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Let's talk about stress

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Let's talk about stress

Ruth Harmsen

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Let's talk about stress

*Beginning secondary school teachers' stress in the context of induction
 programmes*

Proefschrift

Ter verkrijging van de graad van doctor aan de
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CHAPTER 1

Introduction

Thomas–

“My students really pulled all the energy out of me. At a certain point I felt that I was useless for my family as well as for the school. I am better off choosing a different profession before I burn-out”.

(Citation from Thomas, a beginning teacher who quit teaching)

1. Introduction

Teaching is a highly stressful profession; many teachers from various countries report high levels of stress (e.g., Chaplain, 2008; Johnson & Birkeland, 2003; Johnson, Cooper, Cartwright, Donald, Taylor & Millet, 2005; Kyriacou, 2001; Newberry & Allsop, 2017; Skaalvik & Skaalvik, 2015). In the Netherlands specifically, the Centraal Bureau voor de Statistiek (2015) reports that teachers have the highest percentage of burnout symptoms of all professionals, indicating that one of five teachers experience these symptoms. Teachers also report higher workloads than other professionals (Hooftman, Mars, Janssen, de Vroome & Van den Bossche, 2015), and four of five Dutch secondary school teachers report heavy to extremely heavy workloads (van den Berg & Scheeren, 2017).

More particularly, beginning teachers (less than five years' teaching experience) seem more vulnerable to the pressures of the profession than experienced teachers (Gavish & Friedman, 2010; Goddard, O'Brien & Goddard, 2006; Gold & Roth, 1993). A recent U.S. study showed that one-quarter of beginning teachers are at risk of stress in their first year of professional practice (Fitchet, McCarthy, Lambert & Boyle, 2018). High levels of stress among teachers can harm education in many ways; for example, it can have a negative influence on students' perceptions of teachers' teaching quality (Hanif, 2004), students' achievement (Klusmann, Richter & Lütke, 2016; Ronfeldt, Loeb & Wyckoff, 2013) and students' well-being (Oberle & Schonert-Reichl, 2016). In addition, teachers with high levels of stress are more likely to experience burnout and leave the teaching profession (Jones & Youngs, 2012; Klassen & Chiu, 2011; Newberry & Allsop, 2017; Perryman & Calvert, 2019), which can lead to teacher shortages. The shortage of teachers has been reported as a real, large and growing problem in many countries, including the Netherlands and United States (e.g., Ministerie van Onderwijs Cultuur en Wetenschap, 2015; Sutcher, Darling-Hammond & Carver-Thomas, 2016).

Taken together, these factors point to the necessity of decreasing stress levels among teachers, especially beginning teachers. In several countries (e.g., England, Scotland, United States), teachers are offered an additional training programme during their first years of teaching, also known as an *induction* programme. These more or less formalized programmes aim to support beginning teachers in their first years of teaching after their initial teacher education (Beijaard, Buitink & Kessels, 2010). These programmes seek to create a smoother transition, from initial teacher education to the first professional teaching job, and they usually include one or more of the following components (induction arrangements): (1) workload reduction (e.g., no mentor tasks, fewer teaching hours); (2) supporting effective teacher classroom behaviour (e.g., providing a coach/mentor to observe lessons and provide feedback); (3) supporting school enculturation (e.g., providing background information regarding the school culture/climate) and (4) supporting professional development (e.g., organising meetings/courses for beginning teachers).

In recent years, the Dutch Ministry of Education, Culture and Science has supported projects to stimulate the implementation of induction programmes at Dutch secondary schools. Given the supportive nature of induction programmes, it is expected that the programmes have a powerful impact in reducing the amount of stress beginning teachers experience. However, little is known about the impact of different elements of the induction programmes on beginning teachers' stress (unique effects), and questions remain about which elements should be included in an induction programme to reduce beginning teachers' stress in the future. Research assessing the effectiveness of particular intervention strategies to help teachers and schools reduce teacher stress is needed (Kyriacou, 2001). This knowledge can help schools provide sufficiently targeted and tailored support for beginning teachers.

This dissertation aims to investigate beginning secondary school teachers' stress in the context of induction programmes. The following section presents the main research questions. The next section then explains how this dissertation conceptualizes and frames teachers' stress and explicates extant research on teacher stress and the effectiveness of induction programmes for reducing it. The final section provides an overview of the studies that constitute this dissertation.

1.1 Research questions

Investigating beginning secondary school teachers' stress in the context of induction programmes is complex. To provide structured insights into this topic, we conducted four separate studies. First, we investigated how to measure stress among beginning teachers. Second, upon establishing a robust, psychometric measurement of stress, we continued by examining how beginning teachers' stress relates to their teaching behaviour and attrition (leaving the teaching profession). Third, we investigated the effects of induction arrangements on beginning teachers' stress. Fourth, to understand how and why beginning teachers experience stress and how and why they respond the way they do, we examined differences in stress experiences between highly stressed leavers (beginning teachers who left the teaching profession within five years of teaching) and highly stressed stayers (beginning teachers who did not leave the teaching profession within five years of teaching). We conducted these investigations with the aim of answering the following research questions:

1. How can the stress experienced by beginning teachers be measured?
2. Do beginning teachers' stress, teaching behaviours and attrition relate?
3. What are the longitudinal effects of induction arrangements on beginning teachers' stress?
4. What are the differences between highly stressed leavers' and stayers' stress?

The following section explains how this dissertation conceptualizes teachers' stress, as well as how beginning teachers' stress, teaching behaviours, attrition and induction arrangements relate theoretically, according to a general stress model.

1.2 Theoretical framework

To date, experts in the field have provided no consistent definition of (teacher) stress. Competing bodies of literature on teacher stress originate from different fields (e.g., Izawa, Saito, Shirotaki, Sugaya & Nomura 2012; Klassen & Chiu 2010). In general, two general perspectives on (teacher) stress can be distinguished. One perspective views stress responses (e.g., negative emotions) as a result of external factors, beyond the individual (e.g., heavy workload). The other perspective theorises that stress is internal; it pertains to what goes on inside individuals as they interpret or react to what is going on around them (Gold & Roth, 1993). For example, the transactional model of stress (Folkman, 2013; Lazarus & Folkman, 1984) depicts work stress as a result of an interaction and appraisal process between employees and their environment. Due to the on-going debate about the definition of stress and the varying usage of the term ‘teacher stress’, this dissertation uses the term more as a label indicating a specific field of (applied) research.

Following van Veldhoven (1996), we divide teacher stress into (1) stress causes, (2) stress responses and (3) stress outcomes. Stress causes are all the aspects of the work content and the work situation that influence teachers at the cognitive, motivational and emotional levels. For example, student misbehaviour is a stress cause. Stress responses refer to the teachers’ mental interpretation when experiencing stress causes, such as feeling negative emotions (van Veldhoven, 1996). Finally, stress outcomes are the organizational outcomes resulting from persistent stress causes and responses. Leaving the teaching profession (attrition) is a stress outcome.

1.3 Stress model

To shed light on the relationships among beginning teachers’ stress causes, stress responses and stress outcomes, we use a framework based on the transactional model of stress (Lazarus & Folkman, 1987; Lazarus, 2006) and the job demands–resources model (JD-R model; Bakker & Demerouti, 2007), as depicted in Figure 1.1. In this framework, stress outcomes like teacher attrition and less effective teaching behaviour result from the interaction and appraisal process between a person (i.e., teacher) and his or her environment (i.e., school/classroom). The stress model in Figure 1.1 has several elements. The first is a *person*, who has certain beliefs and individual resources (Lazarus, 2006). Beliefs relate to how a person views him- or herself and his or her place in the environment. They form a person’s expectations about what is likely to happen, as well as what she or he fears or hopes for. Individual resources affect what a person is able and unable to do. In general, resources are social, organizational, psychical or psychological aspects that are useful in achieving work goals; reducing job demands and the associated psychological and physiological costs; and stimulating development, learning and personal growth (Bakker & Demerouti, 2007). Some examples of individual resources include self-care, effective coping skills, effective teaching skills and personal attributes (e.g., sense of

humour).

The next element is *environment*, which involves job demands and contextual resources. Job demands are the organizational, social, physical and psychological aspects of the job that require continual investments of psychological and/or physical effort or skills (Bakker & Demerouti, 2007). Contextual resources can help teachers cope with the stress caused by job demands. Some examples of such resources include school/administrative support, support from a mentor or support from colleagues (Beltman, Mansfield & Price, 2011).

According to the model, the person and the environment interact, in a person–environment relationship (Lazarus, 2006). This interaction leads to a *primary appraisal*, in which the teacher assesses whether the situation needs his or her attention and whether it appears negative. For example, if a teacher believes that students can only learn in a quiet environment but notices that students are talking in the classroom, she or he will appraise the situation negatively, and it becomes a potential stress cause. Next, a *secondary appraisal* takes place, in which the teacher evaluates whether he or she has the resources (individual or contextual) to cope with this stress cause (Mansfield, Beltman & Price, 2014). The teacher could, for example, have received advice from a mentor for how to deal with such a situation.

The third element of the model, *strain/stress responses*, can be physiological, affective or behavioural. Stress causes lead to stress responses, though resources can mitigate this relationship. For example, if advice from a mentor gives the teacher the ability to quiet the students, the teacher experiences less tension than if students had continued talking. Finally, the model posits that stress responses can lead to negative stress outcomes. If the teacher continuously experiences discontent due to the challenges of the teaching job, she or he ultimately might leave the teaching profession.

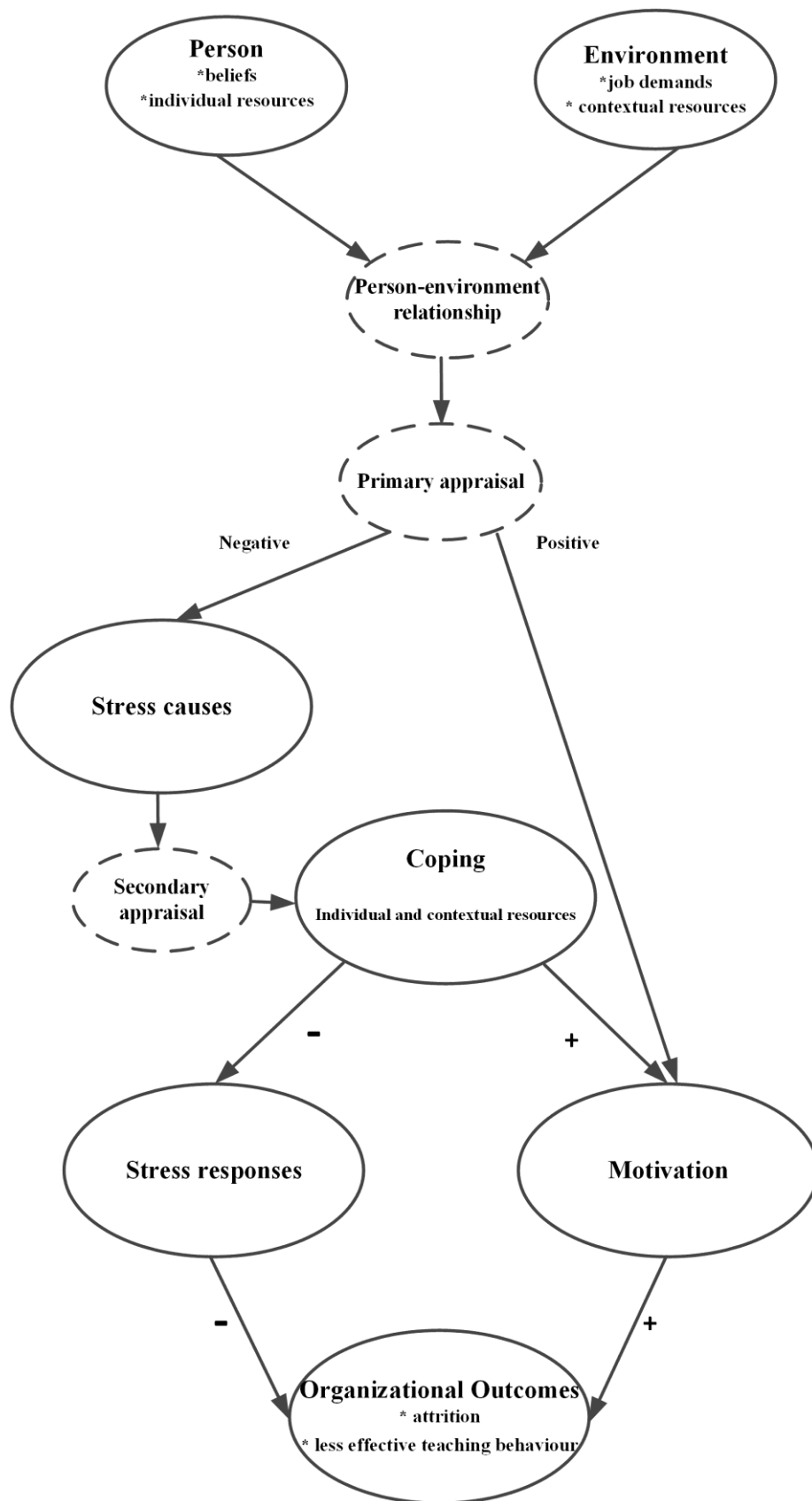


Figure 1.1 Proposed conceptual model of stress based on the JD-R model (Bakker & Demerouti, 2007) and the transactional model of stress (Lazarus, 2006; Lazarus & Folkman, 1984, 1987).

1.4 What is known

Induction programmes are well received and highly valued by beginning teachers (Draper, O'Brien & Christie, 2004; Hodkinson, 2006); research shows that they improve beginning teachers' teaching quality and retention rates, as well as students' achievement (e.g., Helms-Lorenz, van de Grift & Maulana, 2016; Hobson, Ashby, Malderez & Tomlinson, 2009; Ingersoll & Strong, 2011; Smith & Ingersoll, 2004). Therefore, it is likely that these supportive programmes have powerful impacts on reducing the stress that beginning teachers experience. However, little is known about the impact of different elements of induction programmes on beginning teachers' stress (unique effects). To investigate the influence of induction arrangements on beginning teachers' stress, it is important to establish ways to measure stress among beginning teachers, reliably and validly. Prior research shows that the main stress causes among teachers are education-specific workloads (e.g., large class size), student misbehaviour, poor relationships at work, role ambiguity, lack of job autonomy and poor school ethos (Borg & Riding, 1991; Chen & Miller, 1997; Hanif, 2004). Therefore, these stress causes are important to measure when investigating teacher stress. Although many (teacher) stress questionnaires exist, none of them include all these important stress causes. Therefore, one of them needs to be adjusted to cover a more comprehensive scope of important stress causes.

An appropriate stress questionnaire can support investigations of the relationships among beginning teachers' stress, attrition and teaching behaviour. Although previous research on teacher stress has indicated the significant role of stress in relation to attrition and teaching behaviour (Gilboa, Shirom, Fried & Cooper, 2008; Montgomery & Rupp, 2005; Tubre & Collins, 2000), the results remain inconclusive due to the fragmented nature of the research that studies these variables. Moreover, research linking teachers' stress to actual teacher attrition is scarce (Helms-Lorenz et al., 2016); most studies focus on teachers' intentions to quit their job (e.g., Jones & Youngs, 2012).

Previous research has established the following elements as effective support for beginning teachers: (1) having a trained mentor who takes sufficient time to guide the teacher (Gaikhorst, Beishuizen, Korstjens & Volman, 2014; McCormack, Gore & Thomas, 2006), (2) positive relationships with colleagues (Pogodzinski, 2014), (3) positive relationships with peers (Le Cornu, 2013; McCormack et al., 2006), (4) a positive relationship with one's supervisor (Pogodzinski, 2014) and (5) supportive family and friends (Le Cornu, 2013; Mansfield et al., 2014). Induction programmes include some of this support for beginning teachers, such as offering them a mentor/coach and organizing meetings with other beginning teachers (i.e., intervision/peer coaching). Therefore, induction programmes should influence beginning teachers' stress, but more research is needed to investigate this influence.

Finally, most research examining the relationships among teachers' stress, attrition and professional support is quantitative and therefore lacks in-depth explanations of teachers' experiences and interpretations regarding causality. In addition, Lazarus (2006) notes that stress cannot be solely understood from a person's environment; rather, stress is the result of the interaction of a person and

his or her environment. Therefore, to shed light on the stress experiences of beginning teachers and add to a deeper understanding of the relationships among their stress, their experienced support and their decision to leave or stay in the teaching profession, qualitative research is needed to address how and why questions, as a complementary approach and to understand these relationships in more detail.

1.5 This thesis

The main aim of this dissertation is to investigate the complex subject of beginning secondary school teachers' stress in the context of induction programmes. To provide structured insights into teacher stress and induction programmes, the dissertation describes four studies (Chapters 2–5), each conducted using (parts of) the conceptual model displayed in Figure 1.1.

Chapter 2 addresses research question 1, investigating how to measure the stress experienced by beginning teachers. This chapter describes two studies. The first study focuses on adjusting an existing stress questionnaire to make it appropriate to measure stress among beginning teachers. We tested existing items in terms of their relevance for the teaching context, then added relevant teacher-specific stress causes from previous research. The second study examines the factor structure, internal consistency, scalability, construct validity and criterion validity of the adjusted stress questionnaire.

Chapter 3 addresses research question 2, by investigating the relationships among beginning teachers' stress, attrition and teaching behaviour. Using a structural equation modelling framework, we determine which stress causes are significantly and positively related to which stress responses and then which stress responses are significantly and positively related to attrition and teaching behaviour.

Chapter 4 aims to answer research question 3 by investigating the effects of induction on beginning teachers' stress. To provide a general picture regarding changes in stress over time and the influence of individual induction arrangements on (changes in) stress causes and responses, we conducted longitudinal research. To this end, we collected data from 393 beginning teachers across three consecutive years and analysed them using multilevel latent growth curve modelling.

Although Chapters 2–4 provide valuable information regarding beginning secondary school teachers' stress in the context of induction programmes, all three chapters are quantitative studies and focus on only parts of the stress model (Figure 1.1). To understand beginning teachers' stress in the context of induction in more detail, we conducted qualitative research, focussing on the interaction between beginning teachers and their work environments, in **Chapter 5**. The aim of this study is to answer research question 4, or how and why beginning teachers experience stress and how and why they respond to it, by investigating the differences between highly stressed teachers who stayed in the profession (stayers) and highly stressed teachers who left the teaching profession within five years (leavers) via semi-structured interviews.

Finally, **Chapter 6** presents general conclusions and a discussion combining the findings of all the studies covered in this dissertation. In addition, we reflect on the limitations and theoretical and practical implications of the research and suggest avenues for further research.

CHAPTER 2

Measuring general and specific stress causes and stress responses among beginning secondary school teachers in the Netherlands

This chapter is based on: Harmsen, R., Helms-Lorenz, M., Maulana, R., van Veen, K. & van Veldhoven, M. (2018). Measuring general and specific stress causes and stress responses among beginning secondary school teachers in the Netherlands. *International Journal of Research & Method in Education*, 1–18. doi: 10.1080/1743727X.2018.1462313

Abstract

The main aim of this study was to adjust the Questionnaire on the Experience and Evaluation of Work (QEEW) in order to measure stress causes and stress responses of beginning secondary school teachers in the Netherlands. First, the suitability of the original QEEW stress scales for use in the beginning teachers (BTs) context was investigated using a sample of 356 beginning teachers from 51 different secondary school locations in the Netherlands. Confirmatory Factor Analyses, Principal Component Analyses and Mokken scaling item reduction was applied to create high concise and precise scales. Hereafter, based on the teacher stress literature, additional teacher specific stress items were added, resulting in the adjusted version of the measure, the Questionnaire on the Experience and Evaluation of Work – Beginning Teachers (QEEW-BT, study 1). To cross-validate the results and to examine the internal consistency and validity of the adjusted instrument a different sample of 143 beginning teachers from 61 different secondary school locations in the Netherlands was used (study 2). The present findings provide adequate support that the QEEW-BT is a reliable and valid instrument to measure stress causes and responses for beginning secondary school teachers in the Netherlands.

2.1 Introduction

Knowledge about work stress, its causes and negative consequences, and how it affects employees' wellbeing and performance has been well established (van Veldhoven, 1996; van Veldhoven & Meijman, 1994). General stress causes – as measured by the Questionnaire on the Experience and Evaluation of Work (QEEW, in Dutch: VBBA) of Van Veldhoven and Meijman (1994) – are positively related to stress responses, and negatively related to wellbeing and performance. The QEEW has robust psychometric properties and has been widely used and recognized in the Netherlands and various other countries (e.g. Belgium, France, Germany, Italy, and Brasil). Despite its strong psychometric quality and popularity, the QEEW is limited for use in a job-specific context such as the teaching profession. The questionnaire does not cover specific stress factors related to the teaching context. Although we assume that general stress causes and responses apply to teachers' work as well, inclusion of stress factors specifically related to the teaching context is necessary to unravel the knowledge about stress in the teaching profession more comprehensively. In the present study, we aim to adjust the QEEW to measure stress causes and stress responses among beginning teachers (BTs).

The teaching profession is considered to be a highly stressful profession by nature (Johnson et al., 2005). In the Netherlands, in 2014, circa 1 in 5 teachers experienced burnout symptoms. Teachers also reported higher levels of workload compared to other professionals (Hooftman, Mars, Janssen, de Vroome & van den Bossche, 2015).

There is no consistent definition of (teacher) stress provided by the experts in the field and competing bodies of literature on teacher stress exist that originate from different fields (e.g. Izawa, Saito, Shirotaki, Sugaya & Nomura, 2012; Klassen & Chiu, 2010). That being said, there seem to be two general perspectives on (teacher) stress. The first one is that stress responses (e.g. tension) are a result of something outside of the individual, external factors (e.g. heavy workload). For example Kyriacou (2001) and Rudow (1999) define teachers stress as teachers' experience of unpleasant, negative emotions, such as tension and anger, resulting from some aspects of their work. The other perspective posits that stress is internal; it is what goes on inside the individual as they interpret or react to what is going on around them (Gold & Roth, 1993). For example, the Transactional model of Stress (Lazarus & Folkman, 1984; Folkman, 2013) views work stress as a result of an interaction and appraisal process between the employee and its environment. In the same line, other researchers conceptualize stress with both internal and external aspects: the degree of mismatch between the demands made upon an individual and the individual's ability to cope with those demands (Bakker & Demerouti, 2007; McCarthy, Lambert, Lineback, Fitchett, & Baddough, 2015). Given the on-going debate about and the different usages of the term "teacher stress" in this paper the term is used more as a label indicating a specific field of (applied) research. We aim to develop an instrument that can be useful in both externally and internally focussed teacher stress research.

In this study teacher stress is divided into: (1) stress causes, (2) stress responses, and (3) stress outcomes. Stress causes are the collection of aspects of the work content and the work situation that influence employees at a cognitive, motivational and emotional level, for example student misbehaviour. Stress responses are the employees' mental interpretation when experiencing stress causes, for example feeling tension (van Veldhoven, 1996). Stress outcomes result from persistent stress causes and responses, for example leaving the teaching profession (attrition). To understand the chain between beginning teachers' stress causes, responses, teaching behaviour and attrition the well-validated and widely used job demands-resources (JD-R) model is used (Bakker & Demerouti, 2007). According to the JD-R model, there are two main psychological processes at work. The first is called the health impairment process. This process describes the relationship between job demands, job resources, strain and organizational outcomes. The second process is motivational in nature. Hereby it is assumed that job resources have motivational potential and lead to high work engagement, low cynicism, and excellent performance. The focus in this study is to adjust an instrument to measure the outcomes of the health impairment process. The JD-R model posits that job demands cover 'physical, psychological, social, or organizational aspects of the job that require sustained physical and/or psychological (cognitive and emotional) effort or skills. Examples in the teaching context are many hours of actual teaching and student misbehaviour. Although job demands are not necessarily negative, they may turn into stress causes when meeting those demands requires high effort from which the employee has not adequately recovered. Hence, job demands are conceptually related to stress causes. Job resources refer to physical, psychological, social or organizational aspects of the job that are either/or: functional in achieving work goals, reduce job demands and the associated physiological and psychological costs, stimulate personal growth, learning and development (Bakker & Demerouti, 2007). According to the JD-R model: high job demands exhaust employees' mental and physical resources leading to strain. Similarly, in the teaching context stress causes can lead to among other things feelings of tension. Therefore, strain is conceptually related to stress responses. Finally, this strain can lead to negative organizational outcomes like poor performance, health-related problems, and absenteeism (Bakker, Demerouti & Sanz-Vergel, 2014). Translated to the teaching context, tension can eventually lead to negative stress outcomes. Examples of negative stress outcomes are leaving the teaching profession (attrition) and less effective teaching behaviour. Effective teaching behaviour refers to teachers' behaviour which has significant and positive impact on student learning and outcomes (Maulana, Helms-Lorenz, & van de Grift, 2015). According to van de Grift (2007, 2014), effective teaching behaviours which are observable from the teacher's work include: creating a safe and stimulating learning climate, efficient classroom management, clear instruction, activating learning, teaching learning strategies and adaptation.

Stress causes that seem to recur consistently in most of the teacher stress literature involve education specific workload (e.g., big classes), student misbehaviour, poor relationships at work (with students, supervisor, and colleagues), role ambiguity, lack of job autonomy, and poor school ethos

(Borg & Riding, 1991; Chen & Miller, 1997; Hanif, 2004). Therefore, it is important that these teaching-related stress causes are included in measuring teacher stress. These stress causes, except for the role in the organization, are found to be positively related to attrition (Buchanan, 2010; Gonzalez, Brown, & Slate, 2008; Shen, 1997; Struyven & Vanthournout, 2014; Wilhelm, Dewhurst-Savellis, & Parker, 2000). Furthermore, greater levels of stress that are caused by student misbehaviour, education specific workload, and poor relationships at work have a negative impact on teachers' perceived personal accomplishments (Burke & Greenglass, 1993; Kokkinos, 2007). Hanif, Tariq and Nadeem (2011) studied the relationship between stressors and teaching performance of teachers with a minimum one year of teaching experience. The study showed that stress experienced by teachers was negatively related to their teaching behaviour.

BTs are more vulnerable to the pressures of the profession and stress compared to more experienced teachers (Gold & Roth, 1993). This group also shows high attrition rates (MacDonald 1999). Further, BTs show less effective teaching behaviour compared to more experienced teachers (Maulana, Helms-Lorenz, & van de Grift, 2015). Attrition is harmful for student achievement (Ronfelt, Loeb, & Wyckoff, 2013) and less effective teaching behaviour can also influence student achievement negatively (Hattie, 2012).

Insight into which and how stress causes and responses influence BTs' attrition and teaching behaviour remains unclear. This insight could help us signal the possibility of attrition at an early stage in the career, and to develop support which potentially decreases the negative influences of certain stress causes on teachers' teaching behaviour. To this end a valid, reliable and apt instrument to measure teacher stress more comprehensively is necessary.

As mentioned above, although there are several (teacher) stress questionnaires, none of them cover the broad scope of stress causes and stress responses. The Stressor Multilevel context scale of Betoret (2006) and the Stress questionnaire of Payne and Furnham (1987) are both teacher stress questionnaires which do not cover teacher specific stress causes such as poor relationship with students. Additionally, those questionnaires do not include stress responses factors, which limit the insight into the mental interpretation of teachers when experiencing stress causes. The Teacher Stress Inventory of Fimian (1984) lacks the important teacher stress causes such as student misbehaviour, role ambiguity, and poor relationship with students, supervisor, and colleagues. In addition, the teacher stress questionnaire of Kyriacou and Sutcliffe (1978) and the stress questionnaire of Borg and Riding (1991) do not include two of the important stress causes which seem to recur consistently in most of the teacher stress literature, namely poor relationship with students and role ambiguity.

None of the mentioned teacher stress questionnaires cover the broad scope of stress causes and stress responses that we are aiming for. Therefore, the knowledge base on teacher stress will benefit from the construction of a more comprehensive teacher stress measure covering the broad scope of stress causes and stress responses experienced by BTs. Because the QEEW has been proven to be a robust and widely used questionnaire measuring general stress across professions including teaching,

the QEEW will be used as the point of departure to create the Questionnaire on the Experience and Evaluation of Work – Beginning Teachers (QEEW-BT), and we will be both modifying the source and adding scales to it to make it more specific for the context of BTs.

2.1.1 The studies

Two studies were conducted using different samples of secondary education teachers in the Netherlands. Study 1 focuses on adjusting the QEEW to measure general and teacher specific stress causes and stress responses of beginning teachers (BTs), resulting in the concept version of the QEEW-BT. Study 2 focuses on cross-validating the factor structure of the QEEW-BT and on examining the internal consistency, scalability, construct validity and criterion validity of the QEEW-BT, resulting in the final version of the QEEW-BT. Permission to conduct the studies was taken from the concerned authorities of all the schools before the studies were conducted. Also, participants were aware that participation was voluntary and that they could stop participating at any stage of the studies.

Study 1: adjusting the QEEW resulting in the QEEW-BT

2.2 Method

2.2.1 Participants

Sample 1 consisted of 356 beginning teachers from 52 different secondary school locations in the Netherlands (see Table 2.1). The total number of BTs in the 52 school locations was 538. The percentage of female teachers is slightly higher (56.7%) compared to the national secondary school teachers population. The percentage of school locations with less than 1000 students is lower than in the national population. The percentage of school locations with between 1000–2000 is higher in this sample than in the national population. The percentage of qualified teachers is lower than in the national population, both compared to teachers from all ages as well as teachers who are younger than 35 years. The distribution of the denomination, urbanization and SES percentages differ greatly between the national population and the sample. This can be explained by the distribution of the school locations over the regions in the Netherlands (see Table 2.2). The northern regions of the Netherlands (Drenthe, Friesland, and Groningen) are overrepresented. In these regions there are only two catholic school locations. Also, the urbanization and the SES in these regions is lower compared to most of the other regions in the Netherlands.

Table 2.1 Information on the samples and population

		All secondary schools in the Netherlands	Sample 1	Sample 2
Number of teachers		73900 ^a	356	143
Percentage female		46.7% ^a	56.7%	57.3%
Schools ^b		655	25	25
School locations ^b		1432	52	61
Number of students per school location	less than 1000 students	70.5%	65.4%	67.2%
	between 1000–2000 students	24.9%	32.7%	31.1%
	between 2000–3000 students	1.7%	0%	0%
	missing	2.9%	1.9%	1.6%
Teaching qualification ^c	qualified ^d	88.2% ^c	63.8%	95.8%
	appointable ^e	6.2% ^c	3.9%	0.7%
	not qualified ^f	5.6% ^c	19.4%	0.7%
Teaching qualification people < 35 years	qualified	81.1% ^c	63.8%	95.8%
	appointable	8.7% ^c	3.9%	0.7%
	not qualified	10.2% ^c	19.4%	0.7%
	missing		12.9%	2.8%
Denomination	public (in the Netherlands: openbare scholen)	27.2%	51.9%	49.2%
	catholic	21.2%	1.9%	1.6%
	protestan/christian/evangelical /reformed	33.7%	34.6%	37.7%
	free schools (in the Netherlands: Algemeen bijzondere scholen)	16.1%	5.8%	6.6%
	remaining	1.8%	3.8%	3.3%
	missing		2.0%	1.6%
Urbanization	1 (most)	22.4%	9.6%	9.8%
	2	31.4%	11.5%	9.8%
	3	21.1%	34.6%	34.4%
	4	17.7%	23.1%	21.3%
	5 (least)	6.2%	19.2%	21.3%
	missing	1.2%	2.0%	3.3%
Social economic status (SES)	4st (lowest)	32.35	43.42	45.36
	3st	23.61	28.25	26.64
	2st	19.75	14.78	14.03
	1 st (highest)	23.52	11.23	11.54

Note. a Data from 2013. Source: OCW (Ministerie van Onderwijs, Cultuur en Wetenschap, 2014)

b Data from 2014. Source: data from Dienst Uitvoering Onderwijs (DUO)

c Data from 2014. Source: IPTO bevoegdheden en vakken in het VO (Fontein, Prüfer, de Vos and Vloet 2016)

d Teachers who obtained a teaching degree who teach the same subject and education level they have been qualified for

e In the Netherlands teachers are considered to be appointable if they comply to become qualified within two years after being appointed. This category of teachers consist of different types of teachers: teachers with no teaching degree who teach no longer than one year. Teachers who teach a different subject or education level to what they have been qualified for. Pre-service teachers. Second career teachers who are not qualified yet

f Teachers with no teaching degree who teach longer than one year and are not following a teacher education program.

Table 2.2 Distribution of school locations (correspond to Dutch provinces) in both samples (in percentages)

Province	School locations (%)	Sample 1	Sample 2
Drenthe	3.1	23.1	23.0
Flevoland	2.7	1.9	1.6
Friesland	5.7	30.8	31.1
Gelderland	11.7	7.7	6.6
Groningen	4.8	28.8	31.1
Limburg	5.2		
Noord-Brabant	12.7		
Noord-Holland	15.4		
Overijssel	7.8	5.8	4.9
Utrecht	6.3		
Zeeland	2.0		
Zuid-Holland	22.6		
Total	100	100	100

2.2.2 Measures

BTs from sample 1 completed the QEEW around the end of the school year 2012 (April, measurement occasion 1). BTs were defined as teachers who recently obtained their teaching qualification or would obtain this within a year and had less than three years of teaching experience. In addition, one class of students per BT filled in the student questionnaire measuring perceived teaching behaviour (students' perceptions of the teachers' ability on the six domains described below; Maulana, Helms-Lorenz and van de Grift, 2015) also around April for three consecutive years (measurement occasion 1, 2, 3). For each school the contact person of the school randomly chose one of the BTs' classes to fill in the student questionnaire, and a survey administrator supervised the students whilst they were completing the questionnaire (the BT was not allowed to be present). Students were instructed and informed that participation was voluntary and that their answers would be treated anonymously.

Perceived teaching behaviour was measured using an unidimensional student questionnaire consisting of the six domains; safe and stimulating learning climate, efficient classroom management, clear instruction, activating learning, differentiated teaching, and teaching-learning strategies. A total of 6291 students completed the student questionnaire for 281 of the BTs from sample 1 on measurement occasion 1, and a total of 4811 students for 208 of the BTs from sample on measurement occasion 3. The individual student ratings were aggregated to classroom level for which mean averages were used. The instrument had a good internal consistency (Cronbach's alpha = .80), and consisted of 24 questions rated on a four-point Likert scale ranging from 1 (completely disagree) to 4 (completely agree) (Maulana, Helms-Lorenz, & van de Grift, 2015). Change in perceived teaching behaviour was operationalized as the gain score between measurement occasion 1 and 3. For 176 of the BTs from sample 1 the student questionnaire was completed both on occasion 1 and occasion 3, representing 4580 student questionnaires.

Stress causes and stress responses were measured with the original QEEW (van Veldhoven & Meijman, 1994). All 27 scales (201 items) were used (see Appendix A, p. 126 for an overview of the

scales). The internal consistency and validity of this questionnaire was good (Evers, van Vliet-Mulder, & Groot, 2000). Most scales had a good internal consistency (Cronbach's alpha > .80) and five scales had a satisfactory internal consistency (Cronbach's alpha between .65 and .79) in our sample.

Attrition was registered between measurement occasion 1 and 3 when teachers left their first teaching job (1= job leaver, 0= stayer).

2.2.3 Analytic approach

In order to adjust the QEEW to measure general and teacher specific stress causes and stress responses of beginning secondary school teachers in the Netherlands, four systematic steps were followed.

Step 1. Examining and selecting the QEEW scales which are applicable for the beginning teacher context. The QEEW has 27 scales of which we intend to select only those scales that capture the broader scope of stress causes and stress responses. This was achieved by examining and selecting the scales from the QEEW which belonged to second order stress causes and stress responses scales. Second order scales are aggregated scales that measure more aspects (derived from the primary scales) of one latent construct. To examine whether the second order factor structures for the stress causes and stress responses of BTs are similar to that of employees from a variety of occupations as indicated by van Veldhoven (van Veldhoven, see Appendix B, p. 127 structure 1a and 1b), Confirmatory Factor Analyses (CFAs) were conducted at the scale level (see Appendix C, p. 128 for an explanation of the technical and statistical terms). The second order factor structures of BTs appeared to be different from that of employees from a variety of occupations. Therefore, the factor structures were explored by means of Principal Component Analyses (PCAs). The PCAs reflect a formative measurement model, meaning that the measured variables are considered to be the cause of the latent variable. In Appendix B both second order factor structures can be found (structure 1a and 1b, and 2a and 2b). The new factor structure still consisted of 4 factors representing stress causes (structure 2a) and 2 factors representing stress responses (structure 2b). However, role conflict which belonged to the factor of social and organizational aspects in the structure for employees from a variety of occupations belongs to the factor of high psychological task demands in the BT structure. Lack of job autonomy belonged to lack of influence, whereas in the BT structure it belonged to the factor lack of development opportunities. Lack of communication which originally belonged to the factor social and organizational aspects appeared to belong to the factor lack of influence in the BT structure. Finally, poor sleeping quality and tiredness during work belong to the stress response tension in the BT structure. Scales within the PCA factor structure (all scales in structure 2a and 2b) were selected for our purposes to capture the broader scope of stress causes and responses.

Step 2. This step was used to identify scales having significant predictive values for attrition or change in perceived teaching behaviour using regression analyses. Scales that revealed predictive value were selected for our purposes.

Step 3. In order to create a more cost-effective teacher stress instrument with high conciseness and precision (thus avoiding redundancy) and increased user friendliness (i.e., reducing fatigue effects) item reduction was needed. Items from the scales selected in step 1 and 2 were deleted stepwise during three rounds of item reduction, which was consistent with the procedure taken by earlier initiatives for item reduction of the QEEW (Notelaers, de Witte, van Veldhoven, & Vermunt, 2007; van Veldhoven, Prins, van der Laken, & Dijkstra, 2015). Consistent with the procedure taken by Van Veldhoven (1996), Mokken scaling item reduction procedure was conducted. More specifically, the more restrictive double monotonicity Mokken model was applied (Mokken, 1971). The assumption of Unidimensionality was tested by conducting the Mokken analysis for each stress scale. Items with item-scalability values (H(i)-values) below .30 violated the assumption of Unidimensionality and were therefore deleted. The assumption of local independency, was tested by means of the LD X^2 statistic (Chen & Thissen, 1997). Standardized X^2 values above 10 indicate violation of the local independency assumption. The assumption of non-intersecting item response curves was checked using the information from non-intersection based on P-Matrix. *Crit* value above 80 is a strong violation of the assumption of non-intersecting response curves (Molenaar & Sijtsma, 2000).

In the second round of item reduction, items measuring the same content were deleted. This was achieved by checking the mean score of the items. Items with the same mean score (or within a distance of .10) were checked in terms of their content. If the items were similar in content the item with the lowest H(i) score was deleted. One exception to this rule was made for scales with a significant predictive value for change in perceived teaching behaviour and/or attrition. Items in those scales were only deleted if the predictive value of the scale for perceived teaching behaviour and/or attrition remained significant after deletion.

The last round of deletion was content-based. The aim was to reduce the number of original items in the scale to about 50%. Factor loadings of the items on the scale were calculated and the items with the lowest factor loading were deleted stepwise if after deletion the scale internal consistency was minimal .70, the scalability (H(t)) minimal .40 and the number of items per subtopic in the scale was well balanced. That is, the scale lack of job variety for example has items regarding 'Task variety' (subject A) and items regarding 'Creativity' (subject B). The reduced scales has three items regarding subject A and three regarding subject B.

Step 4. As the QEEW measures general stress causes and stress responses, during this step teacher stress causes based on the teacher stress literature were added.

An overview of the steps can be found in Table 2.3 below.

