQ1b, with respect to the amount of variance in intimidation and verbal abuse within- and between-schools, schools with no within school variance for variables of interest were removed. This procedure resulted in a final 4,544 cases (teachers) ready for analysis.

3.2.3 Classification of Items and Instruments

In this study, a total 49 both principal- and teacher-level variables are analyzed. These variables pertain to school peculiarities, perceptions, and practices of principals and teachers. Multiple variables constituted each scale so therefore, the scales needed to be validated. In addition, a four-level social-ecological model is used to categorize different sets of scales that may make teachers in Kazakhstan feel unsafe in schools (Krug, Dahlberg, Mercy, Zwi, and Lozano, 2002).

Table 2
Variables Classification into the Four-Level Social-Ecological Model

Factors for violence	Item in TALIS	TALIS code
Individual	Gender	TT3G01
	Categorized teacher age	TCHAGEGR
	Years of work as a teacher in total	TT3G11B
	Being intimidated or verbally abused	TC3G30D
Relationship	Teacher-Student Relations (scale of 4 items)	T3STUD
	Work stress Addressing parent or guardian concerns	TT3G52J
Community	School type	TC3G12
	School's location	TC3G10
Societal	Teaching was a secure job. (Personal utility motivation to teach)	TT3G07C
	Areas prof.dev. Student behaviors and classroom management. (12 m.)	TT3G23F
	Areas prof.dev. Teacher-parent co-operation (12 m.)	TT3G23M
	Prof.dev needs Student behaviors and classroom management	TT3G27F
	Prof.dev. needs Teacher-parent co-operation	TT3G27M
	School staff enforces rules for student behaviors	TT3G48G
	Satisfied with performance in this school	TT3G53I
	Teachers who began work at this school during the last 12 months	TC3G14A
	Teachers who permanently left this school during the last 12 months	TC3G14B
	ESCS	TT3G35E
	Workplace Well-Being (scale of 4 items)	T3WELS
	Job Satisfaction (composite of 2 scales consisting 8 items)	T3JOBSA
	Teachers Perceived Disciplinary Climate (scale of 4 items)	T3DISC
Student Behavior Stress (scale of 3 items)	T3STBEH	

Table 2 organizes variables according to factors for violence against teachers in terms of individual, relationship, community, and societal related factors.

3.2.4 Instruments Used in the Study

Multiple questions pertaining to teacher safety were addressed to teachers and principals in both the Teacher and Principal Questionnaires. These selected measurement scales were developed by experts with details available in the TALIS 2018 Technical Report. To gain insights into teacher safety in Kazakhstan, other teacher-level variables were included into Table 3 (OECD, 2019). In order to examine the data correctly, the semantic direction of each question was identified and, where negative, was reversed where necessary.

Table 3
Teacher-level variables from the TALIS 2018 Teacher Questionnaire

Variable ID	Item
TT3G35E	ESCS.sch
TT3G01	Gender
TCHAGEGR	Categorized teacher age
TT3G11B	Years of work as a teacher in total
TT3G07C	Teaching was a secure job (How imp. following for you to become a teacher?)
TT3G23F	Areas prof.dev. Student behaviours and classroom management (12 m.)
TT3G23M	Areas prof.dev. Teacher-parent co-operation (12 m.)
TT3G27F	Prof.dev needs Student behaviours and classroom management
TT3G27M	Prof.dev. needs Teacher-parent co-operation
TT3G48G	School staff enforces rules for student behaviour
TT3G52J	Work stress Addressing parent or guardian concerns
TT3G53I	Satisfied with performance in this school
T3STBEH	Student Behavior Stress
TT3G52F	A. Responsible for students' achievement
TT3G52G	B. Maintaining classroom discipline
TT3G52H	C. Being intimidated or verbally abused
T3DISC	Teachers Perceived Disciplinary Climate
TT3G41A	A. Long time for students to quieten down
TT3G41B	B. Students create a pleasant learning atmos.
TT3G41C	C. Students interrupting the lesson
TT3G41D	D. Much disruptive noise in this classroom
T3JOBSA	Job satisfaction, composite
T3JSENV	Job Satisfaction with Work Environment
TT3G53C	A. Would like to change to another school
TT3G53E	B. Enjoy working at this school
TT3G53G	C. Would recommend this school
TT3G53J	D. All in all, satisfied with job
T3JSPRO	Job Satisfaction with Profession
TT3G53A	A. Advantages outweigh disadvantages of being teacher
TT3G53B	B. Still choose to work as a teacher.
TT3G53D	C. Regret that become a teacher (rev.)
TT3G53F	D. Better to choose another profess.
T3STUD	Teacher-Student Relations
TT3G49A	A. Teach. and students usu. get on well
TT3G49B	B. Most teachers believe that the students' well-being is important
TT3G49C	C. Teachers interested in students have to say
TT3G49D	D. School provides extra assistance
T3WELS	Workplace Well-Being
TT3G51A	A. Experience stress in work (rev.)
TT3G51B	B. Job leaves time for personal life
TT3G51C	C. My job neg. impacts my mental health (rev.)
TT3G51D	D. My job neg. impacts my phys. health (rev.)

Note. Items separated by scale where possible; rev. = semantically reversed.

Table 4 displays principal-level variables of interest.

Table 4
Principal-level variables from the TALIS 2018 Principal Questionnaire

Variable ID	Item
TC3G12	School type
TC3G10	School's location
TC3G14A	Teachers who began work at this school during the last 12 months
TC3G14B	Teachers who permanently left this school during the last 12 months
TC3G30D	Intimidation or verbal abuse of teachers or staff

3.2.5 Procedures

All analysis was undertaken with the assistance of the open-source R software program and associated packages (R Core Team, 2020; e.g., lme4, Bates, Maechler, Bolker, & Walker, 2015). RQ1a involves gaining an understanding of the frequency with which middle-school teachers are intimidated or verbally abused by students in Kazakhstan. Therefore, descriptive statistics is an appropriate way to answer this question. Specifically, means and standard deviations for all of the variables of interest will be reported.

RQ1b involves gaining an understanding of how my teacher experience of intimidation and verbal abuse varies within and between schools. For this question, multi-level modeling is an appropriate method. Specifically, intra-class correlations for the variables of interest will be determined with the assistance of the lme4 R package (Bates, ...). If the ICC values for the variables of interest exceed .10, then multilevel modeling would be chosen as the most appropriate technique to answer research questions RQ2a and RQ2b. This is because ICCs above .10 suggest some level of systemic differences between schools which would need to be accounted for by the form of analysis.

RQ2a involves the validation of the scales proposed for measuring teacher safety in Kazakhstan. For this question, confirmatory factor analysis (CFA) is chosen as the most appropriate method. Specifically, in accordance with the two-step approach (Anderson & Gerbing, 1998) a measurement model will first be specified with the assistance of the lavaan package (Rosseel, 2012). Model fit indices will be interpreted in accordance with the following indices including the χ^2/df ratio (under 3.83) and associated non statistically significant p value (Walker, 2013), SRMR (below .08) (Hu & Bentler, 1999), RMSEA (below .08) Browne and Cudeck (1989, 1992) and Byrne (2001), CFI (above .90) and TLI (above .90) (Hoyle, 1995) will be examined. Cronbach's alpha estimates of reliability (above .70) for factors construct validity are also interpreted. In addition to meeting the requirements for model fit, item factor loadings should also be greater than .40 to meet the requirements for indicator reliability (Ab Hamid, Sami, & Mohmad Sidek, 2017).

Additionally, the Average Variance Extracted (AVE) for each factor should also exceed .50 (Ab Hamid, Sami, & Mohmad Sidek, 2017). Finally, discriminant validity is met when the AVE is greater than the shared variance (with connected factors) for each respective factor (Ab Hamid, Sami, & Mohmad Sidek, 2017).

For RQ2b pertaining to identifying the main student, workplace, and contextual drivers of teacher stress due to student behavior, structural equation modeling will be employed with the assistance of the lavaan package (Rosseel, 2012). For this question, the dependent variable of interest will be teacher experience of Student Behaviour Stress.

3.2.6 Ethical Considerations

Ethical considerations are not required because human participants have not been directly involved in this study. The study makes use of secondary data analyses on the data from the online TALIS database. Importantly, “the manner in which data were collected during TALIS 2018 ensured the anonymity of teachers and principals in the reporting of results. It also ensured that any information encountered that may have identified the teachers or principals participating in the survey remained confidential” (OECD, 2019, p. 131).

Chapter 4. Results

4.1 Introduction

This chapter will present and describe the results in a systematic and detailed way. The purpose of this study is to identify potential corollaries and drivers of teacher safety in Kazakhstan. This secondary analysis involved the utilization of OECD's Teaching and Learning International Survey (TALIS) 2018 dataset. This chapter displays the findings of the analysis including comments on the process of data analysis. Also, each research question will be addressed separately to provide information about outcomes.

4.2 Analysis Steps

Principal and Teachers Questionnaires of TALIS 2018 (OECD, 2019) were examined carefully to identify variables of interest of this thesis in line with the theoretical framework. After data preparatory procedures mentioned in methodology chapter a total 4,544 teacher responses from 331 schools, and 49 variables of interest remained. Further, descriptive statistics were applied to visualize and present the data in meaningful way (Thompson, 2006). To identify the intra-class correlations for the variables of interest, multi-level modeling was required. However, the ICC values for the variables of interest were not substantive; consequently, the regression-based analysis was carried out at the single level (Stapleton, McNeish, & Yang, 2016). Since, there was a need to validate the scales proposed for measuring teacher safety in Kazakhstan confirmatory factor analysis (CFA) was applied. Finally, a full structural equation modeling (SEM) was specified to identify the main student, workplace, and contextual drivers of teacher stress due to student behavior in Kazakhstan.

4.2.1 Selection of Scales for the Measurement and Structural Models

In order to perform the analysis for RQ2a (CFA measurement model) and RQ2b (full structural model), this study draws upon six associated measurement scales developed by TALIS experts (see TALIS, 2018, Technical Report). These six scales are represented in Table 5.

Table 5
Teacher-Level Variables in Scales from the TALIS 2018 Technical Report

# TALIS CODE	Scale/Item
(1) Student Behavior Stress¹	
1. TT3G52F	Responsible for students' achievement
2. TT3G52G	Maintaining classroom discipline
3. TT3G52H	Being intimidated or verbally abused
(2) ^RTeachers Perceived Disciplinary Climate²	
4. TT3G41A	Long time for students to quieten down (reverse coded)
5. TT3G41C	Students interrupting the lesson (reverse coded)
6. TT3G41D	Much disruptive noise in this classroom (reverse coded)
(3) ^RJob Satisfaction with Work Environment²	
7. TT3G53C	Would like to change to another school (reverse coded)
8. TT3G53E	Enjoy working at this school
9. TT3G53G	Would recommend this school
10. TT3G53J	All in all, satisfied with job
(4) ^RJob Satisfaction with Profession²	
11. TT3G53B	Still choose to work as a teacher
12. TT3G53D	Regret that become a teacher (reverse coded)
13. TT3G53F	Better to choose another profess (reverse coded)
(5) Teacher-Student Relations²	
14. TT3G49A	Teachers and students usually get on well
15. TT3G49B	Teachers believe students' well-being important
16. TT3G49C	Teachers interested in students have to say
17. TT3G49D	School provides extra assistance
(6) ^RWorkplace Well-Being	
18. TT3G51A	Experience stress in work (reverse coded)
19. TT3G51C	My job negatively impacts my mental health (reverse coded)
20. TT3G51D	My job negatively impacts my physical health (reversed coded)

Note. Denotes scale using ¹1 = Not at all, 2 = To some extent, 3 = Quite a bit, 4 = A lot; ²1 = Strongly disagree, 2 = Disagree, 3 = Somewhat disagree, 4 = Somewhat agree, 5 = Agree, and 6 = Strongly agree. Reverse-coded factors are given in ^Rsuperscript.

In terms of the scale, Student Behaviour Stress, this was the outcome variable of interest in the study. The question included the following stem: "Thinking about your job at this school, to what extent are the following sources of stress in your work?" The scale includes two items pertaining to student behavior while the other item pertains to stress associated with teacher responsibility (OECD, 2019, p. 317). Response options for this scale were coded 1 = Not at all, 2 = To some extent, 3 = Quite a bit, 4 = A lot.

Another question stem "How strongly do you agree or disagree with the following statements about this?" was followed by items regarding student behavior that were used to form the scale Teacher's Perceived Disciplinary Climate (originally 4 initial items). However, an item TT3G41B (Students in this class take care to create a pleasant learning atmosphere) was removed because of poor item-factor loading (OECD, 2019, p. 333). Response options for this scale were coded 1 = Strongly disagree, 2 = Disagree, 3 = Somewhat disagree, 4 = Somewhat agree, 5 = Agree, and 6 = Strongly agree.

The next two subscales formed the multidimensional scale Job Satisfaction, composite (T3JOBSA). These subscales measuring teacher job satisfaction were derived from this question stem: “We would like to know how you generally feel about your job. How strongly do you agree or disagree with the following statements?” The items about the school following this question were used to form the subscale Job Satisfaction with Work Environment (originally 4 initial items), while the items on the teaching profession were used to form the subscale Job Satisfaction with Profession (originally 4 initial items) (OECD, 2019, p. 300). However, one item from the latter scale TT3G53B (The advantages of being a teacher clearly outweigh the disadvantages), was removed due to poor item-factor loading. Response options for these two scales were coded 1 = Strongly disagree, 2 = Disagree, 3 = Somewhat disagree, 4 = Somewhat agree, 5 = Agree, and 6 = Strongly agree.

To note, the Teacher-Student Relation scale which concerns teacher background characteristics was developed from the following question stem: “How strongly do you agree or disagree with the following statements about what happens in this school?” This four-item scale addresses teacher-student interaction facets (OECD, 2019, p. 333). Response options for this scale were coded 1 = Strongly disagree, 2 = Disagree, 3 = Somewhat disagree, 4 = Somewhat agree, 5 = Agree, and 6 = Strongly agree.

The final scale Workplace Well-being was originally made up of four items. However, one item, TT3G51B (“My job leaves me time for my personal life”), was removed due to poor item-factor loading. Response options for this scale were 1 = Not at all, 2 = To some extent, 3 = Quite a bit, 4 = A lot.

4.2.2 Semantically-Reverse Items

Research has shown that scales that include both positive and negative wording of items can potentially distort factor structure (Eggers, 2000; Johanson & Osborn, 2000). Additionally, DeVillis (2012) assumed that respondents might become confused with negatively worded items. Therefore, careful attention will be made to inspect the item factor loading for items that were originally worded

negatively as this may be reason for poor item factor structure. To note the following items were originally semantically negative: TT3G41A, TT3G41C, TT3G41D, TT3G53C, TT3G53D, TT3G53F, TT3G51A, TT3G51C, and TT3G51D. To ensure that they have the same interpretative meaning with the other items, all of these items were reverse coded.

The originally considered item-factor structure, for the six scales presented in Table 5, was 3-4-4-4-4-4, respectively. However, after removing low-loading items, a 3-3-4-3-4-3 item-factor structure was retained (for factors of Teachers Perceived Disciplinary Climate, Job Satisfaction with Profession, and Workplace Well-Being, respectively) and represented a well-fitting theoretically rational final measurement model (Table 5).

Though the factor loading for the item TT3G49B from the scale of Teacher-student relations was slightly under .40, it was not removed due to the meaning of the latent variable. The translation of the concept ‘students’ well-being’ can be interpreted slightly in a different way in Kazakh and Russian languages. If in the English language “students’ well-being refers to the psychological, cognitive, social and physical functioning and capabilities that students need to live a happy and fulfilling life” (OECD, 2017, p. 61) in Kazakh and Russian languages the meaning of the concept narrowed to simply social or material contexts. If the student was from nuclear family, where parents or one parent earns a living that would be reflected in their interpretation of their well-being. This item plays key role in the scale since it helps to determine teacher-student relationship.