Table 2.3 Overview of the steps

Step	Aim	Reason	Analyses	Results
1	Examining the factor structure of the QEEW for beginning teachers.	To identify and select scales of the QEEW contributing to a higher order scale. In order to capture the broader scope of stress causes and stress responses.	CFA, PCA	See step 1: Second order factor structure QEEW
2	Examining which of the scales which were not selected in step 1 have a predictive value for attrition and/or teaching behaviour.	To include scales of the QEEW which do not belong to a higher order scale that do have predictive value for attrition and/or teaching behaviour.	Regression analyses	See step 2: Predictive value
3	Item reduction on the scales which were selected during step 1 and 2.	To make the questionnaire more concise and precise. Hereby reducing the number of items teachers have to fill in.	Mokken	See step 3: Item reduction
4	Adding teacher specific scales.	To make the questionnaire suitable for the teaching context.		See step 4: Additional scales

2.3 Results

Step 1: Second order factor structure of the QEEW. For the stress causes the CFA-model showed poor fit ($\chi^2=297.32$, $df=59$, $p < .001$; RMSEA= .11; CFI= .81; TLI= .75; SRMR= .08). The CFA-model for stress responses also showed poor fit ($\chi^2=92.33$, $df=8$, $p < .001$; RMSEA= .18; CFI= .86; TLI= .73; SRMR= .07). In both models the modification indices indicated ways to improve model-data fit by allowing correlations between scales from the same factor. Nevertheless, allowing scales to correlate did not result in acceptable model-data fit.

PCA was conducted on the 19 stress causes scales using (in line with the development of the original QEEW) orthogonal rotation (varimax). Preliminary analyses supported the adequacy to conduct PCAs. Initial analyses were run to obtain eigenvalues for each component in the data. Six components had eigenvalues over Kaiser's criterion of 1 and in combination explained 61.63% of the variance. Given the relatively large sample size, and the convergence of the scree plot and Kaiser's criterion on six components, four components were retained in the final analysis. PCA was repeated this time with four fixed factors (see Appendix B structure 2 for the factor structure and the factor loadings).

PCA was also conducted on the eight stress responses scales. Two components had eigenvalues over Kaiser's criterion of 1 and in combination explained 62.79% of the variance (see

Appendix B structure 2b, and Table 2.3 for an overview of which stress causes and responses scales were selected in step 1).

Step 2: Predictive value. None of the non-selected scales (scales which were not part of a higher order scale, step 1) had significant correlations with change in perceived teaching behaviour. Therefore no regression analysis was performed and no scales were selected based on this criterion.

Two scales, uncertainty about the future and changes in tasks, showed significant correlations with attrition. Therefore, logistic regression analysis was conducted to predict attrition using these two scales. Uncertainty about the future was a significant predictor of attrition ($\chi^2 = 11.675, p < .001, df=1$ with $Exp(b)=1.61, b=.48, SE=.14$, Nagelkerke $R^2=.06$). Therefore, this scale was retained (see Table 2.3, step 2).

A total of 22 scales had a predictive value for attrition and/or were part of a higher order scale and were therefore selected for the QEEW-BT. The five scales physical effort, lack of possibilities for contact, lack of career opportunities, lack of remuneration, and changes in tasks were not included in the QEEW-BT (25 items). These scales were not part of a higher order scale (step 1) and did not predict attrition and/or teaching behaviour (no evidence of predictive validity).

Step 3: Item reduction. Eight items were deleted as they violated the assumption of Unidimensionality. Four item pairs violated the assumption of local independency. For three out of these four item pairs, the content of the two questions was clearly different, therefore no items were removed. For the last item pair the content was similar. Therefore, the item with the lowest H(i) score was removed. Lastly, two items were deleted as they violated the assumption of non-intersecting response curves.

In the second round of item deletion a total of 20 items were deleted. In the final round of item deletion another 16 items were deleted. A total of 129 items from the QEEW were used for the QEEW-BT.

Step 4: Additional scales. Based on the literature review, additional stress causes which need to be included in a teacher stress questionnaire involve: education specific workload (e.g. big classes), student misbehaviour, poor relationships at work (students, supervisor, and colleagues), role ambiguity, lack of job autonomy, and poor school ethos. Stress causes concerning poor relationships with supervisor, colleagues, role ambiguity and lack of job autonomy were already included in the QEEW. The other stress causes were not included in the original QEEW and were therefore added to the QEEW-BT (46 items, see Table 2.4 for an overview of the additional scales, example of items and the sources).

Table 2.4 Overview of new scales and sources

<i>Scale</i>	<i>Example items</i>	<i>Sources</i>
Student misbehaviour	students who are rude	Sources of Stress Questionnaire (Borg & Riding, 1991), Teacher Stress Questionnaire (Kyriacou & Sutcliffe, 1978), Stress Questionnaire (Payne & Furnham, 1987).
Poor school climate	experiencing lack of recognition for the work you do	
Poor relationship with students	finding it difficult to like your students	Teacher as a Social Context Questionnaire (Wellborn, Connell, Skinner, & Pierson, 1992), subscales affection and attunement. Student-Teacher Relationship Scale (Koomen, Verschueren, van Schooten, Jak, & Pianta, 2012), subscale closeness and conflict.
Education specific workload	too many hours of actual teaching	Teacher Stress Inventory (Fimian, 1984).

The items regarding poor relationship with students were divided into two scales: poor relationship with students 1 and poor relationship with students 2. Both scales cover items measuring teacher-student relationships. However, both scales differ in terms of the response category. The items of the first scale were provided on a four-point Likert scale ranging from 0 (completely disagree) to 3 (completely agree), while those of the second scale were scored on a five-point Likert scale ranging from 1 (definitely not applicable) to 5 (certainly applicable).

An overview of the steps, scales and number of items per scales can be found in Appendix A.

Study 2: Cross-Validation

2.4 Method

Using sample 2 the scalability of the 46 newly constructed items were tested using Mokken scaling. The same assumptions and criteria were employed consistent with study 1. The internal consistency of all QEEW-BT scales was investigated by calculating the Cronbach's alpha and the H(t). The construct validity was investigated by correlating the new stress causes scales with the stress responses scales. The criterion validity was established by correlating the new teacher specific scales with perceived teaching behaviour, see Figure 2.1 for the path of influence. Finally, the factor structure of the QEEW-BT was explored using PCAs.

2.4.1 Participants

Study 2 included a total sample of 143 beginning teachers from 61 different secondary school

locations in the Netherlands (see Table 1). The percentage of female teachers is slightly higher (57.3%) compared to the national secondary school teachers population. The percentage of school locations with less than 1000 students is lower than in the national population. The percentage of school locations with between 1000-2000 students is higher in the samples than in the national population. The percentage of qualified teachers is higher than in the national population. The distribution of the denomination, urbanization and SES percentages differ greatly between the national population and the sample. Similar to sample 1, the northern regions of the Netherlands (Drenthe, Friesland, and Groningen) are overrepresented.

2.4.2 Measures

Stress causes and stress responses. Stress causes and stress responses were measured with the QEEW-BT (see Figure 2.1). The teachers received the questionnaire digitally and they had to fill it in within a three month period.

Perceived teaching behaviour. Perceived teaching behaviour was measured during the same period as the stress causes and responses. The instrument and procedure for this measure are similar to study 1. A total of 1736 students completed the questionnaire for 86 of the BTs of sample 2.

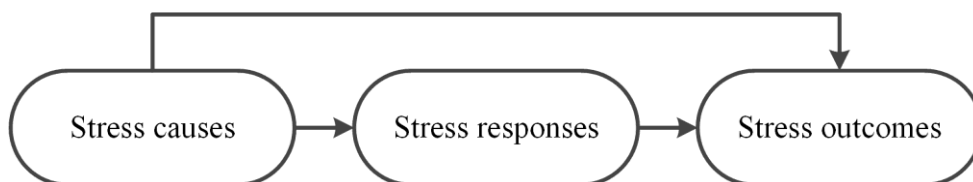


Figure 2.1 Path of influence stress causes, stress responses and stress outcomes

2.5 Results

2.5.1 Scalability

From the 46 newly constructed teacher specific items 5 items violated the assumption of unidimensionality and were therefore deleted. An overview of the final version of the QEEW-BT can be found in Table 2.3.

2.5.2 Internal consistency

Appendix A indicates that all newly developed scales show satisfactory to good internal consistencies (Cronbach's alpha .76 – .89). The QEEW-BT has 14 scales with good internal consistency and 13 scales with satisfactory internal consistency (Cronbach's alpha .70 – .94). Further, all scales have sufficient H(t) values (.40 – .82).

2.5.3 Construct validity

In Table 2.5 the results of the correlations between the new stress causes scales and the stress responses scales are displayed. The results show that the teacher specific stress causes have significant positive relationships with many of the stress responses (Spearman's rho ranging from .15 and .52, non-normally distributed data).

Table 2.5 Correlation (Spearman's rho) between new stress causes scales and stress responses scales

Scale	Lack of work pleasure	Lack of organizational commitment	Turnover	Emotional reactions during work	Tiredness during work	Need for recovery	Poor sleep quality	Rumination
Student misbehaviour	.35**	.37**	.28**	.15*	.21**	.29**	.18*	.20*
Poor relationship with students 1	.39**	.44**	.22**	.20**	.20**	.28**	.18*	.07
Poor relationship with students 2	.45**	.29**	.07	.42**	.12	.20**	.19*	.04
Poor school climate	.10	.31**	.28**	.01	.32**	.36**	.17*	.35*
Education specific workload	.09	.22**	.27**	-.05	.40**	.52**	.33**	.50**

Note. * Correlation is significant at the .05 level (1-tailed).

** Correlation is significant at the .01 level (1-tailed).

2.5.4 Criterion validity

In Table 2.6 the results of the correlations between the new stress causes scales with perceived teaching behaviour scale are displayed. The scales student misbehaviour, poor relationship with students 1 and poor relationship with students 2 are negatively related to the perceived teaching behaviour scale (Spearman's rho - .52, - .31, and - .38).

Table 2.6 Correlation (Spearman's rho) between new stress causes scales and perceived teaching behaviour

<i>Scale</i>	<i>Spearman's rho</i>
Student misbehaviour	-.52*
Poor relationship with students 1	-.31*
Poor relationship with students 2	-.38*
Poor school climate	-.02
Education specific workload	-.03

Note. * Correlation is significant at the .01 level (1-tailed)

2.5.5 Second order factor structure QEEW-BT

PCA was conducted on the 19 stress causes scales with orthogonal rotation (varimax). Initial analyses showed that the scales lack of communication and uncertainty about the future correlated with no other scales and were therefore not included in further analyses of the structure. The PCA was conducted on the remaining 17 stress causes scales with orthogonal rotation. Preliminary analyses supported the adequacy to conduct PCAs and were run to obtain eigenvalues for each component in the data. Five components had eigenvalues over Kaiser's criterion of 1 and in combination explained 66.06% of the variance (see Appendix B structure 3a for the factor structure and the factor loadings).

PCA was also conducted on the eight stress responses scales. Three components had eigenvalues over Kaiser's criterion of 1 and in combination explained 70.68% of the variance (see Appendix B structure 3b).

2.6 Conclusion and discussion

The main aim of this study was to adapt the Questionnaire on the Experience and Evaluation of Work (QEEW) in order to measure stress causes and stress responses of beginning secondary school teachers in the Netherlands. We found that stress of novice employees in the teaching professions manifests itself in a unique way. Suitable QEEW scales were selected and an item reduction procedure was applied. Furthermore, relevant teacher specific stress scales were added resulting in the QEEW-BT. In the second study the factor structure, internal consistency and validity of the QEEW-BT were examined, resulting in the final version of the QEEW-BT.

It was found that the majority of the original QEEW scales were relevant for use in the BTs context. The scales physical effort, lack of possibilities for contact, lack of career opportunities, lack of remuneration, and changes in tasks were evaluated to be not relevant. Those scales did not belong to a higher order scale and did not have predictive value for attrition and/or teaching behaviour. For the relevant scales the item reduction procedure resulted in a reduction to nearly half of the original questionnaire. For physical effort and changes in tasks a restriction of range seems evident. Most BTs (around 90%) in sample 1 never or only sometimes experienced stress caused by physical effort or

changes in tasks. There was more variation on the scales lack of possibilities for contact, lack of career opportunities, and lack of remuneration. However, these stress causes did not seem to influence BTs attrition or perceived teaching behaviour.

Based on teacher stress literature, items regarding student misbehaviour, poor relationship with students, poor school climate and education specific workload were identified as relevant and added to the QEEW resulting in the QEEW-BT (see Appendix A, p.126 for the final version). These additional scales had significant positive correlations with the stress responses scales, meaning that higher levels on one or more of the teacher specific stress causes scales were associated with higher levels on one or more of the stress responses scales. This is in line with findings of Mearns and Cain (2003), adding to the construct validity of the scale and highlighting the importance of measuring these teacher specific stress causes.

More unique to the QEEW-BT, compared to other (teacher) stress questionnaires, are the scales regarding poor relationship with students. This study showed that poor relationships with students are positively related to lack of work pleasure, lack of organizational commitment, turnover, emotional reactions during work, tiredness during work, need for recovery, and poor sleep quality. Furthermore, a negative relationship between poor relationships with students and BTs perceived teaching behaviour was revealed. Therefore, there is evidence that poor relationships between the teacher and their students do not only influence students' school engagement and achievement negatively (Roorda, Koomen, Spilt, & Oort, 2011), but also affect teachers' stress responses and perceived teaching behaviour in a negative fashion.

Student misbehaviour also showed a negative relationship with BTs perceived teaching behaviour. This is in line with earlier research showing that teachers with great levels of stress caused by student misbehaviour have lower levels of perceived personal accomplishment (Abel & Sewell, 1999; Kokkinos, 2007).

Most scales of the QEEW-BT had good internal consistencies and some had satisfactory internal consistencies. The PCA conducted on the stress causes of the QEEW-BT showed that the new scales education specific workload and poor school climate loaded on the existing higher order factors. Whereas, the scales poor relationship with students 1, poor relationship with students 2, and student misbehaviour together loaded on a new higher order factor, students. Thereby adding a new and important factor to the questionnaire. The PCA conducted on the stress responses also showed a new factor, negative emotions, with the scales emotional reactions during work and lack of work pleasure. These scales correlated highly with each other (Spearman's rho .66 in sample 2), meaning that higher levels on emotional reactions during work are associated with more lack of work pleasure. This is in line with the findings of Brackett, Palomera, Mojsa-Kaja, Reyes and Salovey (2010), who found that the ability to regulate emotions is positively associated with job satisfaction in secondary school teachers.

It is interesting that the scales from the higher order scale students all have positive relationships with lack of work pleasure and emotional reactions during work, whereas the other new scales do not. It seems that students play an important role in the emotional reactions and work pleasure of BTs. This is in line with research of Fokkens-Bruinsma and Carrinus (2014) who found that for pre-service secondary school teachers, working with children/adolescents is in the top three of most important motives to become a teacher. This motive has, in turn, a significant relationship with satisfaction, happiness and affective commitment.

Notwithstanding the strengths, the present study also has limitations. Although the samples were relatively large, both samples included mainly school locations in the northern regions of the Netherlands. Therefore, the distribution of the denomination, urbanization, and SES percentages in our samples differed to some extent from the national population profile. Hence, caution should be taken when interpreting results of this study until replication with larger and more representative samples is available. Another limitation was the size of the second sample ($N = 143$). Although this sample is sufficient, a larger sample offers more possibility to examine the relationships between the teacher specific scales and attrition, and change in perceived teaching behaviour with more power. Nevertheless, the QEEW was proven to be a robust questionnaire and has been used in many countries with very diverse cultural backgrounds (e.g. UK, USA, China, Malaysia, Australia, Japan, Brazil, Sweden). Also, both the items from the QEEW as well as from the QEEW-BT reflect the stress factors which are highlighted as important stress factors in international research. Another limitation of this study is the use of PCAs to establish the factor structure of the QEEW-BT. Although Mokken scaling was used next to PCA to determine the unidimensionality, the complicated issue of establishing the factor structure would in hindsight be better employed using another advance statistical method. Future research would benefit from using exploratory structural equation modelling (ESEM; Marsh, Morin, Parker, & Kaur, 2014) as an alternative for analysing stress factors at the item-level.

To conclude, the QEEW-BT offers an instrument that may improve our understanding of relevant BTs' work outcomes related to stress, which supports Sparks and Cooper's (1999) line of thinking advocating the combination of measuring general and specific stressors when assessing specific job settings. The adjustment of the QEEW has resulted in a more comprehensive measure to capture both general and specific stress causes among BTs – the QEEW-BT. Researchers and schools (i.e., coaches, mentors) can use this instrument to provide insight into which stress causes and responses BTs at their school experience in order to adjust their support more right on target to ensure the wellbeing of their (new) teaching staffs. Future research could focus on the question how these stress causes and stress responses influence BTs attrition and change in teaching behaviour.

CHAPTER 3

The relationship between beginning teachers' stress causes, stress responses, teaching behaviour and attrition

This chapter is based on: Harmsen, R., Helms-Lorenz, M., Maulana, R. & van Veen, K. (2018a). The relationship between beginning teachers' stress causes, stress responses, teaching behaviour and attrition. *Teachers and Teaching*, 24(6), 626–643. doi: 10.1080/13540602.2018.1465404

Abstract

In this study the relationships between beginning teachers' perceived stress causes, stress responses, observed teaching behaviour and attrition is investigated employing structural equation modelling (SEM). A total of 143 BTs were surveyed using the Questionnaire on the Experience and Evaluation of Work- BTs (QEEW-BT). Teaching behaviour was observed using the ICALT observation instrument. Results show that BTs' perceived negative pupil aspects relate positively to the stress responses perceived tension, discontent, and negative emotions. Negative emotions, in turn, are negatively associated with observed teaching behaviour. This study also shows that discontent positively relates to attrition. Additionally, this study provides important cues to improve professional support programs for BTs.

3.1 Introduction

The teaching profession is considered to be a highly stressful profession (Johnson et al., 2005; Newberry & Allsop, 2017). Teachers from many countries report high levels of stress (see e.g., Chaplain, 2008; Johnson & Birkeland, 2003; Kyriacou, 2001; Skaalvik & Skaalvik, 2015). In the Netherlands specifically, a figure from 2014 shows that circa 1 out of 5 teachers experienced burnout symptoms. Teachers also reported higher levels of workload compared to other professionals (Hooftman, Mars, Janssen, de Vroome, & van den Bossche, 2015). Particularly, beginning teachers (BTs) seem to be more vulnerable to the pressures of the profession compared to experienced teachers (Gold & Roth, 1993). A recent study in the US showed that one quarter of the BTs are at risk for stress in their first year (Fitchet, McCarthy, Lambert, & Boyle, 2018). Experiencing a high level of stress seems to be detrimental for teachers' wellbeing (Chapter 2) and may indirectly harm students' achievement (Ronfeldt, Loeb, & Wyckoff, 2013). It also seems to influence teachers' intention of leaving the profession/attrition (Jones & Youngs, 2012; Klassen & Chiu, 2011), their decision to leave teaching (Newberry & Allsop, 2017) and their teaching quality (Hanif, 2004).

Although the current knowledge on teacher stress gives an indication about the role of stress factors for outcomes such as wellbeing and attrition, the relationship between teacher stress, teaching behaviour, and attrition remains inconclusive due to the fragmented nature of research in studying the mentioned variables. Moreover, research examining the relationship between stress factors and teaching behaviour is scarce. Additionally, in the past attrition research was commonly studied from the 'intention' perspective instead of from the 'actual' perspective.

In order to fill in the voids in the existing teacher stress literature and how it relates to other important teacher factors, the present study aims to investigate the relationship between stress (causes and responses), teaching behaviour, and actual attrition focusing particularly on BTs. Insight into these relationships can serve as important knowledge for (re)-designing support for BTs' professional development.

3.1.1 Conceptual Framework

3.1.1.1 Defining and modelling stress

Teacher stress can be defined as a teachers' experience of unpleasant, negative emotions resulting from some aspects of their work (Kyriacou, 2001). According to van Veldhoven (1996), teacher stress consists of two components: (1) stress causes, and (2) stress responses. Stress causes are the collection of aspects of the work content and the work situation influencing employees at a cognitive, motivational, and emotional level. Stress responses are the employees' mental interpretations when experiencing stress causes (van Veldhoven, 1996).

The job demands-resources model (JD-R model; Bakker & Demerouti, 2007) is a useful framework to understand the interplay between BTs' stress causes, stress responses, teaching

behaviour and attrition. The model depicts the relationship between work characteristics, well-being, and organizational outcomes comprehensively. Two main psychological processes occur according to this model. The first, the health impairment process, describes the relationship between job demands, job resources, strain and organizational outcomes. The second process, the motivational process, assumes that job resources have motivational potential and lead to high work engagement, low cynicism, and excellent performance. The present study focuses particularly on the health impairment process (see Figure 3.1). Job demands are described as ‘physical, psychological, social, or organizational aspects of the job that require sustained physical and/or psychological (cognitive and emotional) effort or skills (Baker & Demerouti, 2007). In the teaching context this could, for example, be pupil misbehaviour. Job demands are not necessarily negative, but the demands may function as stress causes when meeting those demands requires high effort from an employee who has not adequately recovered from earlier demands. Hence, job demands are conceptually related to stress causes.

Job resources refer to physical, psychological, social or organizational aspects of the job that are either/or: functional in achieving work goals, reduce job demands and the associated physiological and psychological costs, stimulate personal growth, learning, and development (Bakker & Demerouti, 2007). Induction programs (Helms-Lorenz & Maulana, 2016) include support for professional development by providing feedback and social support via mentoring programs and BT group meeting sessions. Therefore, induction programs can be seen as a form of job resources. In line with this, it was found that the lack of experienced support is related to pre-service and BTs’ sense of burnout (Fives, Hamman, & Olivarez, 2007; Gavish & Friedman, 2010) and that support is essential for retention (Ooghe, Thomas, Tuytens, Devos, & Vanderlinde, 2016).

The JD-R model posits that high job demands can exhaust employees’ mental and physical resources leading to psychological strain. Examples of psychological strain are job-related anxiety, exhaustion, and dissatisfaction (Bakker & Demerouti, 2007). Hence, psychological strain is conceptually related to stress responses (tension, negative emotions and discontent) in this study. The psychological strain can lead to negative organizational outcomes like poor performance, health-related problems, and absenteeism (Bakker, Demerouti, & Sanz-Vergel, 2014). Consistently, recent research shows that teachers who experienced high classroom demands but low classroom resources reported less job satisfaction (McCarthy, Lambert, Lineback, Fitchett, & Baddough, 2015).

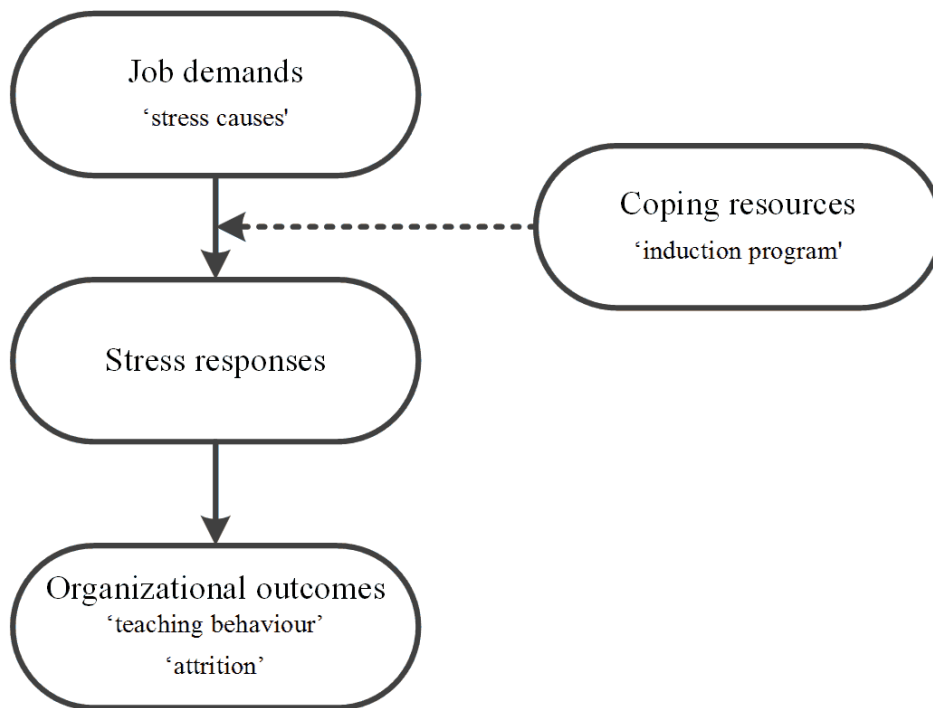


Figure 3.1 Proposed conceptual model of stress based on the Job Demands-Resources model (Bakker & Demerouti, 2007)

3.1.1.2 Stress causes and stress responses

Teachers deal with a wide variety of stress causes on a daily basis. A number of stress causes for teachers, including high job demands, pupil misbehaviour, poor working conditions, poor relationships at work, role conflict, role ambiguity, lack of autonomy, poor school ethos, and lack of developmental opportunities, were revealed in many studies (see Hanif, 2004 for a detailed review). Pupil misbehaviour and high job demands are perceived as most stressful (Clunies-Ross, Little, & Kienhuis, 2008). This is particularly true for the majority of BTs (Borg & Riding, 1991).

These stress causes correlate with stress responses. In a meta-analysis including 65 studies on teacher stress covering a wide variety of teaching experience, a moderate correlation was found between external stressors (i.e., student misbehaviour) and negative emotional responses (Montgomery & Rupp, 2005). Similarly, Jennings and Greenberg (2009) highlighted the importance of healthy teacher-student relationships for teachers' wellbeing.

A recent study investigated components of stress causes and stress responses that are particularly relevant for BTs. The study highlighted important stress causes components such as high psychological task demands, negative social aspects, negative organisational aspects, lack of developmental opportunities and negative pupil aspects. Important components of stress responses include tension, discontent, and negative emotions (Chapter 2). High job demands, lack of learning opportunities, lack of autonomy and influence, and lack of social and organizational job support experienced by BTs were found to be positively related to their tension and discontent (Chapter 2). In

addition, perceived pupil misbehaviour and poor relationship with pupils were found to be positively related to experienced tension, discontent, and negative emotions (Chapter 2). Therefore, we expect that stress causes are positively related to stress responses.

3.1.1.3 Stress responses and teaching behaviour

Several studies have investigated the relationship between stress causes and job performance (Gilbao, Shirom, Fried, & Cooper, 2008; Tubre & Collins, 2000). In general, positive but not particularly strong relationships were found (Jex, 1998). To justify this finding, Jex (1998) contends that in many cases the relationship between stress causes and job performance might be indirect. In line with our proposed model (see Figure 3.1), Jex argues that job-related stressors may induce negative emotional states that, in turn, impact performance.

Research concerning the relationship between teachers' stress responses and actual teaching behaviour is scarce, as most studies focus on perceived performance (e.g., Betoret, 2009; Kokkinos, 2007). It was found that the degree to which teachers respond emotionally to stressful events has a strong negative influence on their degree of perceived performance (Montgomery & Rupp, 2005). Jennings and Greenberg (2009) also highlighted the importance of the ability to adequately respond socially and emotionally to a classroom situation in order to maintain effective classroom management.

An exception is the research of Hanif, Tariq, and Nadeem (2011) examining the relationship between stressors and actual teaching performance of teachers with a minimum of one year teaching experience. The study showed that stress experienced by teachers was negatively related to their teaching behaviour. This study relies solely on students as observers of teaching behaviour, which is mentioned by the authors as a limitation. Our study attempts to address this limitation by using an observation instrument used by experienced teachers to evaluate teaching behaviour. Consistent with Hanif et al. (2011), we expect that BTs' stress responses are negatively related to teaching behaviour.

3.1.1.4 Stress responses and attrition

Teacher attrition, especially during the early years of the teacher career, is a serious problem in many Western societies (Borman & Dowling, 2008; Heikkinen, Jokinen, & Tynjälä, 2012; Ingersoll, 2007). "As an educational issue, teacher attrition refers to the need to prevent good teachers from leaving the teaching job for the wrong reasons" (Kelchtermans, 2017, pp.961). In the United States, it is estimated that between 20 and 50 percent of public school teachers leave the profession within the first five years of their career (Ingersoll, 2003; Gray & Taie, 2015). In countries like Belgium, the UK and Australia this percentage is ca. 25% (Australian Government Productivity Commission, 2012; House of Commons Education Committee, 2012; Vlaams Ministerie van Onderwijs en Vorming, 2013). In the

Netherlands particularly, the attrition rate among BTs is approximately 15% (Helms-Lorenz, van de Grift, & Maulana, 2016). This figure is relatively lower compared to countries mentioned above. Nevertheless, the causes of attrition are comparable to those reported elsewhere (den Brok, Wubbels, & van Tartwijk, 2017).

Attrition was related to stress (Scheopner, 2010). Nevertheless, research linking teacher stress to actual teacher attrition is scarce (Helms-Lorenz et al., 2016) as most research focuses on teachers' intention to quit the job (e.g., Jones & Youngs, 2012; Klassen & Chiu, 2011; Pogodzinski, Youngs, & Frank, 2013). Interview studies with teachers who left the teaching profession revealed that high job demands, lack of support, lack of learning opportunities, poor working conditions, lack of work pleasure, and pupil misbehaviour contribute to explaining attrition (Buchanan, 2010; Gonzalez, Brown, & Slate, 2008). These stress causes and lack of resources result in emotional exhaustion, which significantly relate to intention to leave the profession (McCarthy et al., 2015; Skaalvik & Skaalvik, 2011). Consistently, we expect that BTs' stress responses are positively related to attrition.

3.1.2 Purpose of the study

The aim of the present study is to examine the relationship between stress causes, stress responses, teaching behaviour, and attrition in the context of BTs. From the literature reviewed earlier, it can be concluded that stress causes are positively related to stress responses. Stress responses are negatively associated with teaching behaviour, and positively related to attrition (see Figure 3.2 for the hypothesized model). However, it remains inconclusive which specific aspects of stress causes (e.g. high psychological task demands, negative social aspects, and negative pupil aspects) are positively related to specific aspects of stress responses (tension, discontent, negative emotions). It also remains unclear which aspects of stress responses are negatively associated with aspects of teaching behaviour. Additionally, we know little as to which aspects of stress responses are positively related to attrition.

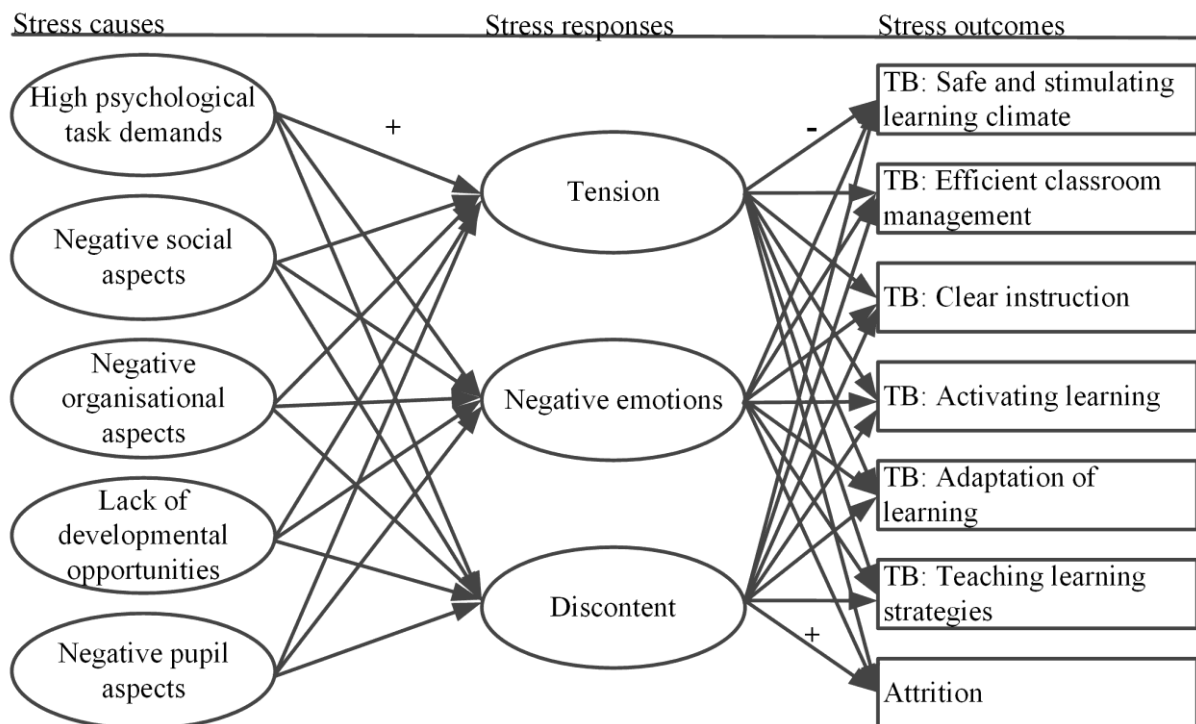


Figure 3.2 Hypothesized model of stress causes stress responses, teaching behaviour and attrition

Note: TB stands for teaching behaviour

3.1.3 Research questions

To guide our research, the following research questions were addressed:

1. Which aspects of BTs' perceived stress causes are positively related to perceived stress responses?
2. Which aspects of BTs' perceived stress responses are negatively associated with observed teaching behaviour?
3. Which aspects of BTs' perceived stress responses are positively related to attrition?

3.2 Method

3.2.1 Procedure and Participants

The sample consisted of 143 BTs ($M = 28$ years old, $SD=7$) from 61 different secondary school locations in the Netherlands. The percentage of female teachers is slightly higher (57.3%) compared to the national secondary school teachers population (46.7%; Ministry of Education, 2014). The term BTs refers to teachers who recently obtained their teaching qualification and who had less than three years' experience in the teaching profession. The percentage of qualified teachers in the current sample is higher (100%) than in the national population (88.2%).

All BTs received induction programs including: (1) workload reduction (e.g. not being a mentor and working less actual teaching hours); (2) supporting effective teacher behaviour in the

classroom (e.g. being observed and receiving feedback from an experienced teacher); (3) supporting school enculturation (e.g. receiving information on school rules and procedures); and (4) supporting professional development (e.g. having BT meetings to exchange experiences between BTs).

The data was collected during a period of two months. Participation in the study was entirely voluntary and informed consent was collected from all the participants.

3.2.2 Measures

3.2.2.1 Perceived stress causes and stress responses

BTs perceived stress causes and stress responses were measured with the valid and reliable Questionnaire on the Experience and Evaluation of Work for BTs (QEEW-BT; Chapter 2). The questionnaire consist of 170 questions rated on a four-point Likert scale ranging from 1 (never) to 4 (always) measuring five stress causes: high psychological task demands (e.g. many hours of actual teaching), negative social aspects (e.g. poor relationship with colleagues or supervisor, poor school climate), poor organizational aspects (e.g. lack of feedback, role clarity), lack of development opportunities (e.g. lack of learning opportunities), negative pupil aspects (e.g. pupil misbehaviour, poor relationships with pupils), and three stress responses: discontent (e.g. lack of organizational commitment, intension to quit), tension (e.g. rumination, tiredness during work), and negative emotions (e.g. emotional reactions during work, lack of work pleasure).

3.2.2.2 Teaching behaviour

BTs' teaching behaviour was measured using the valid and reliable International Comparative Analysis of Learning and Teaching (ICALT; van de Grift, 2014) instrument. The instrument consists of 32 items measuring six domains of teaching behaviour, namely; (1) safe and stimulating learning climate, (2) efficient classroom management, (3) clear instruction, (4) activating learning (e.g. the teacher uses teaching strategies that activate the students), (5) adaptation of teaching (e.g. the teacher differentiates his or her instruction to tailor to the students' teaching needs), and (6) teaching learning strategies (e.g. the teacher teaches the students how to check whether their answers are correct). Response categories were provided on a Likert scale ranging from 1 (predominantly weak) to 4 (predominantly strong). Experienced teachers served as observers who received a four hour intensive training beforehand. In this group training session, the observers first received instructions on how to use the instrument. Where after, they practised using the instrument twice by scoring two video lessons. After scoring the first video the group discussed and resolved scoring discrepancies, if any existed. For the second video observers needed to reach 70% consensus or higher on their observation scores in order to receive an observer qualification certificate.

3.2.2.3 Attrition

BTs' attrition was registered when teachers left their first teaching job within the one year period of this study.

3.2.3 Statistical Analyses

Preliminary descriptive analyses, correlation analyses, reliability analyses, and logistic regression analyses were conducted (using SPSS 23). In addition, structural equation modelling (SEM, using Mplus 7) was used to test the hypothesized relationship between stress causes, stress responses, teaching behaviour, and attrition. As attrition is a binary variable two separate models were tested.

The first SEM model tested the relationships between stress causes, stress responses, and teaching behaviour. The second SEM model investigated the relationships between stress causes, stress responses, and attrition. To evaluate the goodness of fit, the comparative fit index (CFI), the root mean square error of approximation (RMSEA), and the standardized root mean square residual (SRMR) were used. Following the general guidelines the following threshold values were used to determine good and appropriate fit. For the CFI and TLI a value close to 0.95 was considered appropriate (Hu & Bentler, 1999). For the RMSEA measure, a value of 0.06 indicates good fit (Hu & Bentler, 1999) and values ranging from 0.08 to 0.10 indicate mediocre fit (MacCallum, Browne, & Sugawara, 1996). For SRMR, a value less than 0.08 was considered as appropriate and values between 0.08 and 0.10 as moderate fit.

3.3 Results

3.3.1 Preliminary Analysis

Results of the reliability analyses showed that all the scales in this study are reliable (Cronbach's alpha: 0.73 – 0.94, see Table 3.1). Results of the descriptive analyses showed that BTs experience a relatively high level of stress due to negative pupil aspects and poor organizational aspects (see Table 3.1). Furthermore, six BTs left their first school or the profession, while the remaining 137 stayed.

Results of the correlation analyses showed that all stress causes have significant correlations with discontent and tension. Only organizational aspects and pupil aspects have significant correlations with the stress response negative emotions. Further, negative emotions correlate significantly with teaching behaviour domains (see Table 3.2).

Table 3.1 Descriptive statistics and reliability of the scales considered in this study ($n=143$)

	Scale	Mean	SD	Range	Cronbachs alpha	number of items	<i>n</i>
<i>Stress causes</i>	High psychological task demands (F1)	6.26	2.14	0–18.6	0.91	31	
	Negative social aspects (F2)	5.13	2.12	0–16.5	0.90	22	
	Poor organizational aspects (F3)	5.45	1.83	0–12	0.81	8	
	Lack of development opportunities (F4)	4.19	1.83	0–14	0.86	14	
	Negative pupil aspects (F5)	10.22	3.45	0–25	0.92	25	
<i>Stress responses</i>	Discontent (F6)	3.99	1.78	0–18	0.78	12	
	Tension (F7)	7.71	3.38	0–24.8	0.94	33	
<i>Teaching behaviour</i>	Negative emotions (F8)	5.07	2.73	0–25.5	0.86	17	
	Safe and stimulating learning climate	3.37	.50	1–4	0.74	4	
	Efficient classroom management	3.21	.56	1–4	0.73	4	
	Clear instruction	3.0	.57	1–4	0.82	7	
	Activating learning	2.56	.63	1–4	0.79	7	
	Adaptation of teaching	1.96	.72	1–4	0.81	4	
	Teaching learning strategies	2.04	.76	1–4	0.88	6	
	<i>Attrition</i>						

Table 3.2. Pearson's bivariate correlations among variables considered in this study ($n= 143$)

	F1	F2	F3	F4	F5	F6	F7	F8	1	2	3	4	5	6
<i>Stress causes</i>														
F1 High psychological task demands	1													
F2 Negative social aspects	.37**	1												
F3 Negative organizational aspects	.36**	.41**	1											
F4 Lack of development opportunities	.17*	.29**	.23**	1										
F5 Negative pupil aspects	.25**	.31**	.28**	.19*	1									
<i>Stress responses</i>														
F6 Discontent	.30**	.49**	.37**	.27**	.46**	1								
F7 Tension	.63**	.26**	.29**	.15*	.31**	.32**	1							
F8 Negative emotions	.07	.02	.18*	.04	.47**	.16*	.29**	1						
<i>Teaching behaviour</i>														
1. Safe and stimulating learning climate	.09	-.01	-.12	.03	-.31**	-.10	-.01	-.25**	1					
2. Efficient classroom management	.07	-.10	.01	.06	-.35**	-.10	.04	-.22*	.61**	1				
3. Clear instruction	.09	.03	-.05	.06	-.25**	-.01	.08	-.20*	.66**	.68**	1			
4. Activating learning	.10	-.02	-.02	-.07	-.22*	.01	.03	-.21*	.55**	.41**	.71**	1		
5. Adaptation of teaching	.01	.04	.06	.01	-.17*	.07	.01	-.13	.20**	.23**	.32**	.46**	1	
6. Teaching learning strategies	-.06	-.16	-.09	-.12	-.22*	-.04	-.08	-.17*	.28**	.24**	.43**	.66**	.54*	1

3.3.2 Pathway analysis 1: stress causes, stress responses, and observed teaching behaviour

For parsimonious reasons, the first tested multivariate multiple regression model was a model in which all stress causes aspects which had correlations equal to or greater than 0.15 with the stress responses aspects, and all the stress responses which had correlations equal or greater than 0.15 with the teaching behaviour aspects were entered (see Model 1, Figure 3.3).