Table 6 presents a descriptive account for each item of six scales.

Table 6
Descriptive Statistics for Scales

Variable ID	Description	Min	Max	<i>M</i>	<i>SD</i>	Skew.	ICC	Codes
T3STBEH	Student Behavior Stress	6.986	14.961	9.127	1.87	0.78	.06	[TT3G52] To what ext. are the fol. sources of stress in your work?
TT3G52F	A. Responsible for students' achievement	1	4	2.152	0.94	0.35	.05	1 = Not at all, 2 = To some extent, 3 = Quite a bit, 4 = A lot
TT3G52G	B. Maintaining classroom discipline	1	4	1.828	0.86	0.77	.06	1 = Not at all, 2 = To some extent, 3 = Quite a bit, 4 = A lot
TT3G52H	C. Being intimidated or verbally abused	1	4	1.446	0.77	1.73	.06	1 = Not at all, 2 = To some extent, 3 = Quite a bit, 4 = A lot
T3DISC	Teachers Perceived Disciplinary Climate	6.723	14.445	8.751	1.34	0.48	.04	[TT3G41] How str. do you agr./disagr. with fol. statem. <target class>?
TT3G41A	A. Long time for students to quieten down	1	4	3.19	0.65	0.52	.03	1 = Strongly disagree, 2 = Disagree, 3 = Agree, 4 = Strongly agree
TT3G41C	C. Students interrupting the lesson	1	4	3.245	0.67	0.60	.04	1 = Strongly disagree, 2 = Disagree, 3 = Agree, 4 = Strongly agree
TT3G41D	D. Much disruptive noise in this classroom	1	4	3.265	0.67	0.59	.05	1 = Strongly disagree, 2 = Disagree, 3 = Agree, 4 = Strongly agree
T3JOBSA	Job satisfaction, composite	5.851	15.502	12.091	1.58	-0.06	.06	
T3JSENV	Job Satisfaction with Work Environment	5.25	14.80	12.04	1.55	-0.25	.07	[TT3G53] We would like to know how you gen. feel about your job.
TT3G53C	A. Would like to change to another school	1	4	3.088	0.69	0.49	.05	1 = Strongly disagree, 2 = Disagree, 3 = Agree, 4 = Strongly agree
TT3G53E	B. Enjoy working at this school	1	4	3.196	0.62	-0.59	.05	1 = Strongly disagree, 2 = Disagree, 3 = Agree, 4 = Strongly agree
TT3G53G	C. Would recommend this school	1	4	3.101	0.64	-0.58	.07	1 = Strongly disagree, 2 = Disagree, 3 = Agree, 4 = Strongly agree
TT3G53J	D. All in all, satisfied with job	1	4	3.094	0.56	-0.33	.03	1 = Strongly disagree, 2 = Disagree, 3 = Agree, 4 = Strongly agree
T3JSPRO	Job Satisfaction with Profession	6.871	14.490	11.429	1.60	-0.26	.04	[TT3G53] We would like to know how you gen. feel about your job
TT3G53B	B. Still choose to work as a teacher.	1	4	2.747	0.82	-0.38	.03	1 = Strongly disagree, 2 = Disagree, 3 = Agree, 4 = Strongly agree
TT3G53D	C. Regret that become a teacher (rev.)	1	4	3.108	0.73	0.55	.03	1 = Strongly disagree, 2 = Disagree, 3 = Agree, 4 = Strongly agree
TT3G53F	D. Better to choose another profess.	1	4	2.818	0.81	0.13	.02	1 = Strongly disagree, 2 = Disagree, 3 = Agree, 4 = Strongly agree
T3STUD	Teacher-Student Relations	4.666	16.599	13.323	1.63	0.44	.06	[TT3G49] What happens in this school?
TT3G49A	A. Teach. and students usu. get on well	1	4	3.264	0.50	0.23	.06	1 = Strongly disagree, 2 = Disagree, 3 = Agree, 4 = Strongly agree
TT3G49B	B. Teachers bel. stud. well-being important.	1	4	2.996	0.66	-0.42	.08	1 = Strongly disagree, 2 = Disagree, 3 = Agree, 4 = Strongly agree
TT3G49C	C. Teachers interested in students have to say.	1	4	3.161	0.51	0.08	.03	1 = Strongly disagree, 2 = Disagree, 3 = Agree, 4 = Strongly agree
TT3G49D	D. School provides extra assistance	1	4	3.22	0.53	-0.07	.05	1 = Strongly disagree, 2 = Disagree, 3 = Agree, 4 = Strongly agree
T3WELS	Workplace Well-Being	7.471	15.606	9.502	1.93	0.95	.07	[TT3G51] In your experience at this sch., to what extent do the foll. occur?
TT3G51A	A. Experience stress in work (rev.)	1	4	3.252	0.81	0.91	.08	1 = Not at all, 2 = To some extent, 3 = Quite a bit, 4 = A lot
TT3G51C	C. My job neg. impacts my mental health (rev.)	1	4	3.303	0.81	1.00	.06	1 = Not at all, 2 = To some extent, 3 = Quite a bit, 4 = A lot
TT3G51D	D. My job neg. impacts my phys. health (rev.)	1	4	3.258	0.82	0.94	.05	1 = Not at all, 2 = To some extent, 3 = Quite a bit, 4 = A lot

Note. ^a1 = None, 2 = 1% to 10%, 3 = 11% to 30% 4 = 31% to 60%, 5 = More than 60%; *N* = 6,566 teachers; *Number of Schools* = 331. Item descriptions slightly abbreviated

Because the ICC values were consistently under .10, there was no need to undertake multilevel modeling of the data for the measurement and full structural models

4.2.3 Demographic Variables

Four teacher demographic variables were included as control variables in this thesis. Table 7 provides descriptive statistics for these variables. However, structural equation model showed that demographic variables were non-significant predictors of teacher intimidation or verbal abuse, so they were all excluded from the final SEM model.

Table 7.
Demographic Variables

Item	TALIS Code	M	SD	skew	ICC
ESCS.sch	TT3G35E	1.89	0.87	0.94	.17
Gender	TT3G01	1.23	0.26	1.23	.04
^a Categorized teacher age	TCHAGEGR	39.99	10.84	0.10	.07
Years of work as a teacher in total	TT3G11B	9.77	8.96	1.17	.05

Note. ^aAge has been recoded as a continuous variable whereby under 25 = 23, 25 to 29 = 27, 30 to 39 = 34.5, 40 to 49 = 44.5, 50 to 59 = 54.5, & 60 and up = 61.5.

4.3 Results

This section will be organized according to four research questions:

RQ1a: How frequently are middle-school teachers intimidated or verbally abused by students?

RQ1b: How much do teacher intimidation and verbal abuse vary within and between schools?

RQ2a: What measurement model best represents teacher safety in Kazakhstan?

RQ2b: What are the main student, workplace, and contextual drivers of teacher stress due to student behavior in Kazakhstan?

4.3.1 RQ1a: How frequently are middle-school teachers intimidated or verbally abused by students?

This research question was made based on the items from the TALIS 2018 Questionnaires. The original versions are from the Teacher Questionnaire: “Thinking about your job at this school, to what extent being intimidated or verbally abused by students is a source of stress in your work?” (p.

26) and from Principal Questionnaire: “In this school, how often does intimidation or verbal abuse of teachers or staff occur amongst students?” (p. 16).

Table 8 presents the item descriptives for two teacher intimidation or verbal abuse items. Teachers tended to report that they experience intimidation or verbal abuse from students very seldom with mean responses closer to response option 1, not at all ($M = 1.122$, $SD = 0.35$). Principals confirm that teachers in their schools are very rarely subjected to intimidation or verbal abuse by students with mean closer to option 1, never ($M = 1.446$, $SD = 0.77$).

Table 8.
Teacher Safety Issue Variables (Dependent Variable)

Item	TALIS Code	M	SD	skew	ICC
Teacher-level variable					
^a Being intimidated or verbally abused	TT3G52H	1.446	0.77	1.73	.06
Principal-level variable					
^b Intimidation or verbal abuse of teachers or staff	TC3G30D	1.122	0.35	3.43	.07

Note. ^a1 = Not at all, 2 = To some extent, 3 = Quite a bit, 4 = A lot; ^b1 = Never, 2 = Less than monthly, 3 = Monthly, 4 = Weekly, 5 = Daily

Table 9 presents the descriptive statistics for the potential drivers of teacher safety. Teachers’ quite positive belief about teaching being a secure job likely led them to join the profession ($M = 3.148$, $SD = 0.72$). Also, 97% of teachers agree that students and teachers usually get on well with each other ($M = 3.264$, $SD = 0.50$).

The more surprising result to emerge from the data is that addressing parent/guardian concerns in Kazakhstan are slightly higher (problematic) as a source of stress than intimidation or verbal abuse by students, with a mean closer to “to some extent” ($M = 1.782$, $SD = 0.81$).

In terms of professional development, 83.7% of respondents feel prepared to manage the classroom. Still the majority of teachers needed professional development to a moderate level for both (1) Teacher-parent/guardian co-operation with $M = 2.59$ ($SD = 0.98$) and (2) student behavior and classroom management with $M = 2.54$ ($SD = 1.03$).

Overall, teachers were satisfied with their performance in their schools and the degree of teacher mobility was moderate.

Table 9.
Teacher Safety Factors Variables (Independent Variable)

Item	TALIS Code	M	SD	skew	ICC
Teacher-level variable					
^a Teaching was a secure job (Motivation to Teach)	TT3G07C	3.15	0.72	-0.81	.03
^b Teach. and students usu. get on well	TT3G49A	3.26	0.50	0.23	.06
^b School staff enforces rules for student behaviour	TT3G48G	3.21	0.54	-0.12	.03
^c Addr. par./guard. concerns source of stress	TT3G52J	1.78	0.81	0.75	.04
^b Satisfied with performance in this school	TT3G53I	3.07	0.55	-0.30	.02
Areas prof.dev. student behaviour & class. management (last 12 m.)	TT3G23F	1.21	0.40	1.43	.02
Areas prof.dev. teacher-parent co-operation (last 12 m.)	TT3G23M	1.27	0.44	1.04	.03
^d Prof.dev. needs stud. behaviour and classroom management	TT3G27F	2.54	1.03	-0.18	.12
^d Prof.dev. needs teacher-parent co-operation	TT3G27M	2.59	0.98	-0.28	.17
Principal-level variable					
^e Teachers who began work at this school during the last 12 months	TC3G14A	2.81	1.09	0.63	
^e Teachers who permanently left this school during the last 12 months	TC3G14B	2.18	0.86	1.39	

Note. ^a1 = Not important at all, 2 = Of low importance, 3 = Of moderate importance, 4 = Of high importance; ^b1 = Strongly disagree, 2 = Disagree, 3 = Agree, 4 = Strongly agree; ^c1 = Not at all, 2 = To some extent, 3 = Quite a bit, 4 = A lot; ^d1 = No need at present, 2 = Low level of need, 3 = Moderate level of need, 4 = High level of need; ^e1 = 0, 2 = 1-5, 3 = 6-10, 4 = 11-15, 5 = 16 or more; *N* = 6,566 teachers; *Number of Schools* = 331. Item descriptions slightly abbreviated.

4.3.2 RQ1b: How much do teacher intimidation and verbal abuse vary within and between schools?

In order to identify the degree to which teacher intimidation and verbal abuse varies within- and between-schools, multi-level modeling was utilized. For this question, the following variables were of particular interest: Being intimidated or verbally abused (TT3G52H) ICC .06, Teachers and students usually get on well (TT3G49A), ICC = .06, and Addressing parent/guardian concerns source of stress (TT3G52J), ICC =.04.

Results for RQ1b were illustrated in Tables 8 and 9. For these outcomes of interest, intra-class correlations were under .10 suggesting that less than 10% of the variance in those results could be allocated to between-school effects. Due to minimal effects, to account for clustering, multi-level modeling of outcomes at both the within- and between-school levels was not undertaken. As an alternative, it was decided to estimate CFA and SEM parameters by conducting single level factor analyses (see Skinner, Holt & Smith, 1989; Satorra & Muthen, 1995). This approach was implemented in R with the assistance of the lavaan (Rosseel, 2012) package's CFA and SEM functions, in addition to the lavaan.survey (Oberski, 2014) package's lavaan.survey function.

4.3.3 RQ2a: What measurement model best represents teacher safety in Kazakhstan?

In order to validate the scales proposed for measuring teacher safety in Kazakhstan, a CFA was conducted. According to the fit indices (Table 10), the $X^2/df = 10.84$, i.e., statistically significant with a $p < .001$. Though, this is sensitive to large numbers. In terms of the more robust fit statistics, the CFI and TLI are greater than .90 conservatively .94 and .92 indicative of good fit. Additionally, the RMSEA value of .05 indicates good fit.

Table 10.
Model Fit Indices for Measurement and Structural Model.

Model	Model Fit Indices								
	<i>N</i>	X^2	<i>df</i>	X^2/df	<i>p</i>	CFI	TLI	SRMR	RMSEA
CFA & SEM	4544	1311.171	121	10.84	<.001	.94	.92	.05	.05(L=.04, U=.05)

Note. *N* = number of observations; X^2 = Chi-squared; *df* = degrees of freedom; CFI = comparative fit index; TLI = Tucker-Lewis Index; SRMR = Standardized Root Mean Square Residual; RMSEA = root mean square error of approximation; U = upper 90% confidence interval; L=lower 90% confidence interval.

Item-factor loadings for all factors were reasonably high ($\beta > .44$) while some inter-factor loadings were negative and other correlations consistently lower on average ($r = -.34$ and $.45$)

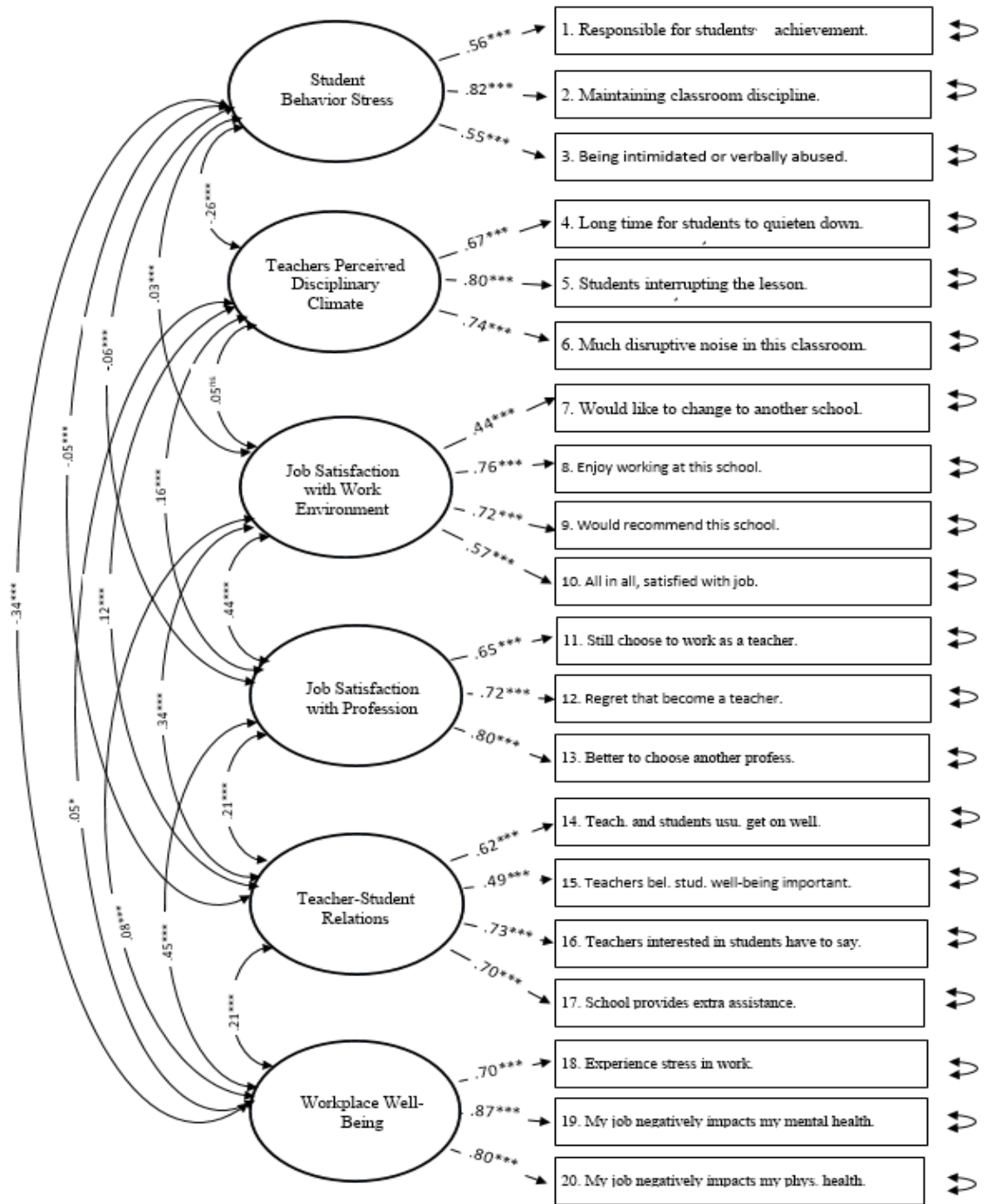


Figure 2. Teacher safety in Kazakhstan Measurement Model. Note. Item descriptions slightly abbreviated; ^{ns}p>.05, *p<.05, **p<.01, ***p<.001

Table 11 presents inter-factor correlation matrix for the measurement model which best represents the main student, workplace, and contextual drivers of teacher stress due to student behavior in Kazakhstan.