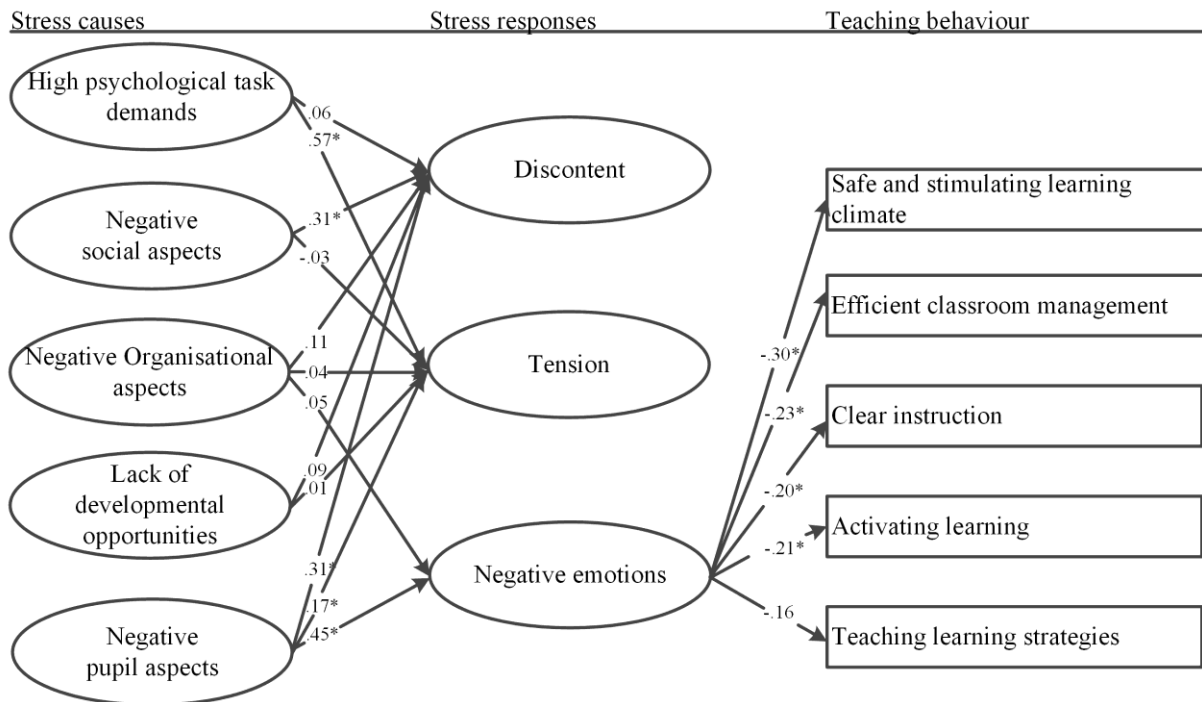


Figure 3.3 Model 1: structural model depicting the relationship between stress causes, stress responses and teaching behaviour in beginning teachers, standardized model results. *significant ($p < .05$); fit indices: goodness-of-fit statistics: CFI = 0.97, TLI = 0.93, RMSEA = 0.06, SRMR = 0.06

The goodness-of-fit statistics showed that the model fits the data well. CFI= 0.97, TLI = 0.93, RMSEA = 0.06, SRMR = 0.06. However, several structural paths were not statistically significant and were therefore removed. The final model had an appropriate fit with CFI = 0.97, TLI = 0.93, RMSEA = 0.07, SRMR = 0.07 (Model 2, Figure 3.4).

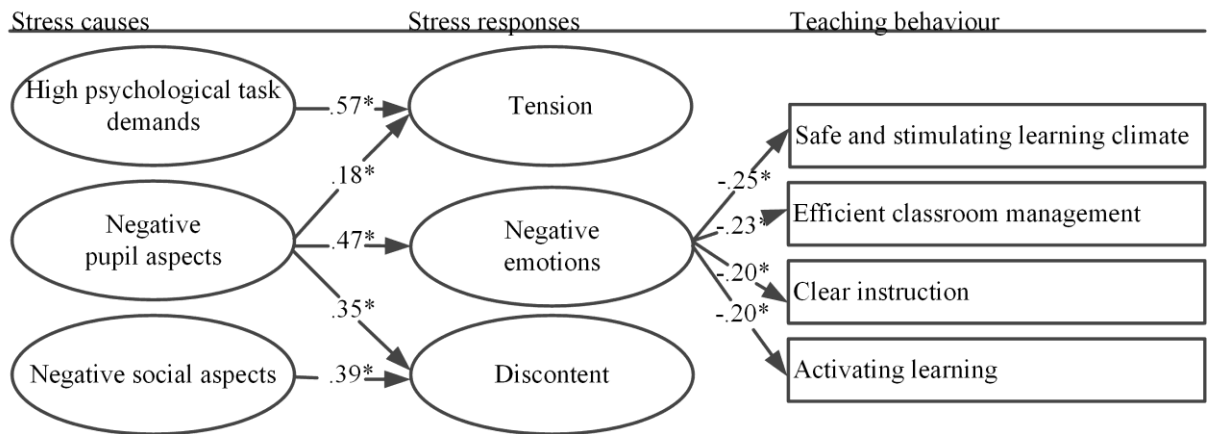


Figure 3.4 Model 2: structural model depicting the relationship between stress causes, stress responses, and teaching behaviour in beginning teachers, standardized model results. *significant ($p < .05$); fit indices: goodness-of-fit statistics: CFI = 0.97, TLI = 0.93, RMSEA = 0.07, SRMR = 0.07

3.3.2.1 Which specific aspects of BTs' perceived stress causes are positively related to perceived stress responses?

Results showed that perceived high psychological task demands ($\beta = 0.57$, $p < 0.01$) and negative pupil aspects ($\beta = 0.18$, $p < 0.01$) are significantly and positively related to perceived tension (see Figure 4). The more psychological task demands and negative pupil aspects the BT experienced, the more tension they experienced. The perceived negative pupil aspects and high psychological task demands together explain about 42% of the variance in tension.

The perceived negative pupil aspects ($\beta = 0.47$, $p < 0.01$) are also significantly and positively related to perceived negative emotions. The poorer the relationship with pupils and the more pupil misbehaviour a BT experienced, the more negative emotional reactions during work and lack of work pleasure a BT experienced. The perceived negative pupil aspects explain about 22% of the variance in perceived negative emotions.

Moreover, perceived negative social aspects ($\beta = 0.39$, $p < 0.01$) and negative pupil aspects ($\beta = 0.35$, $p < 0.01$) are significantly and positively related to perceived discontent. The more BTs experience negative social aspects and negative pupil aspects the more they experience discontent. Perceived negative social aspects and negative pupil aspects together explain about 35% of the variance in discontent.

3.3.2.2 Which specific aspects of BTs' perceived stress responses are negatively associated with observed teaching behaviour?

BTs perceived negative emotions is significantly and negatively related to teaching behaviours in terms of safe and stimulating learning climate ($\beta = -0.25$, $p = 0.01$), efficient classroom management ($\beta = -0.23$, $p = 0.02$), clear instruction ($\beta = -0.20$, $p = 0.03$), and activating learning ($\beta = -0.20$, $p = 0.03$) (see Figure 4). Negative emotions explain about 7% of the variance in safe and stimulating learning climate, 5% of the variance in efficient classroom management, 4% of the variance in clear

instruction, and 3% of the variance in activating learning. BTs experiencing more negative emotions during work, showed a significantly lower quality in: safe and stimulating learning climate, efficient classroom management, clear instruction and activating learning.

3.3.3 Pathway analysis 2: stress causes, stress responses, and attrition

To investigate the relationships between stress causes, stress responses and attrition a logistic regression path model was conducted. The logistic regression path model (Model 3) was partly based on Model 2. The significant paths between stress causes and stress responses from Model 2 were added to Model 3. In addition, for each stress response it was examined whether the path between the stress response and attrition was significant. Only significant paths were added to the model. The path between discontent and attrition was significant ($X^2 = 6.34$, $p = 0.001$, $df = 1$, with $\text{Exp}(b) = 1.61$, $b = 0.48$, $SE = 0.02$, Nagelkerkes $R^2 = 0.11$) and was therefore added to the Model (see Figure 3.5).

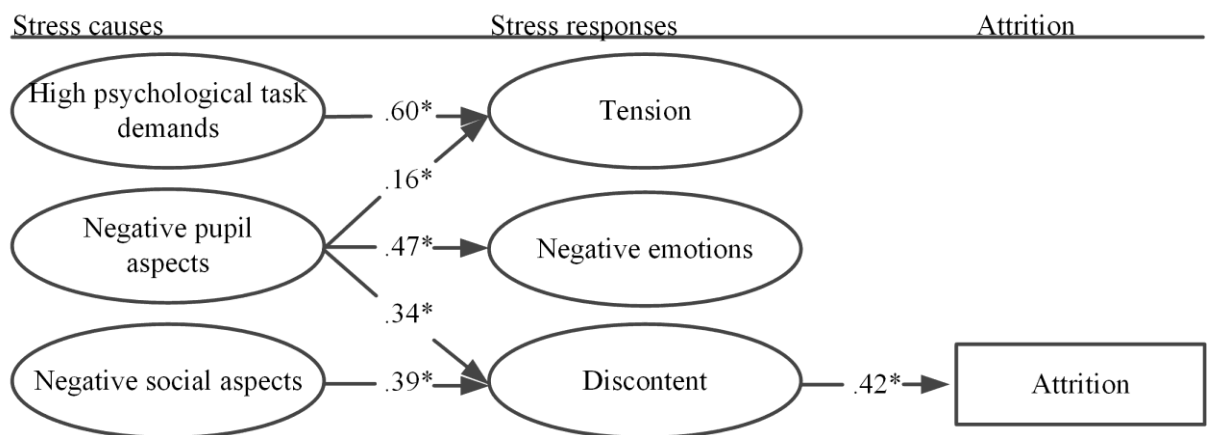


Figure 3.5 Model 2: (logistic) regression model that relates stress causes, stress responses, and attrition in beginning teachers, standardized model results. *significant ($p < .05$); fit indices: AIC = 1927.76, BIC = 1969.24

3.3.3.1 Which specific aspects of BTs perceived stress responses are positively related to attrition?

The result of the logistic regression analysis showed that discontent is related to attrition (see Figure 3.5). The analysis provided odds ratio, which can be interpreted as the multiplicative change in the odds for a one unit change in the predictor variable. For BTs who experience high discontent the odds for leaving the school or profession are 1.61 larger than teachers who experience less discontent

3.4 Discussion and Conclusions

In this study, the relationship between BTs' perceived stress causes, stress responses, observed teaching behaviour, and attrition were investigated. It was found that all five stress causes (high

psychological task demands, negative social aspects, negative organisational aspects, lack of developmental opportunities, and negative pupil aspects) have positive and significant relationships with one or more of the stress responses. However, when these stress causes are estimated all together, high psychological task demands, negative pupil aspects, and negative social aspects appear to be stronger and more stable predictors of stress responses in BTs.

We found that negative pupil aspects are significantly and positively related to tension, negative emotions, and discontent. This is in line with research showing that the quality of student-teacher relationships influences job outcomes (Fransson & Frelin, 2016; Veldman, Admiraal, van Tartwijk, Mainhard, & Wubbels, 2016). Therefore, teachers' work associated with pupil aspects needs close attention when (re)designing professional support for BTs. We also found that high psychological task demands is strongly and positively related to tension. The finding that especially the stress causes negative pupil aspects and high psychological task demands explain variance in the stress response(s) is in line with previous research showing that these stress causes are perceived as most stressful (Clunies-Ross, et al., 2008) particularly by BTs (Borg & Riding, 1991), and are related to teacher burnout (Burke, Greenglass, & Schwarzer, 1996; Byrne, 1991; Kelly & Northrop, 2012).

Negative social aspects were found to be stronger and more stable predictors of discontent, whereas high psychological task demands was found to be stronger predictor of tension. This finding is in line with van Veldhoven, Taris, de Jonge, and Broersen (2005) who stated that quantitative/qualitative demands are related primarily to psychological strain outcomes, while lack of support is related primarily to the attitudinal outcomes. The present study shows that the attitudinal outcome discontent is strongly and positively related to attrition. This suggests that BTs who leave their first school/the profession experience more discontent compared to teachers who stay at their first school. Previous research already showed the link between job dissatisfaction and intention to leave. This study contributes to the stress research by further showing that BTs' dissatisfaction with their job is related to actual attrition.

Recent research also highlights the importance of social-professional support and its relationship with staying or leaving the teaching profession. Newberry and Allsop (2017) showed that the timing and intensity of challenges like heavy workloads and pupil misbehaviour matter for teachers' decision to stay/leave, but the effects are mitigated by the strength of personal and professional relationships. The researchers argue that it is not necessarily the challenge of the job, nor the characteristics of the individual, but the structure of the social-professional support that determines whether teachers stay or leave the profession. Similarly, Kelchtermans (2017) argues that professional core relationships (e.g. relationships with students, colleagues, principal) operate as "double-edged swords" as they are the most important sources for positive job outcomes (e.g. satisfaction and motivation) as well as for negative job outcomes (e.g. stress, burnout).

It is unclear why tension is not related to attrition nor to teaching behaviour. As a possible line of reasoning, it might be that as the BTs in this study received professional support through induction

programs including workload reduction, the workload reduction reduced BT's high psychological task demands and therefore indirectly reduced the experienced tension. This line of reasoning was confirmed in recent research indicating that workload reduction decreases the level of perceived high psychological demands (Chapter 4). Subsequently, we argue that the reduced experienced task demands might lessen the expected effect on teaching behaviour and/or attrition. Additionally, experiencing tension during a short period of time might not necessarily affect teaching behaviour and/or attrition significantly, whereas experiencing tension over a longer period of time might be more powerful to determine negative (changes) in behaviour and/or attrition.

Similarly, this study does not reveal a significant relationship between negative emotions and attrition. This is not in line with the previous longitudinal research showing that the suppression of unpleasant emotions decreases job satisfaction, which in turn increases intention to quit (Côté & Morgan, 2002). The induction program and the timespan might have mitigated this relationship. Recent research shows that the induction program elements including workload reduction and support for effective teaching behaviour decrease the level of negative emotions among BTs (Chapter 4). Whether the two induction elements mitigated the relationship between negative emotions and attrition remains unclear, and is an important subject for future research.

Past research showed the link between teacher stress and student perceptions of teaching behaviour (Hanif, et al., 2011), and between stress and perceived personal accomplishment (Betoret, 2009; Kokkinos, 2007). The present study extends the body of knowledge by showing that negative emotions are related to actual teaching behaviour. This is in line with a recent qualitative study showing that negative emotions stemming from a strained relationship with a mentor and a poor school climate can be so overwhelming that it influences a BTs' teaching practice (Yuan & Lee, 2016).

Notwithstanding the strengths, the present study also has some limitations. The cross-sectional design of the present study is one of those limitations. All constructs were measured once, while measuring them multiple times would provide a better picture of the more representative relationships between the mentioned constructs (Brouwers & Tomic, 2000, Côté & Morgan, 2002). Another limitation of this study is that the observed teaching behaviour was measured during approximately the same period as the stress measures. The order of the measurement is therefore not strictly the same for all teachers. For that reason, the interpretation is limited to the relationship between stress responses and observed teaching behaviour, ruling out any interpretations regarding the causality and potential reciprocal relationships (Helms-Lorenz, van de Grift, & Maulana, 2016). Moreover, although this study showed the direct influence of stress responses on teaching behaviour, previous research shows that (coping) behaviour can mediate the relationship between stress causes and stress responses (Golparvar, 2016; Montgomery & Rupp, 2005). Therefore, the exploratory nature of this study should be highlighted and more research is needed to fully understand the order in which these processes take place.

Furthermore, although about 20% of BTs participating in this study left their first school, the present study might suffer from sample imbalance and representativeness due to the inclusion of only six teachers falling into attrition in the analysis (the remaining teachers with attrition did not respond). Finally, all teachers in this sample received induction arrangements. This might have influenced the response patterns and magnitude of the relationships between the constructs under study. The induction arrangements could have functioned as resources and therefore mitigating the relationship between stress causes and stress responses.

Recent research shows that exposure to induction programs is found to be associated with first-year teachers' risk for stress. Teachers with less risk for stress were three times more likely to have a reduced schedule (workload reduction), they were also more likely to attend seminars, receive supportive communication from administrators, receive common planning time, and were more often provided extra help compared to teachers with more risk for stress (Fitchet et al., 2018). The possible mediating influences of induction arrangements in the relationship between teachers stress, performance, and attrition remains unclear and therefore more research is needed.

3.4.1 Practical Significance

This study highlights that experienced negative pupil aspects are directly related to tension, negative emotions and discontent. In addition, this study shows that negative emotions are related to teaching behaviour, and discontent to attrition. Because relationships with pupils are central to teachers, future efforts to reduce teacher stress, attrition and the negative effect of stress should be directed towards the improvement of teacher-student relationships. It seems that learning how to cope with student misbehaviour and to improve poor teacher-student relationships effectively would take a great amount of the pressure away. Teachers in this study received induction arrangements including support for effective teaching behaviour in the classroom and support for professional development. However, support for teacher-student relationships might still be underrepresented and could be enhanced by, for instance, school-based and classroom-based social, emotional, and behaviour programs (see www.vriendelijkordehouden.nl). This program is aimed to increase social skills and decrease antisocial behaviour (Sklad, Diekstra, Ritter, Ben, & Gravesteyn, 2012) which seems to offer benefit for (beginning) teachers in the effort to improve relationships with their students and thus contribute to potential stress reduction.

CHAPTER 4

The longitudinal effects of induction on beginning teachers' stress

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Abstract

Teaching is a stressful profession especially for beginning teachers. Induction programmes can support beginning teachers. Little is known concerning which elements of induction programmes can influence (the change in) teachers' stress over time. This study aims to investigate the growth of stress causes and stress responses during the first 3 years of professional practice and to reveal the influence of induction arrangement elements on the initial level as well as the change in stress levels over the 2 years that followed. Longitudinal data from a sample of 393 beginning teachers (56.5% female) were collected at three measurement occasions. All teachers were offered four different induction arrangement elements. Results of multiple group confirmatory factor analysis confirmed longitudinal measurement invariance. Multivariate latent growth curve modelling (MLGM) was conducted to examine the initial status, the subsequent linear growth, and the influence of the individual induction arrangement elements on the stress causes and stress responses. MLGM results show that perceived stress caused by high psychological task demands increases over time ($d = 0.22$), whereas perceived stress caused by negative pupil aspects decreases over time ($d = -0.52$). Further, workload reduction decreases the level of perceived high psychological task demands, negative social aspects, and all the stress responses. Perceived support for effective teaching behaviour decreases the level of perceived negative emotions and discontent. Further, school enculturation has an influence on the change in perceived discontent over time. In conclusion, perceived stress causes and stress responses can change over time. Specific induction arrangement elements appear to be powerful elements to reduce the level, and the change over time, of specific perceived stress causes and stress responses.

4.1 Introduction

Despite decades of international research on teacher stress and stress interventions, many teachers still experience severe stress (Johnson & Birkeland, 2003; Skaalvik & Skaalvik, 2015). Particularly, beginning teachers seem to be more vulnerable to the pressures of the profession compared to experienced teachers (Gavish & Friedman, 2010; Goddard, O'Brien, & Goddard, 2006; Gold & Roth, 1993). Experiencing high levels of stress is detrimental for teachers' wellbeing, their teaching behaviour quality and retention (Chapter 3; Hanif, 2004). Furthermore, teacher stress harms students' achievement (Klusmann, Richter, & Lüdtke, 2016; Ronfeldt, Loeb, & Wyckoff, 2013).

Some beginning teachers are offered professional support during their first years of teaching, by means of induction programs. An induction program can be defined as a more or less formalized program that aims to support beginning teachers in their first years of teaching after their pre-service education (Beijaard, Buitink, & Kessels, 2010). These programs aim to create a smoother transition from teacher training to the first teaching job and usually include one or more of the following components (induction arrangements): (1) workload reduction; (2) supporting effective teacher behaviour in the classroom; (3) supporting school enculturation; and/or (4) supporting professional development (Helms-Lorenz, Slob, Vermue, & Canrinus, 2012, see Table 4.1).

Table 4.1 Induction arrangements for beginning teachers

Aspect	Aim	Example(s)
Workload reduction	to ease the job demands	no mentor tasks, less teaching hours
Supporting effective teacher behaviour	to improve the effective teacher behaviour	lesson observation and feedback by a trained coach
Supporting school enculturation	to make the teacher familiar with the school culture/climate	providing background information regarding the school culture
Supporting professional development	to stimulate the teachers' professional development	organizing meetings and/or courses for beginners

Induction programs are highly valued and well received by beginning teachers (Draper, O'Brien, & Christie, 2004; Hodkinson, 2006) and have shown to be beneficial for the improvement of beginning teachers' teaching behaviour, commitment, and significantly improve teachers' retention rates and student achievement (e.g. Helms-Lorenz, van de Grift, & Maulana, 2016; Hobson, Ashby, Malderez, & Tomlinson, 2009; Ingersol & Strong, 2011; Smith & Ingersol, 2004). Further, beginning teachers who receive an induction program experience fewer stress causes compared to beginning teachers who do not receive an induction program (Helms-Lorenz et al., 2012). Therefore, it seems that induction programs have great potential to influence the amount of stress experienced by beginning teachers. No research has investigated the influence of the individual elements of induction programs on stress yet. Therefore, little is known about the impact of these different elements of the induction programs on beginning teachers' stress (over time) and the question remains which elements should be included in an induction program to reduce beginning teachers' stress. Research assessing the effectiveness of particular intervention strategies to help teachers and schools to reduce teacher stress is needed (Kyriacou, 2001) as this knowledge can help schools to provide (sufficient) targeted support for beginning teachers.

To provide a full picture of information regarding the changes in stress over time and the influence of induction arrangements on (changes in) stress causes and responses it has been recommended that longitudinal studies should be undertaken (Brouwers & Tomic, 2000; Coté & Morgan, 2002; Glazerman et al., 2010; Yamasaki, Sakai, & Uchida, 2006). Therefore, this study takes a three year longitudinal approach to exploring beginning secondary school teachers' stress and the influence of the individual induction arrangements on the development of stress over time.

4.1.1 Conceptual Framework

4.1.1.1 Defining and modelling stress

There seem to be two general perspectives on (teacher) stress. One perspective perceives stress responses (e.g. discontent) as a result of something outside of the individual, external factors (e.g. poor working conditions). There is an action (e.g. poor working condition) and a reaction (e.g. feeling

discontent). In this line, Rudow (1999) and Kyriacou (2001) define teachers stress as the experience of unpleasant, negative emotions, such as tension and anger, resulting from some aspects of their work. The other perspective hypothesizes that stress is internal; it is what goes on inside the individual as they interpret or react to what is going on around them (Gold & Roth, 1993). An example is the Transactional model of Stress (Folkman, 2013; Lazarus & Folkman, 1987). This model views work stress as a result of an interaction and appraisal process between the person and his or her environment. In this case, there is an action (e.g. certain working condition), an interpretation (e.g. this is a poor working condition) and a reaction (e.g. feeling discontent). Similarly, researchers conceptualize stress with both internal and external aspects: the degree of mismatch between the demands made upon an individual and the individual's ability to cope with those demands (Bakker & Demerouti, 2007; McCarthy, Lambert, Lineback, Fitchett, & Baddough, 2015). Given the on-going debate about and the different usages of the term "teacher stress" in this paper the term is used more as a label indicating a specific field of (applied) research. In this study teacher stress is divided into two components: (1) stress causes, and (2) stress responses. Stress causes are the collection of aspects of the work content and the work situation influencing teachers at a cognitive, motivational, and emotional level. Stress responses are the results of the employees' mental interpretations when experiencing stress causes (van Veldhoven, 1996).

Recently, the stress causes high psychological task demands, negative social aspects and negative pupil aspects, and the stress responses tension, discontent and negative emotions were found to be the important stress factors to measure among BTs and therefore the focus in this study (Chapter 2). High psychological task demands concern the collection of psychological task demands that influences the teacher negatively at a cognitive, motivation, and emotional level. This concerns the pace and amount of work, education specific workload (e.g. many hours of teaching), emotional workload, mental workload and role conflict (see Appendix B). Negative social aspects are the stress causes concerning the negative social aspects of the teaching job; poor relationships with colleagues, a poor relationship with the supervisor and a poor school climate. Negative pupil aspects are the stress causes related to negative pupil aspects; poor relationship with pupils and pupil misbehaviour. Discontent is a results of the employees' mental interpretations when experiencing the stress causes and concerns; lack of organisational commitment and intentions to quit (turnover). Tension is a stress response which concerns: the need for recovery, rumination, poor sleep quality and tiredness during work. Finally, negative emotions is a stress response which concerns; emotional reactions during work (e.g. feeling sad) and lack of work pleasure.

The job demands-resources model (JD-R model; Bakker & Demerouti, 2007) is useful to frame and understand the interplay between stress causes, induction, and stress responses. The model illustrates the relationship between work characteristics, well-being, and organizational outcomes comprehensively. According to the JD-R model, two main psychological processes occur in concert: the health impairment process and the motivational process. The first, describes the relationship

between job demands, job resources, strain and organizational outcomes. The second, postulates that job resources have motivational potential leading to high work engagement, low cynicism, and excellent performance. In this study the focus is on the health impairment process (see figure 1). Job demands are defined as ‘physical, psychological, social, or organizational aspects of the job that require sustained physical and/or psychological (cognitive and emotional) effort or skills (Bakker & Demerouti, 2007). Translated to the teaching context an example of this would be many hours of teaching. Job demands are not automatically stressful, however, they can turn into stress (causes) when meeting those demands requires too much effort from which the person has not adequately recovered. Hence, job demands of the JD-R model are related to stress causes as defined by Van Veldhoven (1996).

Job resources refer to physical, psychological, social or organizational aspects of the job that are either/or functional in achieving work goals, reduce job demands and the associated physiological and psychological costs, stimulate personal growth, learning, and development (Bakker & Demerouti, 2007). As can be seen in Table 4.1, induction programs (see Helms-Lorenz et al., 2016) provide many kinds of support for BTs and can therefore be seen as job resources.

According to the JD-R model high job demands can exhaust employees’ job resources leading to psychological strain (e.g. dissatisfaction and exhaustion; Bakker & Demerouti, 2007). Therefore, psychological strain of the JD-R model is conceptually related to stress responses as defined by van Veldhoven (1996; negative emotions, discontent and tension). Finally, psychological strain can lead to negative organizational outcomes like absenteeism, poor performance and health-related problems (Bakker, Demerouti, & Sanz-Vergel, 2014).

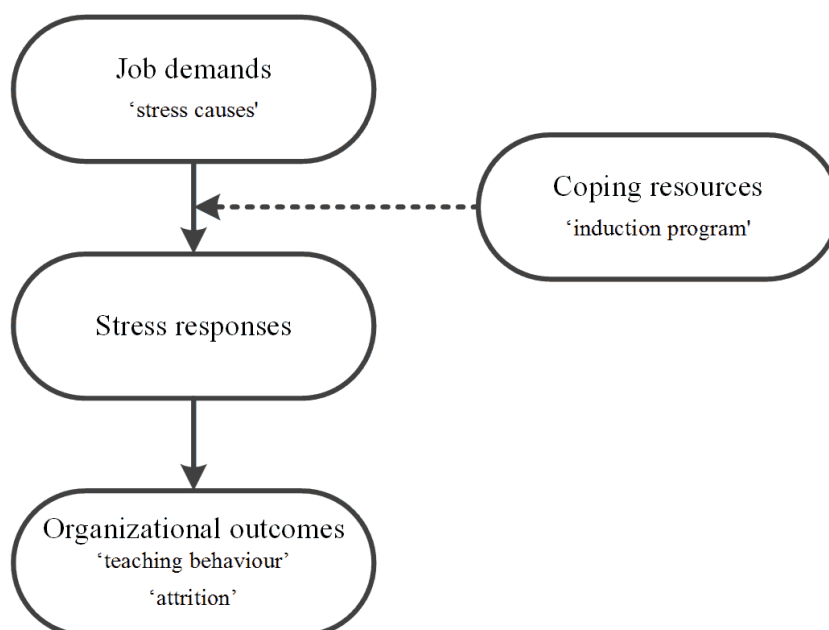


Figure 4.1 Proposed conceptual model of stress based on the Job Demands-Resources model (Bakker & Demerouti, 2007)

Several studies concerning the teaching context have found evidence for the health impairment process. Fives, Hamman and Olivarez (2007) for example found that student-teachers who experienced high guidance during their practicum demonstrated lower levels of emotional exhaustion and depersonalisation at the end of their practicum. This study shows that cooperating teachers and university supervisors can play a role in helping to reduce feelings of emotional exhaustion and depersonalization in student-teachers. They referred to emotional exhaustion in the teaching context as the feeling of having given all that one can, that the teacher put all of his or her energy and focus into the task of teaching and has finally run out of resources. Further, depersonalisation was defined as occurring when the teacher develops negative feelings and cynicism towards his or her students and perhaps even the school community. Both concepts are one of the three sub-concepts of burnout, a syndrome of emotional exhaustion and cynicism that occurs frequently among individuals who do 'people-work' of some kind. The third sub-concept is reduced personal accomplishment which is the feeling of employees that they are not effective in their job (Maslach & Jackson, 1981). Gavish and Friedman (2010) found that among novice teachers perceiving a lack of collaborative and supportive ambience contribute to predicting burnout. According to them a collaborative supportive ambience would be a professional environment without inter- or intra-role conflict, with consistent, clear rules, and a positive and warm social climate, which is supportive of professional development, and which nurtures teacher competencies as an "organizational person".

4.1.1.2 The development of stress causes and stress responses (and the influence of induction)

A longitudinal study (four measurements during two years) amongst 79 Australian beginning teachers showed that beginning teachers experience significantly high work pressures throughout the whole measurement period and that the work pressure felt after 15 and 21 months is higher than the pressure felt after 6 weeks of teaching. Further, the study showed significant declines in the perception of job commitment, job autonomy, role clarity, co-worker cohesion and supervisor support. They also reported a declining view of several key aspects of their work environment. In line with this finding, respondents were asked to rate their work input with respect to the level of satisfaction gained from being a teacher. At the first measurement moment, 35% of the teachers were experiencing an imbalance between the effort they were putting into their work as teachers and the rewards they received from undertaking this work, they felt that they were putting more effort into the job than they got out of the job in rewards. During the time of the study the percentage of teachers experiencing this imbalance increased, after 2 years 49% of the teachers reported this imbalance. Important to rapport is that those teachers who perceived equity in the effort-reward balance reported significantly higher involvement in their work, greater support from their supervisor and lower work pressures compared

to teacher who perceived inequity (Goddard, et al., 2006).

Further, related to the development of stress responses over time, some studies show that beginning teachers' emotional exhaustion, depersonalisation and personal accomplishment all significantly increase during the first two years of teaching (Dicke et al., 2015; Goddard et al., 2006). However, it also has been found that emotional exhaustion decreases during the first year of teaching (Gavish & Friedman, 2010). Important to note is that teachers who perceived equity in the effort-reward transaction reported significantly lower mean scores on these variables compared to teachers who experience inequity (Goddard et al., 2006). Also, professional knowledge was shown to buffer the increase of emotional exhaustion (Dicke et al., 2015).

Helms-Lorenz and Maulana (2016) conducted an experimental study to investigate the influence of induction (all elements in concert) on the longitudinal relationships between self-efficacy and stress causes and responses. Both stress aspects were studied separately because the induction intervention aimed to reduce stress causes as well as outcomes. Workload reduction and enculturation were aimed to reduce stress causes and support in the classroom and professional development support were aimed to increase self-efficacy which mitigates stress responses. They revealed that the link between self-efficacy and stress responses are much stronger in the induction condition. This finding suggests that the induction arrangement (all elements in concert) are a powerful means in sustaining self-efficacy in the class that mitigates the level of job tension. The current study sets out to unravel the influence of individual induction elements on the development of both stress causes and responses over a period of 2 years. The unanswered question is whether induction arrangement elements succeed to reduce stress causes sufficiently as the intervention might also add to high psychological task demands (by increasing accountability and performance stress) even if workload reduction is applied.

4.1.2 The present study

The present study aims to answer the following research questions: (1) How do beginning teachers' perceived stress causes change across three years of professional practice (three measurement occasions)? Do teachers differ in their growth trajectory of perceived stress causes over time? (2) How do beginning teachers' perceived stress responses change across three years of professional practice? Do teachers differ in their growth trajectory of perceived stress responses over time? (3) Do induction arrangements elements provided during the first year of professional practice predict beginning teachers' experienced stress causes and responses at the end of the first year and over time?

Based on the existing research described above we expect that induction arrangements influence (the change in) beginning teachers' stress causes and stress responses. We expect that beginning teachers who experience more support via induction arrangements experience in general less stress causes and stress responses (over time). As no research has investigated the influence of the

individual elements of induction programs on the individual stress causes and stress responses yet, no specific hypotheses regarding these relationships were formulated.

4.2 Method

4.2.1 Procedure and Participants

The sample consisted of 393 (56.5% female¹) beginning teachers from 70 secondary schools in the Netherlands. Beginning teachers in this study were defined as teachers who recently obtained their teaching qualification and who had less than three years' experience in the teaching profession (Kyndt, Gijbels, Grosemans, & Donche, 2016). Teachers participated in this study on a voluntary basis and received a small incentive for their participation. Informed consent was collected from all the participants.

Data for this study was collected in successive years on three measurement occasions Time 1 (T1), Time 2 (T2) and Time 3 (T3) divided into two cohorts (see Table 4.2). Time 1 being the end of the first school year after one year of induction, Time 2 represents the end of the second school year after two years of induction and Time 3 equals to the end of the third school year after three years of induction. Typically in longitudinal studies, the number of teachers per measurement occasion vary (see Table 4.3). Stress data was collected on all three measurement occasions (T1 – T3) all three measurements were used in this study. Data regarding the perceived induction offered to the beginning teacher collected on T1 was used in this study.

Table 4.2 Data collection timeframe

	T1	T2	T3
Cohort 1	May–June 2011	May–June 2012	March–May 2013
Cohort 2	May –June 2012	May–June 2013	March–May 2014

Table 4.3 Number of participants at different measurement occasions

	Frequency	Percentage female
T1	355	58.59
T2	265	56.98
T3	245	58.37

4.2.2 Measures

4.2.2.1 Stress causes and stress responses

¹ The percentage of female teachers at secondary schools in the Netherlands in the population is 46.7% (Ministerie van Onderwijs, Cultuur en Wetenschap, 2014).

The stress causes and stress responses were measured at the same time with the Questionnaire on the Experience and Evaluation of Work (QEEW) (In Dutch: VBBA: Vragenlijst Beleving en Beoordeling van de Arbeid; van Veldhoven & Meijman, 1994). This is a reliable and valid questionnaire (Evers, van Vliet-Mulder, & Groot, 2000) developed by van Veldhoven and Meijman (1994) who aimed to design a questionnaire that was congruent with contemporary theories of and approaches to psychosocial workload and job stress. They performed an extensive facet analysis of fifty existing instruments for measuring these issues. The models used see job stress as the result of a discrepancy between the demands of the job and the ability of the employee to meet these demands. When the job demands exceed the employees' ability to meet these demands over a longer period health problems will arise (van Veldhoven, Prins, Van der Laken, & Dijkstra, 2015). In a recent study the QEEW was adjusted to measure stress causes and stress responses among beginning teachers. Confirmatory Factor Analyses and Mokken scaling item reduction (double monotonicity Mokken model; Mokken, 1971) was applied to create high concise and precise scales. In this study only the items and scales which proved to be of high importance to measuring stress in beginning teachers were used. This were 124 questions belonging to a factor structure with 19 first order scales and six second order scales (see Appendix B; Chapter 2). It has been found that the second-order model provides a significantly better presentation of the data than the first-order model competing models (Van Veldhoven, 1996). In this study the factor structure was re-tested and confirmed (see preliminary results section). The second order scales high psychological task demands (PSY), negative social aspects (SOC), negative pupil aspects (PUPIL), tension (TEN), discontent (DIS) and negative emotions (EM) were used in further analyses in this study. Of these second order scales PSY, SOC and PUPIL are stress causes, whereas TEN, DIS and EM are stress responses.

4.2.2.2 Induction arrangements

The induction arrangements were measured using the school induction arrangement inventory (Helms-Lorenz, Slof, & van de Grift, 2013) at the end of the first induction school year. This questionnaire measures beginning teachers' perceptions of extent to which the school undertakes supportive activities in terms of: (1) workload reduction (WR); (2) school enculturation (SE); (3) effective teaching behaviour (TB); and (4) professional development (PD). All the items were rated on a four-point Likert scale ranging from always (1) to never (4). The item scores were recoded so that the highest scores represents a lot of effort to support beginning teachers during induction and the lowest scores means that schools do not provide the support to a high extent. An inventory representing each of the induction elements mentioned above was computed for use in further analyses. This inventory represents an inventory regarding the beginning teacher's perception of offered support.

4.2.3 Data analyses approach

Preliminary descriptive analyses, reliability analyses (using SPSS23), Confirmatory Factor Analyses (CFAs) and longitudinal invariance tests (using *Mplus*) were conducted. Descriptive analyses were conducted to calculate the means of the second order stress causes and stress responses scales and the means of the induction arrangement inventory. Reliability analyses were conducted to investigate the internal consistency of these scales. CFAs were conducted to examine whether the second order factor structures, for the stress causes and stress responses, which were found in Chapter 2) could be confirmed in this study. Longitudinal invariance tests using the multiple group confirmatory factor analysis (MGCFA) framework were conducted to establish the longitudinal invariance of the QEEW. First, univariate latent growth curve models (ULGMs) were conducted for each stress cause and stress response. The results of these ULGMs were used to create one multivariate latent growth model (MLGM) depicting the growth of stress causes and one MLGM depicting the growth of stress responses. Multivariate latent growth curve models (MLGMs) were conducted to examine the interindividual and intra-individual differences in stress developmental trajectories across time (using *Mplus* version 7.11, Muthén & Muthén, 2013). The minimum requirements of 200 participants per measurement occasion to conduct these analyses (Boomsma & Hoogland, 2001) was met (see Table 4.3). To evaluate the goodness of fit, commonly used fit statistics and fit indices including the chi-square statistic, the comparative fit index (CFI), the root mean square error of approximation (RMSEA), and the standardized root mean square residual (SRMR) were used. Following the general guidelines (Byrne, 2013) the following threshold values were used to determine good and appropriate fit. Models with non-significant chi-squared values, CFI and TLI values above the cut-off value of .95, a RMSEA value less than the cut-off value of .08, and SRMR less than the cut-off value of .08 were considered as good fit. It was noted that the chi-squared statistic can easily be inflated by large sample size (Hu & Bentler, 1999).

Missing data. As is typical in longitudinal studies, and also in this study, attrition and non-response occurred over the 3-year period. “Missingness, based on continuous data, is easily addressed in *Mplus* through use of the robust maximum likelihood (MLR) estimator” (Byrne, 2013, p. 314). Therefore, the missing data in this study were handled using the robust maximum likelihood (MLR) estimator. Also, comparative analyses with datasets including missing data (N = 229) and datasets without missing data (complete data; N = 165) were conducted. Results showed that these datasets did not differ in terms of gender, $\chi^2_{(1, N=394)} = 1.73, p = 0.19$.

Table 4.4 Comparisons among participants with missing data and complete data

	T1			T2			T3		
	N	t	p	N	t	p	N	t	p
PSY	353	-.25	.81	262	.59	.56	243	.70	.49
SOC	343	-1.63	.10	259	-.48	.65	238	.24	.81
PUPIL	353	-1.02	.31	263	-1.34	.18	243	.63	.53
DIS	337	-2.86	.01	253	-1.15	.25	233	.92	.36
TEN	337	-1.39	.16	252	-.10	.92	233	-.01	.99
EM	337	-3.42	.01	253	-.48	.63	233	.60	.48
WR	305	.23	.82				224	.34	.74
SE	304	.35	.73				224	1.00	.32
TB	301	-.96	.34				224	.56	.59
PD	301	-.36	.72				224	-1.28	.20

Note. PSY stands for high psychological task demands, SOC for negative social aspects, PUPIL for negative pupil aspects, DIS for discontent, TEN for tension, EM for negative emotions, WR for workload reduction, SE for supporting school enculturation, TB for support for effective teaching behaviour, and PD for supporting professional development

For most of the scales there were no significant differences between beginning teachers with complete data and incomplete data (see Table 4.4). Nevertheless, significant differences were found regarding discontent and negative emotions at T1 showing that the dataset including missing data showed significantly higher scores on discontent and negative emotions at T1 compared to the dataset without missing data i.e. complete data. Hence, caution should be taken when interpreting the results as it seems that the more unsatisfied teachers did not respond in subsequent measures. Also, additional analyses were performed comparing stress scores of beginning teachers who left their first school with stress scores of beginning teachers who stayed at their first school.

4.3 Results

4.3.1 Preliminary Analysis

Table 4.5 presents the results of the reliability and descriptive statistics analyses. These results show that the stress scales revealed a good reliability (Cronbach's alpha = .78–.94). The induction arrangement inventories had acceptable reliabilities (Cronbach's alpha = .57–.75). The stress cause high psychological task demands increased significantly over time ($d = 0.22$). The stress cause negative social aspects remained relatively stable over time. The stress cause negative pupil aspects

decreased significantly over time ($d = -0.52$). Results also show that the stress responses discontent, tension, and negative emotions remained relatively stable over time. Lastly, preliminary analyses supported the adequacy to conduct CFAs. Table 4.6 shows the correlations among the variables considered in this study. As can be seen from this table there are no over high dependencies among the factors. Results of the CFAs showed that the second order factor structure, for stress causes (CFI = 0.92, TLI = 0.88, RMSEA = 0.09, SRMR = 0.06) and stress responses (CFI = 0.99, TLI = 0.98, RMSEA = 0.03, SRMR = 0.03), found in this study was acceptable and is in line with that found in Chapter 2 (Appendix A).

Table 4.5 Descriptive statistics and reliability of the scales (n = 393)

Stress scale	Items	T1					T2					T3					Effect t2-t1	Effect t3-t1
		Mean	Std. Deviation	Minimum	Maximum	Cronbach's α	Mean	Std. Deviation	Minimum	Maximum	Cronbach's α	Mean	Std. Deviation	Minimum	Maximum	Cronbach's α		
PSY	30	5.97	1.82	.00	13.00	.88	6.10	1.73	2.20	12.00	.88	6.35	1.65	2.60	13.20	.87	.07	.22
SOC	21	3.93	1.78	.25	9.50	.88	4.01	1.92	.25	9.50	.90	3.93	1.82	.00	10.00	.89	.04	.00
PUPIL	7	6.42	4.30	.00	20.00	.89	4.89	3.71	.00	19.00	.87	4.39	3.44	.00	19.00	.85	-.38	-.52
DIS	12	1.72	1.36	.00	6.00	.80	1.62	1.30	.00	6.00	.79	1.70	1.42	.00	6.00	.82	-.08	-.01
TEN	33	3.85	2.62	.00	14.00	.94	3.85	2.27	.00	15.25	.78	3.83	2.32	.00	13.75	.81	.00	-.01
EM	17	1.07	1.38	.00	8.50	.82	.99	1.28	.00	7.00	.80	1.06	1.38	.00	8.00	.83	-.06	-.01
WR	17	0.60	0.19	.00	1.00	.74												
SE	6	0.66	0.23	.00	1.00	.57												
TB	9	0.44	0.27	.00	1.00	.75												
PD	10	0.50	0.26	.00	1.00	.73												

Note. PSY stands for high psychological task demands, SOC for negative social aspects, PUPIL for negative pupil aspects, DIS for discontent, TEN for tension, EM for negative emotions, WR for workload reduction, SE for supporting school enculturation, TB for support for effective teaching behaviour, and PD for supporting professional development

Table 4.6 Pearson's bivariate correlations among variables considered in this study (second-order scales) (n=393)

Scale	PSY	SOC	PUPIL	DIS	TEN	EM	WR	SE	TB	PD
PSY	1									
SOC	.55**	1								
PUPIL	.38**	.21**	1							
DIS	.33**	.46**	.15**	1						
TEN	.62**	.44**	.29**	.29**	1					
EM	.51**	.44**	.30**	.50**	.62**	1				
WR	-.25**	-.31**	.02	-.27**	-.25**	-.23**	1			
SE	-.09	-.18**	-.08	-.21**	-.06	-.16**	.40**	1		
TB	-.14*	-.18**	.05	-.21**	-.14*	-.20**	.28**	.28**	1	
PD	-.12*	-.15*	-.06	-.14**	-.09**	-.09	.33**	.45**	.44**	1

Note. PSY stands for high psychological task demands, SOC for negative social aspects, PUPIL for negative pupil aspects, DIS for discontent, TEN for tension, and EM for negative emotions, WR for workload reduction, SE for supporting school enculturation, TB for support for effective teaching behaviour, PD for supporting professional development. ** Correlation is significant at the 0.01 level. * Correlation is significant at the 0.05 level

4.3.2 Longitudinal invariance testing

In the longitudinal term, the multiple-group refers to multiple time measurement (3 time points). The six-factor stress causes and responses model was estimated simultaneously for the three time measurements. Three competing models were tested including configural, metric, and scalar invariance. The configural invariance model tests whether the six stress factors and the set of items associated with each factor has a similar factor structure over time. The metric invariance model tests whether the stress factors have the same meaning and the same measurement unit in three time measurements by assuming that factor loadings are the same across time. Achieving this level of measurement invariance (MI) allows for comparisons of latent constructs across time, but does not justify comparisons of mean scores over time. For the scalar invariance-model, factor loadings (estimating the meaning of the constructs) and the intercepts are assumed to be equal over time. Reaching this level of MI allows for valid comparisons of factor scores (in our case scale means) over time.

The common model-data goodness of fit indices for the categorical MGCFA model were used, including CFI, TLI, and RMSEA (Brown, 2015; Desa, 2016; Wang & Wang, 2012). Additionally, in evaluating competing models, cut-off criteria for changes in CFI (Δ CFI), TLI (Δ TLI) and RMSEA (Δ RMSEA) of < 0.01 were applied (Desa, 2016; Wang & Wang, 2012).

Results of MGCFA show that the latent factor structure of stress causes and responses is similar over time (see Table 4.7, lower part), as indicated by good indices at the configural, metric, and scalar invariance (CFIs and TLIs > 0.90, RMSEAs < 0.08) as well as by the comparative assessments of relative fit indices (Δ RMSEAs, Δ CFIs, Δ TLIs < 0.01). This confirms that all indicators of stress causes and responses are invariant, and interpreted and responded to in a similar manner over time.

Table 4.7 Results of longitudinal measurement invariance testing

		CFI	TLI	RMSEA		
				Estimate	Lower bound	Upper bound
M1	Configural	0.915	0.900	0.056	0.051	0.060
M2	Metric	0.916	0.904	0.055	0.050	0.059
M3	Scalar	0.916	0.910	0.053	0.048	0.057
Nested models comparisons		Δ CFI	Δ TLI	Δ RMSEA		
Metric vs configural		0.001	0.004	-0.001		
Scalar vs metric		0.000	0.006	-0.002		
Scalar vs configural		0.001	0.010	-0.003		

Note. CFI = comparative fit index, TLI = Tucker-Lewis index, RMSEA = root mean square error of approximation, lower and upper for 90 % confidence interval of RMSEA. Cut-off criteria: CFI \geq 0.90, TLI \geq 0.90, RMSEA < 0.08, Δ CFI < 0.010, Δ TLI < 0.010, Δ RMSEA < 0.015 (Chen, 2007; Cheung & Rensvold, 2002; Desa, 2016; Wang & Wang, 2012)

4.3.3 Changes within and individual differences between beginning teachers' stress causes over time

To examine the within-person growth trajectory and between-person change over time concerning the beginning teachers' stress causes, ULGMs were conducted. Separate ULGMs were conducted for: high psychological task demands (PSY), negative social aspects (SOC) and negative pupil aspects (PUPIL). The trajectory of the hypothesized change is shown to be linear (no evidence of quadratic growth). Therefore the ULGMs include two growth parameters: (1) an intercept parameter representing a beginning teacher's score on the outcome variable at Time 1, which corresponds to the end of the first school year after receiving one year of induction arrangements, and (2) a slope parameter representing the teachers' rate of change on the outcome variable between Time 1, Time 2

and Time 3². Due to the equal interval between the measurement occasions the time scores for the ULGMs were set as 0 for T1, 1 for T2 and 2 for T3 (see Figure 4.2). To take the nested nature of the data into account the standard errors were corrected in the ULGMs by using TYPE=COMPLEX.

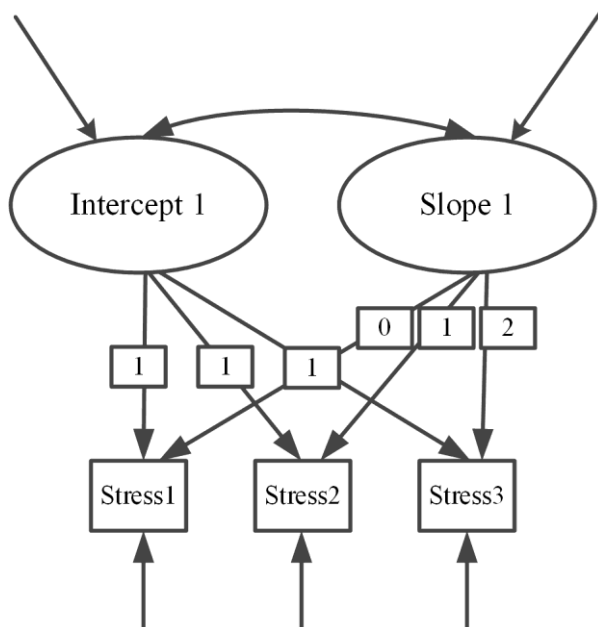


Figure 4.2 Univariate latent growth curve model depicting the growth of stress

The ULGMs depicting the growth of PSY, SOC, and PUPIL show good fit (see Appendix D, p. 129). The parameter estimates from these ULGMS (see Appendix E, p. 130) were used to set up the MLGMs. For the intercepts and slopes with non-significant variance, all covariances were restricted to zero in the MLGM. For the MLGM depicting the growth of stress causes this resulted in only a covariance between the intercept and slope of SOC. Further, based on the results of Chapter 2 and Table 4.6 showing correlations between PSY, SOC, and PUPIL covariances between the intercepts of these variables were added to the MLGM. The model was run, the structural path between the intercept and slope of SOC was not statistically significant and was therefore removed from the model to make the model more parsimonious. The resulting model, displayed in Figure 3, has a good fit; CFI = 0.907, TLI = 0.888, RMSEA = 0.078, SRMR = 0.062.

² The hypothesis of linear changes was tested against the quadratic changes for all stress causes and stress responses. Results showed that no quadratic changes are evident.

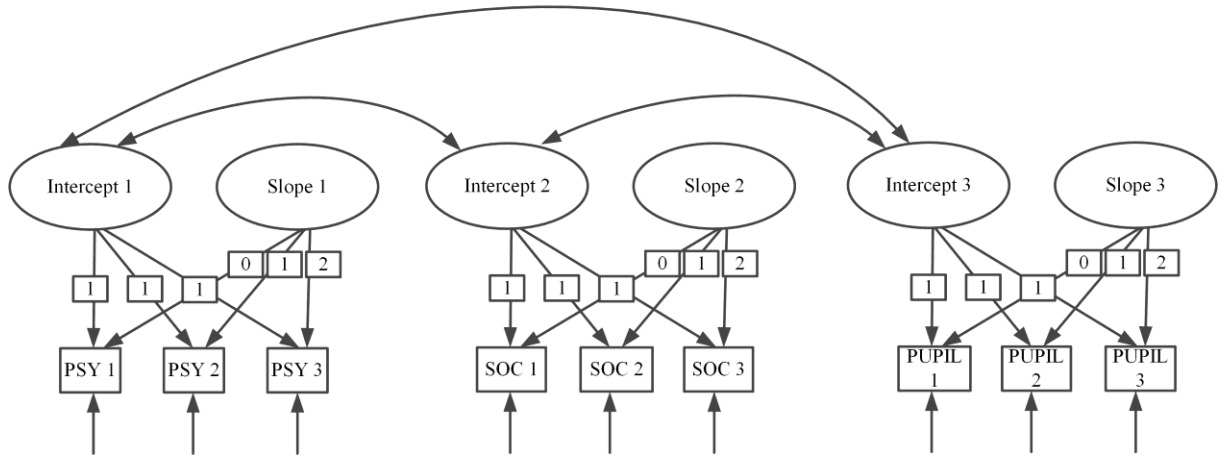


Figure 4.3 Multivariate latent growth curve model (MLGM) depicting the growth of stress causes.

Table 4.8 Parameter estimates for the multivariate latent growth curve model (MLGM) depicting the growth of stress causes with dataset including missing data (dataset 1)

Stress scale	Parameter	Estimate	S.E.	Est./S.E.	Two-Tailed <i>p</i> -value
PSY	Intercept mean	5.95	0.09	64.42	<.01
	Intercept variance	2.17	0.26	8.28	<.01
	Slope mean	0.25	0.04	6.16	<.01
	Slope variance	0.12	0.06	2.13	<.05
SOC	Intercept mean	3.95	0.09	46.53	<.01
	Intercept variance	2.20	0.24	9.28	<.01
	Slope mean	0.09	0.06	1.50	n.s.
	Slope variance	0.18	0.09	2.05	<.05
PUPIL	Intercept mean	6.21	0.20	31.16	<.01
	Intercept variance	6.71	1.01	6.68	<.01
	Slope mean	-0.90	0.11	-8.40	<.01
	Slope variance	0.26	0.65	0.40	n.s.

Note. PSY stands for high psychological task demands, SOC for negative social aspects, PUPIL for negative pupil

4.3.3.1 High psychological task demands

Fitting the MLGM to the teacher PSY data resulted in a mean intercept value of $M_i = 5.95$ ($p < 0.01$), and mean slope of $M_s = 0.25$ ($p < 0.01$) (see Table 4.8). This indicates that, in general, teachers reported a significant increase in high psychological task demands over time. The intercept variance for teacher PSY, $D_i = 2.17$ ($p < 0.01$), suggests that substantial variation existed between individual teachers regarding initial status of PSY. In other words, significant variation existed between individual teachers regarding PSY scores at the end of school year 1 after receiving induction arrangements for one year. The slope variance for PSY, $D_s = 0.12$ ($p < 0.05$), indicates that substantial variation existed within individual teachers regarding change in status of PSY over time. In other words, substantial variation existed within individual teachers regarding the change in PSY scores over year 1, 2 and 3.

4.3.3.2 Negative social aspect

Results show that SOC has a mean intercept value of $M_i = 3.95$ ($p < 0.01$), and mean slope of $M_s = 0.09$ ($p = 0.13$). This indicates that, in general, teachers reported no significant change in negative social aspects over time. However, the intercept variance for teacher SOC, $D_i = 2.20$ ($p < 0.01$) is significant, suggesting substantial variation between individual teachers regarding SOC scores at the end of school year 1 after receiving induction arrangements for one year. Whereas, teachers reported no significant change in negative social aspects over time, the slope variance for negative social aspects shows that there are between teacher differences in change over time, $D_s = 0.18$ ($p < 0.05$).

4.3.3.3 Negative pupil aspects

Teachers reported a mean intercept value for PUPIL $M_i = 6.21$ ($p < 0.01$), and a mean slope of $M_s = -0.90$ ($p < 0.01$). This indicates that teachers reported a significant decrease in negative pupil aspects over time. Further, results show that substantial variation existed between individual teachers regarding PUPIL scores at the end of school year 1 after receiving induction arrangements for one year, $D_i = 6.71$ ($p < 0.01$). No substantial variation existed between individual teachers regarding change in PUPIL scores over time, $D_s = 0.26$ ($p = 0.69$).

4.3.4 Changes within and individual differences between beginning teachers' stress responses over time

Separate ULGMs were also conducted to examine the growth of the stress responses: discontent (DIS), tension (TEN), and negative emotions (EM). The ULGMs depicting the growth of the stress responses show good fit (see Appendix D). The parameter estimates (see Appendix E) were used to set up the MLGMs. For the intercepts and slopes which had non-significant variance, all covariances were restricted to zero in the MLGM, resulting in only a covariance between the intercept and slope of DIS. Further, based on the findings of Chapter 2 and Table 6 showing correlations between DIS, TEN, and EM covariances between the intercepts of these variables were added to the MLGM. Fit statistics show that the model, displayed in Figure 4.4, has an appropriate fit; CFI = 0.890, TLI = 0.863, RMSEA = 0.092, SRMR = 0.060.

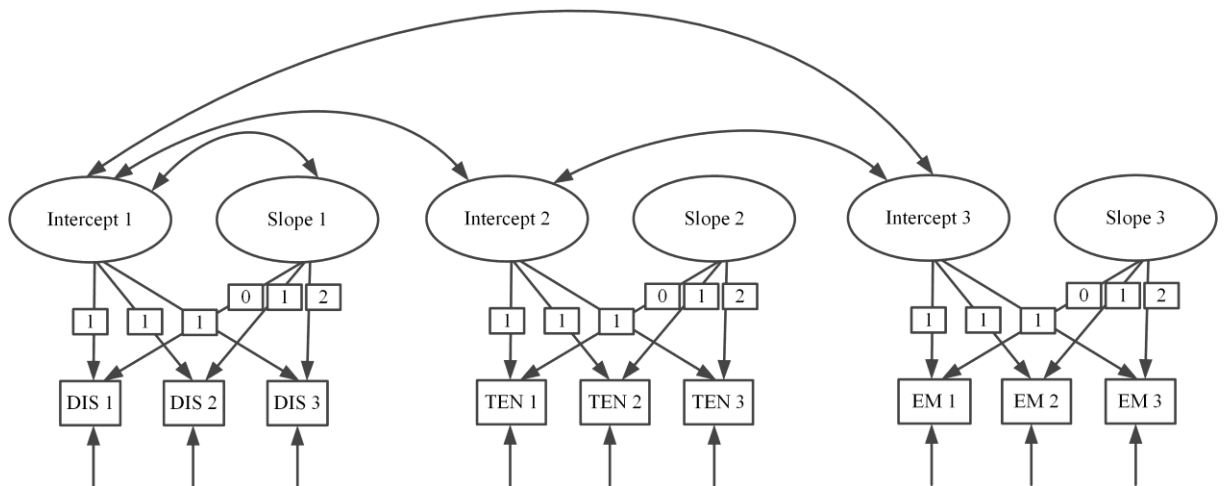


Figure 4.4 Multivariate latent growth curve model (MLGM) depicting the growth of stress responses

Table 4.9 Parameter estimates for the multivariate latent growth curve models (MLGM) depicting the growth of stress responses with dataset including missing data (dataset 1)

Stress scale	Parameter	Estimate	S.E.	Est./S.E.	Two-Tailed <i>p</i> -value
DIS	Intercept mean	1.70	0.07	22.97	<.01
	Intercept variance	1.59	0.26	6.07	<.01
	Slope mean	0.11	0.05	2.04	<.05
	Slope variance	0.33	0.10	3.42	<.01
TEN	Intercept mean	3.86	0.13	28.84	<.01
	Intercept variance	4.79	0.44	10.96	<.01
	Slope mean	0.09	0.06	1.45	n.s.
	Slope variance	0.13	0.12	1.12	n.s.
EM	Intercept mean	1.06	0.07	16.08	<.01
	Intercept variance	1.07	0.15	7.23	<.01
	Slope mean	0.07	0.05	1.44	n.s.
	Slope variance	-0.03	0.06	-0.61	n.s.

Note. DIS for discontent, TEN for tension, and EM for negative emotions

4.3.4.1 Tension, negative emotions and discontent

Fitting the MLGM to the teacher stress responses data resulted in a mean intercept value for DIS of $M_i = 1.70$ ($p < 0.01$, see Table 4.9), and mean slope of $M_s = 0.11$ ($p < 0.05$), for TEN a mean intercept value of $M_i = 3.86$ ($p < 0.01$), and mean slope of $M_s = 0.09$ ($p = 0.15$), and for EM a mean intercept value of $M_i = 1.06$ ($p < 0.01$), and mean slope of $M_s = 0.07$ ($p = 0.15$). The results indicate, a significant increase in DIS over time. Results also show that substantial variation existed between individual teachers regarding DIS, TEN and EM scores at the end of school year 1 after receiving induction arrangements for one year, $D_i = 1.59$ ($p < 0.01$), $D_i = 4.79$ ($p < 0.01$), $D_i = 1.07$ ($p < 0.01$). The slope variance for DIS shows that there are between teacher differences in change of DIS over time, $D_s = 0.33$ ($p < 0.01$).

Complete cases vs. missing data. As significant differences were found regarding DIS and EM at T1 (see Table 4.4) showing that the dataset including missing data (dataset 1) revealed significant higher scores on discontent and negative emotions compared to the dataset excluding missing values the MLGM analysis depicting the growth of stress causes (Figure 4.3), and the MLGM analysis depicting the growth of stress responses (Figure 4.4) were repeated, this time only including participants with complete data (dataset 2) to investigate whether the results which were found using dataset 1 would hold (see Appendix F and G, p. 131).

When comparing the MLGMs ran with dataset 1 to the MLGMs ran with dataset 2 it was found that the slope of EM, $M_s = 0.14$ ($p = <0.01$), increases significantly in the MLGM when the data contains complete cases only. Whereas, this slope was non-significant when analysing the data including participants with missing data. Additional descriptive analyses were performed to find out more regarding the group of participants with missing data.

From the 229 participants with missing data, 65 (27%) left their first school. Of these leavers, 23 (35%) left after the first year, 30 (46%) after their second year, and 12 (19%) after their third year. The reason they left were: to work at a different school (66%), to quit teaching (10%), to go travelling (3%), lack of number of teaching hours (7%), due to poor performance (2%), private reasons (2%), and unknown (10%). An additional independent sample T-test was performed in order to investigate whether the beginning teachers who left their first school (N=65) scored different on the stress causes and stress responses compared to the beginning teachers who stayed at their first school (N=328). Beginning teachers who left their first school within three years scored significantly higher on all the stress causes and stress responses at T1 (see Table 4.10). Therefore, it seems that this group inflated the values of the stress causes and stress responses at T1.

Table 4.10 Comparisons among participants who stayed at their first school with participants who left their first school

	T1		
	N	t	<i>P (one-tailed)</i>
PSY	351	-2.91	<.01
SOC	342	-2.86	<.01
PUPIL	351	-2.82	<.01
TEN	336	-2.30	.03
DIS	336	-6.48	<.01
EM	336	-3.63	<.01

4.3.5 The influence of induction arrangement elements on stress causes and stress responses

There were ULGMs conducted to examine the influence of the induction arrangement elements: WR,

SE, TB, and PD on stress causes and stress responses. The results from the ULGMs (see Appendix H, p.132) were used as input for the MLGMs.

For the MLGM examining the influence of induction arrangement elements on stress causes the MLGM displayed in Figure 4.3 was used as the basis. Further, induction arrangements with a significant influence on the stress causes intercept or slopes (see Appendix H) were added to the MLGM. None of the induction arrangement elements significantly influence the negative pupil aspects (PUPIL). PUPIL was therefore removed from the model. By running the resulting model it was found that the influence of TB on the intercept of SOC was no longer significant, therefore TB was removed from the analyses. The final model (Figure 4.5) had a good fit; CFI = 0.944, TLI = 0.927, RMSEA = 0.077, SRMR = 0.048. The parameter estimates of the MLGM (see Table 4.11) show that workload reduction has a significant negative influence on the intercept of PSY and SOC. In other words, beginning teachers who are offered workload reduction during their first year experience less high psychological task demands and less negative social aspects at the end of that first year.

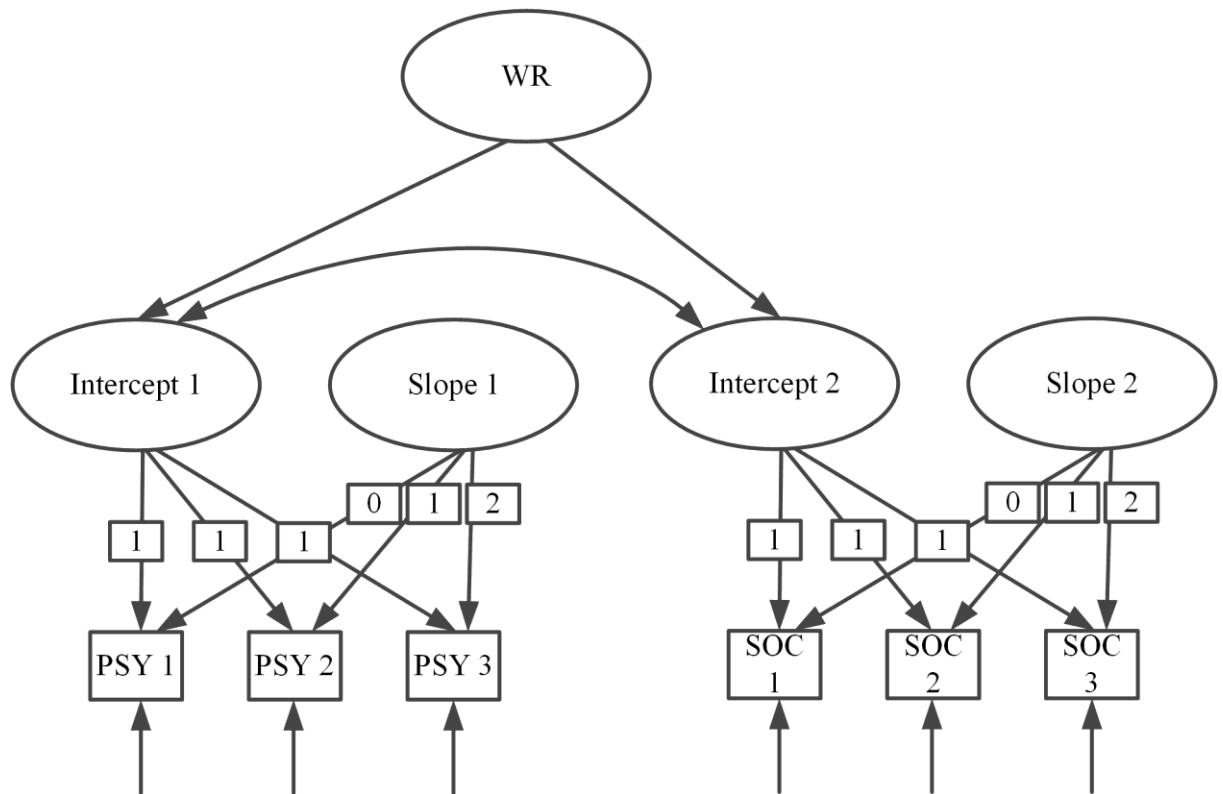


Figure 4.5 Multivariate latent growth curve model (MLGM) depicting the influence of the induction arrangement elements on stress causes. Fit statistics: CFI = 0.944, TLI = 0.927, RMSEA = 0.077, SRMR = 0.048

Table 4.11 Parameter estimates for the multivariate latent growth curve model (MLGM) depicting the influence of an induction arrangements on the intercept of stress causes

Induction arrangement	Stress scale	Parameter	Estimate	S.E.	Est./S.E.	Two-Tailed P-Value
WR	PSY	Intercept	-2.32	0.56	-4.17	<.01
WR	SOC	Intercept	-2.71	0.53	-5.08	<.01

Note. PSY stands for high psychological task demands, SOC for negative social aspects, and WR for workload reduction

For the MLGM examining the influence of induction arrangement elements on stress responses the MLGM displayed in Figure 4.4 was used as basis. Further, induction arrangements with a significant influence on the stress causes intercept or slopes (see Appendix H) were added to the MLGM. The resulting model (Figure 4.6) had a mediocre fit; CFI = 0.821, TLI = 0.787, RMSEA = 0.091, SRMR = 0.093. Based on the strong correlation found between WR and SE (0.40, see Table 4.6), a second model was run including the covariance between WR and SE. The second model, had a good fit; CFI = 0.870, TLI = 0.843, RMSEA = 0.078, SRMR = 0.074.

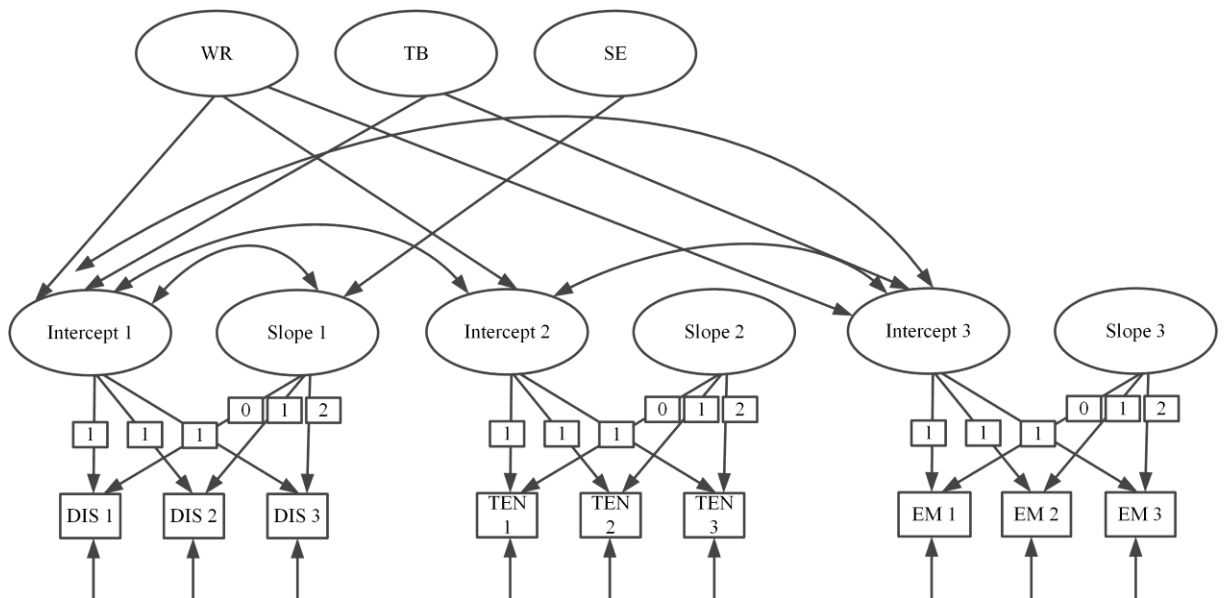


Figure 4.6 Multivariate latent growth curve model (MLGM) depicting the influence of the induction arrangement elements on stress responses

Table 4.12 *Parameter estimates for the multivariate latent growth curve model (MLGM) depicting the influence of an induction arrangements on the intercept of stress responses*

Induction arrangement	Stress scale	Parameter	Estimate	S.E.	Est./S.E.	Two-Tailed P-Value
WR	DIS	Intercept	-1.39	0.34	-4.09	<.01
WR	TEN	Intercept	-2.96	0.79	-3.77	<.01
WR	EM	Intercept	-1.37	0.36	-3.87	<.01
TB	DIS	Intercept	-0.52	0.27	-1.96	0.05
TB	EM	Intercept	-0.44	0.19	-2.29	<.05
SE	DIS	Slope	-0.44	0.15	-2.94	<.01

Note. DIS stands for discontent, TEN for tension, EM for negative emotions, WR for workload reduction, TB for supporting effective teacher behaviour, and SE for stimulating school enculturation

Workload reduction. Workload reduction is a significant predictor of the initial status of PSY, SOC, TEN, EM and DIS (see Table 4.11 and 4.12). In other words, a high degree of perceived workload reduction offered during the first school year corresponds to a lower degree of high psychological task demands, negative social aspects, tension, negative emotions and discontent at the end of the first school year.

Stimulating school enculturation. Stimulating school enculturation is a significant predictor of the change in DIS. This indicates that, a high degree of stimulating school enculturation offered during the first school year corresponds with a decrease in discontent over time. However, as the reliability of SE was very low (0.57) this finding should be regarded with caution.

Supporting effective teacher behaviour. Supporting effective teacher behaviour is a significant predictor of the initial status of EM and DIS. This indicates that, a high degree of support for effective teacher behaviour offered during the first school year corresponds with a low degree of negative emotions and discontent at the end of the first school year.

Stimulating professional development. Stimulating professional development is not a significant predictor of the initial status nor of the change in any of the stress causes or stress responses.

4.4 Conclusions and discussion

The present study aims to contribute to the knowledge base of teacher stress development and influences of professional support programmes by examining how beginning teachers' stress causes and stress responses develop over time and how individual induction arrangement elements provided during the first year of professional practice influences beginning teachers' experienced stress causes and responses after one year of teaching, and over the two years that follow. This study shows, in line with previous research (Goddard et al., 2006), that beginning teachers' perceived high psychological task demands increase significantly over time. This stress cause, is perceived as most salient by the majority of beginning teachers (Borg & Riding, 1991; Boyle, Borg, Falzon, & Biaglionni, 1995;

Kyriacou & Sutcliffe, 1978) and has proven to be a strong predictor for feelings of tension in beginning teachers (Chapter 3). Previous research already stated that high psychological task demands and negative social aspects may be decreased by workload reduction (Helms-Lorenz et al., 2012). This study confirms that workload reduction offered during the first year has indeed a powerful impact on decreasing the perceived high psychological demands and negative social aspects at the end of that year. That being said, none of the support offered during the first year relates to the development of this stress cause over the two years that followed. As this study clearly shows the benefits of workload reduction in order to decrease the high psychological task demands, it is advised that schools keep offering this also during year 2 and year 3 to avoid work overload.

In this study we found no significant increase concerning negative social aspects. This finding is not in line with that of Goddard et al. (2006) who found that co-worker cohesion and supervisor support declined over the first twenty-one months that beginning teachers were working. It might be that in our study negative social aspects of the beginning teachers did not increase due to sufficient workload reduction that was offered as we found that this influences the level of negative social aspects.

Warm teacher-student relationships are often mentioned as one of the main reasons for teachers to stay in the profession (O'Connor, 2008; Wilhelm, Dewhurst-Savellis, & Parker, 2000). Whereas, poor teacher-student relationships are strongly related to experiencing tension, discontent and negative emotions (Chapter 3; Yoon, 2002). This study shows that teachers' perceived negative pupil aspects decreased significantly over time. The induction arrangements offered during the first year had no significant influence on the stress cause: perceived negative pupil aspects at the end of that year, nor, on the decrease of this stress aspect over time. This is an interesting finding. If the induction arrangement elements do not influence the decrease in perceived negative pupil aspects of beginning teachers what does? In this study the focus was only on resources which were offered by the school, so called 'contextual resources'. Whereas, 'individual resources' like active coping skills influence the stress process of teachers too (Beltman, Mansfield, & Price, 2011). It might be that beginning teachers who stay in the profession develop active coping skills which helps them to cope efficiently with negative pupil aspects. Also, it might be that as teachers become more competent in teaching skills like classroom management, pupil misbehaviour decreases. Further, building warm teacher-student relationships might be a skill which teachers develop naturally over time. Future research will benefit from investigating the relationship between the development of teacher-student relationships, teaching skills (e.g. classroom management), and (individual) resources and teacher stress over time.

We found that discontent increased significantly over time. This is in line with prior research showing that feelings of emotional exhaustion, depersonalisation and personal accomplishment all significantly increase during the first two years of teaching (Dicke et al., 2015; Goddard et al., 2006). It is certainly worth paying attention to this finding, because feeling discontent has been found to be

related to beginning teachers' attrition (Chapter 3). In the light of retaining beginning teachers it is important to highlight that we found that WR and TB can both decrease the feelings of discontent. Further, SE offered in the first year can influence the change in discontent over the two years that follow. Feelings of discontent decrease over time when beginning teachers experience SE. This highlights the importance of making beginning teachers familiar with the school culture and school climate. However, due to low reliability of the SE scale this result should be regarded with caution.

The induction element that supports PD does not influence any of the stress causes or stress responses in this study. This result surprises us as previous research found that an environment which lacks support for PD contributes to predicting burnout (Gavish & Friedman, 2010). More research is needed in order to explain this finding.

This study has a number of limitations. First, attrition and non-response occurred over the 2-year period influencing the results of discontent and negative emotions. Therefore, caution should be taken when interpreting the results of discontent and negative emotions in this study. Also, participants participated on a voluntary basis, therefore it is possible that beginning teachers who agreed to participate may behave differently from those who didn't. In the light of experiencing stress it might be that severely stressed teachers did not find the time to participate. Another limitation is that the support from induction arrangements was not measured at every time point which stress was measured. Measuring the induction arrangements at all three time points could have provided us with more insight into the more powerful influence of the arrangements per year. Finally, the variables were assessed via self-reports, which can have several limitations (Trenberth & Dewe, 2004).

Nevertheless, longitudinal studies concerning the development of stress among beginning teachers are scarce, therefore, this study is an important contribution to the scientific knowledge concerning the longitudinal development of stress among beginning teachers. Also, our contribution to the field is that evidence has been offered showing that induction elements not only reduce stress causes but have an impact on stress responses too. Beginning teachers who are supported with induction arrangements, have reduced levels of discontent, and reduced levels of negative emotions. Finally, as mentioned in the introduction, no research has investigated the influence of the individual induction arrangement elements yet. This study highlights which induction arrangements elements reduce the level of beginning teachers' stress causes and stress responses (over time). This important knowledge can help schools target their interventions more precisely after diagnosing the stress causes and responses of their beginning teachers. More research, particularly in-depth interviews with teachers, is needed to shed more light on explaining the complex results related to teacher stress found in this study such as the decrease of perceived negative pupil aspects over time.

CHAPTER 5

Stayers and leavers: Investigating stress causes, coping resources and beliefs of stressed beginning secondary school teachers

This chapter is based on Harmsen, R., van Veen, K. & Verkade, A. (2019, submitted for review), 'Stayers and leavers: investigating stress causes, coping resources and beliefs of stressed beginning secondary school teachers'.

Abstract

Teaching is a stressful profession. Some teachers can cope with the professional challenges, but for others, consistently dealing with teaching challenges leads them to leave the profession (attrition). To shed light on how and why beginning teachers experience and cope with stress, this study examines differences in experienced challenges, coping resources and beliefs of beginning teachers who stayed and those who left the teaching profession. We conducted semi-structured interviews involving five stayers and four leavers, guided by the transactional model and the job-demands stress framework. Results show that leavers experienced difficulties with classroom management, whereas stayers did not. Stayers experienced and used more resources to manage their stress levels, including their social network, good relationships with their students and physical exercise. Finally, we observed strong differences in beliefs regarding self-efficacy, teaching and student learning.