All populations exhibit an acceptable fit for all six scales included in this study since factors meet requirements for AVE-SE rule for discriminant validity: $AVE > .50$; related inter-factor variance (r^2) $< AVE$. This was suggestive of discriminant validity.

Table 11.
Inter-Factor Correlation Matrix for the Measurement Model

Factor	Student Behavior Stress $r(r^2)$	Teachers Perceived Disciplinary Climate $r(r^2)$	Job Satisfaction with Work Environment $r(r^2)$	Job Satisfaction with Profession $r(r^2)$	Teacher-Student Relations $r(r^2)$	Workplace Well-Being $r(r^2)$
AVE	.69 [†]	.66 [†]	.73 [†]	.77 [†]	.74 [†]	.84 [†]
Student Behavior Stress	1.0	-	-	-	-	-
Teachers Perceived Disciplinary Climate	-.26*** (.0676)	1.0	-	-	-	-
Job Satisfaction with Work Environment	.03^{ns} (.0009)	.05^{ns} (.0025)	1.0	-	-	-
Job Satisfaction with Profession	-.06* (.0036)	.16*** (.0256)	.44*** (.1936)	1.0	-	-
Teacher-Student Relations	-.05* (.0025)	.12*** (.0144)	.34*** (.1156)	.21*** (.0441)	1.0	-
Workplace Well-Being	-.34*** (.1156)	.05* (.0025)	.08*** (.0064)	.45*** (.2025)	.21*** (.0441)	1.0

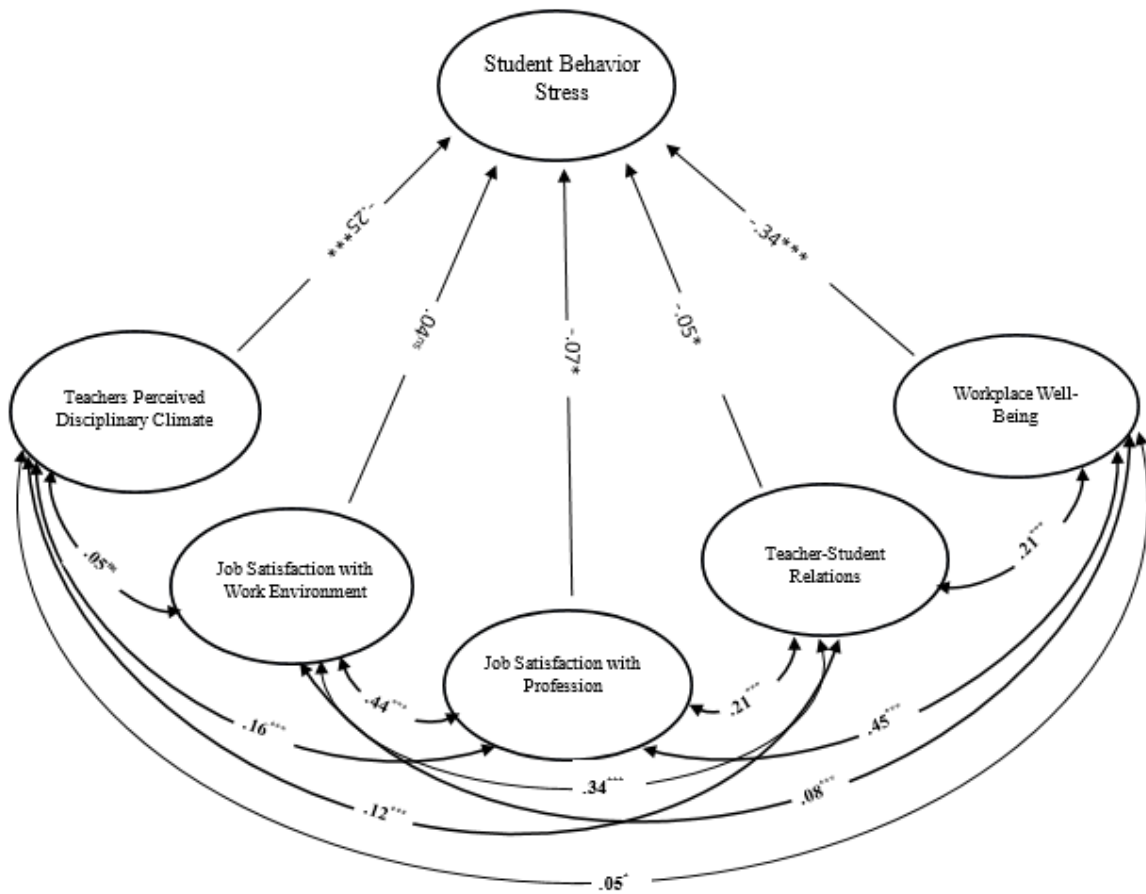
Note. *** $p < .001$, ** $p < .01$, * $p < .05$, ^{ns} $p > .05$; [†]factor meets requirements for AVE-SE rule for discriminant validity: $AVE > .50$; related inter-factor variance (r^2) $< AVE$.

After all factors met the validity requirements, in accordance with the two-step approach, a full structural equation model was specified for RQ2b.

4.3.4 RQ2b: What are the main student, workplace, and contextual drivers of teacher stress due to student behavior in Kazakhstan?

The use of SEM in this study permits the simultaneous evaluation of main student, workplace, and contextual drivers of teacher stress due to student behavior in Kazakhstan. Figure 3 presents the results for RQ2(b). Teacher Perceived Disciplinary Climate ($\beta = -.25$, $p < .001$), Job Satisfaction with Profession ($\beta = -.07$, $p < .05$), Teacher-Student Relationship ($\beta = -.05$, $p < .05$) and Workplace Well-Being ($\beta = -.34$, $p < .001$) were significant predictors of Student Behaviour Stress. Job Satisfaction with Work Environment ($\beta = .04$, $p > .05$) was not a significant predictor.

Figure 3. Structural Equation Model /



4.4 Conclusion

This chapter presented the main findings of the research. The findings were organized according to the research questions. Descriptive statistics demonstrated a low frequency of teacher intimidation or verbal abuse in Kazakhstan while addressing parent/guardian concerns was stressful to some extent. There were minimal effects of school clustering so CFA and SEM models were estimated by not taking into account the nesting of students in schools. Teacher Perceived Disciplinary Climate, Job Satisfaction with Profession, Teacher-Student Relation and Workplace Well-Being were significant predictors of Student Behaviour Stress as experienced by teachers in Kazakhstan.

Chapter 5. Discussion

5.1 Introduction

The previous chapter described the results for the study on teacher safety inclusive of the descriptive statistics, multi-level modeling, confirmatory factor analysis, and structural equation modeling procedures as applied to the teacher and principal data for 6,566 middle-school teachers and 331 associated principals in Kazakhstan from TALIS 2018 survey. The study aimed at understanding teacher safety in schools in Kazakhstan. The data analysis focused on measuring the individual, relationship, community, and societal factors on teacher safety. Individual factors included teacher gender, age, and years of work. Relationship factors included student- and parent-teacher relationships, while community factors focused on school type, and location. Finally, societal factors were measured by way of, for example job satisfaction.

The results of the analysis suggest that teachers likely feel safe in the schools of Kazakhstan and quite rarely experience intimidation or verbal abuse which is considered to be the most common type of violence against teachers (Gregory, Cornell, & Fan, 2012; Alonso, Lopez-Castedo, & Juste, 2009; Mooij, 2011; Ozdemir, 2012). This chapter will discuss the results of the study according to the theoretical framework, literature review, and research questions.

5.2 Individual Factors

The OECD's Teaching and Learning International Survey gives teachers and school leaders a voice to represent their opinions, perceptions, beliefs, and accounts of their activities in schools (OECD, 2019). Based on these responses from teachers in Kazakhstan, findings suggest that individual factors such as age, gender, work experience, and history of intimidation play no significant role beyond the effects of the relational and societal predictors: Teacher Perceived Disciplinary Climate, Job Satisfaction with Profession, Teacher-Student Relations, and Work Place Wellbeing. This finding runs counter to the conceptual framework as set out initially in this thesis. This suggests that experiences of intimidation and bullying are not driven by individual demographic factors of teachers but are more associated with workplace conditions, school climate, and relational aspects

between teachers and students. Therefore, the theories that integrate individual factors may not be relevant to the current milieu. Possible revision of these theories may be in order (see Spilt, Koomen, & Thijs, 2011; Galand, Lecocq, & Philippot, 2007; Ofsted, 2019).

5.3 Relationship Factors

In terms of relationship factors, relations between students and teachers are positive overall, with 97% of teachers in Kazakhstan agreeing that students and teachers usually get on well with each other. However, as stated in the previous section, intimidation or verbal abuse by students is a source of teacher stress for a considerable number of educators. Relational factors appeared to feature as small though important predictors in the final model. For example, The Teacher-Student Relations variable was the fourth largest contributor to teacher experience of intimidation and stress suggestive of a small but important effect. Disciplinary Climate could also be categorized as an important relationship factor though this would extend to the relationships between the teacher and all students. In the current study, this was the second largest predictor of teacher experience of intimidation and stress. Therefore, in terms of relationships in the classroom, both dyadic student-teacher and, more broadly, teacher-student in terms of disciplinary control, appear to be the important drivers of teacher stress and experience of intimidation in Kazakhstan. This general pattern suggests that the maintenance of class discipline represents a key aspect of the reduction of stress and intimidation in schools in Kazakhstan. Though this is small, this result suggests that support and genuine care from teachers can reduce incidents of stress due to mal-adaptive classroom behavior and incidents of intimidation and abuse. Promoting parental involvement can “contribute to children’s socialization, emotional well-being, and behavioral responses” (Cahu, & Quota, 2019, p. 13).

5.4 Community Factors

The second question in this study addressed the features of schools that are associated with becoming victims of violence. It was hypothesized that teachers with a history of experiencing intimidation or verbal abuse by students are set in urban overcrowded public schools as found in previous studies (DeVoe et. al., 2004; Gottfredson, Gottfredson, Payne, & Gottfredson, 2005; Dinkes, Kemp, Baum, & Snyder 2009). However, in this study intra-class correlations were less than 10% of the variance with a quite minimal between school effects for the outcomes of interest. This suggests that teacher experience of violence is not systemically related to the school which he or she teaches in. This is an interesting finding and more research should be done to identify the possible school-based drivers of teachers' experience of violence.

5.5 Societal Factors

Generally, stress affects teacher well-being, a lack of engagement, job dissatisfaction, and poor performance and even can lead to teacher attrition (OECD, 2019). Regarding Student Behavioral Stress scale, accountability for students' achievements causes more teacher stress compared with students' aggressive behavior. It is difficult to explain this result, but it might be related to the types of responsibilities. For example, when teachers demonstrate a personal sense of responsibility, they are self-determined and ready to invest effort in work-related tasks even without exterior control or motivation (Lauermann & Karabenick, 2011); consequently, this type of responsibility is unlikely to be a source of stress. In contrast, if teachers are held formally accountable for learning outcomes that refer to conformity with policy and professional norms (Anderson 2005) due to social-emotional climate tension they can experience stress (Collie, Shapka, & Perry, 2012).

Another explanation might be related to the lack of clarity concerning the responsibility for learning outcomes around three main stakeholders (students, teachers, and parents). For example, the participants of Peterson and his colleagues (2011, p. 9) study "pointed their finger away from themselves" when students demonstrated low academic performance, "with the students and parents

tending to blame the teacher; and the teachers being more likely to look to students and parents”. Consequently, this could lead to adverse relationship factors.

The current study found that Workplace Well-Being has a considerable negative effect on Student Behavior Stress. These findings suggest that enhancing workplace wellbeing, specifically alleviating the negative impacts on mental and physical health, will likely reduce student behaviour stress and conflict. In their study, Greenberg, Brown, and Abenavoli, (2016) illustrated different kind of programs developed to reduce teacher stress and improve teacher well-being, health and performance. For example, Wellness Programs in Schools, which is intended to enhance teachers’ physical and mental health, has helped 46% of American teachers reduce body mass index, lower systolic blood pressure (about 35%) and blood glucose (about 65%). Another significant program is Mindfulness Programs which assist educators to manage emotions by reducing negative consequences, teacher burnout, sleep-disorder, and daily physical symptoms (Abenavoli, Jennings, Greenberg, Harris, & Katz, 2013). These programs can be included into in-service teacher courses in Kazakhstan.

Job Satisfaction has a very small but statistically significant negative effect on incidents of Student Behavior Stress. Although, negligible, this finding suggests that improving the general conditions of the job may also alleviate some of the stress due to poor classroom discipline and incidents of intimidation and verbal abuse. The status of teachers and teacher job satisfaction are closely related. Therefore, the effective implementation of law “On the Teacher’s Status” in Kazakhstan can improve teacher job satisfaction.

5.6 Conclusion

The purpose of this chapter was to discuss the main findings of the secondary analysis of the items of interest from the TALIS 2018 data set. The chapter was organized according to the four-level social-ecological model (Krug, Dahlberg, Mercy, Zwi, and Lozano, 2002). The results show that teacher intimidation or verbal abuse are not driven by individual demographic factors of teachers

but are more associated with workplace conditions, school climate, and relational aspects between teachers and students. Also, the findings suggest that teacher experience of violence is not systemically related to the school type or location.

Chapter 6 Conclusion

6.1 Summary of Research Findings

The main goal of the current study was to determine the drivers of teacher safety (or lack thereof) in Kazakhstan. These findings suggest that in general teachers feel safe in their school and their relationships with students are quite positive. It was also shown that individual factors (gender, age and years of work) and community factors (school type and location) have no statistically significant correlation with the frequency of teacher intimidation or verbal abuse in Kazakhstan. This study has demonstrated, for the first time, that teacher intimidation or verbal abuse in schools in Kazakhstan is mostly associated with workplace conditions, school climate, and relational aspects between teachers and students.