5.1 Introduction

The teaching profession is considered a highly stressful profession (Johnson et al., 2005; Newberry & Allsop, 2017; Johnson & Birkeland, 2003; Skaalvik & Skaalvik, 2015), particularly for beginning teachers (Gavish & Friedman, 2010; Goddard, O'Brien & Goddard, 2006). Experiencing high levels of stress can negatively influence teachers' teaching behaviour and thereby harm students' achievements (Chapter 3; Klusmann, Richer & Lüdke, 2016; Ronfeldt, Loeb & Wyckoff, 2013). Also, it can negatively influence teachers' retention and well-being (Chapter 3; Hanif, 2004). Retaining teachers is high on the agenda of countries with a teacher shortage, including the Netherlands and many other countries (e.g., the Ministry of Education, Culture and Science, 2015; Sibieta, 2018; U.S. Department of Education, 2016).

Previous research has revealed causes of stress that beginning teachers experience (Borg & Riding, 1991; Clunies-Ross, Little & Kienhuis, 2008; den Brok, Wubbels & van Tartwijk, 2017). Studies have also documented relationships among these challenges, beginning teachers' stress responses, teaching behaviour and attrition (Gilboa, Shirom, Fried & Cooper, 2008; Jennings & Greenberg, 2009; Montgomery & Rupp, 2005; Tubre & Collins, 2000), as well as the effects of support programmes on beginning teachers' stress (Chapter 4; Helms-Lorenz, Slof & van de Grift, 2013; Helms-Lorenz, Slof, Vermue & Canrinus, 2012). Although existing studies might attempt to explain why certain teachers leave the teaching profession, whereas others stay, most research to date is quantitative (as are the previous chapters); therefore, they do not provide insight into the underlying mechanisms involved in the decision-making process of highly stressed stayers and leavers.

Lazarus (2006) postulated that stress and coping are the result of the interaction between a person and his or her environment, such that the emotional life cannot be understood solely from the standpoint of the person or the environment. Feeling stress is the result of a certain person acting or reacting to a situation in his or her environment. In these interactions, specific core aspects of the professional identity play a role, such as how the nature of teaching and students' learning behaviour is perceived (van Veen, Slegers & van de Ven, 2005). In general, teaching can be understood in terms of the transmission of knowledge, for which adequate classroom management is needed, or as the organization of students' learning, which refers to how students learn and how this process can be facilitated (Hattie, 2012). Related to these views, the teacher can designate students' learning behaviour as mainly the responsibility of students themselves (external attribution) or as the responsibility of teachers (internal attribution) (Hattie, 2012; Scheerens, 2016). Their cognitive appraisals of teaching and learning likely influence beginning teachers' stress and coping.

In general, insights into how teachers perceive and experience these relationships are fruitful (Hong, 2012) and could help schools to design effective professional support programmes. It may also increase beginning teachers' awareness of how they and their school could use more effective coping mechanisms to handle the challenges of their job better. This study focuses on how beginning

teachers, both stayers and leavers, experienced and coped with stress related to their daily work, as well as their attitudes toward teaching and learning and the role of these attitudes in determining their appraisals of situations that then lead to decisions to stay in or leave the profession.

5.1.1 Theoretical framework

Some teachers are able to cope with the challenges that they confront, whereas others, after consistently dealing with teaching challenges, leave the profession. The transactional model of stress (Lazarus, 2006; Lazarus & Folkman, 1987) and the JD-R model (Bakker & Demerouti, 2007) provide useful frameworks to understand the interplay between beginning teachers' challenges and individual and contextual resources, by shedding light on why some beginning teachers leave and others stay. According to these models, organizational outcomes like teacher attrition are the result of an interaction and appraisal process between a person (i.e., the teacher) and his or her environment. Figure 5.1 shows two main psychological processes: the health impairment process (on the left) and the motivational process (on the right). The first model pertains to the relationship among the person, his or her environment, stress causes, coping, strain/stress responses and negative organizational outcomes (e.g., attrition). The second model postulates that individual and contextual resources have the potential to lead to positive organizational outcomes (e.g., job satisfaction).

The health impairment process contains several elements. The first element is the person. Person variables (beliefs and individual resources) influence what people are able and unable to do as they seek to gratify needs, attain goals and cope with the stresses produced by demands (Lazarus, 2006). As Lazarus (2006, p. 71) explained, 'Beliefs have to do with how we conceive ourselves and our place in the environment. They shape our expectations about what is likely to happen in an encounter; what we hope for and fear; and, therefore, what our anticipatory and outcome emotions are likely to be. We must consider our chances of mastering the transactions and having a positive outcome, what we have to do to attain the goal, and what price we must pay for success and failure'. Perceived job-related resources generally include physical, psychological, social or organizational aspects that are functional in achieving work goals; reducing job demands and the associated physiological and psychological costs; and stimulating personal growth, learning and developing (Bakker & Demerouti, 2007). Examples of individual resources are personal attributes (e.g., sense of humour), effective coping skills (e.g., ability to let go, accept failure, learn and move on), effective teaching skills (e.g., wide range of instructional practice skills), professional reflection (e.g., self-insight) and self-care (e.g., taking active responsibility for one's own well-being).

The second element of the stress model is the environment. One element of the environment is job demands, which include physical, psychological, social, or organizational aspects of the job that require sustained physical and/or psychological effort or skills and, therefore, provide challenges for teachers (Bakker & Demerouti, 2007). Another element is contextual resources, which can help

teachers cope with the stresses caused by the job demands. Examples are school/administrative support (e.g., not being assigned the most difficult classes), support from a mentor, support from peers and colleagues, working with students (e.g., positive student–teacher relationships) and support from family and friends (Beltman, Mansfield & Price, 2011).

According to Lazarus (2006), the person and the environment interact, which leads to a primary appraisal, in which the teacher evaluates whether the situation is worthy of attention and if it is a negative situation. If a teacher believes that students should learn in a quiet environment and he or she notices that some students are talking in the classroom, the teacher might appraise this situation as negative and in turn perceive it as a stress cause. Subsequently, secondary appraisal takes place, whereby the teacher evaluates whether she or he has the individual or contextual resources to cope with this stress cause. Teachers can actively respond to the challenges they experience by leveraging their individual or contextual resources (Mansfield, Beltman & Price, 2014).

The next element of the hypothesized model concerns teachers' strain/stress response to the situation. Strain/stress responses can be affective, behavioural or physiological (e.g., negative emotions, discontent, tension). Stress causes lead to stress responses; however, having and using resources effectively can mitigate this relationship.

Finally, the health impairment process includes the path from stress responses to negative organizational outcomes. If, for example, a beginning teacher continually experiences discontent due to the challenges of the teaching job, she or he is likely to leave the profession.

The right-hand side of Figure 5.1 depicts the motivational process. It represents how teachers' resources lead to increased motivation, which can lead to positive organizational outcomes (e.g., staying in the profession).

5.1.2 Previous research

The most significant challenges for beginning teachers are negative pupil aspects, high psychological task demands (e.g., many hours of teaching) and negative social aspects (Borg & Riding, 1991; Chapter 3; Clunies-Ross et al., 2008; den Brok et al., 2017; Struyven & Vanthournout, 2014). As mentioned earlier, beginning teachers can actively respond to challenges using individual or contextual resources (Mansfield, et al., 2014). Important contextual resources for beginning teachers include (1) a mentor who takes sufficient time to guide the teacher, is trained to coach and takes the teacher seriously (Gaikhorst, Beishuizen, Korstjens & Volman, 2014; McCormack, Gore & Thomas, 2006); (2) positive relationships with colleagues with whom a teacher can discuss daily problems and issues that need immediate attention (Pogodzinski, 2014); (3) positive relationships with peers to discuss content and receive emotional support as they are experiencing similar doubts and difficulties (Le Cornu, 2013; McCormack et al., 2006); (4) a positive relationship with a supervisor for content and emotional support (Pogodzinski, 2014), particularly if that supervisor cares about them, stimulates

their well-being and creates a positive school climate of shared responsibility (Aspfors & Bondas, 2013; Le Cornu, 2013); and (5) supportive family and friends (Le Cornu, 2013; Mansfield et al., 2014), in that beginning teachers with a strong informal support network are more involved and motivated to stay in the teaching profession (Mansfield et al., 2014).

Some schools offer beginning teachers contextual resources in the form of induction programmes. These more or less formalized programmes aim to support beginning teachers in their first years of teaching after their pre-service education (Beijaard, Buitink & Kessels, 2010). They usually include one or more of the following components (induction arrangements): (1) workload reduction (e.g., no mentor tasks, fewer teaching hours), (2) supporting effective teacher behaviour in the classroom (e.g., having a mentor/coach), (3) supporting school enculturation (i.e., making the teacher familiar with the school culture) and/or (4) supporting professional development (e.g., creating personal development plans). Because of their supportive nature, these programmes arguably should reduce beginning teacher stress. However, as revealed in Chapter 4, only workload reduction decreased perceptions of high psychological task demands and negative social aspects among beginning teachers. The other elements stimulated the development of teaching skills rather than well-being (Helms-Lorenz, van de Grift & Maulana, 2016), which is another goal of induction arrangements.

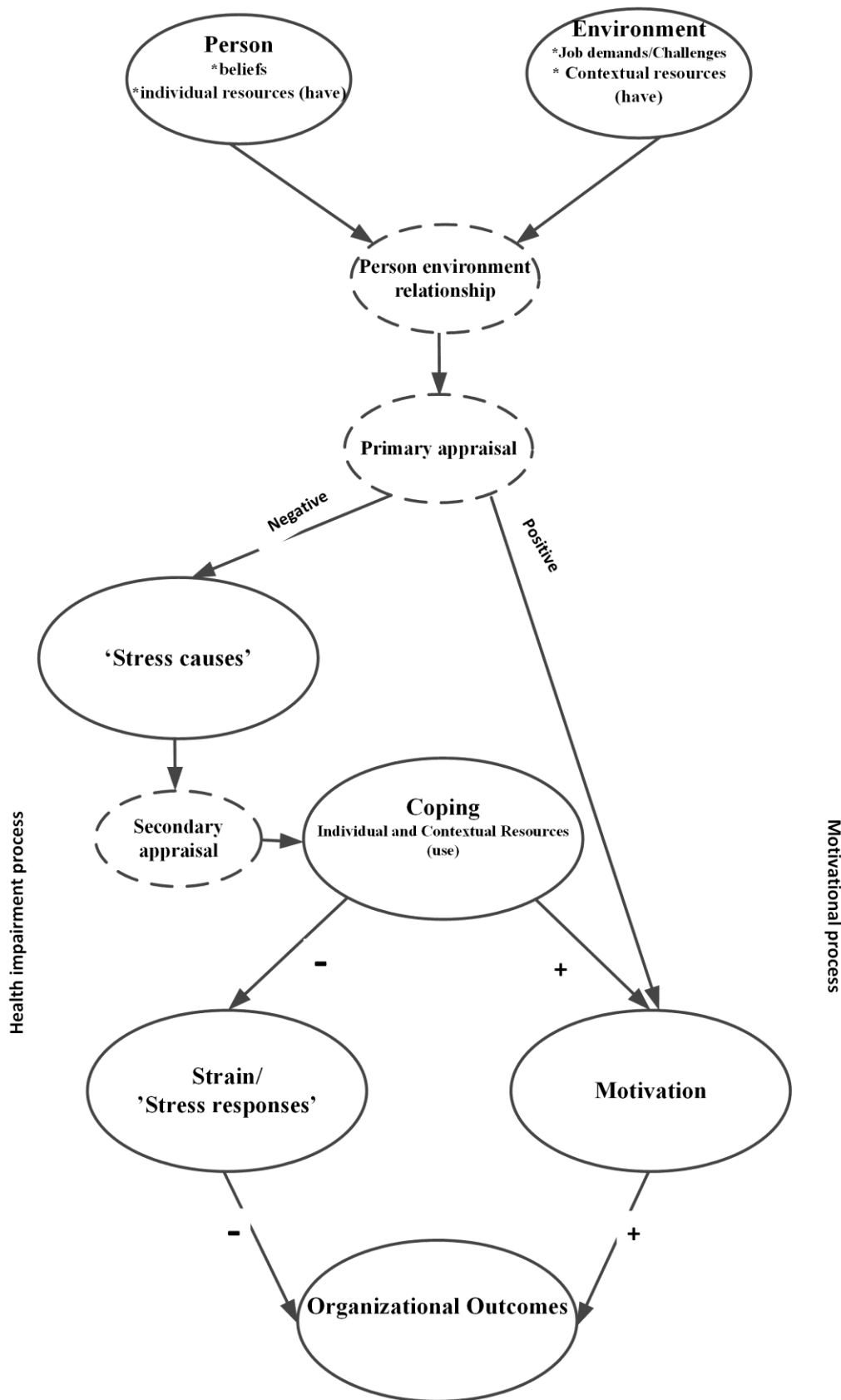


Figure 5.1 Proposed conceptual model of stress based on the JD-R model (Bakker & Demerouti, 2007) and the transactional model of stress (Lazarus, 2006; Lazarus & Folkman, 1984, 1987)

5.1.3 Qualitative study

Informed by and building on the preceding quantitative studies, this study aims to provide an in-depth investigation of highly stressed beginning teachers who left the profession within five years of teaching (*leavers*) and highly stressed beginning teachers who stayed in the teaching profession (*stayers*). The goal is to achieve a deeper understanding of how and why beginning teachers experience stress and of the decision mechanisms related to attrition and retention. More specifically, we explore stayers' and leavers' interaction and appraisal processes with their work environment, guided by the hypothesized model in Figure 5.1. In line with previous research and the hypothesized model, we formulate the following research question: How do stayers and leavers differ in how they perceive stress and in their resources and beliefs with regard to how they cope?

5.2 Method

5.2.1 Participants and selection procedure

We interviewed nine beginning teachers, of whom five were still working as teachers (*stayers*) and four had left the teaching profession within five years (*leavers*). Semi-structured interviews were conducted. We defined 'beginning teachers' as those who obtained their teaching qualification and had less than five years' experience in the teaching profession. The participants were selected from a national research project called *Begeleiding Startende Leraren* [Supporting beginning teachers]. The participants were from different regions throughout the Netherlands.

As part of the national research project, participants completed a set of questionnaires including the stress questionnaire related to the teaching job called the 'Questionnaire on the Experience and Evaluation of Work- Beginning Teachers' (QEEW-BT; Chapter 2). In addition, participants who left their school during the three-year project completed a questionnaire that asked about their reasons for leaving, called the 'Exit Questionnaire'. Results from the stress questionnaire were used to select highly stressed teachers.

We preselected teachers who responded to the question 'How stressful do you find your work as a teacher in general?' with either 'really stressful' or 'extremely stressful'. From this group, we randomly selected participants to participate in this study. We executed this selection procedure repeatedly until a total of five stayers agreed to participate. To select leavers, we began with the same procedure, which resulted in one leaver agreeing to participate. Then, we used results from a self-developed Exit Questionnaire to select the other leavers, by identifying ex-teachers who had high scores (4 or 5 of 5, indicating they experienced a high level of stress) on the Exit Questionnaire. From this selection, we randomly chose ex-teachers and approached them to participate. We obtained ethical approval, and participants gave informed consent to participate in this study. More information on the sample can be found in Table 1.

Table 5.1 Sample information

Pseudonym ^a	Stayer/leaver	Gender	Teaching experience ^b
Esther	Leaver	Female	Quit after 1 year of teaching as a qualified teacher
Kristel	Leaver	Female	Quit after 2 years of teaching as a qualified teacher
Thomas	Leaver	Male	Quit six months after being qualified, taught for 3.5 years as an unqualified teacher.
Willem	Leaver	Male	Quit during his first year of qualified teaching.
Pieter	Stayer	Male	2 years
Daniël	Stayer	Male	4 years
Marlijn	Stayer	Female	5 years
Niek	Stayer	Male	4 years
Roos	Stayer	Female	4 years

^a We use pseudonyms to guarantee participants' anonymity.

^b Teaching experience at the time of the interview (school year 2017–2018).

5.2.2 Interviews and interview procedure

We used semi-structured interviews as the primary data collection tool, conducting them during the period November 2017–February 2018. All participants were Dutch, and the interviews were conducted in Dutch. Two researchers conducted the interviews face-to-face, except one conducted via Skype due to the participant's location. Two interviews were conducted by only one interviewer due to the unavailability of the second interviewer at the time.

Using the hypothesized model displayed in Figure 5.1 as a guide, we developed the interview questions (see Appendix I, p.133–136 for the English version) from the theoretical framework to focus on the stayers' and leavers' interaction and appraisal processes with their work environments. Appendix I (parts 1–6) displays the interview questions for the stayers. The interview questions for the leavers were similar in content, except that we used past tense during the interviews to reflect that the work situations occurred in the past. In addition, part 6 was replaced by part 7, which features questions about their decision to leave the profession. With permission from the participants, we audio recorded the interviews.

5.2.3 Data analysis

The first step in the data analysis process was to transcribe the recorded interviews. The researchers listened individually to the voice recordings and transcribed them verbatim. Then, we applied a deductive approach using the theoretical framework. We created a coding scheme, wherein codes for terms such as 'demands', 'resources' and 'strain' were generated. We ensured the internal consistency of the coding by having two researchers annotate and code 50 text fragments from one of the interviews independently. Subsequently, both researchers discussed all codes they highlighted in these interviews to ascertain whether the codes were accurate in terms of the text fragments surrounding them. Interrater agreement on the quotations was high, with a Cohen's κ agreement estimate of .90.

All disagreements were resolved by discussion until consensus was reached. After both researchers reached a good agreement level, the remaining interviews were coded by the two researchers separately. Uncertainties regarding the interpretation of the data were resolved through subsequent discussion.

We created an overview of teachers' experienced demands (challenges), (lack of) individual resources, (lack of) contextual resources and beliefs concerning teaching and student learning (see Appendix J, p.137–142). From these overviews, we extracted information and compared it quantitatively to answer the research questions.

5.3 Results

Table 2 summarises how stayers and leavers differ in the way they perceive stress, their resources, and their beliefs. This table is taken from the extended summary of results displayed in Appendix J.

Table 5.2 Overview of stayers' and leavers' stress causes, resources and beliefs

Stress cause		Stayers	Leavers
Heavy workload	Resources	- Setting boundaries regarding number of working hours and being proactive - Exercise - Social network - Good relationships with students	- Setting boundaries regarding number of working hours and being proactive
Negative induction organizational aspects	Resources	- Setting boundaries regarding work conditions and being proactive	- Setting boundaries regarding work conditions and being proactive
Negative social aspects	Resources	- Social network	- Limited social network
Negative student aspects	Resources	- Setting boundaries regarding student behaviour - Setting emotional boundaries - Social network - Coach	- Setting emotional boundaries - Limited social network - Coach - Intervention meeting
	Beliefs	- High self-efficacy: Feel competent in their ability to teach - See teaching as the organisation of student learning - Focus is on how students learn and how this process can be facilitated - Enjoy teaching and the interaction with students	- Low self-efficacy: Did not feel competent in their ability to manage the classroom - Saw teaching as a transmission of knowledge that should be absorbed by (all) their students - Thought students should be intrinsically motivated to learn

5.3.1 Stress causes

All teachers, both stayers and leavers, experienced stress in their work (which was also why they were selected for this study). They tended to experience the same stress causes, except for student behaviour, which was mainly an issue for the leavers. Analysing their experiences shows why those

causes were stressful to them.

The first cause of stress, which participants discussed extensively, was the heavy workload. They referred specifically to their teaching tasks and being a class mentor or tutor, and the main reason mentioned was insufficient experience with the tasks required of them: planning their lessons, designing the curriculum, developing tests for their students and correcting these tests. Their lack of experience meant it took them longer to do these tasks than the time allocated, which resulted in high costs in terms of personal time and energy. Four beginning teachers (one leaver, three stayers) noted that no curricula were available for most or all their classes and that they had to design curricula during their first year as a teacher. As Roos (stayer) stated: ‘this was the biggest stress factor during my first year as a teacher’ (p. 109). Furthermore, six teachers (five stayers, one leaver) were mentors of a class in their first or second year as a teacher, though only two of them (one stayer, one leaver) received mentor training. Having conversations with mentee students and their parents and being confronted with students’ personal lives in detail was new to all of them, and these participants experienced this task as substantial and emotionally demanding.

The second set of stress causes can be summarized as induction organizational aspects; these stressors involved aspects of the way the school organized the induction programmes (e.g., organizing meetings with a coach, attending intervision meetings, workload reductions). Two beginning teachers (one stayer, one leaver) experienced challenges concerning their coaching. There were no fixed appointments with coaches, and due to the coaches’ heavy workload, it was difficult to make an appointment: ‘We have a written exam for the first time. How do we do this exactly? I had so many questions.... She really was the only one I could ask these questions to.... I had to consult her, but she was too busy’ (Roos, p. 115). Another example referred to attending intervision meetings. Three beginning teachers (two stayers, one leaver) could not attend these meetings because they were organized parallel to other professional obligations or outside their working hours. A third example concerns the issue of workload reduction, which is part of the induction programmes that all schools involved used. The original idea is that the beginners receive a 20% reduction in their teaching hours. However, schools vary in the way they operationalize this 20%: Thomas (leaver) received a 20% workload reduction on his nonteaching hours (less nonteaching time was required compared with teaching time; therefore, the number of hours reduced was lower), and Roos, Daniël and Pieter (all stayers) received 20% extra pay instead of workload reduction.

A third set of stress causes were social aspects, which involves the challenges that beginning teachers experienced related to their social relationships within the school (e.g., with their supervisor, colleagues, school organization). The first example refers to the support from the school the teachers experienced in their contact with parents. Five teachers (two stayers, three leavers) felt that the school leaders often took the side of the students’ parents over that of the beginning teachers in conflict situations, even sometimes overruling the teachers without any discussion. Another example entails a lack of support from colleagues. Two leavers felt they could not consult with anyone in the school

about their teaching challenges, despite their felt need for such interactions. Willem (leaver) explains: ‘So I had to handle it all by myself ... and that is difficult. Especially when you know that your department does not support you when, for example, you dismiss a student’ (Willem, p. 156).

The last stress cause participants mentioned was students’ behaviour, though this stressor was mainly an issue for the leavers. For five beginning teachers (four leavers, one stayer), classroom management was a challenge (the other four stayers did not report it as a challenge). Some of their students did not follow their instructions, making it difficult for the beginning teachers to teach. Moreover, some of the leavers experienced conflict situations that they could not solve. For instance, Thomas (leaver) related the following incident: ‘It went all wrong with one student, so I dismissed the student, who then laid on the ground. Well, what would you do in this situation? So, he got all the attention, and everyone stood around him. Then the head of department came, the coach was there, I was there, three grownups to dismiss one student’ (Thomas, p. 139). In addition, some leavers felt angry or annoyed when students misbehaved or disturbed their lessons. Thomas often felt angry when students did not pay attention in his lessons. In the end he was ‘getting nervous about everything that concerned interaction with students’ (p. 131).

In contrast, all stayers said that they enjoyed teaching. Daniël stated this point several times during the interview. Marlijn said she especially enjoyed ‘improvising during her lessons and responding to class situations’ (p. 58). Pieter enjoyed teaching and liked to make his subject fun to teach. Roos ‘enjoys the interaction with the students’ (p. 122) and cited it as the reason she teaches.

5.3.2 Coping resources

All teachers worked in schools with induction programmes, which means a variety of resources were available to them. However, the stayers and leavers differed in how they made use of these resources and sometimes in their perception of the availability of those resources. The resources mentioned were setting boundaries and being proactive related to working hours, classroom behaviour and emotional involvement, physical exercise, social network, coaching and the quality of relationships with students.

A first example, for which stayers and leavers differed very little, shows that for all teachers it was necessary to cope with the heavy workload. All respondents noted that they learned to set clear boundaries and be proactive regarding the number of working hours, with the aim of maintaining a healthy work–life balance. Examples they gave included (1) saying no to extra work, (2) keeping track of the hours they worked and stopping working after a certain number of hours, (3) lowering the bar sometimes for how perfect a lesson should be, (4) not grading exams as quickly as possible, (5) requesting to teach classes from the same year group, (6) clearly communicating what can be expected of them and (7) decreasing the number of hours in their teaching contract. Daniël, Pieter and Roos (stayers) reduced their teaching contract from a 40-hour to a 32-hour contract so they could to teach

four days a week and use one unpaid day a week for lesson planning, grading and other teacher tasks. This way they had most of their evenings and their weekends to recharge. Thomas and Esther (leavers) reduced their teaching days from four to three days.

Regarding disciplinary boundaries in the classroom, the stayers and leavers strongly differed. All stayers described that they can (or learned to) effectively set disciplinary boundaries in their classroom, whereas for the leavers, classroom management remained an issue. By setting clear disciplinary boundaries, the stayers were able to teach their lessons effectively. Marlijn (stayer) had some difficulties at the start of her teaching career setting disciplinary boundaries in her classroom. She described how, at first, she did not know yet what her rules in the classroom should be and how she should handle some of the student misbehaviour.

Related to setting disciplinary boundaries in the classroom was setting emotional boundaries. Most of the stayers (four of five) seem more effective than the leavers at not taking things personally or not taking problems home. They were also more cognizant that they were beginners and therefore were still learning to master the skills of teaching. Niek (stayer) noted that though he cares about his students and their problems, he can distance himself from those problems and does not take them home. Esther and Thomas (leavers) tried to set emotional boundaries by doing everything related to their teaching job at school. However, they could not help thinking about their lessons and student misbehaviour when they were at home.

Another resource used by all five stayers, and not any of the leavers, was physical exercise. Exercising helped them release tension, gave them energy and helped them set boundaries on the hours they spent on their teaching preparations.

A third resource in which stayers and leavers differed was their social networks. All five stayers, in contrast to three of four of the leavers, had strong social networks. Their social networks included colleagues, other beginning teachers, friends and their partners. They used their social networks to discuss work-related challenges, exchange teaching experiences, exchange lesson materials and have informal conversations. The leavers, except for Kristel, felt that they could not consult their colleagues (Esther and Willem) or that the advice given was not helpful (Thomas).

A fourth resource mentioned was coaching and intervision meetings, which were part of the induction programmes. For most (four stayers, two leavers), having a coach was helpful, as someone they could share their teaching experiences with and learn teaching skills from. However, as reported, one stayer and two leavers rarely met with their coaches due to conflicting schedules. Only two leavers described their intervision meetings as useful.

Finally, the stayers mentioned positive relationships with their students. In contrast with the leavers, all stayers really enjoyed interacting with students. These good relationships seemed to mitigate the relationship between their workload and the resulting stress. Roos, for example, explained that 'successful moments with students outweigh the work stress' and that she 'gets energy from the students' energy' (p. 128).

5.3.3 Coping beliefs

Two sets of beliefs played a role in how beginning teachers experienced stress and coped with it: self-efficacy beliefs and beliefs about teaching and student learning.

Teachers' self-efficacy is defined as their beliefs in their ability to execute a certain course of action successfully, which determines whether someone will take action, how much effort they will spend and how long they are willing to face obstacles and failures (Bandura, 1997). We observed differences between stayers and leavers' self-efficacy. All stayers, in contrast to the leavers, indicated that they felt confident in their teaching skills. Four of the five stayers noted that they felt confident about their teaching skills from the start and had no issues with classroom management. One stayer (Marlijn) explained that she gained confidence in her teaching skills during her first few years as a teacher. All leavers instead described a lack of confidence in their teaching skills, because they experienced difficulties with classroom management and in interactions with some of their students. Even though they were all offered support, the issues remained.

Regarding beliefs about teaching and student learning, the stayers reported teaching in terms of organizing their students' learning and described receiving energy from their students. Daniël liked to see 'students make progress' and when 'students start to see things differently', knowing that 'he makes a difference' (p. 21). Niek enjoyed getting 'the most out of his lessons concerning supporting his students' and seeing 'students make progress' (p. 79). Marlijn felt motivated to facilitate her students' learning when they 'work hard, are enthusiastic, and really want to and dare to participate' (p. 57). She described how she helped three students with a project that was not really her subject; however, as they were 'nice and enthusiastic girls' (p. 57), she decided she wanted to help them. Marlijn knew someone whom the girls could interview for their project and arranged to babysit so the girls could interview this person. Marlijn learned from her coach that student learning does not automatically happen when teachers present them with information; instead, it needs to be stimulated by 'giving students an assignment to learn the curriculum' (p. 51).

In contrast, the leavers talked about teaching mainly in terms of classroom management and about their students' learning in terms of students' own responsibility. According to three of the four leavers, students should be intrinsically motivated to learn. Esther elaborated: 'You have to make sums, do assignments, make homework. School is meant to check homework and ask questions, not to simply provide the answers.... There is no point coming to lessons unprepared. Otherwise you don't have to come to the lesson, and I can simply give you the answers' (p. 33). Similar to Esther's beliefs, both Thomas and Willem stated that in an ideal lesson the teacher explains certain information, the students listen and then the students who do not get it ask questions; afterward, all students work quietly and individually on assignments. However, in practice their students did not work quietly on their assignments, 'they start talking with each other anyway, when I am here they start talking over there,... and in the end there is chatter everywhere' (p. 131).

5.4 Conclusions, discussion and practical implications

Motivated by our quantitative studies regarding beginning teachers' stress and coping, this study examined in depth how beginning teachers who indicated experiencing high levels of stress and left (leavers) or stayed in (stayers) the teaching profession experienced stress in their work and how they coped with this stress in terms of the use of resources and their beliefs. A first main finding of this study is the insight into why these beginning teachers experienced high stress levels in their work, specifically with regard to heavy workloads, negative student aspects, a lack of social support and the poor organization of the induction programmes. For all of them, despite their recent teacher preparation, many aspects of the work were new or ones with which they had little experience (e.g., designing teaching materials, tutoring). Veenman (1984) and others (Bullough, 1997; Stokking, Leenders, De Jong & Van Tartwijk, 2003) describe this experience as part of the practice shock that beginners feel when faced with the full reality of the workplace, including being fully responsible for the learning of many students, the number of tasks that are part of the work and having to get used to many interactions each day. From the perspective of the highly stressed beginning teachers in this study, the complexity and intensity of the work seem vastly underestimated, by the teachers themselves as well as by the school.

Another stress cause related to practice shock was the social issues several beginners experienced with colleagues, supervisors and the school organization, which resulted in a sense of a lack of support. Blase (1991) and others (Kelchtermans & Ballet, 2002; van Veen et al. 2005) refer to this aspect as a lack of organizational literacy, related to learning how 'to handle the norms and values that prevail in an organization, to deal with a principal or with the colleagues in the staff, as well as with the parents of their pupils' (Kelchtermans & Ballet, 2002, p. 1).

All the teachers in this study were working at schools with induction programmes aimed at reducing practice shock and the lack of organizational literacy. However, as their stories showed, such programmes can only be effective if they are conducted as intended. Workload reduction was operationalized as reduction in nonteaching hours or compensation in salary. Intervision meetings were scheduled at times that some teachers were not available, and some coaches did not have the time to coach the beginners.

A last cause that applied only to the teachers who left the profession related to the students, or more specifically to poor relationships with the students and having difficulties with classroom management. This finding confirmed previous studies with beginning teachers that show causal relationships among less effective teaching skills, stress reactions and attrition (Helms-Lorenz, van de Grift & Maulana, 2016; Krieg, 2006; van de Grift & Helms-Lorenz, 2013).

A second main finding of this study pertains to how the highly stressed teachers coped with the experienced stress and which differences were evident between those who stayed and those who left the profession. As mentioned, all teachers worked in schools where they participated in induction

programmes, which implies a variety of available resources. However, the stayers and leavers differed in how they made use of these resources, as well as in their perception of the availability of resources. The stories they told confirmed earlier findings (Hong, 2012): Stayers experienced and used more resources than the leavers, to prevent themselves from getting too stressed. The resources mentioned by the beginners were setting boundaries and being proactive with regard to working hours, classroom behaviour and emotional involvement; physical exercise (all stayers exercised regularly, and none of the leavers did); their social network; coaching and the quality of the relationship with students. Striking in this respect was that several teachers reduced their number of working hours, indicating that a full-time job is difficult to maintain. The study also illustrated that for beginning teachers, having good relationships with students is one of the most important resources they have, and these relationships are crucial for retention. One of the stayers (Roos) literally stated that the good relationships she had with her students outweighed the stress of her teaching job. In contrast, the leavers, who described the relationship with (some of) their students as poor, noted that this negative relationship led to negative emotions, discontent and ultimately attrition.

In addition, stayers experienced a strong supportive social network at their school, providing detailed accounts that matched the conclusions of previous research by Day et al. (2007), Ingersoll, Merrill, Stuckey and Collins (2018) and Ingersoll (2001), namely, that the support of colleagues is critical for beginning teachers. They all reported having (several) people (e.g., colleagues, supervisor, coach) with whom they consulted, when necessary, regarding the challenges they were experiencing.

In summary, these coping resources and how beginning teachers made use of them illustrates the importance of organizational literacy that implies knowing how to work in an organization. It could also be described as a kind of professional literacy: knowing how to work, what to do and what not to do, setting clear boundaries and so on.

A last main finding pertains to beginner teachers' beliefs regarding their self-efficacy beliefs and about teaching and student learning. The teachers who stayed had a strong sense of self-efficacy that they could do the work, and they also enjoyed it; in contrast, the ones who left had a low sense of self-efficacy. This finding is in line with the conclusion that the leavers had more issues with classroom management, considered the core of teaching, which was a daily struggle for them.

Regarding beliefs about teaching and student learning, the leavers saw teaching more as the of transmission of knowledge and had strong external attributions: when it came to student learning; it was mainly students' responsibility to learn. The stayers, in contrast, saw teaching more as the organization of student learning and were more focused on trying to understand how students learned (Hattie, 2012).

A limitation of this study is its explicit focus on only highly stressed beginning teachers, which provides only their perspective and experiences. It might be that less stressed beginning teachers experience the work differently and use different resources. However, as other research

shows, the work of teaching is generally experienced as stressful, and the chosen perspective provides a better understanding of those teachers most at risk of leaving.

Considering the experiences, coping resources and beliefs of beginning teachers, several implications can be formulated regarding their induction. In general, this study confirms the need for induction programmes and emphasizes the importance of implementing all elements of those programmes as they are intended. In these induction arrangements, it also is relevant to pay attention to what is described as organizational and professional literacy, including knowing how to work in the school as an organization and knowing how to perform the work of teaching. Moreover, this study demonstrates the importance of knowing how to get and maintain a healthy work–life balance, which can be achieved by setting clear boundaries in the classroom about which behaviour is acceptable, as well as the amount of work beginning teachers should take on and how extensive their lesson (planning) should be. Stayers also demonstrate the need to take time to recharge by, for example, not working on the weekends or making exercise part of the working week routine to ‘empty your head’.

Finally, it would be useful to focus explicitly on beginning teachers’ beliefs regarding their self-efficacy, teaching and student learning. The stories of the beginning teachers in this study clearly showed that they can stay in the job only if they enjoy teaching and being with students and focus on how to organize their students’ learning.

CHAPTER 6

Discussion

Teaching is a highly stressful profession (Johnson et al., 2005; Newberry & Allsop, 2017; Skaalvik & Skaalvik, 2015), and many beginning secondary school teachers leave the profession early (attrition). In recent years, the Dutch Ministry of Education, Culture and Science funded projects to stimulate the implementation of induction programmes at Dutch secondary schools. Considering the supportive nature of these programmes, it is not surprising that they offer high potential to support beginning teachers and decrease their stress levels. However, no research has investigated these programmes yet, and therefore, the main aim of this dissertation was to investigate beginning secondary school teachers' stress in the context of induction programmes.

To do so, we developed a framework based on the transaction model of stress (Lazarus, 2006; Lazarus & Folkman, 1987) and the JD-R model (Bakker & Demerouti, 2007), used throughout this dissertation (see p. 7–10 for a full description of this framework). According to this framework, outcomes such as attrition are the result of an interaction and appraisal process between the person (i.e., the teacher) and his or her environment. To investigate beginning teachers' stress in the context of induction programmes, we formulated four research question:

- 1) How can beginning teachers' stress be measured?
- 2) Do beginning teachers' stress, teaching behaviour and attrition relate?
- 3) What are the longitudinal effects of induction arrangements on beginning teachers' stress?
- 4) What are the differences between highly stressed teachers who leave the profession within five years of teaching (leavers) and highly stressed teachers who stay (stayers)?

These research questions were answered in four studies (Chapters 2–5). This chapter summarizes the results of these investigations. Next, the general conclusions and the importance and meaning of the results are discussed. Finally, limitations, suggestions for future research and implications for practice are presented.

6.1 Summary of the results

6.1.1 How can the stress of beginning teachers be measured?

The studies presented in Chapter 2 primarily focussed on how the stress of beginning teachers can be measured, in line with research question 1. First, we explored which stress causes recur consistently in teacher stress literature to determine essential stress elements for measuring beginning teachers' stress. Second, we assessed existing (stress) questionnaires that include these stress causes. None of these questionnaires covered all the beginning teacher' stress causes. Third, we expanded an existing stress questionnaire by adding additional teacher stress causes. The QEEW (van Veldhoven & Meijman, 1994) served this purpose; it has been proven robust and is widely used to measure general stress across various professions internationally. Fourth, we examined the suitability of the original QEEW stress scales for beginning teachers' context, using a sample of 356 beginning teachers from 52 secondary schools in the Netherlands. We found that the majority of the original QEEW scales were relevant for use in this context. To make the questionnaire concise, we applied Mokken scaling item

reduction (Mokken, 1971) to the relevant scales, which resulted in a reduction of nearly half of the items of the original questionnaire. Fifth, we added more items regarding relevant teacher stress causes to the questionnaire. To ensure these additional scales were also concise, we executed item reduction on these items as well, which resulted in the QEEW-BT. To double-check whether the QEEW-BT is an appropriate instrument to measure beginning teachers' stress, we used a different sample of 143 beginning teachers from 61 schools in the Netherlands. The main conclusion of this chapter was that the QEEW-BT is an appropriate, reliable and valid instrument to measure beginning teachers' stress in terms of the level of experienced stress causes and stress responses.

To date, the QEEW-BT has only been used to measure Dutch secondary school teachers' stress. Assuming that the work of teaching is organized differently in each country, more research in other countries is needed to examine the reliability and validity of this instrument in other countries. Nevertheless, this stress questionnaire includes all the relevant stress causes found in earlier stress research from various countries, so we expect it should generalize to other settings.

6.1.2 The relationship of beginning teachers' stress causes, stress responses, teaching behaviour and attrition

The study in Chapter 3 focused on research question 2 by exploring the relationships among beginning teachers' stress causes (e.g., high psychological task demands, negative pupil aspects, negative social aspects), stress responses (i.e., tension, negative emotions and discontent), teaching behaviour and attrition. We asked 143 beginning teachers to complete the beginning teachers stress questionnaire described in Chapter 1. In addition, we observed their teaching behaviour using the International Comparative Analysis of Learning and Teaching (van de Grift, 2014) instrument. Results showed relationships between stress causes and stress responses. Specifically, the more psychological task demands (e.g., many teaching hours) and negative pupil aspects (e.g., student misbehaviour, poor relationship with students) the beginning teachers experienced, the more tension (e.g., rumination) they experienced. Also, the poorer the relationship with pupils and the more pupil misbehaviour a beginning teacher experienced, the more negative emotional reactions (e.g., feeling lack of pleasure in work), tension and discontent (e.g., lack of organizational commitment) the beginning teachers experienced. Finally, the more beginning teachers experienced negative social aspects (e.g., poor relationship with colleagues, supervisor) and negative pupil aspects, the more they experienced discontent.

In addition, we observed meaningful relationships between stress responses and teaching behaviour. Beginning teachers who experienced more negative emotions during work also showed significantly lower teaching behaviour in such aspects as creating a safe and stimulating learning climate, maintaining efficient classroom management, having clear instruction and being able to activate their students' learning. Finally, we found that beginning teachers' high levels of discontent

were related to leaving the school or the profession. In conclusion, beginning teachers' stress influences their teaching behaviour and attrition.

6.1.3 Longitudinal effects of induction arrangements on beginning teachers' stress

The study described in Chapter 4 focused on research question 3 by investigating the longitudinal effects of induction arrangements on beginning teachers' stress. We examined the influence of (1) workload reduction, (2) supporting effective teacher behaviour, (3) supporting school enculturation and/or (4) supporting professional development on stress experienced at the end of the beginning teachers' first teaching year. We also investigated the longitudinal influence of these induction arrangements on the increase or decrease of the beginning teachers' stress over the course of three years of teaching. Data from 393 beginning teachers, collected over three years at three points, served as a basis for this analysis. They indicated that beginning teachers who perceived workload reduction during their first year experienced less psychological task demands, negative social aspects, tension, negative emotions and discontent at the end of their first school year.

In addition, higher levels of perceived opportunities of school enculturation during the first school year corresponded with lower levels of discontent over the following two teaching years. Higher perceived levels of support of effective teacher behaviour during the first school year also corresponded with lower levels of negative emotions and discontent at the end of the first school year. Only support for professional development was not found to be effective. As possible reason for this finding, Kessels (2010) argues that most beginners do not focus on professional development but rather on their well-being and survival. Although the data indicate that most induction arrangements were effective in reducing stress, and therefore should be included in induction programmes, the quantitative nature of the study did not reveal how beginners experienced their work as stressful or how they actually coped with the experienced stress.

6.1.4 Differences between highly stressed leavers and highly stressed stayers

To gain a deeper understanding of how beginning teachers experienced and coped with stress, the study in Chapter 5 qualitatively explored the experiences of highly stressed beginning teachers who stayed in the teaching profession (stayers) and highly stressed beginning teachers who left (leavers), in line with research question 4. This group of highly stressed teachers provided insights into why the work appears stressful and how those teachers cope with the stress. The main reason they experienced teaching as stressful was their insufficient experience with the tasks required of them: planning their lessons, designing the curriculum, developing tests for their students and correcting these tests. Their lack of experience meant it took them longer to do these tasks than the time allocated, which resulted in high costs in terms of personal time and energy, despite the schools' organized induction programmes. These teachers' stories showed that such programmes can only be effective if they are

conducted in the way intended. Respondents reported that workload reduction was operationalized as reductions in nonteaching hours or compensation in salary. Intervisitation meetings were scheduled at times that some teachers were not available, and some coaches did not have the time to coach the beginners. A stress cause that applied to the teachers who left the profession related to the students, including poor relationships with the students and difficulty with classroom management.

Regarding the way the teachers cope with their stress, we find that both stayers and leavers had access to a variety of resources from the induction programmes, but they differed in how they made use of those resources and also their perceptions of their availability. The stayers experienced and used more resources compared with the leavers to prevent themselves from getting too stressed. The resources mentioned by the beginners included setting boundaries and being proactive with working hours, classroom behaviour and emotional involvement, physical exercise (all stayers exercised, and none of the leavers did), social networks, coaching and the quality of relationships with students. Striking in this respect was that several teachers reduced the number of working hours, indicating that a full-time job is difficult to maintain. The study also illustrated that for beginning teachers, having good relationships with students is one of their most important resources, crucial for retention. The stayers described their good relationships with their students as compensating for the stress of teaching. In contrast, the leavers, who described relationships with (some of) their students as poor, related that this negative relationship led to negative emotions, discontent and ultimately attrition. In addition, stayers experienced a strong supportive social network at their school. They all reported having (several) people (e.g., colleagues, supervisor, coach) to consult with, when necessary, regarding the challenges they experienced.

In addition, beginner teachers' beliefs regarding their self-efficacy and about teaching and student learning differed. The teachers who stayed had a strong sense of self-efficacy that they could do the work, and they also enjoyed it; in contrast, the ones who left had a low sense of self-efficacy. Regarding the beliefs about teaching and student learning, the stayers described teaching more as the organization of student learning and were more focussed on trying to understand how the students learned. In contrast, the leavers described teaching as an act of transmission of knowledge and had strong external attributions when it came to student learning; they considered it mainly the student's responsibility to learn.

6.2 Overall conclusions

6.2.1 Stress

As mentioned previously, teaching is a stressful profession, especially for beginning teachers – specifically due to the heavy workload, the negative social aspects and student behaviour (in line with Borg & Riding, 1991; Clunies-Ross, Little & Kienhuis, 2008; den Brok, Wubbels & van Tartwijk, 2017). For most beginners, despite their preparation, teaching tasks (e.g., planning lessons, teaching,

designing and marking exams, being a class mentor) were either new to them or ones with which they had little experience. Therefore, it took them longer to complete these tasks. When a beginning teacher has the full responsibility to prepare for and teach multiple classes a day but has little experience doing so, it causes stress. Being a teacher requires a certain level of professional (knowing how to teach) and organizational (knowing how to work in a school) literacy that most beginners do not have yet. Both beginning teachers and schools seem to underestimate the complexity and duration of mastering the profession of teaching.

6.2.2 Relationships

Another main conclusion refers to the relationships among stress, stress causes, stress responses, teaching behaviour and attrition. Research examining these relationships is scarce, and those studies that do address this relationship commonly investigate attrition from an 'intention' perspective instead of an 'actual' perspective. Focussing on the main stress causes, our research shows that heavy workloads led to feelings of tension among beginning teachers and that negative social aspects led to feelings of discontent among beginning teachers. Moreover, negative student aspects (student misbehaviour and poor relationships with students) led to negative emotions, tension and discontent. In addition, discontent as an attitudinal outcome is strongly related to leaving the teaching profession (attrition), and negative emotions are related to less effective teaching behaviour. In other words, the experience of high stress among beginners should be taken seriously because of its consequences. Our results are in line with the general labour research of van Veldhoven, Taris, de Jonge, and Broersen (2005), who found that quantitative/qualitative demands (e.g., workload) relate primarily to psychological strain outcomes (e.g., tension), whereas lack of support (e.g., negative social aspects) is primarily related to attitudinal outcomes (e.g., discontent). Our results are also in line with Skaalvik and Skaalvik's (2011) finding that higher job satisfaction among teachers relates to a lower motivation to leave the profession.

6.2.3 Induction programmes

In general, induction programmes can help reduce stress among beginners. Workload reduction resulted, such that beginners experienced fewer negative social aspects and fewer psychological task demands. Workload reduction, stimulating school enculturation and support for effective teaching behaviour decreased beginning teachers' feelings of discontent. In addition, supporting beginning teachers' teaching skills decreased their feelings of negative emotions during work. However, induction programmes are only effective if they are implemented and executed as intended. Our data show that workload reduction was operationalized in some schools in such a way that the actual teaching workload was not reduced or the coach was not available; as Gaikhorst, Beishuizen, Korstjens and Volman (2014) stated, coaching can only be effective when a coach takes sufficient

time to guide the teacher and takes the teacher seriously. In other words, an induction programme in the school is not sufficient per se; the induction arrangement elements must be executed as they were intended.

6.2.4 Coping

Regarding the responses to stress or how beginners cope with stress, beginning teachers found a variety of resources, such as setting boundaries regarding student behaviour, having good relationships with students, being proactive, setting emotional boundaries, reducing workload, meetings with or observations of a coach and making use of social networks. These findings are in line with other research (Newberry & Allsop, 2017; Stokking et al, 2013). Newberry and Allsop (2017) also found that the timing and intensity of challenges like poor relationships with students matter; they stated that it is not the challenge of the job but the structure of the social-professional support that determines whether teachers stay or leave. In this vein, Kelchtermans (2017) argued that professional core relationships (e.g., relationships with students) operate as ‘double-edged swords’, as the most important sources for positive job outcomes (e.g., motivation) but also for negative job outcomes (e.g., leaving the profession).

In addition, stayers’ and leavers’ beliefs regarding their self-efficacy and the nature of teaching and student learning differ. Highly stressed teachers who decided to stay in the profession had a strong sense of self-efficacy, in contrast with those who left. Moreover, they saw teaching in terms of organizing the learning of their students, trying to understand their students in terms of what they as teachers could do to help (Hattie, 2012). In contrast, the ones who left saw teaching more in terms of a transmission of knowledge by telling and showing, such that the students were to blame if they did not learn. Although we explored beginning teachers’ beliefs among only nine teachers, it seems reasonable to assume that such beliefs about teaching and student learning play a role in how teachers perceive their work.

6.3 Limitations and recommendations for research

We acknowledge several limitations that should be considered when interpreting the findings of this dissertation. A first limitation relates to the representativeness of the samples. In Chapter 2, we used two samples, both of which included mainly schools in the northern regions of the Netherlands. The comparison of these samples with the national population profile showed that the distribution of the denomination, urbanization and SES percentages differed. Furthermore, in the sample used in Chapter 3 the percentage of female teachers is slightly higher (57.3%) compared with the national secondary school teacher populations (46.7%; Ministerie van Onderwijs, Cultuur en Wetenschap, 2014), and the

percentage of qualified teachers is higher (100%) in the sample than in the national population (88.2%). We do not view these differences as serious problems; the results are similar to previous research findings and therefore seem to represent beginning teachers' stress well. Respondents in all samples also participated voluntarily, so it is unclear if beginning teachers who agreed to participate may behave differently from those who did not. Especially in light of their stress, it might be that severely stressed teachers could not find time to participate. Fortunately, in the last study we were able to include nine teachers who experienced a high level of stress who shared their experiences.

A second limitation pertains to the operationalization of the induction programmes at school. If a school offers an induction programme, it does not automatically mean the arrangements are implemented correctly, nor does it mean that beginning teachers make use of the induction arrangements. In Chapter 5, we found that some schools offer beginning teachers more salary or workload reduction on nonteaching tasks instead of offering a 20% workload reduction on their teaching tasks. In addition, some beginning teachers were mentors of a class in their first year; others could not attend intervision meetings, because they were organised at times when they had other obligations. In addition, some beginning teachers had a coach, but conflicting teaching schedules and other obligations made it difficult to meet on a regular basis. All these findings should be considered when interpreting the findings of Chapter 4. In Chapter 4, we investigated the influence of the individual induction arrangements on beginning teachers' stress, but we only considered whether the induction arrangement was offered to the beginning teacher, not whether and how often they made use of it or how the induction arrangement was designed. Further research should consider not only whether the induction arrangements are offered to the beginning teachers but also whether and how much they use this support.

A final limitation relates to the timing and frequency of gathering the beginning teachers' data. In Chapters 2–4, beginning teachers' data were gathered once a year, at the end of the school year, when teachers might experience higher stress levels that might not represent the stress they experienced throughout the year. In addition, stress levels vary within the same period; therefore, caution should be taken when interpreting the results of Chapter 4 in which we investigated the increase/decrease of stress over time. In Chapter 3, we found that negative emotions and less effective teaching skills are related. However, teaching behaviour and stress were measured during the same period, so we cannot be sure whether negative emotions led to less effective teaching behaviour or vice versa. More research is needed to establish the causality of these relationships.

6.4 Practical implications

We draw on previous research and the four studies in this dissertation to give suggestions to secondary schools regarding how they might support beginning teachers in their schools, to reduce their stress levels. In addition, we offer suggestions for beginning secondary school teachers related to ways they

might cope with the challenges of their teaching job to manage their stress levels.

6.4.1 Implications for schools

Schools should implement induction programmes for beginning teachers. Previous research has already shown that these programmes are highly valued and well received by beginning teachers (Draper, O'Brien & Christie, 2004; Hodkinson, 2006) and that they are beneficial for improving teaching behaviour, beginning teachers' commitment and student achievement (e.g., Helms-Lorenz, van de Grift & Maulana, 2016; Hobson, Ashby, Malderez & Tomlinson, 2009; Ingersoll & Strong, 2011). The results of this dissertation add to current knowledge by showing that the induction arrangements can also reduce beginning teachers' stress.

Workload reduction, which aims to ease the job demands of beginning teachers, has a powerful impact on decreasing beginning teachers' perceived workload and negative social aspects. Heavy workload and negative social aspects are two of the three main stress causes for beginning teachers. Workload reduction might be implemented by reducing beginning teachers' teaching hours (not nonteaching hours or a salary increase instead of workload reduction). For example, the school could offer at least a 20% workload reduction on teaching hours for the first three teaching years. Considering the conclusions in this dissertation that for many beginners the work is very stressful, because it is all new to them, we strongly recommend that school leaders implement this 20% workload reduction for beginners. As another concrete recommendation, beginners should not mentor any class in their first years of teaching; instead, they should focus on the core task of teaching.

We also recommend implementing induction arrangements for effective teaching behaviour and supporting school enculturation, both of which decrease discontent among beginning teachers. In addition, support for effective teaching behaviour decreased the levels of negative emotions among beginning teachers. High levels of discontent related to leaving the teaching profession, and high levels of negative emotions related to less effective teaching behaviour. Therefore, supporting beginning teachers by implementing these induction arrangements seems important. Support for effective teaching behaviour can be implemented by letting a trained coach or mentor observe the beginning teacher's lesson and providing him or her with feedback. Furthermore, having regular (fixed) appointments between the beginning teacher and the coach to discuss the beginning teachers' beliefs about self-efficacy and teaching and students' learning and the challenges they face are critical. Supporting school enculturation, which involves making the teacher familiar with the school culture and climate, can be implemented by providing background information to these teachers regarding schools' culture and climate.

A complete induction programme often includes support for professional development. Chapter 4 showed though that this induction arrangement did not reduce the stress of beginning teachers. As Kessels (2010) argued, most beginners largely ignore professional development; rather,

they focus on their well-being and survival. In addition, in Chapter 5 it became clear that only two beginning teachers found the intervision meetings organised at their school useful. Some teachers, especially those who had no problem with classroom management or individual students, found the intervision meetings useless and time consuming. They would have liked to use that time more efficiently to meet their heavy workloads. Two other beginners could not attend the meetings due to other obligations. Therefore, schools might make attending intervision meetings optional so that beginners who benefit from these meetings can make use of them, while others who do not feel the need to attend can use their time more efficiently.

6.4.2 Implications for beginning teachers

We strongly recommend that beginning teachers maintain a healthy work–life balance. As our studies show, coping with heavy workloads can be achieved by (1) setting clear boundaries on the number of working hours (e.g., stopping after contracted working hours), (2) taking time to recharge (e.g., not working in the weekends, making exercise part of a routine), (3) using social networks (e.g., sharing experiences with other beginning teachers, colleagues, friends, family) and (4) receiving workload reductions at school. Coping with negative student aspects can be achieved by (1) setting clear boundaries in the classroom regarding student behaviour, (2) seeking help from the coach/mentor (e.g., being observed and receiving feedback) and (3) using social networks to seek help and share experiences. Finally, using social networks can also help with other negative social aspects (e.g., issues with parents, colleagues, supervisor) that beginning teachers might experience.

REFERENCES

A

- Abel, M. H., & Sewell, J. (1999). Stress and burnout in rural and urban secondary school teachers. *The Journal of Educational Research*, 92(5), 287-293.
doi:10.1080/00220679909597608
- Aspfors, J., & Bondas, T. (2013). Caring about caring: Newly qualified teachers' experiences of their relationships within the school community. *Teachers and teaching*, 19(3), 243-259. doi:10.1080/13540602.2012.754158
- Australian Government Productivity Commission. (2012). Schools workforce: Research report. Canberra. Retrieved from <http://www.pc.gov.au/projects/study/education-workforce/schools/report>

B

- Bakker, A. B., & Demerouti, E. (2007). The job demands-resources model: State of the art. *Journal of Managerial Psychology*, 22, 309-328. doi:10.1108/02683940710733115
- Bakker, A. B., Demerouti, E., & Sanz-Vergel, A. I. (2014). Burnout and work engagement: The JD-R approach. *Annual Review of Organizational Psychology*, 1, 389-411.
doi:10.1108/02683940710733115
- Bandalos, D. L., & Finney, S. J. (2010). Factor analysis: Exploratory and confirmatory. In G. R. Hancock & R. O. Mueller (Eds.), *The reviewer's guide to quantitative methods in the social sciences* (p. 93-114). New York, NY: Routledge.
- Bandura, A. (1997). *Self-efficacy: The exercise of control*. New York, NY: Freeman/Times Books/Henry Holt.
- Beijaard, D., Buitink, J., & Kessels, C. (2010). *Teacher induction*. In B. McGaw, P.L. Peterson & E. Baker (Eds.) *International Encyclopedia of Education 3rd Edition*. Oxford, England: Elsevier Scientific Publishers.
- Beltman, S., Mansfield, C., & Price, A. (2011). Thriving not just surviving: A review of research on teacher resilience. *Educational Research Review*, 6, 185-207.
doi:10.1016/j.edurev.2011.09.001
- Betoret, F. D. (2006). Stressors, self-efficacy, coping resources, and burnout among secondary school teachers in Spain. *Educational Psychology*, 26(4), 519-539.
doi:10.1080/01443410500342492

- Betoret, F. D. (2009). Self-efficacy, school resources, job stressors and burnout among Spanish primary and secondary school teachers: a structural equation approach. *Educational Psychology, 29*(1), 45-68. doi:10.1080/01443410802459234
- Blase, J. J. (Ed.). (1991). *The politics of life in schools. Power, conflict, and cooperation.* Newbury Park–London–New Delhi:Sage.
- Boomsma, A., & Hoogland, J. J. (2001). *The robustness of LISREL modeling revisited. Structural Equation Models: Present and Future.* A Festschrift in Honor of Karl Jöreskog, 2, 139-168. Available at: <https://core.ac.uk/download/pdf/20770852.pdf>
- Borg, M. G., & Riding, R. J. (1991). Towards a model for the determinants of occupational stress among schoolteachers. *European Journal of Psychology of Education, 6*(4), 355-373. doi:10.1007/BF03172771
- Borman, G. D., & Dowling, N. M. (2008). Teacher attrition and retention: A meta-analytic and narrative review of the research. *Review of educational research, 78*(3), 367-409. doi:10.3102/0034654308321455
- Boyle, G. J., Borg, M. G., Falzon, J. M., & Baglioni, A. J. (1995). A structural model of the dimensions of teacher stress. *British Journal of Educational Psychology, 65*, 49-67. doi:10.1111/j.2044-8279.1995.tb01130.x
- Brackett, M. A., Palomera, R., Mojsa-Kaja, J., Reyes, M. R., & Salovey, P. (2010). Emotion-regulation ability, burnout, and job satisfaction among British secondary-school teachers. *Psychology in the Schools, 47*(4), 406-417. doi:10.1002/pits.20478
- Brouwers, A., & Tomic, W. (2000). A longitudinal study of teacher burnout and perceived self-efficacy in classroom management. *Teaching and Teacher education, 16*(2), 239-253. doi:10.1016/S0742-051X(99)00057-8
- Buchanan, J. (2010). May I be excused? Why teachers leave the profession. *Asia Pacific Journal of Education, 30*(2), 199-211. doi:10.1080/02188791003721952
- Bullough, R.V. (1997) *Becoming a teacher: self and the social location of teacher education.* In: B.J. Biddle, T.L. Good, & I.F. Goodson (Eds.) *International Handbook of Teachers and Teaching* (p. 79–134). Dordrecht: Kluwer Academic Publishers.
- Burke, R. J., & Greenglass, E. (1993). Work stress, role conflict, social support, and psychological burnout among teachers. *Reports, 73*(2), 371-380. doi:10.2466/pr0.1993.73.2.371
- Burke, R. J., Greenglass, E. R., & Schwarzer, R. (1996). Predicting teacher burnout over time: Effects of work stress, social support, and self-doubts on burnout and its

consequences. *Anxiety, Stress, and Coping*, 9(3), 261-275.

doi:10.1080/10615809608249406

Byrne, B. M. (1991). Burnout: Investigating the impact of background variables for elementary, intermediate, secondary, and university educators. *Teaching and Teacher Education*, 7(2), 197-209. doi:10.1016/0742-051X(91)90027-M

Byrne, B. M. (2013). *Structural equation modeling with Mplus: Basic concepts, Applications, and Programming*. London, England: Routledge.

C

Centraal Bureau voor de Statistiek (2015, November). *CBS en TNO: Een op de zeven werknemers heeft burn-outklachten*. [CBS and TNO: One in seven employees experience burnout symptoms]. Retrieved from: <https://www.cbs.nl/nl-nl/nieuws/2015/47/cbs-en-tno-een-op-de-zeven-werknemers-heeft-burn-outklachten>

Chaplain, R. P. (2008). Stress and psychological distress among trainee secondary teachers in England. *Educational Psychology*, 28(2), 195-209. doi:10.1080/01443410701491858

Chen (2007) Sensitivity of Goodness of Fit Indexes to Lack of Measurement Invariance, *Structural Equation Modeling: A Multidisciplinary Journal*, 14:3, 464-504, doi:10.1080/10705510701301834

Chen, M., & Miller, G. (1997). *Teacher Stress: A Review of the International Literature* (Research report No. ED410187). Retrieved from <http://files.eric.ed.gov/fulltext/ED410187.pdf>

Chen, W. H., & Thissen, D. (1997). Local dependence indexes for item pairs using item response theory. *Journal of Educational and Behavioural Statistics*, 22(3), 265-289. doi:10.3102/10769986022003265

Cheung, G. W., & Rensvold, R. B. (2002). Evaluating goodness-of-fit indexes for testing measurement invariance. *Structural equation modelling*, 9(2), 233-255. doi:10.1207/S15328007SEM0902_5

Clunies-Ross, P., Little, E., & Kienhuis, M. (2008). Self-reported and observed use of proactive and reactive classroom management strategies and their relationship with teacher stress and student behaviour. *Educational Psychology*, 28(6), 693-710. doi:10.1080/01443410802206700

Cortina, J. M. (1993). What is coefficient alpha? An examination of theory and applications. *Journal of applied psychology*, 78(1), 98. doi:10.1037/0021-9010.78.1.98

Côté, S., & Morgan, L. M. (2002). A longitudinal analysis of the association between emotion regulation, job satisfaction, and intentions to quit. *Journal of Organizational Behaviour*, 23(8), 947-962. doi:10.1002/job.174

D

Day, C., Sammons, P., & Stobart, G. (2007). *Teachers matter: Connecting work, lives and effectiveness*. UK: McGraw-Hill Education.

den Brok, P., Wubbels, T., & Van Tartwijk, J. (2017). Exploring beginning teachers' attrition in the Netherlands. *Teachers and Teaching*, 23(8), 881-895. doi:10.1080/13540602.2017.1360859

Desa, D. (2016). Understanding non-linear modelling of measurement invariance in heterogeneous populations. *Advances in Data Analysis and Classifications*, 1-25. doi:10.1007/s11634-016-0240-3

Dicke, T., Parker, P. D., Holzberger, D., Kunina-Habenicht, O., Kunter, M., & Leutner, D. (2015). Beginning teachers' efficacy and emotional exhaustion: Latent changes, reciprocity, and the influence of professional knowledge. *Contemporary Educational Psychology*, 41, 62-72. doi:10.1016/j.cedpsych.2014.11.003

Draper, J., O'Brien, J., & Christie, F. (2004). First Impressions: the new teacher induction arrangements in Scotland. *Journal of In-service Education*, 30, 201-224. doi:10.1080/13674580100200242

E

Evers A., Vliet-Mulder J.C., Van & Groot C.J. (2000) *Documentatie van tests en testresearch in Nederland* [Documentation of tests and test research in the Netherlands]. *Testbeschrijvingen*, 649-650. Assen, Netherlands: Van Gorcum & Comp. B.V.

F

Field, A. (2013). Exploratory Factor Analysis. In A. Field (Ed.), *Discovering statistics using IBM SPSS statistics* (pp.627-685). London, UK: Sage.

Fimian, M. J. (1984). The development of an instrument to measure occupational stress in teachers: The Teacher Stress Inventory. *Journal of Occupational Psychology*, 57(4), 277-293. doi:10.1111/j.2044-8325.1984.tb00169.x

- Fitchett, P. G., McCarthy, C. J., Lambert, R. G., & Boyle, L. (2018). An examination of US first-year teachers' risk for occupational stress: associations with professional preparation and occupational health. *Teachers and Teaching*, 24(2), 99-118. doi:10.1080/13540602.2017.1386648
- Fives, H., Hamman, D., & Olivarez, A. (2007). Does burnout begin with student-teaching? Analyzing efficacy, burnout, and support during the student-teaching semester. *Teaching and Teacher Education*, 23(6), 916-934. doi:10.1016/j.tate.2006.03.013
- Fokkens-Bruinsma, M., & Canrinus, E. T., (2014). Motivation for becoming a teacher and engagement with the profession: Evidence from different contexts. *International Journal of Educational Research*, 65, 65-74. doi:10.1016/j.ijer.2013.09.012
- Folkman, S. (2013). Stress: appraisal and coping. In M. D. Gellman (Ed.), *Encyclopedia of behavioral medicine* (p. 1913-1915). New York, NY: Springer.
- Fontein, P., Prüfer, P., de Vos, K., Vloet, A. (2016). *IPTO: bevoegdheden en vakken in het vo*[IPTO: teaching qualifications and subjects in secondary education]. Retrieved from <https://www.rijksoverheid.nl/documenten/rapporten/2016/06/17/ipto-bevoegdheden-en-vakken-in-het-vo>.
- Fransson, G., & Frelin, A. (2016). Highly committed teachers: what makes them tick? A study of sustained commitment. *Teachers and Teaching*, 22(8), 896-912. doi:10.1080/13540602.2016.1201469

G

- Gaikhorst, L., Beishuizen, J. J., Korstjens, I. M., & Volman, M. L. (2014). Induction of beginning teachers in urban environments: An exploration of the support structure and culture for beginning teachers at primary schools needed to improve retention of primary school teachers. *Teaching and teacher education*, 42, 23-33. doi:10.1016/j.tate.2014.04.006
- Gavish, B., & Friedman, I. A. (2010). Novice teachers' experience of teaching: A dynamic aspect of burnout. *Social Psychology of Education*, 13(2), 141-167. doi:10.1007/s11218-009-9108-0
- Gilboa, S., Shirom, A., Fried, Y., & Cooper, C. (2008). A meta-analysis of work demand stressors and job performance: examining main and moderating effects. *Personnel Psychology*, 61(2), 227-271. doi:10.1111/j.1744-6570.2008.00113.x

- Glazerman, S., Isenberg, E., Dolfen, S., Bleeker, M., Johnson, A., Grider, M., & Jacobus, M. (2010). *Impacts of comprehensive teacher induction: Final results from a randomized controlled study* (No. 691d9603eb074051b57684e4affae4d4). Mathematica Policy Research. Available at: <https://www.mathematica-mpr.com/-/media/publications/pdfs/education/teacherinduction-fnlrpt.pdf>
- Goddard, R., O'Brien, P., & Goddard, M. (2006). Work environment predictors of beginning teacher burnout. *British educational research journal*, 32, 857-874.
doi:10.1080/01411920600989511
- Gold, Y., & Roth, R. A. (1993). *Teachers Managing Stress and Preventing Burnout: The Professional Health Solution*. London, England: The Falmer Press.
- Golparvar, M. (2016). Unconventional functions of deviant behaviours in the relationship between job stress and emotional exhaustion: Three study findings. *Current Psychology*, 35(3), 269-284. doi:10.1007/s12144-014-9292-8
- Gonzalez, L., Brown, M. S., & Slate, J. R. (2008). Teachers who left the teaching profession: A qualitative understanding. *The Qualitative Report*, 13(1), 1-11. Retrieved from: <http://www.nova.edu/ssss/QR/QR13-1/gonzalez.pdf>
- Gray, L., & Taie, S. (2015). *Public School Teacher Attrition and Mobility in the First Five Years: Results from the First through Fifth Waves of the 2007-08 Beginning Teacher Longitudinal Study* (NCES 2015-337). U.S. Department of Education. Washington, DC: National Center for Education Statistics. Retrieved from: <http://nces.ed.gov/pubsearch>.

H

- Hanif, R. (2004). *Teacher stress, job performance and self-efficacy of women school teachers* (Doctoral thesis, National Institute of Psychology, Quaid-e-Azam University, Islamabad, Pakistan). Retrieved from: <http://pr.hec.gov.pk/jspui/bitstream/123456789/5603/1/2352.pdf>
- Hanif, R., Tariq, S., & Nadeem, M. (2011). Personal and job related predictors of teacher stress and job performance among school teachers. *Pakistan Journal of Commerce and Social Sciences*, 5(2), 319-329. Retrieved from: <https://pdfs.semanticscholar.org/6c6f/cc73456527f6c4cda597d4f5d2a7844c33fb.pdf>
- Hattie, J. (2012). *Visible learning for teachers: Maximizing impact on learning*. London, England: Routledge.

- Heikkinen, H.L.T., Jokinen, H., & Tynjälä, P. (2012). Teacher education and development as lifelong and lifewide learning. In H.L.T. Heikkinen, H. Jokinen & P. Tynjälä (Eds.), *Peer-group mentoring for teacher development*. (p. 3-30). London: Routledge.
- Helms-Lorenz, M., & Maulana, R. (2016). Influencing the psychological well-being of beginning teachers across three years of teaching: self-efficacy, stress causes, job tension and job discontent. *Educational Psychology*, 36(3), 569-594.
doi:10.1080/01443410.2015.1008403
- Helms-Lorenz, M., Slof, B., & van de Grift, W. (2013). First year effects of induction arrangements on beginning teachers' psychological processes. *European journal of psychology of education*, 28(4), 1265-1287. doi:10.1007/s10212-012-0165-y
- Helms-Lorenz, M., Slof, B., Vermue, C. E., & Canrinus, E. T. (2012). Beginning teachers' self-efficacy and stress and the supposed effects of induction arrangements. *Educational Studies*, 38(2), 189-207. doi:10.1080/03055698.2011.598679
- Helms-Lorenz, M., van de Grift, W., & Maulana, R. (2016). Longitudinal effects of induction on teaching skills and attrition rates of beginning teachers. *School Effectiveness and School Improvement*, 27(2), 178-204. doi:10.1080/09243453.2015.1035731
- Hobson, A. J., Ashby, P., Malderez, A., & Tomlinson, P. D. (2009). Mentoring beginning teachers: What we know and what we don't. *Teaching and Teacher Education*, 25, 207-216. doi:10.1016/j.tate.2008.09.001
- Hodkinson, A. (2006). Career entry development profiles and the statutory induction arrangements in England: a model of effective practice for the professional development of Newly Qualified Teachers? *Journal of In-service Education*, 32, 287-300. doi:10.1080/13674580600841612
- Hong, J. Y. (2012). Why do some beginning teachers leave the school, and others stay? Understanding teacher resilience through psychological lenses. *Teachers and Teaching*, 18, 417-440. doi:10.1080/13540602.2012.696044
- Hooftman, W. E., Mars, G. M. J., Janssen, B., de Vroome, E. M. M., & Van den Bossche, S. N. J. (2015). *Nationale Enquête Arbeidsomstandigheden 2014. Methodologie en globale resultaten [National working conditions survey 2014. Methodology and overall results]*. Leiden, Netherlands: TNO. Retrieved from: <https://www.cbs.nl/nl-nl/publicatie/2015/21/nationale-enquete-arbeidsomstandigheden-2014>
- House of Commons Education Committee. (2012). *Great teachers: Attracting, training and retaining the best*. (HC1515). London: The Stationery Office Limited. Retrieved from:

<http://www.publications.parliament.uk/pa/cm201012/cmselect/cmeduc/1515/151502.htm>

Hu, L. T., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling: a Multidisciplinary Journal*, 6(1), 1-55. doi:10.1080/10705519909540118

I

Ingersoll, R. (2001). Teacher turnover and teacher shortages: An organizational analysis. *American Educational Research Journal*, 38(3), 499–534.
doi:10.3102/00028312038003499

Ingersoll, R. (2003). *Is There Really a Teacher Shortage?*. (Document R-03-4) Washington, DC: CPRE Research Reports. Retrieved from:
http://www.cpre.org/sites/default/files/researchreport/822_shortage-ri-09-2003.pdf

Ingersoll, R. (2007). *Misdiagnosing the teacher quality problem*. (CPRE Policy Briefs No. RB-49), Consortium for policy research in education. University of Pennsylvania. Retrieved from:
https://repository.upenn.edu/cgi/viewcontent.cgi?article=1015&context=cpre_policybriefs

Ingersoll, R., Merrill, E., Stuckey, D., and Collins, G. (2018). *Seven Trends: The Transformation of the Teaching Force* – Updated October 2018. CPRE Research Reports. Retrieved from: https://repository.upenn.edu/cpre_researchreports/108

Ingersoll, R. M., & Strong, M. (2011). The impact of induction and mentoring programs for beginning teachers: A critical review of the research. *Review of Educational Research*, 81, 201-233. doi:10.3102/0034654311403323

Izawa, S., Saito, K., Shiotsuki, K., Sugaya, N., & Nomura, S. (2012). Effects of prolonged stress on salivary cortisol and dehydroepiandrosterone: a study of a two-week teaching practice. *Psychoneuroendocrinology*, 37(6), 852-858.
doi:10.1016/j.psyneuen.2011.10.001

J

Jennings, P. A., & Greenberg, M. T. (2009). The prosocial classroom: Teacher social and emotional competence in relation to student and classroom outcomes. *Review of educational research*, 79(1), 491-525. doi:10.3102/0034654308325693

- Jex, S. M. (1998). *Stress and job performance: Theory, research, and implications for managerial practice*. Thousand Oaks, CA, US: Sage Publications Ltd.
- Johnson, S. M., & Birkeland, S. E. (2003). Pursuing a “sense of success”: New teachers explain their career decisions. *American Educational Research Journal*, 40(3), 581-617. doi:10.3102/00028312040003581
- Johnson, S., Cooper, C., Cartwright, S., Donald, I., Taylor, P., & Millet, C. (2005). The experience of work-related stress across occupations. *Journal of Managerial Psychology*, 20(2), 178-187. doi:10.1108/02683940510579803
- Jones, N., & Youngs, P. (2012). Attitudes and Affect: Daily Emotions and Their Association with the Commitment and Burnout of Beginning Teachers. *Teachers College Record*, 114. Retrieved from: <https://eric.ed.gov/?id=EJ998988>

K

- Kelchtermans, G. (2017). ‘Should I stay or should I go?’: unpacking teacher attrition/retention as an educational issue. *Teachers and Teaching*, 23(8), 961-977. doi:10.1080/13540602.2017.1379793
- Kelchtermans, G. & Ballet, K. (2002). The micropolitics of teacher induction. A narrative-biographical study on teacher socialisation. *Teaching and Teacher Education*, 18(1), 105-120. doi:10.1016/S0742-051X(01)00053-1
- Kelly, S., & Northrop, L. (2015). Early career outcomes for the “best and the brightest” selectivity, satisfaction, and attrition in the beginning teacher longitudinal survey. *American Educational Research Journal*, 52(4), 624-656. doi:10.3102/0002831215587352
- Kessels, C. (2010). *The influence of induction programs on beginning teachers' well-being and professional development* (Doctoral dissertation, Leiden University Graduate School of Teaching (ICLON), Leiden University).
- Klassen, R. M., & Chiu, M. M. (2010). Effects on teachers' self-efficacy and job satisfaction: Teacher gender, years of experience, and job stress. *Journal of Educational Psychology*, 102(3), 741.
- Klassen, R. M., & Chiu, M. M. (2011). The occupational commitment and intention to quit of practicing and pre-service teachers: Influence of self-efficacy, job stress, and teaching context. *Contemporary Educational Psychology*, 36(2), 114-129. doi:10.1016/j.cedpsych.2011.01.002

- Klusmann, U., Richter, D., & Lüdtke, O. (2016). Teachers' emotional exhaustion is negatively related to students' achievement: Evidence from a large-scale assessment study. *Journal of Educational Psychology*, 108, 1193. doi: 10.1037/edu0000125
- Krieg, J. M. (2006). Teacher quality and attrition. *Economics of Education Review*, 25, 13–27. doi:10.1016/j.econedurev.2004.09.004
- Kokkinos, C. M. (2007). Job stressors, personality and burnout in primary school teachers. *British Journal of Educational Psychology*, 77(1), 229-243. doi:10.1348/000709905X90344
- Koomen, H. M., Verschueren, K., Van Schooten, E., Jak, S., & Pianta, R. C. (2012). Validating the Student-Teacher Relationship Scale: Testing factor structure and measurement invariance across child gender and age in a Dutch sample. *Journal of School Psychology*, 50(2), 215-234. doi:10.1016/j.jsp.2011.09.001
- Kyndt, E., Gijbels, D., Grosemans, I., & Donche, V. (2016). Teachers everyday professional development: Mapping informal learning activities, antecedents, and learning outcomes. *Review of Educational Research*, 86, 1111-1150. doi:10.3102/0034654315627864
- Kyriacou, C. (2001). Teacher stress: Directions for future research. *Educational Review*, 53(1), 27-35. doi:10.1080/00131910120033628
- Kyriacou, C., & Sutcliffe, J. (1978). Teacher stress: Prevalence, sources, and symptoms. *British Journal of Educational Psychology*, 48(2), 159-167. doi:10.1111/j.2044-279.1978.tb02381.x

L

- Lazarus, R. S. (2006). *Stress and emotion: A new synthesis*. New York, NY, US: Springer Publishing Company.
- Lazarus, R. S., & Folkman, S. (1984). *Stress, appraisal, and coping*. New York, NY, US: Springer.
- Lazarus, R. S., & Folkman, S. (1987). Transactional theory and research on emotions and coping. *European Journal of Personality*, 1, 141-169. doi:10.1002/per.2410010304
- Le Cornu, R. (2013). Building early career teacher resilience: The role of relationships. *Australian Journal of Teacher Education (Online)*, 38(4), 1. doi:10.14221/ajte.2013v38n4.4

M

- MacCallum, R. C., Browne, M. W., & Sugawara, H. M. (1996). Power analysis and determination of sample size for covariance structure modeling. *Psychological Methods, 1*(2), 130-149.
- Mansfield, C., Beltman, S., & Price, A. (2014). 'I'm coming back again!' The resilience process of early career teachers. *Teachers and Teaching, 20*(5), 547-567. doi:10.1080/13540602.2014.937958
- Maslach, C., & Jackson, S. E. (1981). The measurement of experienced burnout. *Journal of Organizational Behavior, 2*, 99-113. doi:10.1002/job.4030020205
- Macdonald, D. (1999). Teacher attrition: A review of literature. *Teaching and Teacher Education, 15*(8), 835-848. doi:10.1016/S0742-051X(99)00031-1
- Marsh, H. W., Morin, A. J., Parker, P. D., & Kaur, G. (2014). Exploratory structural equation modeling: An integration of the best features of exploratory and confirmatory factor analysis. *Annual review of clinical psychology, 10*, 85-110. doi:10.1146/annurev-clinpsy-032813-153700
- Maulana, R., Helms-Lorenz, M., & Van de Grift, W. (2015). Development and evaluation of a questionnaire measuring pre-service teachers' teaching behaviour: A Rasch modelling approach. *School Effectiveness and School Improvement, 26*, 169-194. doi:10.1080/09243453.2014.939198
- McCarthy, C. J., Lambert, R. G., Lineback, S., Fitchett, P., & Baddouh, P. G. (2015). Assessing teacher appraisals and stress in the classroom: Review of the classroom appraisal of resources and demands. *Educational Psychology Review, 28*(3), 577-603. doi:10.1007/s10648-015-9322-6
- McCarthy, C. J., Lambert, R. G., Lineback, S., Fitchett, P., & Baddouh, P. G. (2015). Assessing teacher appraisals and stress in the classroom: Review of the classroom appraisal of resources and demands. *Educational Psychology Review, 28*, 577-603. doi:10.1007/s10648-015-9322-6
- McCormack, A., Gore, J., & Thomas, K. (2006). Early career teacher professional learning. *Asia-Pacific Journal of Teacher Education, 34*(1), 95-113. doi:10.1080/13598660500480282
- Mearns, J., & Cain, J. E. (2003). Relationships between teachers' occupational stress and their burnout and distress: Roles of coping and negative mood regulation expectancies. *Anxiety, Stress & Coping, 16*(1), 71-82. doi:10.1080/1061580021000057040

- Ministerie van Onderwijs, Cultuur en Wetenschap [Dutch Ministry of Education, Culture and Science]. (2014). *Kerncijfers 2009-2013, Onderwijs, Cultuur en Wetenschap [Key Figures 2009-2013, Education, Culture and Science]*. Retrieved from:
<https://www.rijksoverheid.nl/documenten/jaarverslagen/2014/05/21/ocw-kerncijfers>
- Ministerie van Onderwijs Cultuur en Wetenschap [Dutch Ministry of Education, Culture and Science]. (2015). Kamerbrief over onderwijsarbeidsmarkt [Letter to parliament about education labour market]. Den Haag: Rijksoverheid. Retrieved from:
<https://www.rijksoverheid.nl/documenten/kamerstukken/2015/11/03/kamerbrief-over-onderwijsarbeidsmarkt>
- Mokken, R. J. (1971). *A theory and procedure of scale analysis*. The Hague, Netherlands: Mouton.
- Molenaar, I. W., & Sijtsma, K. (2000). *User's manual MSP5 for Windows*. Groningen, Netherlands: iecProGAMMA.
- Montgomery, C., & Rupp, A. A. (2005). A meta-analysis for exploring the diverse causes and effects of stress in teachers. *Canadian Journal of Education/Revue canadienne de l'éducation*, 28, 458-486. doi:10.2307/4126479
- Muthén, L. K., & Muthén, B. O. (2013). *Mplus 7.11*. Los Angeles, CA: Muthén & Muthén.