6.2 Limitations and Recommendations

Finally, a number of important limitations need to be considered. First, despite data being drawn from an established organization and having undergone rigorous procedures, the questionnaires were completed by teachers and school leaders and represent their perceptions only, which could potentially result in some inconsistent and inaccurate data. For example, while teachers might agree that they enjoy working at their school, they may also want to change their school. Second, conducting secondary analysis limits us from investigating other drivers of teacher safety in Kazakhstan. For example, understanding the relationship between teachers and school leaders may also expand our understanding of teacher safety in Kazakhstan. Third, the data collection is limited by middle-school teachers. Primary school pupils and higher secondary school students behave differently from middle-school students so this should also be explored.

Recommendation for future research

Based on the results of the study and the limitations indicated above, some recommendations for future research can be suggested. For instance, future studies could replicate the results of this study

by surveying schoolteachers of all levels. Moreover, our knowledge of teacher safety issues would be extended if future studies cover more items about types of violence against teachers. Also, other studies could consider exploring the school leaders and teaching staff relationships by examining the effectiveness of teacher support services in school.

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Appendix A

**В Комитет по правовой статистике и
специальным учетам Генеральной
прокуратуры Республики Казахстан**

г. Нур-Султан, ул. Мәскеу 34

**от: магистранта Высшей школы
образования АОО «Назарбаев
Университет»
Досмурзиной Д.Б.**

ИИН 830805401182

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(Через портал электронного правительства)*

г. Алматы

«13» ноября 2020 года

ЗАПРОС

В связи с выбором выпускной научно-исследовательской работы магистратуры Назарбаев Университета на тему «Безопасность учителей в школах Казахстана», для приведения статистических данных и углубленного изучения, мною осуществляется сбор данных для объективного, всестороннего и полного исследования выбранной темы.

На основании вышеизложенного и руководствуясь ст. ст. 6,7,8 Закона Республики Казахстан «О порядке рассмотрения обращений физических и юридических лиц»

ПРОШУ ВАС:

1. Предоставить сведения (статистические данные) по уголовным и административным правонарушениям, по которым потерпевшими признавались учителя (педагоги, работники организаций образования), а правонарушителями, подозреваемыми, обвиняемыми учащиеся в разрезе правонарушений против личности на период за последние 5 лет.

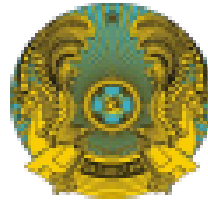
С уважением,

(подписано ЭЦП)

Досмурзина Д.Б.

Appendix B

«ҚАЗАҚСТАН РЕСПУБЛИКАСЫ
БАС ПРОКУРАТУРАСЫНЫҢ
ҚҰҚЫҚТЫҚ СТАТИСТИКА
ЖӘНЕ АРНАЙЫ БЕСПЕНЕ АЛУ
ЖӨНІНДЕГІ КОМИТЕТІ»
МӘМЛЕКЕТТІК МӘКЕМЕСІ



ГОСУДАРСТВЕННОЕ
УЧРЕЖДЕНИЕ «КОМИТЕТ ПО
ПРАВОВОЙ СТАТИСТИКЕ И
СПЕЦИАЛЬНОМУ УЧЕТАМ
ГЕНЕРАЛЬНОЙ ПРОКУРАТУРЫ
РЕСПУБЛИКИ КАЗАХСТАН»



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20.11.2020 № 3-20-20-69208

Досмуриной Д.Б.

Портал «электронного правительства»

Комитетом рассмотрен Ваш запрос от 13 ноября т.г., ЖТ-Д-201-20-02423 о предоставлении статистических данных за 5 лет, о зарегистрированных уголовных и административных правонарушений против личности, по которым потерпевшими признавались учителя, при этом правонарушителями явились учащиеся учебных заведений.

Согласно сведениям Единого реестра досудебных расследований, за запрашиваемый период зарегистрировано 2 преступления данной категории, в 27.12.2016г. в г.Павлодар по ст.106 ч.2 УК и 21.10.2016г. в г.Актобе по ст.107 ч.2 УК.

По административным делам, сведениями не располагаем.

В соответствии со статьей 12 Закона Республики Казахстан «О порядке рассмотрения обращений физических и юридических лиц», Вы вправе обжаловать данный ответ вышестоящему должностному лицу либо в суд.

Заместитель Председателя

Г. Миразов

Документ подготовил: Асбаев Марат Куанышович, 7175271@prokuror.kz
Документ подписал: Миралон Габит Турсунов, 20.11.2020 15:24:19

ИЭС-КазНП.ИД-2017110

Исп. Асбаев М.К.
тел.317-511

Appendix C

1. Reading in TALIS Teacher Data

```
library("haven")
talis.teacher <- haven::read_sav("BTGKAZT3_TALIS_Teacher.sav")
talis.principal <- haven::read_sav("BCGKAZT3_TALIS_Principal.sav")
```

2. Exploring the data

```
# (a) using nrow and ncol functions on the data frames
```

```
dim(talis.teacher)
dim(talis.principal)
```

```
# (b) trying to find the variables of interest
```

```
names(talis.teacher)
names(talis.principal)
```

```
# (c) exploring attributes(df$variable): This reviews SPSS variable labels
```

```
attributes(talis.teacher$IDCNTRY)
attributes(talis.principal$IDCNTRY)
```

3. Subsetting the TALIS teacher and principal data to only include Kazakhstan

```
class(talis.teacher)
str(talis.teacher)
dim(talis.teacher)
colnames(talis.teacher)
length(unique(talis.teacher$IDCNTRY))
head(talis.teacher)
talis.teacher[talis.teacher$IDCNTRY== 398, ]
df.kaz.talis.teacher <- talis.teacher[talis.teacher$IDCNTRY== 398, ]
head(df.kaz.talis.teacher)
```

```
class(talis.principal)
str(talis.principal)
dim(talis.principal)
length(unique(talis.principal$IDCNTRY))
head(talis.principal)
talis.principal[talis.principal$IDCNTRY== 398, ]
df.kaz.talis.principal <- talis.principal[talis.principal$IDCNTRY== 398, ]
head(df.kaz.talis.principal)
```

4. Merging the TALIS principal and teacher datasets to create a master dataset names(df.kaz.talis.teacher)[1:10]

```
head(df.kaz.talis.teacher)
```

```
names(df.kaz.talis.principal)[1:10]
head(df.kaz.talis.principal)
```

```
length(unique(df.kaz.talis.teacher$IDSCHOOL))
length(unique(df.kaz.talis.principal$IDSCHOOL))
6566/331
```

```
talis.teach.school <- merge(df.kaz.talis.teacher, df.kaz.talis.principal, all.x = T, by = "IDSCHOOL")
```

5. Exploring the merged data frame

```
head(talis.teach.school)
dim(talis.teach.school)          ### 6566 940
names(talis.teach.school)
class(talis.teach.school)
length(talis.teach.school)
str(talis.teach.school)
```

6. Identifying the variables to include in study

Running Head: Understanding Teacher Safety in Schools in Kazakhstan

```
project.variable.Logic <- colnames(talis.teach.school) %in% c("IDSCHOOL", "TC3G12", "TC3G10", "TC3G14A",
"TC3G14B", "TC3G30D",
"IDTEACH", "TT3G01", "TCHAGEGR", "TT3G11B", "TT3G35E", "TT3G07C",
"TT3G23F", "TT3G23M", "TT3G27F", "TT3G27M", "TT3G48G", "TT3G52J",
"TT3G53I", "T3STBEH", "TT3G52F", "TT3G52G", "TT3G52H", "T3DISC",
"TT3G41A", "TT3G41B", "TT3G41C", "TT3G41D", "T3JOBBSA", "T3JSENV",
"TT3G53C", "TT3G53E", "TT3G53G", "TT3G53J", "T3JSPRO", "TT3G53A",
"TT3G53B", "TT3G53D", "TT3G53F", "T3STUD", "TT3G49A", "TT3G49B",
"TT3G49C", "TT3G49D", "T3WELS", "TT3G51A", "TT3G51B", "TT3G51C",
"TT3G51D"
)

project.df <- talis.teach.school[, project.variable.Logic]
head(project.df)
dim(project.df)          ### 6566 49

#### 7. Checking the number of complete cases
total.complete.cases <- sum(complete.cases(project.df))
percentage.complete <- total.complete.cases/ nrow(project.df) *100
print(percentage.complete) # 88.40999

#### 8. Removing missing data
library("tidyr")
removed <- project.df %>% tidyr::drop_na()
dim(removed)            ### 5805 49

#### 9. Checking variation in variables within schools: removing singletons
str(removed)
head(removed)
colnames(removed)
sort(table(removed$IDSCHOOL))  ### at least 3 teachers (no singletons)

####10. Checking variation in all variables within schools
# (a) Checking principal-level variables variations within schools #####

# School type
removed$TC3G12
summary(removed$TC3G12)
table(removed$TC3G12)
TC3G12.Sds <- tapply(removed$TC3G12, removed$IDSCHOOL, FUN = function(x)sd(x, na.rm = T))
sort(TC3G12.Sds)

# School location
removed$TC3G10
summary(removed$TC3G10)
table(removed$TC3G10)
TC3G10.Sds <- tapply(removed$TC3G10, removed$IDSCHOOL, FUN = function(x)sd(x, na.rm = T))
sort(TC3G10.Sds)

# Teachers start working last 12 month
removed$TC3G14A
summary(removed$TC3G14A)
table(removed$TC3G14A)
TC3G14A.Sds <- tapply(removed$TC3G14A, removed$IDSCHOOL, FUN = function(x)sd(x, na.rm = T))
sort(TC3G14A.Sds)

# Teachers left last 12 month
removed$TC3G14B
summary(removed$TC3G14B)
table(removed$TC3G14B)
TC3G14B.Sds <- tapply(removed$TC3G14B, removed$IDSCHOOL, FUN = function(x)sd(x, na.rm = T))
sort(TC3G14B.Sds)

# Intimidation or verbal abuse of teachers or staff
removed$TC3G30D[removed$IDSCHOOL == 3003]
```

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```
table(removed$TC3G30D)
summary(removed$TC3G30D)
table(removed$TC3G30D)
TC3G30D.Sds <- tapply(removed$TC3G30D, removed$IDSCHOOL, FUN = function(x)sd(x, na.rm = T))
sort(TC3G30D.Sds)

# (b) Checking teacher- level variables variations in schools #####

# IDSCHOOL
table(removed$IDSCHOOL)
removed$IDSCHOOL
summary(removed$IDSCHOOL)
table(removed$IDSCHOOL)
IDSCHOOL.Sds <- tapply(removed$IDSCHOOL, removed$IDSCHOOL, FUN = function(x)sd(x, na.rm = T))
sort(IDSCHOOL.Sds)

# IDTEACH
table(removed$IDTEACH)
removed$IDTEACH
summary(removed$IDTEACH)
table(removed$IDTEACH)
IDTEACH.Sds <- tapply(removed$IDTEACH, removed$IDSCHOOL, FUN = function(x)sd(x, na.rm = T))
sort(IDTEACH.Sds)

# ESCS
table(removed$IDSCHOOL)
removed$TT3G35E[removed$IDSCHOOL == 3001]
summary(removed$TT3G35E)
table(removed$TT3G35E)
TT3G35E.Sds <- tapply(removed$TT3G35E, removed$IDSCHOOL, FUN = function(x)sd(x, na.rm = T))
sort(TT3G35E.Sds)
Sch.no.ESCS.sd <- names(which(sort(TT3G35E.Sds) == 0))
print(Sch.no.ESCS.sd)
length(Sch.no.ESCS.sd)
IDSCH.ESCS.v.logical <- !removed$IDSCHOOL %in% Sch.no.ESCS.sd
removed <- removed[IDSCH.ESCS.v.logical, ]
dim(removed)          ### 5499 49    (306 teachers removed, 20 schools)
sum(is.na(TT3G35E.Sds))

# School staff enforces rules for student behaviour
removed$TT3G48G[removed$IDSCHOOL == 3001]
summary(removed$TT3G48G)
table(removed$TT3G48G)
TT3G48G.Sds <- tapply(removed$TT3G48G, removed$IDSCHOOL, FUN = function(x)sd(x, na.rm = T))
sort(TT3G48G.Sds)
Sch.no.staff.enf.sd <- names(which(sort(TT3G48G.Sds) == 0))
print(Sch.no.staff.enf.sd)
length(Sch.no.staff.enf.sd)
IDSCH.staff.enf.v.logical <- !removed$IDSCHOOL %in% Sch.no.staff.enf.sd
removed <- removed[IDSCH.staff.enf.v.logical, ]
dim(removed)          ### 5483 49    (16 teachers removed, 1 school)
sum(is.na(TT3G48G.Sds))

# Teachers and students usually get on well with each other
removed$TT3G49A[removed$IDSCHOOL == 3001]
summary(removed$TT3G49A)
table(removed$TT3G49A)
TT3G49A.Sds <- tapply(removed$TT3G49A, removed$IDSCHOOL, FUN = function(x)sd(x, na.rm = T))
sort(TT3G49A.Sds)
Sch.no.t.s.getonwell.sd <- names(which(sort(TT3G49A.Sds) == 0))
print(Sch.no.t.s.getonwell.sd)
IDSCH.t.s.getonwell.v.logical <- !removed$IDSCHOOL %in% Sch.no.t.s.getonwell.sd
removed <- removed[IDSCH.t.s.getonwell.v.logical, ]
dim(removed)          ### 5460 49    (23 teachers removed, 2 schools)
sum(is.na(TT3G49A.Sds))
```

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```
# Teacher gender
removed$TT3G01
summary(removed$TT3G01)
table(removed$TT3G01)
TT3G01.Sds <- tapply(removed$TT3G01, removed$IDSCHOOL, FUN = function(x)sd(x, na.rm = T))
sort(TT3G01.Sds)
Sch.no.G.sd <- names(which(sort(TT3G01.Sds) == 0))
print(Sch.no.G.sd)
length(Sch.no.G.sd)
IDSCH.Gen.v.logical <- !removed$IDSCHOOL %in% Sch.no.G.sd
removed <- removed[IDSCH.Gen.v.logical, ]
dim(removed)          ### 5349 49   (111 teachers removed, 7 schools)
sum(is.na(TT3G01.Sds))

# Teacher age
removed$TCHAGEGR
summary(removed$TCHAGEGR)
table(removed$TCHAGEGR)
TCHAGEGR.Sds <- tapply(removed$TCHAGEGR, removed$IDSCHOOL, FUN = function(x)sd(x, na.rm = T))
sort(TCHAGEGR.Sds)
dim(removed)

# Teaching was a secure job
removed$TT3G07C
summary(removed$TT3G07C)
table(removed$TT3G07C)
TT3G07C.Sds <- tapply(removed$TT3G07C, removed$IDSCHOOL, FUN = function(x)sd(x, na.rm = T))
sort(TT3G07C.Sds)
Sch.no.secure_job.sd <- names(which(sort(TT3G07C.Sds) == 0))
print(Sch.no.secure_job.sd)
IDSCH.secure_job.v.logical <- !removed$IDSCHOOL %in% Sch.no.secure_job.sd
removed <- removed[IDSCH.secure_job.v.logical, ]
dim(removed)          ### 5343 49   (6 teachers removed, 1 school)
sum(is.na(TT3G07C.Sds))

# Years of work experience as a teacher in total
removed$TT3G11B
summary(removed$TT3G11B)
table(removed$TT3G11B)
TT3G11B.Sds <- tapply(removed$TT3G11B, removed$IDSCHOOL, FUN = function(x)sd(x, na.rm = T))
sort(TT3G11B.Sds)
dim(removed)

# Prof. development on student behaviour, classroom management. last 12 months
removed$TT3G23F
summary(removed$TT3G23F)
table(removed$TT3G23F)
TT3G23F.Sds <- tapply(removed$TT3G23F, removed$IDSCHOOL, FUN = function(x)sd(x, na.rm = T))
sort(TT3G23F.Sds)
Sch.no.beh.cl.man.sd <- names(which(sort(TT3G23F.Sds) == 0))
print(Sch.no.beh.cl.man.sd)
length(Sch.no.beh.cl.man.sd)
IDSCH.beh.cl.man.v.logical <- !removed$IDSCHOOL %in% Sch.no.beh.cl.man.sd
removed <- removed[IDSCH.beh.cl.man.v.logical, ]
dim(removed)          ### 4945 49   (398 teachers removed, 24 schools)
sum(is.na(TT3G23F.Sds))

# Prof. development on parent/guardian cooperation last 12 months
removed$TT3G23M
summary(removed$TT3G23M)
table(removed$TT3G23M)
TT3G23M.Sds <- tapply(removed$TT3G23M, removed$IDSCHOOL, FUN = function(x)sd(x, na.rm = T))
sort(TT3G23M.Sds)
Sch.no.par.coop.topic.sd <- names(which(sort(TT3G23M.Sds) == 0))
print(Sch.no.par.coop.topic.sd)
length(Sch.no.par.coop.topic.sd)
```