N

- Newberry, M., & Allsop, Y. (2017). Teacher attrition in the USA: the relational elements in a Utah case study. *Teachers and Teaching*, 23(8), 863-880.
doi:10.1080/13540602.2017.1358705
- Notelaers, G., De Witte, H., Van Veldhoven, M. J. P. M., & Vermunt, J. K. (2007). Construction and validation of the short inventory to monitor psychosocial hazards. *Médecine du Travail et Ergonomie*, 44(1/4), 11.

O

- Oberle, E., & Schonert-Reichl, K. A. (2016). Stress contagion in the classroom? The link between classroom teacher burnout and morning cortisol in elementary school students. *Social Science & Medicine*, 159, 30-37.
doi:10.1016/j.socscimed.2016.04.031

- O'Connor, K. E. (2008). "You choose to care": Teachers, emotions and professional identity. *Teaching and Teacher Education*, 24, 117-126. doi:10.1016/j.tate.2006.11.008
- Ooghe, L., Thomas, L., Tuytens, M., Devos, G., & Vanderlinde, R. (2016). Het sociaal netwerk van beginnende leraren in relatie tot hun professioneel zelfverstaan: Een exploratief onderzoek. *Pedagogische Studiën*, 93(3), 178-204. Retrieved from: <https://biblio.ugent.be/publication/8068704/file/8501758>

P

- Payne, M. A., & Furnham, A. (1987). Dimensions of occupational stress in West Indian secondary school teachers. *British Journal of Educational Psychology*, 57(2), 141-150. doi:10.1111/j.2044-8279.1987.tb03148.x
- Perryman, J., & Calvert, G. (2019). What motivates people to teach, and why do they leave? Accountability, performativity and teacher retention. *British Journal of Educational Studies*, 1-21. doi:10.1080/00071005.2019.1589417
- Pogodzinski, B. (2014). Collegial support and novice teachers' perceptions of working conditions. *Journal of Educational Change*, 15(4), 467-489. doi:10.1007/s10833-013-9221-x
- Pogodzinski, B., Youngs, P., & Frank, K. A. (2013). Collegial climate and novice teachers' intent to remain teaching. *American Journal of Education*, 120(1), 027-054. doi:10.1086/673123

R

- Ronfeldt, M., Loeb, S., & Wyckoff, J. (2013). How teacher turnover harms student achievement. *American Educational Research Journal*, 50(1), 4-36. doi:10.3102/0002831212463813
- Roorda, D. L., Koomen, H. M., Spilt, J. L., & Oort, F. J. (2011). The influence of affective teacher-student relationships on students' school engagement and achievement a meta-analytic approach. *Review of Educational Research*, 81(4), 493-529. doi:10.3102/0034654311421793
- Rudow, B. (1999). *Stress and burnout in the teaching profession: European studies, issues, and research perspectives*. New York, NY, US: Cambridge University Press.

S

- Scheerens, J. (2016). *Educational Effectiveness and Ineffectiveness: A Critical Review of the Knowledge Base*. Dordrecht: Springer.
- Scheopner, A. J. (2010). Irreconcilable differences: Teacher attrition in public and catholic schools. *Educational Research Review*, 5(3), 261-277.
doi:10.1016/j.edurev.2010.03.001
- Shen, J. (1997). Teacher retention and attrition in public schools: Evidence from SASS91. *The Journal of Educational Research*, 91(2), 81-88. doi:10.1080/00220679709597525
- Sibieta, L. (2018). *The teacher labour market in England: Shortages, subject expertise and incentives*. Retrieved from: https://epi.org.uk/wp-content/uploads/2018/08/EPI-Teacher-Labour-Market_2018.pdf
- Sparks, K., & Cooper, C. L. (1999). Occupational differences in the work-strain relationship: Towards the use of situation-specific models. *Journal of Occupational and Organizational Psychology*, 72(2), 219-229. doi:10.1348/096317999166617
- Skaalvik, E. M., & Skaalvik, S. (2011). Teacher job satisfaction and motivation to leave the teaching profession: Relations with school context, feeling of belonging, and emotional exhaustion. *Teaching and Teacher Education*, 27(6), 1029-1038.
doi:10.1016/j.tate.2011.04.001
- Skaalvik, E. M., & Skaalvik, S. (2015). Job Satisfaction, Stress and Coping Strategies in the Teaching Profession-What Do Teachers Say? *International Education Studies*, 8(3), 181-192. doi:10.5539/ies.v8n3p181
- Sklad, M., Diekstra, R., Ritter, M. D., Ben, J., & Gravesteyn, C. (2012). Effectiveness of school-based universal social, emotional, and behavioural programs: Do they enhance students' development in the area of skill, behaviour, and adjustment? *Psychology in the Schools*, 49(9), 892-909. doi:10.1002/pits.21641
- Smith, T. M., & Ingersoll, R. M. (2004). What are the effects of induction and mentoring on beginning teacher turnover? *American Educational Research Journal*, 41, 681-714.
doi:10.3102/00028312041003681
- Stokking, K., Leenders, F.J., De Jong, J.A. & Van Tartwijk, J. (2003). From student to teacher: Reducing practice shock and early attrition in the teaching profession. *European Journal of Teacher Education*, 26(3), 329-350.
doi:10.1080/0261976032000128175

Struyven, K., & Vanthournout, G. (2014). Teachers' exit decisions: An investigation into the reasons why newly qualified teachers fail to enter the teaching profession or why those who do enter do not continue teaching. *Teaching and Teacher Education*, 43, 37-45. doi:10.1016/j.tate.2014.06.002

Sutcher, L., Darling-Hammond, L., & Carver-Thomas, D. (2016). A coming crisis in teaching? Teacher supply, demand, and shortages in the US. *Learning Policy Institute*.

T

Trenberth, L., & Dewe, P. (2004). Work stress and coping: Drawing together research and practice. *British Journal of Guidance & Counselling*, 32, 143-156.
doi:10.1080/03069880410001692201

Tubre, T. C., & Collins, J. M. (2000). Jackson and Schuler (1985) revisited: A meta-analysis of the relationships between role ambiguity, role conflict, and job performance. *Journal of Management*, 26(1), 155-169. doi:10.1177/014920630002600104

U

U.S. Department of Education (2016). *Teacher Shortage Areas: Nationwide listing 1990-1991 through 2016-2017*. Retrieved from:
<http://www2.ed.gov/about/offices/list/ope/pol/tsa.doc>

V

van de Grift, W. (2007). Quality of teaching in four European countries: a review of the literature and application of an assessment instrument. *Educational Research*, 49(2), 127-152. doi:10.1080/00131880701369651

van de Grift, W. J. (2014). Measuring teaching behaviour in several European countries. *School Effectiveness and School Improvement*, 25(3), 295-311.
doi:10.1080/09243453.2013.794845

van de Grift, W., & Helms-Lorenz, M. (2013). *Waarom verlaten zoveel beginnende leraren de school waar ze hun carrière begonnen?* [Why do so many beginning teachers leave the school where they stated their career?] *Van Twaalf tot Achten* (october 2014), 12–15.

van Veen, K., Slegers, P., & Van de Ven, P. H. (2005). One teacher's identity, emotions, and commitment to change: A case study into the cognitive–affective processes of a

- secondary school teacher in the context of reforms. *Teaching and teacher education*, 21(8), 917-934. doi:10.1016/j.tate.2005.06.004
- van Veldhoven, M. (1996). *Psychosociale arbeidsbelasting en werkstress* [Psycho-social workpressure and workstress] (Doctoral thesis, Rijksuniversiteit Groningen, Groningen, Netherlands).
- van Veldhoven M. & Meijman T.F. (1994). *Het meten van psychosociale arbeidsbelasting met een vragenlijst: de vragenlijst beleving en beoordeling van de arbeid (VBBA)* [Measuring psycho-social workpressure and workstress with a questionnaire: the Questionnaire on the Experience and Evaluation of Work (QEEW)]. Amsterdam, Netherlands: Nederlands Instituut voor Arbeidsomstandigheden.
- van Veldhoven, M., Prins, J., van der Laken, P. , & Dijkstra, L. (2015). *QEEW2. 0; 42 short scales for survey research on work, well-being and performance*. SKB. Amsterdam.
- van Veldhoven, M., Taris, T. W., de Jonge, J., & Broersen, S. (2005). The relationship between work characteristics and employee health and well-being: how much complexity do we really need? *International Journal of Stress Management*, 12(1), 3-28. doi:10.1037/1072-5245.12.1.3
- Veenman, S.A.M. (1984) Perceived problems of beginning teachers, *Review of Educational Research*, 54, p. 143–178. doi:10.3102/00346543054002143
- Veldman, I., Admiraal, W., van Tartwijk, J., Mainhard, T., & Wubbels, T. (2016). Veteran teachers' job satisfaction as a function of personal demands and resources in the relationships with their students. *Teachers and Teaching*, 22(8), 913-926. doi:10.1080/13540602.2016.1200546
- Vlaams Ministerie van Onderwijs en Vorming (2013). *Arbeidsmarkt rapport Prognose 2011-2015*. [Labor market report prognosis 2011-2015]. Brussel, Belgium: Vlaams Ministerie van Onderwijs en vorming [Flemish Ministry of Education]. Retrieved from: <https://www.vlaanderen.be/nl/publicaties/detail/arbeidsmarkt-rapport-basisonderwijs-en-secundair-onderwijs-1>

W

- Wellborn, J., Connell, J., Skinner, E., & Pierson, L. (1992). *Teacher as Social Context (TASC)*. Rochester, NY: University of Rochester.

Wilhelm, K., Dewhurst-Savellis, J., & Parker, G. (2000). Teacher stress? An analysis of why teachers leave and why they stay. *Teachers and Teaching: Theory and Practice*, 6(3), 291-304. doi:10.1080/713698734

Y

Yamasaki, K., Sakai, A., & Uchida, K. (2006). A longitudinal study of the relationship between positive affect and both problem-and emotion focused coping strategies. *Social Behaviour and Personality: an International Journal*, 34, 499-510. doi:10.2224/sbp.2006.34.5.499

Yoon, J. (2002). Teacher characteristics as predictors of teacher-student relationships: Stress, negative affect, and self-efficacy. *Social Behavior and Personality: an International Journal*, 30, 485-493. doi:10.2224/sbp.2002.30.5.485

Yuan, R., & Lee, I. (2016). 'I need to be strong and competent': a narrative inquiry of a student-teacher's emotions and identities in teaching practicum. *Teachers and Teaching*, 22(7), 819-841. doi:10.1080/13540602.2016.1185819

APPENDICES

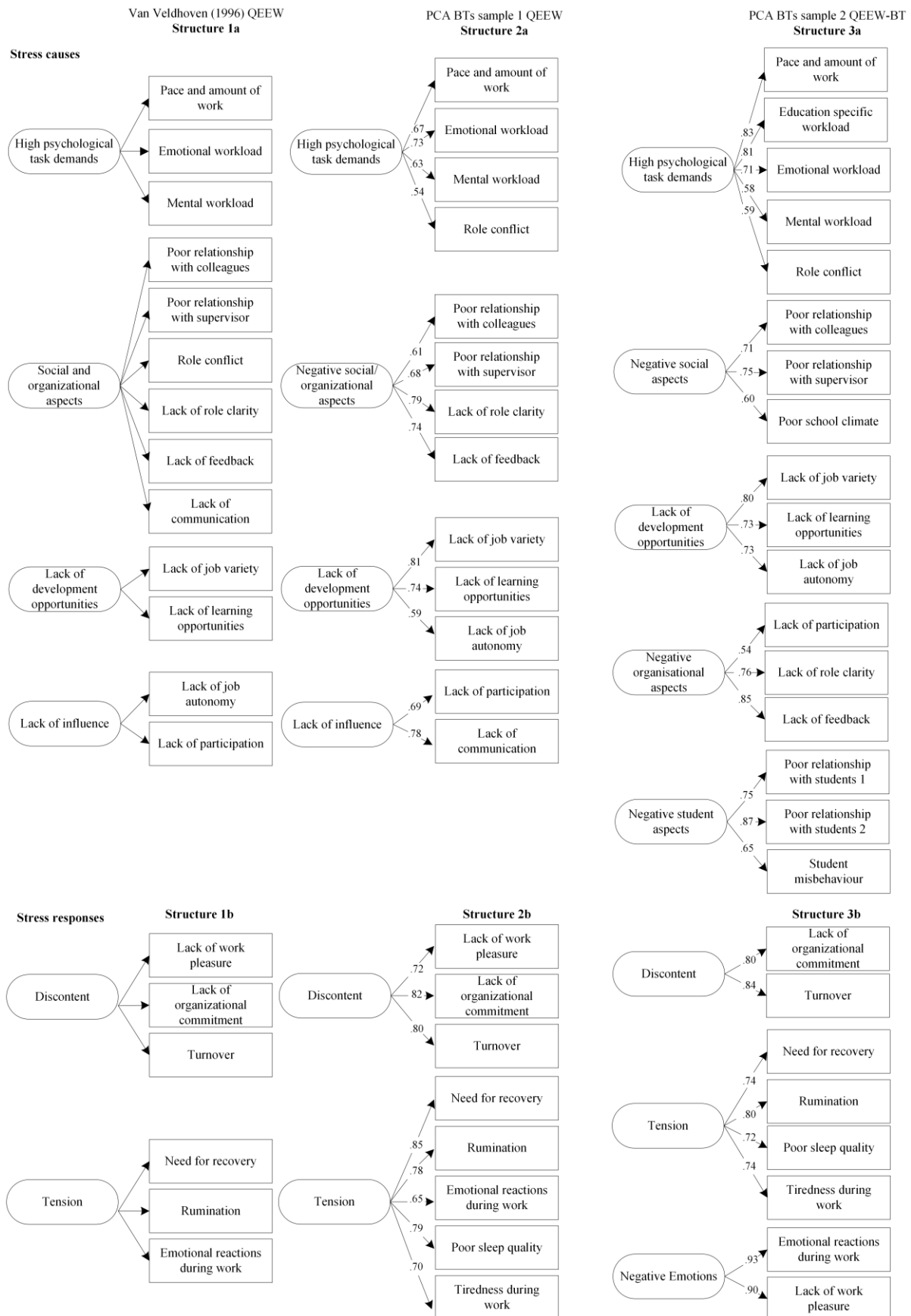
- I. Appendices A-J**
- II Nederlandse samenvatting**
- III Dankwoord**
- IV About the author**
- V List of publications**

Appendix A. Overview stress causes and stress responses scales used in each sample, and number of items per scale which are used in each sample and the final version of the QEEW-BT

	Scale	Sample 1 QEEW (N items)	Sample 2 QEEW- BT (N items)	Final version QEEW- BT (N items)	H (t) QEEW-BT	Rho (t) QEEW-BT	Cron- bach's alpha QEEW- BT	
Stress causes	Step 1	Pace and amount of work	11	6	6	.58	.83	.85
		Emotional workload	7	6	6	.45	.74	.70
		Mental workload	7	4	4	.57	.76	.75
		Role conflict	6	6	6	.49	.76	.73
		Poor relationship with colleagues	9	6	6	.59	.85	.85
		Poor relationship with supervisor	9	5	5	.71	.89	.88
		Lack of role clarity	5	4	4	.61	.81	.82
		Lack of feedback	7	4	4	.65	.83	.82
		Lack of job variety	6	4	4	.68	.86	.81
		Lack of learning opportunities	4	4	4	.59	.83	.83
		Lack of job autonomy	11	6	6	.55	.83	.80
		Lack of participation	8	4	4	.54	.74	.75
		Lack of communication	4	4	4	.67	.83	.83
	Step 2	Uncertainty about the future	4	4	4	.79	.93	.93
		Physical effort	7					
		Lack of possibilities for contact	4					
		Lack of career opportunities	4					
		Lack of remuneration	5					
	Step 4	Changes in tasks	5					
		Student misbehaviour*		13	12	.52	.90	.89
Poor relationship with students 1*			8	8	.46	.85	.82	
Poor relationship with students 2*			5	5	.44	.76	.76	
Poor school climate*			11	7	.40	.78	.77	
Education specific workload*		9	9	.36	.80	.80		
Stress responses	Step 1	Lack of work pleasure	9	8	8	.42	.74	.74
		Lack of organizational commitment	8	8	8	.45	.74	.75
		Turnover	4	4	4	.82	.86	.75
		Need for recovery	11	8	8	.45	.82	.79
		Rumination	4	4	4	.76	.83	.77
		Emotional reactions during work	12	9	9	.45	.78	.70
		Poor sleep quality	14	7	7	.57	.80	.77
		Tiredness during work	16	14	14	.60	.94	.94

Note. * Rho (t), H (t) and Cronbach's alpha for the new scales are based on sample 2. For all the other scales they are based on Sample 1.

Appendix B. Overview of the factor structures of the QEEW found by van Veldhoven (structure 1a and 1b), found in sample 1 (structure 2a and 2b) and found in sample 2 for the QEEW-BT (structure 3a and 3b)



Appendix C. Explanation of the technical and statistical terms used in chapter 2

Term	Explanation
Confirmatory Factor Analysis	Factor analysis is a method of modelling the covariation among a set of observed variables as a function of one or more latent constructs (constructs that cannot directly be measured like stress). This technique can be used to construct a questionnaire to measure an underlying construct. Two broad classes of factor analytic methods are Confirmatory Factor Analysis (CFA) and Exploratory Factor Analysis (EFA). Whereas both techniques model the observed covariation among variables as a function of latent construct, in EFA the purpose of the models is to identify the latent constructs or to generate hypotheses about their possible structures, whereas the purpose of CFA is to evaluate hypothesized structures of the latent constructs and/or to develop a better understanding of such structures. Therefore, CFA should only be used if the structure of the variables has been previously studied using Exploratory Factor Analysis (EFA) and independent source of data (Bandalos and Finney 2010). In this study CFA was used to examine the underlying latent constructs of the stress variables for the beginning teacher context. CFA was appropriate to use as the structure of the questionnaire was previously studied using EFA and independent source of data by authors (Van Veldhoven & Meijman 1994; Van Veldhoven 1996).
Principal Component Analysis	Closely related to EFA is Principal Component Analysis (PCA). This is a method for reducing the dimensionality of a set of observed variables through the creation of an optimum number of weighted composites. This technique is mostly used as a tool in exploratory data analysis and can be used to construct a questionnaire or to explore the new factor structure of a questionnaire when new items have been added (Field 2013). In this study PCAs were conducted to explore the factor structure of the QEEW and later the QEEW-BT.
Mokken Scaling	Mokken scaling is a psychometric method which can be used for data reduction. For a scale to be a Mokken scale it has to meet several assumptions. Firstly, the assumption of <i>unidimensionality</i> . A scale is unidimensional when the items of the scale measure the same latent trait. Secondly, the assumption of <i>local independency</i> . This assumption is met when the response to one item does not influence the response to another item, except for an influence that can be explained from the latent variable which is being measured with the set of items. Further, for a Mokken scale to meet the assumption of the double monotonicity model, the last assumption states that <i>the response curves of the items are not allowed to intersect</i> . The extent to which a set of items is unidimensional is given by the Loevinger's coefficient (H). H can be calculated for individual items $H(i)$ and for the overall set of items $H(t)$. A $H(i)$ value of minimal 0.3 and a $H(t)$ value of minimal 0.35 is acceptable (Mokken 1971). The extent to which a set of items is reliable is given by the $Rho(t)$. $Rho(t)$ is comparable to the way internal consistency is calculated with Cronbach's alpha.
Unidimensionality	
Local independency	
Non-intersecting item response curves	
$H(i)$ score	
$H(t)$ score	
$Rho(t)$	
Cronbach's alpha	Cronbach's alpha, α , is the most common measure of scale reliability. It is a measure of internal consistency, meaning, a how closely related a set of items are as a group. Generally a value of above 0.80 is great and a value below .70 is unacceptable (Field 2013). However, Cortina (1993) argued that such general guidelines need to be used with caution as the value of α depends on the number of items on the scale. As the number of items on the scale increases, the α will increase.
Spearman's rho	Spearman's rho is a non-parametric statistic which can be used to calculate the correlation between variables when the data has violated parametric assumptions such as non-normally distributed data. Spearman's test works by first ranking the data, and then applying Pearson's equation to those ranks (Field 2013). In this study the data violated the assumption of normally distributed data and therefore Spearman's rho was used for the calculation of the correlations between the variables.

Appendix D. Model fit statistics and fit indices of the univariate latent growth models (ULGMs) depicting the growth of stress

Fit statistics	Stress causes				Stress responses	
	PSY	SOC	PUPIL	DIS	TEN	EM
Chi-square						
Value	0.579	1.180	3.504	0.843	0.547	0.304
Degrees of freedom	1	1	1	1	1	1
<i>p</i> Value	.447	.277	.061	.359	.460	.582
Scaling Correction Factor for MLR	0.999	0.857	1.673	1.251	1.349	1.367
CFI	1.00	1.00	0.95	1.00	1.00	1.00
TLI	1.01	1.00	0.85	1.00	1.01	1.04
RMSEA						
Estimate	0.00	0.02	0.08	0.00	0.00	.00
Confidence interval	.000, .121	.000, .139	.000, .177	.000, .132	.000, .122	.000, .111
SRMR	0.008	0.011	0.034	0.011	0.009	0.009

Note. PSY stands for high psychological task demands, SOC for negative social aspects, PUPIL for negative pupil aspects, DIS for discontent, TEN for tension, and EM for negative emotions.

Appendix E. Parameter estimates for the univariate latent growth curve models (ULGMs) depicting the growth of stress

Stress scale	Parameter	Estimate	S.E.	Est./S.E.	Two-Tailed <i>p</i> -value
PSY	Intercept mean	5.95	0.09	64.44	<.01
	Intercept variance	2.17	0.32	6.85	<.01
	Slope mean	0.24	0.04	5.76	<.01
	Slope variance	0.08	0.15	0.54	n.s.
SOC	Intercept mean	3.94	0.08	47.63	<.01
	Intercept variance	2.41	0.36	6.75	<.01
	Slope mean	0.08	0.06	1.31	n.s.
	Slope variance	0.43	0.16	2.59	<.01
PUPIL	Intercept mean	6.22	0.20	30.43	<.01
	Intercept variance	7.58	2.54	2.98	<.01
	Slope mean	-0.94	0.10	-9.14	<.01
	Slope variance	0.47	1.39	0.34	n.s.
DIS	Intercept mean	1.70	0.08	22.83	<.01
	Intercept variance	1.45	0.27	5.32	<.01
	Slope mean	0.10	0.06	1.66	n.s.
	Slope variance	0.32	0.11	2.83	<.01
TEN	Intercept mean	3.86	0.13	28.94	<.01
	Intercept variance	4.56	0.70	6.56	<.01
	Slope mean	0.04	0.07	0.63	n.s.
	Slope variance	0.26	0.40	0.65	n.s.
EM	Intercept mean	1.06	0.07	16.18	<.01
	Intercept variance	0.89	0.28	3.17	<.01
	Slope mean	0.06	0.06	0.98	n.s.
	Slope variance	-0.08	0.16	-0.50	n.s.

Note. PSY stands for high psychological task demands, SOC for negative social aspects, PUPIL for negative pupil aspects, DIS for discontent, TEN for tension, and EM for negative emotions.

Appendix F. Parameter estimates for the multivariate latent growth curve model (MLGM) depicting the growth of stress causes complete cases only (dataset 2)

Stress scale	Parameter	Estimate	S.E.	Est./S.E.	Two-Tailed <i>p</i> -value
PSY	Intercept mean	5.85	0.11	54.91	<.01
	Intercept variance	1.73	0.25	7.02	<.01
	Slope mean	0.24	0.04	5.48	<.01
	Slope variance	0.18	0.07	2.62	<.01
SOC	Intercept mean	3.77	0.11	34.69	<.01
	Intercept variance	1.74	0.24	7.35	<.01
	Slope mean	0.09	0.07	1.35	0.18
	Slope variance	0.21	0.08	2.45	<.05
PUPIL	Intercept mean	5.92	0.23	25.71	<.01
	Intercept variance	5.54	0.86	6.45	<.01
	Slope mean	-0.87	0.13	-6.82	<.01
	Slope variance	0.38	0.69	0.55	0.59

Note: PSY stands for high psychological task demands, SOC for negative social aspects, PUPIL for negative pupil. Fit statistics: CFI= 0.921, TLI= 0.905, RMSEA= 0.091, SRMR= 0.053.

Appendix G. Parameter estimates for the multivariate latent growth curve model (MLGM) depicting the growth of stress responses complete cases only (dataset 2)

Stress scale	Parameter	Estimate	S.E.	Est./S.E.	Two-Tailed <i>p</i> -value
DIS	Intercept mean	1.45	0.08	17.41	<.01
	Intercept variance	1.12	0.25	4.54	<.01
	Slope mean	0.12	0.05	2.27	<.05
	Slope variance	0.29	0.09	3.33	<.01
TEN	Intercept mean	3.72	0.19	19.99	<.01
	Intercept variance	4.03	0.58	6.92	<.01
	Slope mean	0.09	0.07	1.36	n.s.
	Slope variance	0.19	0.11	1.66	n.s.
EM	Intercept mean	0.80	0.07	11.49	<.01
	Intercept variance	0.68	0.15	4.60	<.01
	Slope mean	0.14	0.05	2.88	<.01
	Slope variance	-0.02	.06	-0.30	n.s.

Note. DIS for discontent, TEN for tension and EM for negative emotions. Fit statistics: CFI= 0.881, TLI= 0.853, RMSEA= 0.120, SRMR= 0.078.

Appendix H. Parameter estimates for the univariate latent growth curve models (ULGMs) depicting the influence the induction arrangements on the intercept (and slope) of stress

ULGM	Induction arrangement	Parameter	Estimate	S.E.	Est./S.E.	Two-Tailed P-Value
PSY	WR	Intercept	-2.19	0.61	-3.62	<.01
	SE	Intercept	0.46	0.47	0.97	n.s.
	PD	Intercept	-0.13	0.44	-0.29	n.s.
	TB	Intercept	-0.52	0.37	-1.42	n.s.
SOC	WR	Intercept	-1.98	0.50	-3.96	<.01
	SE	Intercept	-0.25	0.48	-0.53	n.s.
	PD	Intercept	-0.11	0.51	-0.22	n.s.
	TB	Intercept	-0.82	0.41	-1.98	<.05
	WR	Slope	-0.37	0.29	-1.28	n.s.
	SE	Slope	-0.11	0.30	-0.37	n.s.
	PD	Slope	0.25	0.30	0.85	n.s.
PUPIL	TB	Slope	0.24	0.27	0.89	n.s.
	WR	Intercept	1.21	1.09	1.12	n.s.
	SE	Intercept	-1.46	0.78	-1.86	n.s.
	PD	Intercept	-0.91	0.85	-1.08	n.s.
DIS	TB	Intercept	0.68	0.75	0.91	n.s.
	WR	Intercept	-1.43	0.44	-3.24	<.01
	SE	Intercept	-0.02	0.47	-0.04	n.s.
	PD	Intercept	0.10	0.42	0.23	n.s.
	TB	Intercept	-0.79	0.28	-2.82	<.01
	WR	Slope	0.00	0.29	0.01	n.s.
	SE	Slope	-0.57	0.26	-2.24	<.05
TEN	PD	Slope	0.16	0.20	0.77	n.s.
	TB	Slope	0.16	0.23	0.68	n.s.
	WR	Intercept	-3.07	0.81	-3.82	<.01
	SE	Intercept	0.60	0.58	1.02	n.s.
EM	PD	Intercept	0.10	0.73	0.14	n.s.
	TB	Intercept	-0.78	0.46	-1.70	n.s.
	WR	Intercept	-1.17	0.40	-2.97	<.01
	SE	Intercept	-0.38	0.38	-1.00	n.s.
	PD	Intercept	0.39	0.36	1.08	n.s.
	TB	Intercept	-0.71	0.27	-2.65	<.01

Note. PSY stands for high psychological task demands, SOC for negative social aspects, PUPIL for negative pupil aspects, DIS for discontent, TEN for tension, EM for negative emotions, WR for workload reduction, SE for supporting school enculturation, TB for support for effective teaching behaviour, and PD for supporting professional development.

Appendix I. Interview questions beginning teachers

Stayers

Part 1

Is it okay if we make a audio recording of this interview?

Good morning/afternoon [introducing ourselves]. We really appreciate your willingness to talk to us today. Data derived from this interview will be used to study the relationships between beginning teachers' perceived stress causes and stress responses conducted by the department of Teacher Education of the University of Groningen. Through this interview we would like to find out which situations at school cause you to experience stress and which colleagues and activities undertaken by your school make you feel less stressed and supported. Prior to this interview we have sent you an informed consent which you signed, that gives us permission to use the data collected through this interview for research purposes. Is that right? We will make sure that all the information collected through this interview and used for our research can not be traced back to you or your school. In addition, we will first send you all the information we will use so that you can check whether we have understood you correctly during the interview. You can decide at any point in time, even when you see the results of this study, that we are not allowed to use your data. Is that clear to you? Do you agree with this?

Good. Then we can now start the interview.

Do you find it difficult to talk about this subject?

Part 2

1. When we sent you the stress questionnaire you indicated that you experience a lot of stress during your work. Can you tell us more about that?
 2. What happens to you when (repeat just described situation)What does that do to you? Why? How does it make you feel when something like that happens? Why?
 3. Is it important to you to have (e.g. a good relationship with students)?
Why/why not?
 4. Does it affect how you feel after working hours?
If yes: Can you explain in what kind of way?
 5. Do these situations occur often?
If so: What does it do to you? Does your response to this kind of situations become more intense/different?
 6. Do you feel that these kind of situations occur more or less often over time?
 7. Are there colleagues or activities undertaken by your school that support you in handling (mentioned situation)? In what way? How do these colleagues/activities ensure that you experience less stress?
 8. What else would help you to experience less stress regarding (the stress cause mentioned).
 9. Are there other things besides (mentioned stress cause) that cause you to experience work related stress? If yes: what?
- ➔ Repeat the same questions starting at question 2

High psychological task demands

Do you feel that the amount of work is also causing you to experience stress? / You indicated that ...

1. When do tasks cause you to experience stress?
2. Do you consider your duties as a teacher to be important?
3. (see questions 2 to 9, part 2)

Negative pupil aspects

Do you feel that situations with students can also cause you to experience stress? / You indicated that ...

1. Can you tell us about a situation of last year where student behaviour caused you to experience stress? What happened?
2. Do you find it important to have a good relationship with your students?
3. (see questions 2 to 9, part 2)

Negative social aspects

Do you think that certain situations involving colleagues/your supervisor(s) can also cause you to experience stress? / You indicated that ...

1. Can you tell us about a situation that occurred between a colleague/supervisor and you that caused you to experience stress? What happened?
2. Do you find it important to have good contacts within the school?
3. (see questions 2 to 9, part 2)

Part 3

Stress responses

You indicated that different situations at school evoke tension, dissatisfaction and/or negative emotions.

1. Do you feel that these reactions become more intense as the years of teaching experience increase?
2. Do you feel that these stress causes influence the way you teach? If yes: can you illustrate this with an example?
3. How do you handle stress causes?
4. What would help you deal with these stress reactions?

Induction arrangements

When you started as a beginning teacher, you were probably offered a few things to support your first years in front of the class. You can think of: an introduction within the school, coaching, classroom observations followed by feedback, courses, etc.

Could you mention the most important things that caused you to experience less stress?

Could you mention the most important things that helped you to deal with stress more effectively?

Final questions

Despite of the stress you experience at work, you still teach.

1. Why?
2. Have you ever thought about quitting teaching? What caused you to think about it? What has kept you from quitting?

If after this interview things come to mind which you would like to add, share with us, or you just want to talk more about it, please let us know.

Interview questions beginning teachers - leavers

Part 1

Is it okay if we make a sound recording of this interview?

Good morning/afternoon [introducing ourselves]. We really appreciate your willingness to talk to us today. Data derived from this interview will be used to study the relationships between beginning teachers' perceived stress causes and stress responses conducted by the department of Teacher Education of the University of Groningen. Through this interview we would like to find out which situations at school cause you to experience stress and which colleagues and activities undertaken by your school make you feel less stressed and supported. Prior to this interview, we have sent you an informed consent which you signed, that gives us permission to use the data collected through this interview for research purposes. Is that right? We will make sure that all the information collected through this interview and used for our research cannot be traced back to you or your school. In addition, we will first send you all the information we will use so that you can check whether we have understood you correctly during the interview. You can decide at any point in time, even when you see the results of this study, that we are not allowed to use your data. Is that clear to you? Do you agree with this?

Good. Then we can now start the interview.

Do you find it difficult to talk about this subject?

Part 2

1. When we sent you the stress questionnaire, you indicated that you experienced a lot of stress during your work as a teacher. Can you tell us more about that?
 2. What happened to you when (repeat just described situation)What did that do to you? (tension, negative emotions, discontent)
 3. Was it important to you to have (e.g. a good relationship with students)? Why/why not?
 4. Did it affect how you felt after working hours?
If yes: Can you explain in what kind of way?
 5. Did these situations occur often?
If so: What did it do to you? Did your response to this kind of situations become more intense/different?
 6. Did you feel that these kind of situations occurred more or less often over time?
 7. Were there colleagues or activities undertaken by your school that supported you in handling (mentioned situation)? In what way? How did these colleagues/activities ensure that you experienced less stress?
 8. What else would have helped you to experience less stress regarding (the stress cause mentioned)?
 9. Were there other things besides (mentioned stress cause) that caused you to experience work related stress? If yes: what?
- ➔ Repeat the same questions starting at question 2

High psychological task demands

Did you feel that the amount of work also caused you to experience stress? / You indicated that ...

1. When did tasks cause you to experience stress?
2. Did you consider your duties as a teacher to be important?
3. (see questions 2 to 9, part 2)

Negative pupil aspects

Did you feel that situations with students also caused you to experience stress? / You indicated that ...

1. Can you tell us about a situation where student behaviour caused you to experience stress? What happened?
2. Did you find it important to have a good relationship with your students?
3. (see questions 2 to 9, part 2)

Negative social aspects

Did certain situations involving colleagues/your supervisor(s) also cause you to experience stress? / You indicated that ...

1. Can you tell us about a situation that occurred between a colleague/supervisor and you that caused you to experience stress? What happened?
2. Did you find it important to have good contacts within the school?
3. (see questions 2 to 9, part 2)

Part 3

Stress responses

You indicated that different situations at school evoked tension, dissatisfaction and/or negative emotions.

1. Did you feel that these reactions became more intense as the years of teaching experience increased?
2. Did you feel that these stress causes influenced the way you taught? If yes: can you illustrate this with an example?
3. How did you handle these stress causes?
4. What would have helped you deal with these stress reactions?

Induction arrangements

When you started as a beginning teacher, you were probably offered a few things to support your first years in front of the class. You can think of: an introduction within the school, coaching, classroom observations followed by feedback, courses, etc.

Could you mention the most important things that caused you to experience less stress?

Could you mention the most important things that helped you to deal with stress more effectively?

Final questions

You stopped teaching.

1. Why? What was the most important factor?
2. What could have prevented you from quitting teaching?

If after this interview things come to mind which you would like to add, share with us, or you just want to talk more about it, please let us know.

Appendix J. Beginning teachers' demands, resources and beliefs regarding teaching and student learning

Name	Stayer/leaver	Demands (challenges)	(Lack of) Individual resources	(Lack of) Contextual resources	Beliefs regarding teaching and student learning
Daniël	Stayer	<p>1. High psychological task demands:</p> <ul style="list-style-type: none"> - Was expected to do, and did, many extra tasks. <p>2. Negative organizational aspects:</p> <ul style="list-style-type: none"> - Tutoring his tutorgroup was scheduled at the same time as other meetings. - Did not get his nice (requested) tutorgroup his second year. - Had to deal with unreasonable parents. - Had to mark assignments during the summer holidays, school decided afterwards to not let the results count. - Advice given during meetings was not used. - Received 20% extra salary instead of workload reduction. <p>3. Negative social aspects:</p> <ul style="list-style-type: none"> - Supervisor would please parents and students. 	<p>1. Personal attributes:</p> <ul style="list-style-type: none"> - Is well organized. <p>2. Self-efficacy:</p> <ul style="list-style-type: none"> - Is confident regarding his teaching skills. <p>3. Coping skills:</p> <ul style="list-style-type: none"> - Has strong social networks at school as well as outside of the school. - Has a four day teaching contract, so he can recharge during the weekends. <p>4. Effective teaching skills:</p> <ul style="list-style-type: none"> - Enjoys teaching, has no issues with classroom management. - Enjoys the progress students make. <p>5. Professional reflection:</p> <ul style="list-style-type: none"> - Is able to reflect on his skills and abilities. <p>6. Self-care:</p> <ul style="list-style-type: none"> - Is able to prioritize. - Is able to set clear boundaries. - Only takes fun tasks home. - Exercises after work to empty his head. - Dares to stand up for himself. 	<p>1. School/administrative support</p> <p><i>Induction element:</i></p> <p>Supporting professional development:</p> <ul style="list-style-type: none"> - Meetings for beginning teachers were organized. - Teachers could attend courses. <p><i>Induction element:</i></p> <p>Workload reduction</p> <ul style="list-style-type: none"> - Did not have to be a tutor for his first two teaching years. - Was offered 20% extra pay instead of workload reduction. <p>2. Support from a mentor</p> <p><i>Induction element:</i></p> <p>Supporting effective teacher behaviour:</p> <ul style="list-style-type: none"> - Had fixed appointments with coach. - Subjectcoach and supervisor observed 6 of his lessons. <p>3. Support from peers and colleagues:</p> <ul style="list-style-type: none"> - Close relationships with colleagues from his department. - Close relationships with other teachers. <p>4. Working with students</p> <ul style="list-style-type: none"> - Close relationships with his students. - Enjoys the interaction with students. <p>5. Support from family and friends:</p> <ul style="list-style-type: none"> - Shares teaching experiences with his friends - Shares teaching experiences with his girlfriend. 	<p>1. Beliefs regarding teaching and student learning</p> <ul style="list-style-type: none"> - Enjoys the progress his students make. - Enjoys teaching his students language and literature. - Like to make the difference. - Enjoys to notice that his students start to think differently.
Marlijn	Stayer	<p>1. High psychological task demands:</p> <ul style="list-style-type: none"> - Finds it hard to get a good work-life balance. - Had to design her lessons. <p>2. Negative organizational aspects:</p> <ul style="list-style-type: none"> - Was not prepared for her role as tutor. Tutor preparation course was organized at one of her non-working days. - Intervention session was also organized at one of her non-working days. <p>3. Negative social aspects:</p> <ul style="list-style-type: none"> - Had a big argument with a colleague. <p>4. Negative pupil aspects:</p> <ul style="list-style-type: none"> - Had a difficult tutor group. 	<p>1. Personal attributes</p> <ul style="list-style-type: none"> - She is not a quitter. <p>2. Self-efficacy:</p> <ul style="list-style-type: none"> - Gained confidence to set boundaries towards student behaviour and workload. - Gained confidence in her teaching skills. <p>3. Coping skills</p> <ul style="list-style-type: none"> - Does notice when her work-life balance gets in a disbalance and takes action. - Uses her social network at school to ask for help when needed. - Knows when she has made a mistakes, learns from it and moves on. <p>4. Effective teaching skills:</p> <ul style="list-style-type: none"> - Enjoys teaching. 	<p>1. School/administrative support</p> <p><i>Induction element:</i></p> <p>Supporting professional development:</p> <ul style="list-style-type: none"> - School organizes useful courses. <p>2. Support from a mentor</p> <p><i>Induction element:</i></p> <p>Supporting effective teacher behaviour:</p> <ul style="list-style-type: none"> - Had two coaches, one she consulted regularly. <p>3. Support from peers and colleagues:</p> <ul style="list-style-type: none"> - Consults colleagues when needed. - Shares and discusses teaching experiences with colleagues. 	<p>1. Beliefs regarding teaching and student learning</p> <ul style="list-style-type: none"> - A good lesson is a lesson in which students are stimulated to absorb the lesson material in some sort of way. - Sets clear boundaries in her classroom concerning appropriate behaviour. - Connects well with students who are enthusiastic, dare to participate in her lessons and work hard.