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```
IDSCH.par.coop.topic.v.logical <- !removed$IDSCHOOL %in% Sch.no.par.coop.topic.sd
removed <- removed[IDSCH.par.coop.topic.v.logical, ]
dim(removed)                ### 4828 49    (117 teachers removed, 8 schools)
sum(is.na(TT3G23M.Sds))

# Prof. development needed on student behaviors and classroom management
removed$TT3G27F
summary(removed$TT3G27F)
table(removed$TT3G27F)
TT3G27F.Sds <- tapply(removed$TT3G27F, removed$IDSCHOOL, FUN = function(x)sd(x, na.rm = T))
sort(TT3G27F.Sds)
dim(removed)

#Prof. development needed on teacher-parent co-operation
removed$TT3G27M
summary(removed$TT3G27M)
table(removed$TT3G27M)
TT3G27M.Sds <- tapply(removed$TT3G27M, removed$IDSCHOOL, FUN = function(x)sd(x, na.rm = T))
sort(TT3G27M.Sds)
dim(removed)

# Addressing parent or guardian concerns stressful
removed$TT3G52J
summary(removed$TT3G52J)
table(removed$TT3G52J)
TT3G52J.Sds <- tapply(removed$TT3G52J, removed$IDSCHOOL, FUN = function(x)sd(x, na.rm = T))
sort(TT3G52J.Sds)
Sch.no.addr.parent.con.sd <- names(which(sort(TT3G52J.Sds) == 0))
print(Sch.no.addr.parent.con.sd)
IDSCH.addr.parent.con.v.logical <- !removed$IDSCHOOL %in% Sch.no.addr.parent.con.sd
removed <- removed[IDSCH.addr.parent.con.v.logical, ]
dim(removed)                ### 4813 49    (15 teachers removed, 1 school)
sum(is.na(TT3G52J.Sds))

# Satisfied with performance in this school
removed$TT3G53I
summary(removed$TT3G53I)
table(removed$TT3G53I)
TT3G53I.Sds <- tapply(removed$TT3G53I, removed$IDSCHOOL, FUN = function(x)sd(x, na.rm = T))
sort(TT3G53I.Sds)
Sch.no.sati.with.sch.sd <- names(which(sort(TT3G53I.Sds) == 0))
print(Sch.no.sati.with.sch.sd)
IDSCH.sati.with.sch.v.logical <- !removed$IDSCHOOL %in% Sch.no.sati.with.sch.sd
removed <- removed[IDSCH.sati.with.sch.v.logical, ]
dim(removed)                ### 4777 49    (36 teachers removed, 3 schools)
sum(is.na(TT3G53I.Sds))

# Check student behavior stress / Configural (All)
removed$T3STBEH
summary(removed$T3STBEH)
table(removed$T3STBEH)
T3STBEH.Sds <- tapply(removed$T3STBEH, removed$IDSCHOOL, FUN = function(x)sd(x, na.rm = T))
sort(T3STBEH.Sds)
dim(removed)

# Responsible for students' achievement
removed$TT3G52F
summary(removed$TT3G52F)
table(removed$TT3G52F)
TT3G52F.Sds <- tapply(removed$TT3G52F, removed$IDSCHOOL, FUN = function(x)sd(x, na.rm = T))
sort(TT3G52F.Sds)
dim(removed)

# Maintaining classroom discipline
removed$TT3G52G
summary(removed$TT3G52G)
```

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```
table(removed$TT3G52G)
TT3G52G.Sds <- tapply(removed$TT3G52G, removed$IDSCHOOL, FUN = function(x)sd(x, na.rm = T))
sort(TT3G52G.Sds)
dim(removed)

# Being intimidated or verbally abused by students
removed$TT3G52H
summary(removed$TT3G52H)
table(removed$TT3G52H)
TT3G52H.Sds <- tapply(removed$TT3G52H, removed$IDSCHOOL, FUN = function(x)sd(x, na.rm = T))
sort(TT3G52H.Sds)
Sch.no.imti.ver.abus.sd <- names(which(sort(TT3G52H.Sds) == 0))
print(Sch.no.imti.ver.abus.sd)
length(Sch.no.imti.ver.abus.sd)
IDSCH.imti.ver.abus.v.logical <- !removed$IDSCHOOL %in% Sch.no.imti.ver.abus.sd
removed <- removed[IDSCH.imti.ver.abus.v.logical, ]
dim(removed)          ### 4647  49    (130 teachers removed, 8 schools)
sum(is.na(TT3G52H.Sds)

# Teachers perceived disciplinary climate / Metric (All)
removed$T3DISC
summary(removed$T3DISC)
table(removed$T3DISC)
T3DISC.Sds <- tapply(removed$T3DISC, removed$IDSCHOOL, FUN = function(x)sd(x, na.rm = T))
sort(T3DISC.Sds)
dim(removed)

# When the lesson begins, I have to wait quite a long time for students to quieten down
removed$TT3G41A
summary(removed$TT3G41A)
table(removed$TT3G41A)
TT3G41A.Sds <- tapply(removed$TT3G41A, removed$IDSCHOOL, FUN = function(x)sd(x, na.rm = T))
sort(TT3G41A.Sds)
dim(removed)

# Check Students in this class take care to create a pleasant learning atmosphere
removed$TT3G41B
summary(removed$TT3G41B)
table(removed$TT3G41B)
TT3G41B.Sds <- tapply(removed$TT3G41B, removed$IDSCHOOL, FUN = function(x)sd(x, na.rm = T))
sort(TT3G41B.Sds)
dim(removed)

# I lose quite a lot of time because of students interrupting the lesson
removed$TT3G41C
summary(removed$TT3G41C)
table(removed$TT3G41C)
TT3G41C.Sds <- tapply(removed$TT3G41C, removed$IDSCHOOL, FUN = function(x)sd(x, na.rm = T))
sort(TT3G41C.Sds)
dim(removed)

# There is much disruptive noise in this classroom
removed$TT3G41D
summary(removed$TT3G41D)
table(removed$TT3G41D)
TT3G41D.Sds <- tapply(removed$TT3G41D, removed$IDSCHOOL, FUN = function(x)sd(x, na.rm = T))
sort(TT3G41D.Sds)
dim(removed)

# Job satisfaction with work environment (subscale)
removed$T3JSENV
summary(removed$T3JSENV)
table(removed$T3JSENV)
T3JSENV.Sds <- tapply(removed$T3JSENV, removed$IDSCHOOL, FUN = function(x)sd(x, na.rm = T))
sort(T3JSENV.Sds)
dim(removed)
```

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```
# I would like to change to another school if that were possible
removed$TT3G53C
summary(removed$TT3G53C)
table(removed$TT3G53C)
TT3G53C.Sds <- tapply(removed$TT3G53C, removed$IDSCHOOL, FUN = function(x)sd(x, na.rm = T))
sort(TT3G53C.Sds)

# Enjoy working at this school
removed$TT3G53E
summary(removed$TT3G53E)
table(removed$TT3G53E)
TT3G53E.Sds <- tapply(removed$TT3G53E, removed$IDSCHOOL, FUN = function(x)sd(x, na.rm = T))
sort(TT3G53E.Sds)
dim(removed)

# I recommend this school as a good place to work
removed$TT3G53G
summary(removed$TT3G53G)
table(removed$TT3G53G)
TT3G53G.Sds <- tapply(removed$TT3G53G, removed$IDSCHOOL, FUN = function(x)sd(x, na.rm = T))
sort(TT3G53G.Sds)
dim(removed)

# Satisfied with job
removed$TT3G53J
summary(removed$TT3G53J)
table(removed$TT3G53J)
TT3G53J.Sds <- tapply(removed$TT3G53J, removed$IDSCHOOL, FUN = function(x)sd(x, na.rm = T))
sort(TT3G53J.Sds)
Sch.no.satis.withjob.sd <- names(which(sort(TT3G53J.Sds) == 0))
print(Sch.no.satis.withjob.sd)
length(Sch.no.satis.withjob.sd)
IDSCH.satis.withjob.v.logical <- !removed$IDSCHOOL %in% Sch.no.satis.withjob.sd
removed <- removed[IDSCH.satis.withjob.v.logical, ]
dim(removed)                ### 4629  49   (18 teachers removed, 2 schools)
sum(is.na(TT3G53J.Sds))

# Job satisfaction with profession (subscale)
removed$T3JSPRO
summary(removed$T3JSPRO)
table(removed$T3JSPRO)
T3JSPRO.Sds <- tapply(removed$T3JSPRO, removed$IDSCHOOL, FUN = function(x)sd(x, na.rm = T))
sort(T3JSPRO.Sds)
dim(removed)

# The advantages of being a teacher clearly outweigh the disadvantages
removed$TT3G53A
summary(removed$TT3G53A)
table(removed$TT3G53A)
TT3G53A.Sds <- tapply(removed$TT3G53A, removed$IDSCHOOL, FUN = function(x)sd(x, na.rm = T))
sort(TT3G53A.Sds)
dim(removed)

# If I could decide again, I would still choose to work as a teacher.
removed$TT3G53B
summary(removed$TT3G53B)
table(removed$TT3G53B)
TT3G53B.Sds <- tapply(removed$TT3G53B, removed$IDSCHOOL, FUN = function(x)sd(x, na.rm = T))
sort(TT3G53B.Sds)
dim(removed)

# I regret that I decided to become a teacher
removed$TT3G53D
summary(removed$TT3G53D)
table(removed$TT3G53D)
```

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```
TT3G53D.Sds <- tapply(removed$TT3G53D, removed$IDSCHOOL, FUN = function(x)sd(x, na.rm = T))
sort(TT3G53D.Sds)
dim(removed)
```

```
# I wonder whether it would have been better to choose another profession
removed$TT3G53F
summary(removed$TT3G53F)
table(removed$TT3G53F)
TT3G53F.Sds <- tapply(removed$TT3G53F, removed$IDSCHOOL, FUN = function(x)sd(x, na.rm = T))
sort(TT3G53F.Sds)
dim(removed)
```

```
# Teacher-student relations / Metric (All)
removed$T3STUD
summary(removed$T3STUD)
table(removed$T3STUD)
T3STUD.Sds <- tapply(removed$T3STUD, removed$IDSCHOOL, FUN = function(x)sd(x, na.rm = T))
sort(T3STUD.Sds)
dim(removed)
```

```
# Most teachers believe that the students' well-being is important.
removed$TT3G49B
summary(removed$TT3G49B)
table(removed$TT3G49B)
TT3G49B.Sds <- tapply(removed$TT3G49B, removed$IDSCHOOL, FUN = function(x)sd(x, na.rm = T))
sort(TT3G49B.Sds)
dim(removed)
```

```
# Most teachers are interested in what students have to say
removed$TT3G49C
summary(removed$TT3G49C)
table(removed$TT3G49C)
TT3G49C.Sds <- tapply(removed$TT3G49C, removed$IDSCHOOL, FUN = function(x)sd(x, na.rm = T))
sort(TT3G49C.Sds)
Sch.no.T.inter.stud.say.sd <- names(which(sort(TT3G49C.Sds) == 0))
print(Sch.no.T.inter.stud.say.sd )
IDSCH.T.inter.stud.say.v.logical <- !removed$IDSCHOOL %in% Sch.no.T.inter.stud.say.sd
removed <- removed[IDSCH.T.inter.stud.say.v.logical, ]
dim(removed)          ### 4581  49   (48 teachers removed, 3 schools)
sum(is.na(TT3G49C.Sds))
```

```
# If a student needs extra assistance, the school provides it
removed$TT3G49D
summary(removed$TT3G49D)
table(removed$TT3G49D)
TT3G49D.Sds <- tapply(removed$TT3G49D, removed$IDSCHOOL, FUN = function(x)sd(x, na.rm = T))
sort(TT3G49D.Sds)
dim(removed)
```

```
# Check Workplace well-being and stress
removed$T3WELS
summary(removed$T3WELS)
table(removed$T3WELS)
T3WELS.Sds <- tapply(removed$T3WELS, removed$IDSCHOOL, FUN = function(x)sd(x, na.rm = T))
sort(T3WELS.Sds)
dim(removed)
```

```
# I experience stress in my work
removed$TT3G51A
summary(removed$TT3G51A)
table(removed$TT3G51A)
TT3G51A.Sds <- tapply(removed$TT3G51A, removed$IDSCHOOL, FUN = function(x)sd(x, na.rm = T))
sort(TT3G51A.Sds)
Sch.no.exp.str.sd <- names(which(sort(TT3G51A.Sds) == 0))
print(Sch.no.exp.str.sd)
IDSCH.exp.str.v.logical <- !removed$IDSCHOOL %in% Sch.no.exp.str.sd
```

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```
removed <- removed[IDSCH.exp.str.v.logical, ]
dim(removed)          ### 4563  49   (18 teachers removed, 1 school)
sum(is.na(TT3G51A.Sds)

# My job leaves me time for my personal life
removed$TT3G51B
summary(removed$TT3G51B)
table(removed$TT3G51B)
TT3G51B.Sds <- tapply(removed$TT3G51B, removed$IDSCHOOL, FUN = function(x)sd(x, na.rm = T))
sort(TT3G51B.Sds)
dim(removed)

# My job negatively impacts my mental health
removed$TT3G51C
summary(removed$TT3G51C)
table(removed$TT3G51C)
TT3G51C.Sds <- tapply(removed$TT3G51C, removed$IDSCHOOL, FUN = function(x)sd(x, na.rm = T))
sort(TT3G51C.Sds)
Sch.no.ment.health.sd <- names(which(sort(TT3G51C.Sds) == 0))
print(Sch.no.ment.health.sd)
IDSCH.ment.health.v.logical <- !removed$IDSCHOOL %in% Sch.no.ment.health.sd
removed <- removed[IDSCH.ment.health.v.logical, ]
dim(removed)          ### 4544  49   (19 teachers removed, 1 school)
sum(is.na(TT3G51C.Sds)

# My job negatively impacts my physical health
removed$TT3G51D
summary(removed$TT3G51D)
table(removed$TT3G51D)
TT3G51D.Sds <- tapply(removed$TT3G51D, removed$IDSCHOOL, FUN = function(x)sd(x, na.rm = T))
sort(TT3G51D.Sds)
dim(removed)

##### STEP 1 NULL Models #####
# exploring how much variation in variables is due to schools
removed$IDSCHOOL

library(lme4)
library(optimx)

# Explore gender ICC
removed$TT3G01
NULL.MODEL <- lme4::lmer(TT3G01 ~ 1
predicting gender, hence '1'
+ (1 | IDSCHOOL),
only
data = removed,
REML=F,
estimation, not restricted ML
control = lme4::lmerControl(optimizer = "optimx",
calc.derivs = FALSE,
optCtrl = list(method = "nlnmb"))
summary(NULL.MODEL)
Var.comp <- print(VarCorr(NULL.MODEL), comp="Variance")
Var.comp <- as.data.frame(Var.comp)
Between.School <- Var.comp$vcov[1]
Within.School <- Var.comp$vcov[2]
total.var <- Between.School + Within.School
ICC <- Between.School/total.var
print(ICC)

# Explore teacher age groups ICC
removed$TCHAGEGR
NULL.MODEL <- lme4::lmer(TCHAGEGR ~ 1
+ (1 | IDSCHOOL),
only
```

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```
      data = removed,
      REML=F,
estimation, not restricted ML
      control = lme4::lmerControl(optimizer = "optimx",
                                calc.derivs = FALSE,
                                optCtrl = list(method = "nlminb"))
summary(NULL.MODEL)
Var.comp <- print(VarCorr(NULL.MODEL), comp="Variance")
Var.comp <- as.data.frame(Var.comp)
Between.School <- Var.comp$vcov[1]
Within.School <- Var.comp$vcov[2]
total.var <- Between.School + Within.School
ICC <- Between.School/total.var
print(ICC)

# Explore teaching was a secure job ICC
removed$TT3G07C
NULL.MODEL <- lme4::lmer(TT3G07C ~ 1
                        + (1 | IDSCHOOL),
only
      data = removed,
      REML=F,
estimation, not restricted ML
      control = lme4::lmerControl(optimizer = "optimx",
                                calc.derivs = FALSE,
                                optCtrl = list(method = "nlminb"))
summary(NULL.MODEL)
Var.comp <- print(VarCorr(NULL.MODEL), comp="Variance")
Var.comp <- as.data.frame(Var.comp)
Between.School <- Var.comp$vcov[1]
Within.School <- Var.comp$vcov[2]
total.var <- Between.School + Within.School
ICC <- Between.School/total.var
print(ICC)

# Explore years of work as a teacher in total ICC
removed$TT3G11B
NULL.MODEL <- lme4::lmer(TT3G11B ~ 1
                        + (1 | IDSCHOOL),
only
      data = removed,
      REML=F,
estimation, not restricted ML
      control = lme4::lmerControl(optimizer = "optimx",
                                calc.derivs = FALSE,
                                optCtrl = list(method = "nlminb"))
summary(NULL.MODEL)
Var.comp <- print(VarCorr(NULL.MODEL), comp="Variance")
Var.comp <- as.data.frame(Var.comp)
Between.School <- Var.comp$vcov[1]
Within.School <- Var.comp$vcov[2]
total.var <- Between.School + Within.School
ICC <- Between.School/total.var
print(ICC)

# Explore prof. dev. on student behaviour and classroom management last 12 months ICC
removed$TT3G23F
NULL.MODEL <- lme4::lmer(TT3G23F ~ 1
                        + (1 | IDSCHOOL),
only
      data = removed,
      REML=F,
estimation, not restricted ML
      control = lme4::lmerControl(optimizer = "optimx",
                                calc.derivs = FALSE,
                                optCtrl = list(method = "nlminb"))
```

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```
summary(NULL.MODEL)
Var.comp <- print(VarCorr(NULL.MODEL), comp="Variance")
Var.comp <- as.data.frame(Var.comp)
Between.School <- Var.comp$vcov[1]
Within.School <- Var.comp$vcov[2]
total.var <- Between.School + Within.School
ICC <- Between.School/total.var
print(ICC)

# Explore prof. dev. on teacher-parent/guar. co-operation last 12 months ICC
removed$TT3G23M
NULL.MODEL <- lme4::lmer(TT3G23M ~ 1
                        + (1 | IDSCHOOL),
only
                        data = removed,
                        REML=F,
estimation, not restricted ML
                        control = lme4::lmerControl(optimizer = "optimx",
                                                    calc.derivs = FALSE,
                                                    optCtrl = list(method = "nlminb"))))
summary(NULL.MODEL)
Var.comp <- print(VarCorr(NULL.MODEL), comp="Variance")
Var.comp <- as.data.frame(Var.comp)
Between.School <- Var.comp$vcov[1]
Within.School <- Var.comp$vcov[2]
total.var <- Between.School + Within.School
ICC <- Between.School/total.var
print(ICC)

# Explore prof.dev needs studbeh & clmanagement ICC
removed$TT3G27F
NULL.MODEL <- lme4::lmer(TT3G27F ~ 1
                        + (1 | IDSCHOOL),
only
                        data = removed,
                        REML=F,
estimation, not restricted ML
                        control = lme4::lmerControl(optimizer = "optimx",
                                                    calc.derivs = FALSE,
                                                    optCtrl = list(method = "nlminb"))))
summary(NULL.MODEL)
Var.comp <- print(VarCorr(NULL.MODEL), comp="Variance")
Var.comp <- as.data.frame(Var.comp)
Between.School <- Var.comp$vcov[1]
Within.School <- Var.comp$vcov[2]
total.var <- Between.School + Within.School
ICC <- Between.School/total.var
print(ICC)

# Explore prof.dev needs teacher-parent co-operation ICC
removed$TT3G27M
NULL.MODEL <- lme4::lmer(TT3G27M ~ 1
                        + (1 | IDSCHOOL),
only
                        data = removed,
                        REML=F,
estimation, not restricted ML
                        control = lme4::lmerControl(optimizer = "optimx",
                                                    calc.derivs = FALSE,
                                                    optCtrl = list(method = "nlminb"))))
summary(NULL.MODEL)
Var.comp <- print(VarCorr(NULL.MODEL), comp="Variance")
Var.comp <- as.data.frame(Var.comp)
Between.School <- Var.comp$vcov[1]
Within.School <- Var.comp$vcov[2]
total.var <- Between.School + Within.School
```

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```
ICC <- Between.School/total.var
print(ICC)

# Explore school staff enforces rules for student behaviour ICC
removed$TT3G48G
NULL.MODEL <- lme4::lmer(TT3G48G ~ 1
                        + (1 | IDSCHOOL),
only
                        data = removed,
                        REML=F,
estimation, not restricted ML
                        control = lme4::lmerControl(optimizer = "optimx",
                                                    calc.derivs = FALSE,
                                                    optCtrl = list(method = "nlminb")))
summary(NULL.MODEL)
Var.comp <- print(VarCorr(NULL.MODEL), comp="Variance")
Var.comp <- as.data.frame(Var.comp)
Between.School <- Var.comp$vcov[1]
Within.School <- Var.comp$vcov[2]
total.var <- Between.School + Within.School
ICC <- Between.School/total.var
print(ICC)

# Explore addressing parent/guar. concerns is a source of stress ICC
removed$TT3G52J
NULL.MODEL <- lme4::lmer(TT3G52J ~ 1
                        + (1 | IDSCHOOL),
only
                        data = removed,
                        REML=F,
estimation, not restricted ML
                        control = lme4::lmerControl(optimizer = "optimx",
                                                    calc.derivs = FALSE,
                                                    optCtrl = list(method = "nlminb")))
summary(NULL.MODEL)
Var.comp <- print(VarCorr(NULL.MODEL), comp="Variance")
Var.comp <- as.data.frame(Var.comp)
Between.School <- Var.comp$vcov[1]
Within.School <- Var.comp$vcov[2]
total.var <- Between.School + Within.School
ICC <- Between.School/total.var
print(ICC)

# Explore satisfied with performance in this school ICC
removed$TT3G53I
NULL.MODEL <- lme4::lmer(TT3G53I ~ 1
                        + (1 | IDSCHOOL),
only
                        data = removed,
                        REML=F,
estimation, not restricted ML
                        control = lme4::lmerControl(optimizer = "optimx",
                                                    calc.derivs = FALSE,
                                                    optCtrl = list(method = "nlminb")))
summary(NULL.MODEL)
Var.comp <- print(VarCorr(NULL.MODEL), comp="Variance")
Var.comp <- as.data.frame(Var.comp)
Between.School <- Var.comp$vcov[1]
Within.School <- Var.comp$vcov[2]
total.var <- Between.School + Within.School
ICC <- Between.School/total.var
print(ICC)

# Explore student behavior stress / Configural (All) ICC
removed$T3STBEH
NULL.MODEL <- lme4::lmer(T3STBEH ~ 1
```

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```
      + (1 | IDSCHOOL),
only
      data = removed,
      REML=F,
estimation, not restricted ML
      control = lme4::lmerControl(optimizer = "optimx",
                                calc.derivs = FALSE,
                                optCtrl = list(method = "nlminb"))
summary(NULL.MODEL)
Var.comp <- print(VarCorr(NULL.MODEL), comp="Variance")
Var.comp <- as.data.frame(Var.comp)
Between.School <- Var.comp$vcov[1]
Within.School <- Var.comp$vcov[2]
total.var <- Between.School + Within.School
ICC <- Between.School/total.var
print(ICC)

# Explore T's responsible for students' achievement ICC
removed$TT3G52F
NULL.MODEL <- lme4::lmer(TT3G52F ~ 1
                        + (1 | IDSCHOOL),
only
                        data = removed,
                        REML=F,
estimation, not restricted ML
                        control = lme4::lmerControl(optimizer = "optimx",
                                                  calc.derivs = FALSE,
                                                  optCtrl = list(method = "nlminb"))
summary(NULL.MODEL)
Var.comp <- print(VarCorr(NULL.MODEL), comp="Variance")
Var.comp <- as.data.frame(Var.comp)
Between.School <- Var.comp$vcov[1]
Within.School <- Var.comp$vcov[2]
total.var <- Between.School + Within.School
ICC <- Between.School/total.var
print(ICC)

# Explore maintaining classroom discipline ICC
removed$TT3G52G
NULL.MODEL <- lme4::lmer(TT3G52G ~ 1
                        + (1 | IDSCHOOL),
only
                        data = removed,
                        REML=F,
estimation, not restricted ML
                        control = lme4::lmerControl(optimizer = "optimx",
                                                  calc.derivs = FALSE,
                                                  optCtrl = list(method = "nlminb"))
summary(NULL.MODEL)
Var.comp <- print(VarCorr(NULL.MODEL), comp="Variance")
Var.comp <- as.data.frame(Var.comp)
Between.School <- Var.comp$vcov[1]
Within.School <- Var.comp$vcov[2]
total.var <- Between.School + Within.School
ICC <- Between.School/total.var
print(ICC)

# Explore Being intimidated or verbally abused by students ICC
removed$TT3G52H
NULL.MODEL <- lme4::lmer(TT3G52H ~ 1
                        + (1 | IDSCHOOL),
only
                        data = removed,
                        REML=F,
estimation, not restricted ML
```

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```
control = lme4 ::lmerControl(optimizer = "optimx",
                           calc.derivs = FALSE,
                           optCtrl = list(method = "nlsminb"))

summary(NULL.MODEL)
Var.comp <- print(VarCorr(NULL.MODEL), comp="Variance")
Var.comp <- as.data.frame(Var.comp)
Between.School <- Var.comp$vcov[1]
Within.School <- Var.comp$vcov[2]
total.var <- Between.School + Within.School
ICC <- Between.School/total.var
print(ICC)
# Explore teachers perceived disciplinary climate / Metric (All) ICC
removed$T3DISC
NULL.MODEL <- lme4::lmer(T3DISC ~ 1
                        + (1 | IDSCHOOL),

only
                        data = removed,
                        REML=F,
estimation, not restricted ML
                        control = lme4 ::lmerControl(optimizer = "optimx",
                                                    calc.derivs = FALSE,
                                                    optCtrl = list(method = "nlsminb"))

summary(NULL.MODEL)
Var.comp <- print(VarCorr(NULL.MODEL), comp="Variance")
Var.comp <- as.data.frame(Var.comp)
Between.School <- Var.comp$vcov[1]
Within.School <- Var.comp$vcov[2]
total.var <- Between.School + Within.School
ICC <- Between.School/total.var
print(ICC)

# Explore long time for students to quieten down ICC
removed$TT3G41A
NULL.MODEL <- lme4::lmer(TT3G41A ~ 1
                        + (1 | IDSCHOOL),

only
                        data = removed,
                        REML=F,
estimation, not restricted ML
                        control = lme4 ::lmerControl(optimizer = "optimx",
                                                    calc.derivs = FALSE,
                                                    optCtrl = list(method = "nlsminb"))

summary(NULL.MODEL)
Var.comp <- print(VarCorr(NULL.MODEL), comp="Variance")
Var.comp <- as.data.frame(Var.comp)
Between.School <- Var.comp$vcov[1]
Within.School <- Var.comp$vcov[2]
total.var <- Between.School + Within.School
ICC <- Between.School/total.var
print(ICC)

# Explore Sts create a pleasant learning atmosphere ICC
removed$TT3G41B
NULL.MODEL <- lme4::lmer(TT3G41B ~ 1
                        + (1 | IDSCHOOL),

only
                        data = removed,
                        REML=F,
estimation, not restricted ML
                        control = lme4 ::lmerControl(optimizer = "optimx",
                                                    calc.derivs = FALSE,
                                                    optCtrl = list(method = "nlsminb"))

summary(NULL.MODEL)
Var.comp <- print(VarCorr(NULL.MODEL), comp="Variance")
Var.comp <- as.data.frame(Var.comp)
Between.School <- Var.comp$vcov[1]
```

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```
Within.School <- Var.comp$vcov[2]
total.var <- Between.School + Within.School
ICC <- Between.School/total.var
print(ICC)

# Explore students interrupting the lesson ICC
removed$TT3G41C
NULL.MODEL <- lme4::lmer(TT3G41C ~ 1
  + (1 | IDSCHOOL),
  only
  data = removed,
  estimation, not restricted ML
  REML=F,
  control = lme4::lmerControl(optimizer = "optimx",
    calc.derivs = FALSE,
    optCtrl = list(method = "nminb")))
summary(NULL.MODEL)
Var.comp <- print(VarCorr(NULL.MODEL), comp="Variance")
Var.comp <- as.data.frame(Var.comp)
Between.School <- Var.comp$vcov[1]
Within.School <- Var.comp$vcov[2]
total.var <- Between.School + Within.School
ICC <- Between.School/total.var
print(ICC)

# Explore disruptive noise in this classroom ICC
removed$TT3G41D
NULL.MODEL <- lme4::lmer(TT3G41D ~ 1
  + (1 | IDSCHOOL),
  only
  data = removed,
  REML=F,
  estimation, not restricted ML
  control = lme4::lmerControl(optimizer = "optimx",
    calc.derivs = FALSE,
    optCtrl = list(method = "nminb")))
summary(NULL.MODEL)
Var.comp <- print(VarCorr(NULL.MODEL), comp="Variance")
Var.comp <- as.data.frame(Var.comp)
Between.School <- Var.comp$vcov[1]
Within.School <- Var.comp$vcov[2]
total.var <- Between.School + Within.School
ICC <- Between.School/total.var
print(ICC)

# Explore Job satisfaction, composite ICC
removed$T3JOBSA
NULL.MODEL <- lme4::lmer(T3JOBSA ~ 1
  + (1 | IDSCHOOL),
  only
  data = removed,
  REML=F,
  estimation, not restricted ML
  control = lme4::lmerControl(optimizer = "optimx",
    calc.derivs = FALSE,
    optCtrl = list(method = "nminb")))
summary(NULL.MODEL)
Var.comp <- print(VarCorr(NULL.MODEL), comp="Variance")
Var.comp <- as.data.frame(Var.comp)
Between.School <- Var.comp$vcov[1]
Within.School <- Var.comp$vcov[2]
total.var <- Between.School + Within.School
ICC <- Between.School/total.var
print(ICC)

# Explore Job satisfaction with work environment (subscale) ICC
```

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```
removed$T3JSENV
NULL.MODEL <- lme4::lmer(T3JSENV ~ 1
  + (1 | IDSCHOOL),
  only
    data = removed,
    REML=F,
  estimation, not restricted ML
    control = lme4::lmerControl(optimizer = "optimx",
      calc.derivs = FALSE,
      optCtrl = list(method = "nminb"))
summary(NULL.MODEL)
Var.comp <- print(VarCorr(NULL.MODEL), comp="Variance")
Var.comp <- as.data.frame(Var.comp)
Between.School <- Var.comp$vcov[1]
Within.School <- Var.comp$vcov[2]
total.var <- Between.School + Within.School
ICC <- Between.School/total.var
print(ICC)

# Explore would like to change to another school ICC
removed$TT3G53C
NULL.MODEL <- lme4::lmer(TT3G53C ~ 1
  + (1 | IDSCHOOL),
  only
    data = removed,
    REML=F,
  estimation, not restricted ML
    control = lme4::lmerControl(optimizer = "optimx",
      calc.derivs = FALSE,
      optCtrl = list(method = "nminb"))
summary(NULL.MODEL)
Var.comp <- print(VarCorr(NULL.MODEL), comp="Variance")
Var.comp <- as.data.frame(Var.comp)
Between.School <- Var.comp$vcov[1]
Within.School <- Var.comp$vcov[2]
total.var <- Between.School + Within.School
ICC <- Between.School/total.var
print(ICC)

# Explore enjoy working at this school ICC
removed$TT3G53E
NULL.MODEL <- lme4::lmer(TT3G53E ~ 1
  + (1 | IDSCHOOL),
  only
    data = removed,
    REML=F,
  estimation, not restricted ML
    control = lme4::lmerControl(optimizer = "optimx",
      calc.derivs = FALSE,
      optCtrl = list(method = "nminb"))
summary(NULL.MODEL)
Var.comp <- print(VarCorr(NULL.MODEL), comp="Variance")
Var.comp <- as.data.frame(Var.comp)
Between.School <- Var.comp$vcov[1]
Within.School <- Var.comp$vcov[2]
total.var <- Between.School + Within.School
ICC <- Between.School/total.var
print(ICC)

# Explore recommend this school as a good place to work ICC
removed$TT3G53G
NULL.MODEL <- lme4::lmer(TT3G53G ~ 1
  + (1 | IDSCHOOL),
  only
    data = removed,
    REML=F,
```

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```
estimation, not restricted ML
      control = lme4 ::lmerControl(optimizer = "optimx",
                                calc.derivs = FALSE,
                                optCtrl = list(method = "nlminb"))

summary(NULL.MODEL)
Var.comp <- print(VarCorr(NULL.MODEL), comp="Variance")
Var.comp <- as.data.frame(Var.comp)
Between.School <- Var.comp$vcov[1]
Within.School <- Var.comp$vcov[2]
total.var <- Between.School + Within.School
ICC <- Between.School/total.var
print(ICC)

# Explore satisfied with my job ICC
removed$TT3G53J
NULL.MODEL <- lme4::lmer(TT3G53J ~ 1
                        + (1 | IDSCHOOL),
                        only
                        data = removed,
                        REML=F,
estimation, not restricted ML
      control = lme4 ::lmerControl(optimizer = "optimx",
                                calc.derivs = FALSE,
                                optCtrl = list(method = "nlminb")))

summary(NULL.MODEL)
Var.comp <- print(VarCorr(NULL.MODEL), comp="Variance")
Var.comp <- as.data.frame(Var.comp)
Between.School <- Var.comp$vcov[1]
Within.School <- Var.comp$vcov[2]
total.var <- Between.School + Within.School
ICC <- Between.School/total.var
print(ICC)

# Explore job satisfaction with profession (subscale) ICC
removed$T3JSPRO
NULL.MODEL <- lme4::lmer(T3JSPRO ~ 1
                        + (1 | IDSCHOOL),
                        only
                        data = removed,
                        REML=F,
estimation, not restricted ML
      control = lme4 ::lmerControl(optimizer = "optimx",
                                calc.derivs = FALSE,
                                optCtrl = list(method = "nlminb")))

summary(NULL.MODEL)
Var.comp <- print(VarCorr(NULL.MODEL), comp="Variance")
Var.comp <- as.data.frame(Var.comp)
Between.School <- Var.comp$vcov[1]
Within.School <- Var.comp$vcov[2]
total.var <- Between.School + Within.School
ICC <- Between.School/total.var
print(ICC)

# Explore advantages of being a teacher clearly outweigh the disadvantages ICC
removed$TT3G53A
NULL.MODEL <- lme4::lmer(TT3G53A ~ 1
                        + (1 | IDSCHOOL),
                        only
                        data = removed,
                        REML=F,
estimation, not restricted ML
      control = lme4 ::lmerControl(optimizer = "optimx",
                                calc.derivs = FALSE,
                                optCtrl = list(method = "nlminb")))

summary(NULL.MODEL)
Var.comp <- print(VarCorr(NULL.MODEL), comp="Variance")
```

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```
Var.comp <- as.data.frame(Var.comp)
Between.School <- Var.comp$vcov[1]
Within.School <- Var.comp$vcov[2]
total.var <- Between.School + Within.School
ICC <- Between.School/total.var
print(ICC)

# Explore still choose to work as a teacher ICC
removed$TT3G53B
NULL.MODEL <- lme4::lmer(TT3G53B ~ 1
  + (1 | IDSCHOOL),
  only
    data = removed,
    REML=F,
  estimation, not restricted ML
    control = lme4::lmerControl(optimizer = "optimx",
      calc.derivs = FALSE,
      optCtrl = list(method = "nlminb"))
  summary(NULL.MODEL)
  Var.comp <- print(VarCorr(NULL.MODEL), comp="Variance")
  Var.comp <- as.data.frame(Var.comp)
  Between.School <- Var.comp$vcov[1]
  Within.School <- Var.comp$vcov[2]
  total.var <- Between.School + Within.School
  ICC <- Between.School/total.var
  print(ICC)

# Explore regret of becoming a teacher ICC
removed$TT3G53D
NULL.MODEL <- lme4::lmer(TT3G53D ~ 1
  + (1 | IDSCHOOL),
  only
    data = removed,
    REML=F,
  estimation, not restricted ML
    control = lme4::lmerControl(optimizer = "optimx",
      calc.derivs = FALSE,
      optCtrl = list(method = "nlminb"))
  summary(NULL.MODEL)
  Var.comp <- print(VarCorr(NULL.MODEL), comp="Variance")
  Var.comp <- as.data.frame(Var.comp)
  Between.School <- Var.comp$vcov[1]
  Within.School <- Var.comp$vcov[2]
  total.var <- Between.School + Within.School
  ICC <- Between.School/total.var
  print(ICC)

# Explore better to choose another profession ICC
removed$TT3G53F
NULL.MODEL <- lme4::lmer(TT3G53F ~ 1
  + (1 | IDSCHOOL),
  only
    data = removed,
    REML=F,
  estimation, not restricted ML
    control = lme4::lmerControl(optimizer = "optimx",
      calc.derivs = FALSE,
      optCtrl = list(method = "nlminb"))
  summary(NULL.MODEL)
  Var.comp <- print(VarCorr(NULL.MODEL), comp="Variance")
  Var.comp <- as.data.frame(Var.comp)
  Between.School <- Var.comp$vcov[1]
  Within.School <- Var.comp$vcov[2]
  total.var <- Between.School + Within.School
  ICC <- Between.School/total.var
  print(ICC)
```

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```
# Explore teacher-student relations / Metric (All) ICC
removed$T3STUD
NULL.MODEL <- lme4::lmer(T3STUD ~ 1
  + (1 | IDSCHOOL),
  only
    data = removed,
    REML=F,
  estimation, not restricted ML
    control = lme4::lmerControl(optimizer = "optimx",
      calc.derivs = FALSE,
      optCtrl = list(method = "nlsminb"))))
summary(NULL.MODEL)
Var.comp <- print(VarCorr(NULL.MODEL), comp="Variance")
Var.comp <- as.data.frame(Var.comp)
Between.School <- Var.comp$vcov[1]
Within.School <- Var.comp$vcov[2]
total.var <- Between.School + Within.School
ICC <- Between.School/total.var
print(ICC)

# Exploret teachers-students get on well ICC
removed$TT3G49A
NULL.MODEL <- lme4::lmer(TT3G49A ~ 1
  + (1 | IDSCHOOL),
  only
    data = removed,
    REML=F,
  estimation, not restricted ML
    control = lme4::lmerControl(optimizer = "optimx",
      calc.derivs = FALSE,
      optCtrl = list(method = "nlsminb"))))
summary(NULL.MODEL)
Var.comp <- print(VarCorr(NULL.MODEL), comp="Variance")
Var.comp <- as.data.frame(Var.comp)
Between.School <- Var.comp$vcov[1]
Within.School <- Var.comp$vcov[2]
total.var <- Between.School + Within.School
ICC <- Between.School/total.var
print(ICC)

# Explore students' well-being is important ICC
removed$TT3G49B
NULL.MODEL <- lme4::lmer(TT3G49B ~ 1
  + (1 | IDSCHOOL),
  only
    data = removed,
    REML=F,
  estimation, not restricted ML
    control = lme4::lmerControl(optimizer = "optimx",
      calc.derivs = FALSE,
      optCtrl = list(method = "nlsminb"))))
summary(NULL.MODEL)
Var.comp <- print(VarCorr(NULL.MODEL), comp="Variance")
Var.comp <- as.data.frame(Var.comp)
Between.School <- Var.comp$vcov[1]
Within.School <- Var.comp$vcov[2]
total.var <- Between.School + Within.School
ICC <- Between.School/total.var
print(ICC)

# Explore teachers are interested in what students have to say ICC
removed$TT3G49C
NULL.MODEL <- lme4::lmer(TT3G49C ~ 1
  + (1 | IDSCHOOL),
  only
```

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```
      data = removed,
      REML=F,
estimation, not restricted ML
      control = lme4 ::lmerControl(optimizer = "optimx",
                                calc.derivs = FALSE,
                                optCtrl = list(method = "nlminb"))
summary(NULL.MODEL)
Var.comp <- print(VarCorr(NULL.MODEL), comp="Variance")
Var.comp <- as.data.frame(Var.comp)
Between.School <- Var.comp$vcov[1]
Within.School <- Var.comp$vcov[2]
total.var <- Between.School + Within.School
ICC <- Between.School/total.var
print(ICC)

# Explore school provides extra assistance to stud. ICC
removed$TT3G49D
NULL.MODEL <- lme4::lmer(TT3G49D ~ 1
                        + (1 | IDSCHOOL),
only
      data = removed,
      REML=F,
estimation, not restricted ML
      control = lme4 ::lmerControl(optimizer = "optimx",
                                calc.derivs = FALSE,
                                optCtrl = list(method = "nlminb"))
summary(NULL.MODEL)
Var.comp <- print(VarCorr(NULL.MODEL), comp="Variance")
Var.comp <- as.data.frame(Var.comp)
Between.School <- Var.comp$vcov[1]
Within.School <- Var.comp$vcov[2]
total.var <- Between.School + Within.School
ICC <- Between.School/total.var
print(ICC)

# Explore Workplace well-being and stress ICC
removed$T3WELS
NULL.MODEL <- lme4::lmer(T3WELS ~ 1
                        + (1 | IDSCHOOL),
only
      data = removed,
      REML=F,
estimation, not restricted ML
      control = lme4 ::lmerControl(optimizer = "optimx",
                                calc.derivs = FALSE,
                                optCtrl = list(method = "nlminb"))
summary(NULL.MODEL)
Var.comp <- print(VarCorr(NULL.MODEL), comp="Variance")
Var.comp <- as.data.frame(Var.comp)
Between.School <- Var.comp$vcov[1]
Within.School <- Var.comp$vcov[2]
total.var <- Between.School + Within.School
ICC <- Between.School/total.var
print(ICC)

# Explore T. experience stress in work ICC
removed$TT3G51A
NULL.MODEL <- lme4::lmer(TT3G51A ~ 1
                        + (1 | IDSCHOOL),
only
      data = removed,
      REML=F,
estimation, not restricted ML
      control = lme4 ::lmerControl(optimizer = "optimx",
                                calc.derivs = FALSE,
                                optCtrl = list(method = "nlminb"))
```

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```
summary(NULL.MODEL)
Var.comp <- print(VarCorr(NULL.MODEL), comp="Variance")
Var.comp <- as.data.frame(Var.comp)
Between.School <- Var.comp$vcov[1]
Within.School <- Var.comp$vcov[2]
total.var <- Between.School + Within.School
ICC <- Between.School/total.var
print(ICC)

# Explore teaching leaves time for personal life ICC
removed$TT3G51B
NULL.MODEL <- lme4::lmer(TT3G51B~ 1
                        + (1 | IDSCHOOL),
only
                        data = removed,
                        REML=F,
estimation, not restricted ML
                        control = lme4::lmerControl(optimizer = "optimx",
                                                    calc.derivs = FALSE,
                                                    optCtrl = list(method = "nlminb")))
summary(NULL.MODEL)
Var.comp <- print(VarCorr(NULL.MODEL), comp="Variance")
Var.comp <- as.data.frame(Var.comp)
Between.School <- Var.comp$vcov[1]
Within.School <- Var.comp$vcov[2]
total.var <- Between.School + Within.School
ICC <- Between.School/total.var
print(ICC)

# Explore teaching negatively impacts mental health ICC
removed$TT3G51C
NULL.MODEL <- lme4::lmer(TT3G51C~ 1
                        + (1 | IDSCHOOL),
only
                        data = removed,
                        REML=F,
estimation, not restricted ML
                        control = lme4::lmerControl(optimizer = "optimx",
                                                    calc.derivs = FALSE,
                                                    optCtrl = list(method = "nlminb")))
summary(NULL.MODEL)
Var.comp <- print(VarCorr(NULL.MODEL), comp="Variance")
Var.comp <- as.data.frame(Var.comp)
Between.School <- Var.comp$vcov[1]
Within.School <- Var.comp$vcov[2]
total.var <- Between.School + Within.School
ICC <- Between.School/total.var
print(ICC)

# Explore teaching negatively impacts physical health ICC
removed$TT3G51D
NULL.MODEL <- lme4::lmer(TT3G51D~ 1
                        + (1 | IDSCHOOL),
only
                        data = removed,
                        REML=F,
estimation, not restricted ML
                        control = lme4::lmerControl(optimizer = "optimx",
                                                    calc.derivs = FALSE,
                                                    optCtrl = list(method = "nlminb")))
summary(NULL.MODEL)
Var.comp <- print(VarCorr(NULL.MODEL), comp="Variance")
Var.comp <- as.data.frame(Var.comp)
Between.School <- Var.comp$vcov[1]
Within.School <- Var.comp$vcov[2]
total.var <- Between.School + Within.School
```

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```
ICC <- Between.School/total.var
print(ICC)

# Explore Socioeconomic status of students ICC
removed$TT3G35E
NULL.MODEL <- lme4::lmer(TT3G35E~ 1
                        + (1 | IDSCHOOL),
only
                        data = removed,
                        REML=F,
estimation, not restricted ML
                        control = lme4 ::lmerControl(optimizer = "optimx",
                                                    calc.derivs = FALSE,
                                                    optCtrl = list(method = "nlminb"))))
summary(NULL.MODEL)
Var.comp <- print(VarCorr(NULL.MODEL), comp="Variance")
Var.comp <- as.data.frame(Var.comp)
Between.School <- Var.comp$vcov[1]
Within.School <- Var.comp$vcov[2]
total.var <- Between.School + Within.School
ICC <- Between.School/total.var
print(ICC)

# Explore teacher ID ICC
removed$IDTEACH
NULL.MODEL <- lme4::lmer(IDTEACH~ 1
                        + (1 | IDSCHOOL),
only
                        data = removed,
                        REML=F,
estimation, not restricted ML
                        control = lme4 ::lmerControl(optimizer = "optimx",
                                                    calc.derivs = FALSE,
                                                    optCtrl = list(method = "nlminb"))))
summary(NULL.MODEL)
Var.comp <- print(VarCorr(NULL.MODEL), comp="Variance")
Var.comp <- as.data.frame(Var.comp)
Between.School <- Var.comp$vcov[1]
Within.School <- Var.comp$vcov[2]
total.var <- Between.School + Within.School
ICC <- Between.School/total.var
print(ICC)

# Explore school ID ICC
removed$IDSCHOOL
NULL.MODEL <- lme4::lmer(IDSCHOOL~ 1
                        + (1 | IDSCHOOL),
                        data = removed,
                        REML=F,
estimation, not restricted ML
                        control = lme4 ::lmerControl(optimizer = "optimx",
                                                    calc.derivs = FALSE,
                                                    optCtrl = list(method = "nlminb"))))
summary(NULL.MODEL)
Var.comp <- print(VarCorr(NULL.MODEL), comp="Variance")
Var.comp <- as.data.frame(Var.comp)
Between.School <- Var.comp$vcov[1]
Within.School <- Var.comp$vcov[2]
total.var <- Between.School + Within.School
ICC <- Between.School/total.var
print(ICC)

### 1.1 Exploring data
removed$IDTEACH
summary(removed$IDTEACH)
```

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table(removed\$IDTEACH)
sd(removed\$IDTEACH)

removed\$IDSCHOOL
summary(removed\$IDSCHOOL)
table(removed\$IDSCHOOL)
sd(removed\$IDSCHOOL)

removed\$TT3G35E
summary(removed\$TT3G35E)
table(removed\$TT3G35E)
sd(removed\$TT3G35E)

removed\$TT3G01
summary(removed\$TT3G01)
table(removed\$TT3G01)
sd(removed\$TT3G01)

removed\$TCHAGEGR
summary(removed\$TCHAGEGR)
table(removed\$TCHAGEGR)
sd(removed\$TCHAGEGR)

removed\$TT3G11B
summary(removed\$TT3G11B)
table(removed\$TT3G11B)
sd(removed\$TT3G11B)

removed\$TT3G07C
summary(removed\$TT3G07C)
table(removed\$TT3G07C)
sd(removed\$TT3G07C)

removed\$TT3G23F
summary(removed\$TT3G23F)
table(removed\$TT3G23F)
sd(removed\$TT3G23F)

removed\$TT3G23M
summary(removed\$TT3G23M)
table(removed\$TT3G23M)
sd(removed\$TT3G23M)

removed\$TT3G27F
summary(removed\$TT3G27F)
table(removed\$TT3G27F)
sd(removed\$TT3G27F)

removed\$TT3G27M
summary(removed\$TT3G27M)
table(removed\$TT3G27M)
sd(removed\$TT3G27M)

removed\$TT3G48G
summary(removed\$TT3G48G)
table(removed\$TT3G48G)
sd(removed\$TT3G48G)

removed\$TT3G52J
summary(removed\$TT3G52J)
table(removed\$TT3G52J)
sd(removed\$TT3G52J)

removed\$TT3G53I
summary(removed\$TT3G53I)
table(removed\$TT3G53I)

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sd(removed\$TT3G53I)

removed\$T3STBEH
summary(removed\$T3STBEH)
table(removed\$T3STBEH)
sd(removed\$T3STBEH)

removed\$TT3G52F
summary(removed\$TT3G52F)
table(removed\$TT3G52F)
sd(removed\$TT3G52F)

removed\$TT3G52G
summary(removed\$TT3G52G)
table(removed\$TT3G52G)
sd(removed\$TT3G52G)

removed\$TT3G52H
summary(removed\$TT3G52H)
table(removed\$TT3G52H)
sd(removed\$TT3G52H)

removed\$T3DISC
summary(removed\$T3DISC)
table(removed\$T3DISC)
sd(removed\$T3DISC)

removed\$TT3G41A
summary(removed\$TT3G41A)
table(removed\$TT3G41A)
sd(removed\$TT3G41A)

removed\$TT3G41B
summary(removed\$TT3G41B)
table(removed\$TT3G41B)
sd(removed\$TT3G41B)

removed\$TT3G41C
summary(removed\$TT3G41C)
table(removed\$TT3G41C)
sd(removed\$TT3G41C)

removed\$TT3G41D
summary(removed\$TT3G41D)
table(removed\$TT3G41D)
sd(removed\$TT3G41D)

removed\$T3JOBSA
summary(removed\$T3JOBSA)
table(removed\$T3JOBSA)
sd(removed\$T3JOBSA)

removed\$T3JSENV
summary(removed\$T3JSENV)
table(removed\$T3JSENV)
sd(removed\$T3JSENV)

removed\$TT3G53C
summary(removed\$TT3G53C)
table(removed\$TT3G53C)
sd(removed\$TT3G53C)

removed\$TT3G53E
summary(removed\$TT3G53E)
table(removed\$TT3G53E)
sd(removed\$TT3G53E)

removed\$TT3G53G
summary(removed\$TT3G53G)
table(removed\$TT3G53G)
sd(removed\$TT3G53G)

removed\$TT3G53J
summary(removed\$TT3G53J)
table(removed\$TT3G53J)
sd(removed\$TT3G53J)

removed\$T3JSPRO
summary(removed\$T3JSPRO)
table(removed\$T3JSPRO)
sd(removed\$T3JSPRO)

removed\$TT3G53A
summary(removed\$TT3G53A)
table(removed\$TT3G53A)
sd(removed\$TT3G53A)

removed\$TT3G53B
summary(removed\$TT3G53B)
table(removed\$TT3G53B)
sd(removed\$TT3G53B)

removed\$TT3G53D
summary(removed\$TT3G53D)
table(removed\$TT3G53D)
sd(removed\$TT3G53D)

removed\$TT3G53F
summary(removed\$TT3G53F)
table(removed\$TT3G53F)
sd(removed\$TT3G53F)

removed\$T3STUD
summary(removed\$T3STUD)
table(removed\$T3STUD)
sd(removed\$T3STUD)

removed\$TT3G49A
summary(removed\$TT3G49A)
table(removed\$TT3G49A)
sd(removed\$TT3G49A)

removed\$TT3G49B
summary(removed\$TT3G49B)
table(removed\$TT3G49B)
sd(removed\$TT3G49B)

removed\$TT3G49C
summary(removed\$TT3G49C)
table(removed\$TT3G49C)
sd(removed\$TT3G49C)

removed\$TT3G49D
summary(removed\$TT3G49D)
table(removed\$TT3G49D)
sd(removed\$TT3G49D)

removed\$T3WELS
summary(removed\$T3WELS)
table(removed\$T3WELS)
sd(removed\$T3WELS)

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```
removed$TT3G51A
summary(removed$TT3G51A)
table(removed$TT3G51A)
sd(removed$TT3G51A)
```

```
removed$TT3G51B
summary(removed$TT3G51B)
table(removed$TT3G51B)
sd(removed$TT3G51B)
```

```
removed$TT3G51C
summary(removed$TT3G51C)
table(removed$TT3G51C)
sd(removed$TT3G51C)
```

```
removed$TT3G51D
summary(removed$TT3G51D)
table(removed$TT3G51D)
sd(removed$TT3G51D)
```

```
removed$TC3G12
summary(removed$TC3G12)
table(removed$TC3G12)
sd(removed$TC3G12)
```

```
removed$TC3G10
summary(removed$TC3G10)
table(removed$TC3G10)
sd(removed$TC3G10)
```

```
removed$TC3G14A
summary(removed$TC3G14A)
table(removed$TC3G14A)
sd(removed$TC3G14A)
```

```
removed$TC3G14B
summary(removed$TC3G14B)
table(removed$TC3G14B)
sd(removed$TC3G14B)
```

```
removed$TC3G30D
summary(removed$TC3G30D)
table(removed$TC3G30D)
sd(removed$TC3G30D)
```

STEP 2. SCALE VALIDATION

```
removed$TT3G41A<- car::recode(removed$TT3G41A,"
    1 = 4;
    2 = 3;
    3 = 2;
    4 = 1")
summary(removed$TT3G41A)
table(removed$TT3G41A)
```

```
removed$TT3G41C<- car::recode(removed$TT3G41C,"
    1 = 4;
    2 = 3;
    3 = 2;
    4 = 1")
summary(removed$TT3G41C)
table(removed$TT3G41C)
```

```
removed$TT3G41D<- car::recode(removed$TT3G41D,"
    1 = 4;
    2 = 3;
```

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```
      3 = 2;
      4 = 1")
summary(removed$TT3G41D)
table(removed$TT3G41D)

removed$TT3G53C<- car::recode(removed$TT3G53C,"
      1 = 4;
      2 = 3;
      3 = 2;
      4 = 1")
summary(removed$TT3G53C)
table(removed$TT3G53C)

removed$TT3G51A<- car::recode(removed$TT3G51A,"
      1 = 4;
      2 = 3;
      3 = 2;
      4 = 1")
summary(removed$TT3G51A)
table(removed$TT3G51A)

removed$TT3G51C<- car::recode(removed$TT3G51C,"
      1 = 4;
      2 = 3;
      3 = 2;
      4 = 1")
summary(removed$TT3G51C)
table(removed$TT3G51C)

removed$TT3G51D<- car::recode(removed$TT3G51D,"
      1 = 4;
      2 = 3;
      3 = 2;
      4 = 1")
summary(removed$TT3G51D)
table(removed$TT3G51D)

removed$TT3G53D<- car::recode(removed$TT3G53D,"
      1 = 4;
      2 = 3;
      3 = 2;
      4 = 1")
summary(removed$TT3G53D)
table(removed$TT3G53D)

removed$TT3G53F<- car::recode(removed$TT3G53F,"
      1 = 4;
      2 = 3;
      3 = 2;
      4 = 1")
summary(removed$TT3G53F)
table(removed$TT3G53F)

##### STEP 3. SINGLE LEVEL MODELING #####
library("lavaan")

model <- '
sbs =~ TT3G52F + TT3G52G + TT3G52H
dc =~ TT3G41B + TT3G41C + TT3G41D
je =~ TT3G53C + TT3G53E + TT3G53G + TT3G53J
jp =~ TT3G53B + TT3G53D + TT3G53F
sr =~ TT3G49A + TT3G49B + TT3G49C + TT3G49D
wb =~ TT3G51A + TT3G51C + TT3G51D
'

fit <- cfa(model = model,
```

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```
data = removed,
std.lv=T,
estimator="MLR")

summary(fit, fit.measures=T)
estim <- parameterestimates(fit, standardized=TRUE)
options(max.print=1000000)
print(estim)

lambda <- c(.567, .821, .556)
AVE <- sum(lambda)^2 / (sum(lambda)^2 + sum(1-(lambda^2)))
print(AVE)          ### .690

lambda <- c(.301, .791, .747)
AVEdc <- sum(lambda)^2 / (sum(lambda)^2 + sum(1-(lambda^2)))
print(AVEdc)       ### .66

lambda <- c(.448, .762, .723, .574)
AVEje <- sum(lambda)^2 / (sum(lambda)^2 + sum(1-(lambda^2)))
print(AVEje)       ### .73

lambda <- c(.651, .728, .804)
AVEjp <- sum(lambda)^2 / (sum(lambda)^2 + sum(1-(lambda^2)))
print(AVEjp)       ### .77

lambda <- c(.630, .490, .731, .702)
AVEsr <- sum(lambda)^2 / (sum(lambda)^2 + sum(1-(lambda^2)))
print(AVEsr)       ### .74

lambda <- c(.705, .873, .807)
AVEwb <- sum(lambda)^2 / (sum(lambda)^2 + sum(1-(lambda^2)))
print(AVEwb)       ### .84

##### STEP 4. STRUCTURAL MODEL #####
model <- '
sbs =~ TT3G52F + TT3G52G + TT3G52H
dc =~ TT3G41B + TT3G41C + TT3G41D
je =~ TT3G53C + TT3G53E + TT3G53G + TT3G53J
jp =~ TT3G53B + TT3G53D + TT3G53F
sr =~ TT3G49A + TT3G49B + TT3G49C + TT3G49D
wb =~ TT3G51A + TT3G51C + TT3G51D
sbs ~ dc + je + jp + sr + wb
'

fit <- sem(model = model,
data = removed,
std.lv=T,
estimator="MLR")

summary(fit, fit.measures=TRUE, rsquare=T)
estim <- parameterestimates(fit, standardized=TRUE)
options(max.print=1000000)
print(estim)          ### R-squared for sbs (outcome variable) is 0.261
.261 / (1-.261)      ### 0.35 (large effect) (.02 small, .15 medium, and .35 is large)

# Closer look at predictors of verbal intimidation...
model <- '
dc =~ TT3G41B + TT3G41C + TT3G41D
je =~ TT3G53C + TT3G53E + TT3G53G + TT3G53J
jp =~ TT3G53B + TT3G53D + TT3G53F
sr =~ TT3G49A + TT3G49B + TT3G49C + TT3G49D
wb =~ TT3G51A + TT3G51C + TT3G51D
TT3G52H =~ dc + je + jp + sr + wb
'

fit <- sem(model = model,
data = removed,
std.lv=T,
```

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```
estimator="MLR")

summary(fit, fit.measures=TRUE, rsquare=T)
estim <- parameterestimates(fit, standardized=TRUE)
options(max.print=1000000)
print(estim)

# Closer look at maintaining discipline
model <- '
dc =~ TT3G41B + TT3G41C + TT3G41D
je =~ TT3G53C + TT3G53E + TT3G53G + TT3G53J
jp =~ TT3G53B + TT3G53D + TT3G53F
sr =~ TT3G49A + TT3G49B + TT3G49C + TT3G49D
wb =~ TT3G51A + TT3G51C + TT3G51D
TT3G52G ~ dc + je + jp + sr + wb
'

fit <- sem(model = model,
           data = removed,
           std.lv=T,
           estimator="MLR")

summary(fit, fit.measures=TRUE, rsquare=T)
estim <- parameterestimates(fit, standardized=TRUE)
options(max.print=1000000)
print(estim)

# Closer look at stress about student achievement
model <- '
dc =~ TT3G41B + TT3G41C + TT3G41D
je =~ TT3G53C + TT3G53E + TT3G53G + TT3G53J
jp =~ TT3G53B + TT3G53D + TT3G53F
sr =~ TT3G49A + TT3G49B + TT3G49C + TT3G49D
wb =~ TT3G51A + TT3G51C + TT3G51D
TT3G52F ~ dc + je + jp + sr + wb
'

fit <- sem(model = model,
           data = removed,
           std.lv=T,
           estimator="MLR")

summary(fit, fit.measures=TRUE, rsquare=T)
estim <- parameterestimates(fit, standardized=TRUE)
options(max.print=1000000)
print(estim)

# Closer look at individual factor predictors of verbal intimidation...
model <- '
dc =~ TT3G41B + TT3G41C + TT3G41D
je =~ TT3G53C + TT3G53E + TT3G53G + TT3G53J
jp =~ TT3G53B + TT3G53D + TT3G53F
sr =~ TT3G49A + TT3G49B + TT3G49C + TT3G49D
wb =~ TT3G51A + TT3G51C + TT3G51D
TT3G52H ~ dc + je + jp + sr + wb + TT3G01 + TCHAGEGR + TT3G11B
'

fit <- sem(model = model,
           data = removed,
           std.lv=T,
           estimator="MLR")

summary(fit, fit.measures=TRUE, rsquare=T)
estim <- parameterestimates(fit, standardized=TRUE)
options(max.print=1000000)
print(estim)
```