- Had difficulties with classroom management at the start of her career.

- Gained confidence to take action when needed.
- Sets clear boundaries in the classroom concerning appropriate behaviour.
- Learnt to improvise to attend to students' needs.
- Can predict well how a lesson will go.

5. Professional reflection:

- Knows that despite not being a perfect teacher she has made real progress.
- Knows how to reflect on herself well, notices when she could improve something, evaluates it, and then acts differently the next time.

6. Self-care:

- Picked up exercising again to get a healthy work-life balance.

- Exchanges lesson materials with her colleagues.
- Close relationship with coach.
- Close relationships with colleagues.
- Close relationship with another beginning teacher.
- Feels supported by her supervisor.

4. Working with students:

- Close relationships with some of her students.
- Enjoys the interactions with the students.

5. Support from family and friends:

- Shares her teaching experiences with her partner and mother.

- Gets motivation from students who participate in her lessons.
- Is confident and enjoys to improvise in her lessons.
- Enjoys teaching.

Niek Stayer

1. High psychological task demands:

- Had to design a great amount of lesson materials during his first years.
- Is the only chemistry teacher teaching the upper groups (in Dutch bovenbouw), therefore he has to do everything by himself.
- Works around 2 to 3 hours after work to finish his work.
- Studied to become a first degree teacher besides his job as a second degree teacher.
- There are students in his tutor group with issues.

1. Personal attributes:

- Uses humor when he teaches.

2. Self-efficacy

- Is confident regarding his teaching skills.

3. Coping skills

- Does not take students' issues personally.

- Learnt how to plan realistically.

- Started to prioritize tasks.

4. Effective teaching skills:

- Has no difficulties with classroom management and no issues with students' behaviour.

- Enjoys teaching.

5. Professional reflection:

- Enjoys to improve his teaching skills and is willing to invest in this personally.

6. Self-care:

- Sets clear boundaries concerning what students, supervisors and colleagues can expect from him.
- Spends one day a week for swimming.

1. School/administrative support

Induction element:

Supporting professional development:

- Courses were organized.

Induction element:

Workload reduction:

- Was tutor of a group of students from his first year onwards.

2. Support from a mentor

Induction element:

Supporting effective teacher behaviour:

- Was allocated an experienced coach who could be consulted anytime.

3. Support from peers and colleagues:

- Has close relationships with the teachers from his department.

4. Working with students:

- Has close and meaningful relationships with his students.
- Enjoys the interaction with his students.

1. Beliefs regarding teaching and student learning

- Describes some of the projects as a lot of work, however, does feel satisfied when the implementation of the projects go well.
- Feels responsible for his students' wellbeing, however, is able to set emotional boundaries.
- Improving his teaching skills is something he enjoys and gives him energy.
- Providing the best support to stimulate student' learning gives him joy.
- Likes it when students show their gratitude for his teaching.
- He enjoys to see his students make progress.

Pieter Stayer

1. High psychological task demands:

- Experiences a heavy workload.
- Feels that his time to prepare lessons well gets jeopardized by all the other tasks he has to do.

2. Negative organizational aspects:

- Experiences uncertainty regarding his contract
- Received extra salary instead of workload reduction.

1. Personal attributes:

- Enjoys interacting with people.

2. Self-efficacy:

- Is confident regarding his teaching skills.

3. Coping skills:

- Is pro-active: made his own teaching schedule to ensure he had a convenient one.

- Started a homework group for students to attend after school if they had not done their homework.

- Shared his teaching experiences with people.

4. Effective teaching skills:

- Has no difficulties with classroom management.

1. School/administrative support

Induction element:

Supporting professional development:

- Was offered a course for tutorship.

- Was offered intervision meeting, however, he did not find these useful so quit going to these meetings.

Induction element:

Workload reduction:

- Received extra pay instead of workload reduction.

Induction element: school enculturation:

1. Beliefs regarding teaching and student learning

- Finds it important that his students learn.
- Prioritizes being good teacher above being liked by his students.
- He has some basic rules students have to follow in the classroom.
- Tries to make his subject more fun being introducing games as he

5. Professional reflection:

- Is able to reflect on his teaching skills.
- Enjoys improving his teaching skills.

6. Self-care:

- Makes sure he always sleeps well at night.
- Devotes one day a week to swimming which he greatly enjoys.

- Received an introduction to the school and the school system on his first day.

Induction element: workload reduction

- Did not have to be a tutor in his first teaching year, was a co-tutor in his second year, and tutor in his third year.

2. Support from a mentor**Induction element:****Supporting effective teacher behaviour:**

- Was allocated two coaches.

3. Support from peers and colleagues:

- Had close relationships with multiple colleagues who kept an eye out for his health and with whom he shared experiences with .

4. Working with students:

- Enjoys teaching.

- is aware that mathematics is not a popular subject to study.

- Wants his students to succeed.

- Wants his students to make the most out of his lessons, he does not care that he has to be strict sometimes to achieve this.

Roos Stayer

1. High psychological task demands:

- Tutored a group of students in her second teaching year.
- Gets especially stressed during the “peak moments” where she has to do lots of extra tasks in the evenings and she can no longer maintain her healthy work-life balance.

- Had to create lesson materials for all her classes during her first year.
- Felt pressure to tutor weak students to increase their exam results.

2. Negative organizational aspects

- Had to do many extra tasks.
- Had to tutor a group unprepared in her second teaching year.

3. Negative social aspects

- Parents complain a lot.
- No fixed appointments with her coach, neither after requesting this.
- Did not receive any information regarding her school when she started.
- Was offered intervision sessions during her second year as a teacher, however, the sessions focused on classroom management which was not an issue for her.
- Received extra pay instead of workload reduction.

1. Personal attributes:

- Enjoys students’ progress.

2. Self-efficacy:

- Is confident regarding her teaching skills.

3. Coping:

- Is pro-active.
- Is able to prioritize tasks.

- Sets clear boundaries concerning workload to maintain a healthy work-life balance.

- Dares to say “no” to extra work.

4. Effective teaching skills:

- Teaching goes well.
- She masters the curriculum.

5. Professional reflection

- Able to reflect on her teaching skills.

6. Self-care:

- Decided to teach 4 days a week to maintain a healthy work-life balance.
- Exercises every day after work to empty her head.
- Makes sure she maintains a healthy work-life balance.

1. School/administrative support**Induction element:****Supporting professional development:**

- Intervention meetings were organised.

Induction element:

- Workload reduction:**
- Received extra pay instead of workload reduction.

2. Support from a mentor**Induction element:****Supporting effective teacher behaviour:**

- Received lessons observation and feedback.
- had two coaches.

3. Support from peers and colleagues:

- Warm and supportive colleagues.

- Build a database with lesson materials together with her colleague, this way each year it will be easier to prepare lessons.

4. Working with students:

- Pleasant conversations with her students.

- Good relationships with her students and with other students in her school.

5. Support from family and friends:

- Felt a great amount of support from her boyfriend during her first year as a teacher.

1. Beliefs regarding teaching and student learning

- Feels responsible for her students’ wellbeing.
- Feels emphatic towards her students.

- Finds it hard to set emotional boundaries, personal situations of students do influence her wellbeing also after school.

- Close relationships with many of her students.

- Prioritizes being a good teacher above being liked by her students, but is both at the moment.

- Enjoys building meaningful relationships with her students.

- Gets energy from her students’ energy.

- Having memorable moments with students and booking successes with them outweighs the heavy workload of the teaching job.

- Enjoys students’ progress

- Enjoys to see her students graduate after having taught them for multiple years.

Esther Leaver

1. High psychological task demands:

- Felt the number of students in her classroom was too high.
- Had to teach many different student groups.

1. Personal attributes:

- Has a passion for education.
- Finds it important to make a difference.

2. Self-efficacy:**1. School/administrative support**

- Had to teach difficult and big groups of students.

Induction element:**Workload reduction**

- Did not have to be a tutor.

1. Beliefs regarding teaching and student learning

2. Negative organizational aspects:

- Department meetings were scheduled on non-working days.
- Felt that the number of teachers in her intervention group was too high (15 teachers)
- Intervention sessions were scheduled on her non-working days.
- Received teaching materials three days for the start of the school year.
- The communication regarding the induction programme was late.
- Found it frustrating that teacher changed their plans and decision in order to please parents.
- She and her school had a different philosophy regarding teaching and students.

3. Negative social aspects:

- Within her department there was no consultation.
- She did not get support from the head of department, not even when she asked for help.
- Felt that she could not consult anyone at her school to share her worries and experiences with.

4. Negative pupil aspects:

- Had difficulties with classroom management.
- Often felt like she was only managing misbehaviour instead of teaching her lessons.
- Sometimes students completely ignored her.

- Feels that students are responsible for their own learning.
- She feels that she would be better able to teach to smaller number of students.
- Feels that she is better able to teach smart students.

3. Coping skills:

- Did not have a strong social network at her school. She felt she could not consult anyone at her school to share her experiences.
- Asked for help a few times but did not get it.

4. Effective teaching skills:

- Had difficulties with classroom management.
- Felt like all her time and energy was spend on managing misbehaviour instead of teaching.
- The curriculum was too simple for her, she did not know how to teach this.
- She felt that she would be better able to teach smart students.

5. Professional reflection:

- She preferred to teach small groups over big groups of students.
- Noticed that she had difficulties with classroom management.

6. Self-care:

- She decreased her teaching days from 4 days to 3 days.
- She dropped her two most difficult classes.

Induction element: Supporting professional development:

- The school offered intervention meetings.
- Two of her lessons were observed and she received feedback.
- The school offered an introduction programme.

2. Support from a mentor Induction element: Supporting effective teacher behaviour:

- She was allocated a coach.

3. Support from peers and colleagues:

- Felt that she could not consult anyone in her school.

4. Working with students:

- Feels to be better able to teach smarter students.
- Feels to be better able to teach small groups of students instead of big groups.
- Feels that students are responsible for their own learning. Wants students to be self-motivated and driven to learn.
- Felt a loss in energy when students did not listen to her.
- Felt sometimes more like a police than a teacher.

- Students need to be intrinsically motivated in order to teach them.
- Students need to be intrinsically motivated, if they are not she feels like she is wasting her time.
- Prefers smaller groups of students.
- Feels that students need to learn to be independent, school feels differently.
- Students should do their home work and listen during class only then she can teach well.
- Teaching was exhausting her.
- Feels to be better able to teach smarter students.
- The curriculum was too simple for her, she did not know how to teach this.

Kristel Leaver

1. High psychological task demands:

- Found it difficult that the number of students in her classroom was high (30/31 students).
 - Difficulty taking breaks as there were always students or colleagues who wanted something.
- ## **4. Negative pupil aspects:**
- Found it difficult sometimes that some students were not motivated at all.
 - Did not get on well with some of the male students.
 - Could become fierce in case students were disrespectful.

1. Personal attributes:

- Intrinsically motivated to teach people.

2. Self-efficacy:

- Internal locus of control.

3. Coping skills:

- Actively asked for help.
- Kept thinking about things that didn't go well after work.
- Had a strong network at school.
- Shared her experiences with others.

4. Effective teaching skills:

- Difficulty with classroom management.

5. Professional reflection:

- Realized certain things were not going well, wanted to do those things better and solve them, but could not work it out sometimes.

6. Self-care:

1. School/administrative support

Induction element: Supporting professional development:

- The school offered intervention meetings.
- Was offered a course for tutorship.

Induction element: Workload reduction

- Had her own classroom.
- Was tutor from her fifth year

2. Support from a mentor Induction element:

Supporting effective teacher behaviour:

- Observed her colleagues
- Had a coach who taught the same subject whom she could always ask for help and who would regularly observe her.

3. Support from peers and colleagues:

- Received support from colleagues, supervisor and school head.

4. Working with students

- Had a good relationship with some of her students.

1. Beliefs regarding teaching and student learning

- Felt that the number of students in her classroom was too high.
- Found teaching to large groups of students not easy and it did not become easier through the years
- Wanted every student to understand the curriculum.

- Liked it when students were motivated and started to understand the curriculum.
- Had absolutely no connection with the male students.

Thomas Leaver

1. High psychological task demands

- Some classes were packed with approximately 30 students.
- Would have been made tutor when he would get a permanent contract, but he had negative feelings towards the idea of becoming a tutor.
- Had to stay at school for detention of his students.
- Had to think of something to do for his students who had detention.
- Found it hard to differentiate between students who already understood the subject and those who needed extra instructions.

2. Negative organizational aspects

- The detention system caused a lot of extra work and frustration for teachers (when a teacher removed a student from class the students had to stay after school time where the teacher had to make up extra assignments for the students to complete.
- The teachers who taught the same subject were divided over three buildings.

3. Negative social aspects

- Sometimes felt like a stranger among his colleagues when he was teaching at a different location.
- Sometimes had to justify his decision to send off a student to his supervisor.

4. Negative pupil aspects

- Could not figure out how to improve his relationship with students and began to not looking forward to anything that had to do with students.
- Some lessons really got out of hand, during one lesson one of the students lay down on the ground and 3 people had to remove the student from class.
- The misbehaving students drained his energy.

1. Personal attributes:

- Has perseverance, has taught for several years even though it didn't go well. Quit after he got a permanent contract because he had proven that he could do it.

2. Self-efficacy:

- Had the feeling he might not be suited for teaching.
- Had the feeling he did not get things done with students that other teachers did get done.

3. Coping skills:

- Found it hard to let go of things that happened at school:
- * Was still thinking about it at home

- * If students asked him something after class he said they should have paid attention during class.
- * Could get really angry at students.

- * Was completely empty after a day's work.
- Had a network within the school.

- Asked for help.

4. Effective teaching skills:

- had geen overmacht in de klas .
- His instructions were not understood as meant.
- Could not figure out "what he was lacking" compared to other teachers.

5. Professional reflection:

- Knew that it was not going well in his classes compared to other teachers.
- Was open to receive feedback.
- Was motivated to find out how he could improve his lessons.

6. Self-care:

- Consciously chose to do everything school related at school.
- Arranged in his final year that he had certain classes so that he had to prepare less.

1. School/administrative support

Induction element: Supporting professional development:

- the school offered intervision meetings.

Induction element:

Workload reduction:

- Was offered 20% workload reduction.
- Did not become a tutor.

2. Support from a mentor

Induction element: Supporting effective teacher behaviour:

- Was linked to an experienced teacher, who always wanted to help and was good with students.
- The team leader regularly came to watch.

3. Support from peers and colleagues:

- Close relationship with some colleagues

4. Working with students

- Really wants students to learn something but they have to pay attention during class.
- Wants the best for his students.
- Frustrating relationship with some students because they did not want to listen to him, they needed to say for detention.
- Could get really angry at students if they misbehaved.
- Played soccer occasionally with a teacher team against a student team.

1. Beliefs regarding teaching and student learning

- Tried to teach "by the book" but that didn't work.
- At a certain point he was spending more time managing misbehaviour instead of teaching.
- Felt anger towards misbehaving students.
- A good lesson to him is: explaining something briefly, letting the students try it, and walking around for any questions from students and then the students have to work quietly.
- Really wants to help students during class.
- Found the most difficult thing about teaching that he did not know how students would react to his lesson and how he should respond to these situations.
- Took the misbehaviour of his students personally.
- Started teaching with the idea "I like to teach people something".

Willem Leaver

1. High psychological task demands

- Had a lot of extra work by letting students stay for detention.
- Had to design exams for some of his classes.

1. Personal attributes:

- Loves a joke in class.
- Believes that he can focus well.

2. Self-efficacy:

- External attribution:

1. School/administrative support

Induction element: Supporting professional development:

- School offered intervision.

1. Beliefs regarding teaching and student learning

- Describes a typical lesson as: explaining what they will do in

2. Negative organizational aspects

- Experienced a "bad school culture" students started very motivated but soon became unmotivated to do well in school.
 - Felt like the school leader listened more to parents and students rather than teachers.
 - There was no sanction for the student when they got dismissed, teacher had to justify the discussion to the coordinator.
 - The coordinator had a double role in sending students out; he was the student's mentor as well as the authority that had to decide on the consequences the students faced by getting expelled.
 - No fixed appointments with coach, had to get appointments spontaneously.
- ### **3. Negative social aspects**
- Did not feel supported by the coordinator when dismissing students.
 - Did not feel supported by the supervisor when students had complained that it was not fun in his class. This was assumed to be true and a coach was appointed who told him to change his class management rules.
 - Felt that the third colleague in the section did not make a sufficient contribution.
- ### **4. Negative pupil aspects**
- Students complained about the classroom management system.

- * Believes that the school culture caused the students to become annoying
 - * School leaders pleased students' (parents) instead of teachers.
 - * Felt that third colleague in the section was not competent and did not do enough.
 - * Felt that students in his class had lack of knowledge because his colleague made easy exams the year before.
 - * Felt that the section worked against him when it came to dismissing students.
 - * Felt that many of his students had problems (e.g. divorced parents) which was reflected in their behaviour.
 - * The Dutch educational system frustrates him as it focusses too much on grades.
- ### **3. Coping skills:**
- Could not sleep well due to the stress
 - Woke up crying and decided to quit teaching.
- ### **4. Effective teaching skills:**
- If he gave the students freedom to work by themselves, this did not happen.
 - Developed a whole system to control undesirable behaviour, the students did not like this.
- ### **5. Professional reflection:**
- To his opinion his classroom management system was working well.
- ### **6. Self-care:**
- Tried not to work longer than his contracted hours.
 - Experienced the school as a source of stress (especially the lack of support).

- Had a coach after students complained about the class atmosphere.

Induction element:

Workload reduction

- Did not have to be a tutor.

2. Support from a mentor

Induction element:

Supporting effective teacher behaviour:

- Had a mentor but no fixed appointments.
- Felt the need to share his experiences with someone but felt no one was available.

3. Support from peers and colleagues:

- Shared workload with a colleague.

4. Working with students

- Could get along with some students but not with others.
- His values did not match with the students.
- Talks about a punishment system to control students.
- Got frustrated when things were not going well in the classroom.

5. Support from family and friends:

- Tried to solve his problems by himself.

- class, followed by about 15 minutes explaining a piece of grammar, working 20-25 minutes themselves, seeing what they did, a few more exercises, discussing and then just keep track of who did (not) finish work.
 - To his opinion the classroom is a place to work.
 - Finds that students do "something naughty" when they display behaviour that the teacher finds not suitable for the classroom.
 - Found it necessary to develop a system in which "naughty behaviour" was punished.
 - Punishing "naughty behaviour" should prevent it from occurring frequently during class.
 - Found that his "non-Christian" classes had a different lifestyle, more outspokenly selfish, compared to classes in Christian schools.
 - To his opinion "hypocrisy" in a Christian school can have a positive effect on class behaviour, which helps the class atmosphere.
 - Believes that the student's behaviour is due to problems at home "otherwise it won't happen"
 - Believes that an upbringing in which parents stay together and norms and values are taught, forms the basis of good behaviour.
 - Believes that children of divorced parents and children who go to day care received relatively little attention since childhood and do not really develop proper norms and values.
-

Samenvatting in het Nederlands

Lesgeven op de middelbare school is stressvol. Af en toe een beetje druk kan motiverend werken, maar langdurige stress heeft onder andere negatieve gevolgen voor de gezondheid van de docent en voor de prestaties van leerlingen. Vooral beginnende docenten kampen met stress. Een groot percentage van deze beginners verlaat de beroepsgroep dan ook binnen vijf lesgeefjaren. Dit is ongunstig aangezien er sprake is van een lerarentekort. In de Lerarenagenda van 2013-2020 stelde het ministerie van Onderwijs, Cultuur en Wetenschap (OCW) dat alle beginnende docenten in 2020 een driejarig begeleidingsprogramma (inductieprogramma) moeten volgen op de werkplek. Het doel van deze inductieprogramma's is om de overgang van de lerarenopleiding naar het lesgeven soepeler te laten verlopen. Deze programma's lijken potentie te hebben om stress bij docenten te verminderen. Wetenschappelijk onderzoek naar de effectiviteit van de individuele inductie-elementen op stress van beginnende docenten was tot op heden nog niet uitgevoerd. Daarnaast is er nog weinig onderzoek gedaan naar de relatie tussen stress bij beginnende docenten en hun lesgeefgedrag en voortijdige beroepsverlating. Inzicht in deze relaties en de effectiviteit van inductie-elementen is belangrijk om te bepalen hoe we docenten goed kunnen ondersteunen zodat ze minder stress ervaren, effectief les kunnen geven en het onderwijs niet voortijdig verlaten. Daarom wordt in dit proefschrift onderzoek gedaan naar stress van beginnende middelbare school docenten in de context van inductieprogramma's en naar de relaties tussen stress van beginnende docenten, hun lesgeefgedrag en beroepsverlating.

Hoofdstuk 1: theoretische raamwerk

In hoofdstuk 1 is het theoretisch raamwerk van dit proefschrift uitgewerkt. Hierin wordt aan de hand van een conceptueel stressmodel uitgelegd hoe we het ontstaan van stress en de gevolgen van stress bij beginnende docenten zien. Daarnaast worden de onderzoeksvragen van dit proefschrift gepresenteerd.

Er bestaat geen consistente definitie van stress in de wetenschappelijke literatuur. Gegeven de vele definities van stress wordt in dit proefschrift de term stress meer gebruikt als een label om een specifiek gebied van onderzoek te vermelden. In dit proefschrift wordt stress van docenten verdeeld in: (1) stressorzaken, (2) stressreacties en (3) stressuitkomsten. Stressorzaken zijn alle aspecten van de inhoud van het werk en de werksituatie die invloed hebben op de cognitie, motivatie en emotie van de docent. Stressreacties refereren naar de mentale interpretatie van de docent wanneer zij stressorzaken ervaart en stressuitkomsten zijn de organisatorische uitkomsten die het resultaat zijn van aanhoudende stressorzaken en stressreacties.

Om de relaties tussen stressorzaken, stressreacties en stressuitkomsten te begrijpen is een analysekader geconstrueerd gebaseerd op het *Transactioneel Model van Stress* en het *Belasting-belastbaarheid model* (zie Figuur 1.1, p. 10). Stressuitkomsten zoals beroepsverlating worden hierin als het resultaat gezien van de interactie tussen een persoon (in dit geval de docent) en haar omgeving (in dit geval de school of het klaslokaal). Zoals opgemaakt kan worden uit Figuur 1.1 spelen hierbij verschillende elementen een rol. Een van die elementen is de *persoon*. Een persoon heeft bepaalde opvattingen en individuele hulpbronnen. De opvattingen van een persoon kunnen gezien worden als hoe een persoon zichzelf ziet en hoe deze persoon haar omgeving waarneemt. Opvattingen van een persoon vormen haar verwachtingen van wat er gaat gebeuren, wat zij vreest en waar zij op hoopt. In het geval van docenten heeft dit ook betrekking op het werk zelf: lesgeven en het leren van leerlingen. Individuele hulpbronnen hebben invloed op wat een persoon wel en niet kan doen. In het algemeen zijn hulpbronnen sociale, organisatorische, fysieke of psychologische aspecten die bruikbaar zijn bij het behalen van werkdoelen, het reduceren van werkbelasting en de daarbij behorende fysieke en psychologische belasting, stimuleren van ontwikkeling, leren en persoonlijke groei. Voorbeelden van individuele hulpbronnen zijn goed voor jezelf zorgen, zelfinzicht hebben en flexibel zijn.

Het volgende element dat een rol speelt in de interactie is de *omgeving*, dat in dit proefschrift betrekking heeft op de werkbelasting en de contextuele hulpbronnen. Werkbelasting zijn de organisatorische, sociale, fysieke en psychologische aspecten van het werk die continue psychologische en/of fysieke inspanning en vaardigheden vragen van een persoon. Contextuele hulpbronnen kunnen helpen om met de door stress veroorzaakte werkbelasting om te kunnen gaan. Een aantal voorbeelden hiervan zijn hulp van collega's, het hebben van een coach en steun van familie en vrienden.

Er vindt dus een interactie plaats tussen de docent en haar omgeving, dit wordt de persoon-omgeving interactie genoemd. Deze interactie leidt tot de primaire beoordeling waarbij de docent evalueert of de situatie waarin zij zich bevindt aandacht van haar vraagt en of de situatie negatief is. Bijvoorbeeld, een docent heeft als opvatting dat leerlingen het beste leren wanneer het stil is in de klas. Wanneer in haar klas een aantal leerlingen aan het kletsen zijn vraagt deze situatie om haar aandacht en wordt deze situatie als negatief ervaren. Deze situatie kan dan ervaren worden als een stressoorzaak. Daarna vindt de tweede beoordeling plaats, hierbij evalueert de docent of zij hulpbronnen heeft (individueel of contextueel) om met deze situatie om te gaan. De docent kan bijvoorbeeld van haar coach hebben geleerd om met een dergelijke situatie om te gaan.

Het volgende element is de *stressreactie*. Stressreacties kunnen fysiologisch, affectief of gedragsmatig zijn (bijv. geïrriteerd voelen, boos worden) en zijn het directe gevolg van de stressorzaken. Hulpbronnen kunnen de relatie tussen stressorzaken en stressreacties verzachten. Als de docent bijvoorbeeld het advies van haar coach gebruikt om de leerlingen succesvol weer stil te krijgen zal de docent minder spanning ervaren dan wanneer zij geen raad weet met de situatie.

De stressreacties leiden tot stressuitkomsten, dit zijn de langetermijngevolgen van aanhoudende stressorzaken en stressreacties. Hierbij kun je denken aan een docent die uiteindelijk het beroep verlaat omdat zij het klassenmanagement niet op orde krijgt.

Samengevat, dit analysekader wordt in deze dissertatie gehanteerd om meer inzicht te krijgen in de stresservaringen van beginnende docenten in de context van inductieprogramma's en naar de relatie tussen stress van beginnende docenten, hun lesgeefgedrag en voortijdige beroepsverlating. Om hier een duidelijk beeld van te krijgen zijn vier deelvragen geformuleerd:

1. Hoe kan stress van beginnende docenten worden gemeten?
2. Hoe is stress van beginnende docenten gerelateerd aan hun lesgeefgedrag en voortijdige beroepsverlating?
3. Wat zijn de longitudinale effecten van inductie-elementen op stress van beginnende docenten?
4. Wat zijn de verschillen tussen erg gestreste beginnende docenten die les zijn blijven geven en erg gestreste beginnende docenten die binnen vijf lesjaren zijn gestopt met lesgeven?

Hoofdstuk 2: Hoe kan stress bij beginnende docenten worden gemeten?

In dit hoofdstuk staat de vraag centraal: hoe kan stress van beginnende docenten gemeten worden. In het hoofdstuk worden twee studies beschreven. In studie 1 werd allereerst onderzocht welke stressorzaken vaak voorkomen in de wetenschappelijke literatuur over stress bij docenten. Vervolgens werd gekeken naar de inclusie van deze stressorzaken in bestaande stressvragenlijsten. Omdat geen enkele stressvragenlijst al deze stressorzaken bevatte, is gekozen om een robuuste en veel (internationaal) gebruikte stressvragenlijst als basis te kiezen voor ons onderzoek naar stress bij beginnende docenten, de Vragenlijst Beleving en Beoordeling van de Arbeid (VBBA). Deze stressvragenlijst bestaat uit 201 vragen die gegroepeerd zijn in 27 schalen (groepen van vragen over hetzelfde onderwerp). Met een steekproef van 356 beginnende docenten werd onderzocht welk van de schalen relevant waren voor het meten van stress bij beginnende docenten. Irrelevante schalen werden verwijderd. Daarna werd op de relevante schalen Mokken-schaal-item-reductie toegepast om het aantal vragen in de vragenlijst te reduceren. Vervolgens zijn de stressorzaken die relevant bleken uit de literatuur om stress bij docenten te onderzoeken toegevoegd aan de vragenlijst. Ook op deze schalen werd Mokken- schaal-item-reductie toegepast waarna de nieuwe versie van de stressvragenlijst ontstond: de Vragenlijst Beleving en Beoordeling van de Arbeid- Beginnende Docenten (VBBA-BD).

Studie 2 focust op het testen van de nieuwe versie van de vragenlijst. Uit de resultaten van hoofdstuk 1 blijkt dat de VBBA-BD een betrouwbaar en valide instrument is om stressorzaken en stressreacties bij beginnende docenten te meten.

Hoofdstuk 3: Hoe is stress van beginnende docenten gerelateerd aan hun lesgeefgedrag en beroepsverlating?

In hoofdstuk 3 worden de relaties tussen stressorzaken, stressreacties (spanning, negatieve emoties en ontevredenheid) en stressuitkomsten (lesgeefgedrag en voortijdig beroepsverlating) van beginnende docenten onderzocht. 143 beginnende docenten deden mee aan deze studie. De drie grootste stressorzaken bij deze docenten zijn: (1) een hoge psychologische werkdruk (bijv. veel lessen), (2) negatieve leerlingaspecten (slechte docent-leerling relaties en gedragsproblemen van leerlingen) en (3) negatieve sociale aspecten (bijv. slechte relaties met collega's). We vonden dat hoe meer psychologische werkdruk beginners ervaarden hoe meer spanning dit opleverde. Daarnaast dat hoe meer negatieve leerlingaspecten ze ervaarden hoe meer spanning, negatieve emoties en ontevredenheid dit opleverde. Tenslotte, hoe meer negatieve sociale aspecten de beginners ervaarden hoe meer dit leidde tot ontevredenheid.

Ook blijken stressreacties sterk samen te hangen met stressuitkomsten. Hoe sterker de beginners negatieve emoties ervaarden hoe minder goed ze waren in het lesgeven zelf. Tenslotte, hoe meer ontevreden de beginners waren hoe waarschijnlijker het was dat ze het beroep gingen verlaten.

Hoofdstuk 4: Wat zijn de longitudinale effecten van inductie-elementen op stress van beginnende docenten?

De effecten van de volgende vier inductie-elementen op de stressbeleving van docenten zijn onderzocht: (1) vermindering van werkdruk, (2) het ondersteunen van enculturatie (gewenningsproces) in de school en het schoolbeleid, (3) het ondersteunen van professionalisering en (4) het ondersteunen van effectief lesgeefgedrag. Enculturatie is het proces waarbij de startende leraar in de beroeps- en schoolcultuur van de school wordt opgenomen en actief deel uit gaat maken van de beroepsgroep en schoolgemeenschap. Het doel van het ondersteunen van enculturatie is dat de docent zich thuis gaat voelen in het beroep en snel haar weg vindt binnen de school, zich opgenomen voelt en een bijdrage gaat leveren aan de verdere ontwikkeling van de school.

Daarnaast werd de invloed van deze inductiearrangementen op de toename of afname van stress van de beginnende docenten over een periode van drie jaar onderzocht. 393 beginnende docenten deden mee aan dit onderzoek en zijn over een periode van drie jaar gevolgd. Beginnende docenten die werkdrukreductie hadden tijdens hun eerste schooljaar ervaarden minder werkdruk, minder negatieve sociale aspecten, minder spanning, minder negatieve emoties en ontevredenheid aan het eind van dat schooljaar. Daarnaast hoe de beginners gewend waren geraakt aan de school (enculturatie) tijdens hun eerste schooljaar, hoe lager de ontevredenheid van deze beginners in de twee daaropvolgende schooljaren. Ook werd gevonden dat hoe meer ondersteuning voor effectief lesgeefgedrag werd ervaren tijdens het eerste schooljaar, hoe minder ontevredenheid en negatieve emoties de beginners ervaarden aan het eind van dat schooljaar. De ondersteuning van

professionalisering bleek in ons onderzoek niet effectief de stress van beginnende docenten te beïnvloeden.

Hoofdstuk 5: Wat zijn de verschillen tussen erg gestreste beginnende docenten die les blijven geven en erg gestreste beginnende docenten die binnen vijf lesjaren voortijdig stoppen met lesgeven?

Om meer inzicht te krijgen in de manier waarop beginnende docenten stress ervaren, waarom ze stress ervaren en hoe ze ermee omgaan (coping) is tot slot een negental zeer gestreste docenten diepgaand bevraagd over hun ervaringen. Vijf van deze docenten zijn nog werkzaam in het beroep en vier hebben het beroep voortijdig verlaten.

Al deze beginnende docenten ervoeren veel stress door de hoge werkdruk die ze ervoeren. Deze hoge werkdruk ontstond doordat ze weinig tot geen ervaring hadden met de taken die van hun docent als docent verwacht werden zoals: het plannen van lessen, het maken en nakijken van toetsen en mentor van een klas zijn. Daarnaast speelde het bij enkelen ook een rol dat ze taken graag heel goed wilden voltooien waardoor ze de lat voor zichzelf veelal te hoog legden. Een andere stressfactor voor de beginnende docenten was dat de ondersteuning die op hun school d.m.v. de inductie-elementen aangeboden werd niet correct werd geïmplementeerd waardoor ze niet of nauwelijks de ondersteuning kregen aangeboden die ze nodig hadden. Intervisiebijeenkomsten werden bijvoorbeeld georganiseerd op momenten dat de docenten vrij hadden. De werkdrukreductie van 20% op de lesgeefuren werd ingezet op de taakuren (die veel minder waren) of werd omgezet in extra loon in plaats van werkdrukreductie. Ook hadden sommige beginners een coach die nauwelijks tijd voor hen had waardoor ze hun ervaringen, vragen en zorgen niet konden bespreken. Voor sommigen gold ook dat ze hun ervaringen, vragen en zorgen niet met hun collega's of leidinggevende konden delen.

Alle beroepsverlaters, in tegenstelling tot maar 1 van de 4 blijvers, ervoeren naast bovengenoemde stressorzaken ook stress door het gedrag van hun studenten. Klassenmanagement bleef voor alle beroepsverlaters een issue ook nadat ze hulp aangeboden hadden gekregen. Daarnaast hadden ze slechte pedagogische relaties met (enkele van) hun leerlingen wat zorgde voor spanningen, negatieve emoties en ontevredenheid.

De beroepsverlaters en blijvers, die allemaal op scholen lesgeven waar inductieprogramma's aangeboden werden, verschilden met betrekking tot hoe ze met de stress omgingen. De blijvers ervoeren en gebruikten meer hulpbronnen in vergelijking met de beroepsverlaters. Hulpbronnen die door de beginners werden genoemd waren grenzen aangeven en proactief zijn met betrekking tot het aantal werkuren, gedrag van studenten en hun emotionele betrokkenheid. Maar ook sporten werd als hulpbron genoemd. Alle blijvers sportte regelmatig na hun werk, de beroepsverlaters deden dit niet. Andere hulpbronnen die genoemd werden waren het gebruikmaken van hun sociale netwerk, coaching en goede banden hebben met hun leerlingen. Opvallend was dat veel van de beginners het aantal werkuren verminderden om de werkdruk te verlagen. Dat geeft wellicht aan dat een voltijd baan in het

onderwijs voor beginners niet houdbaar is. Wat ook duidelijk naar voren komt is dat goede docent-leerlingrelaties cruciaal zijn voor het behoud van docenten in het onderwijs. De blijvers omschreven warme docent-leerlingrelaties en hoe deze pedagogische relaties zwaarder wegen dan de stress die ze van hun baan krijgen. De beroepsverlaters daarentegen omschreven de banden met (enkele van) hun leerlingen als slecht en dat deze negatieve relaties leidde tot spanning, negatieve emoties, ontevredenheid en uiteindelijk tot het verlaten van de beroepsgroep.

Tenslotte vonden we duidelijke verschillen in de opvattingen van blijvers en de beroepsverlaters met betrekking tot hun bekwaamheid en met betrekking tot lesgeven en het leren van hun leerlingen. De blijvers hadden een sterk gevoel van bekwaamheid en hadden plezier in het lesgeven. Ze zagen lesgeven als het organiseren van het leren van leerlingen waarbij de focus lag op het begrijpen van hoe leerlingen leren. De beroepsverlaters daarentegen hadden een lager gevoel van bekwaamheid en omschreven lesgeven meer als een transitie van kennis en hadden externe attributies: de leerlingen zelf waren vooral verantwoordelijk voor hun eigen leren.

Hoofdstuk 6: conclusies en discussie

Op basis van de empirische studies worden vier algemene conclusies getrokken die de individuele hoofdstukken overstijgen.

Conclusie 1: lesgeven wordt als stressvol ervaren door veel beginnende docenten

Dit komt met name door de hoge werkdruk, het gedrag van leerlingen en negatieve sociale aspecten (bijv. slechte relatie met collega's). Ondanks de voorbereiding op het beroep tijdens de lerarenopleiding worden veel taken (bijv. lessen plannen, lessen geven, toetsen maken en nakijken, mentor- en oudergesprekken) door beginnende docenten als nieuw ervaren of hebben ze er nog weinig ervaring mee waardoor het langer duurt om ze uit te voeren. Wanneer nieuwe docenten de volledige verantwoordelijkheid krijgen om meerdere klassen per dag les te geven, maar hier nog niet veel ervaring mee hebben en onder andere nog aan het leren zijn hoe ze effectief kunnen lesgeven, is dit stressvol. Leraar zijn vereist een bepaald niveau van professionele (weten hoe je effectief moet lesgeven) en organisatorische (weten hoe je binnen een school moet werken) geletterdheid die de meeste beginnend docenten nog niet hebben. Zowel beginners als scholen lijken de complexiteit en de duur van het leren beheersen van het beroep van leraar te onderschatten.

Conclusie 2: de relaties tussen stressorzaken, stressreacties en stressuitkomsten

Ons onderzoek richt zich op de belangrijkste oorzaken van stress bij beginnende docenten en laat zien dat hoge werkdruk leidde tot gevoelens van spanning en dat negatieve sociale aspecten leidde tot gevoelens van onvrede. Daarnaast vonden we dat negatieve leerlingaspecten leidde tot negatieve emoties, spanning en onvrede. Bovendien vonden we dat gevoelens van onvrede sterk gerelateerd zijn

aan het vroegtijdig verlaten van het beroep. Daarnaast dat negatieve emoties sterk gerelateerd zijn aan slechter lesgeven. Met andere woorden, de ervaring van hoge stress bij beginners moet serieus genomen worden vanwege de negatieve gevolgen.

Conclusie 3: inductieprogramma's kunnen stress van beginnende docenten reduceren wanneer inductie-elementen correct worden geïmplementeerd.

Het merendeel van de inductie-elementen bleek te helpen om bij beginners stress te reduceren. Wat hierbij van belang is dat het correct moet worden uitgevoerd.

Op een aantal scholen werden (enkele) inductie-arrangementen incorrect geïmplementeerd.

Bijvoorbeeld werkdrukreductie, een reductie van 20% op de lesgeefuren van een beginnend docent, werd geïmplementeerd als reductie op de taakuren van de docent of als extra salaris.

Intervisiebijeenkomsten werden georganiseerd op momenten dat de docenten andere verplichtingen of een vrije dag hadden. Daarnaast gold voor enkele docenten dat hun coach niet of nauwelijks tijd voor hun had terwijl ze wel graag gecoacht zouden willen worden. Met andere woorden, het aanbieden van een inductieprogramma alleen is niet genoeg, de elementen moeten juist worden geïmplementeerd om de beginnende docenten daadwerkelijk te kunnen ondersteunen.

Conclusie 4: beginnende docenten blijven in het beroep als ze goed met de stress kunnen omgaan, goed worden ondersteund en lesgeven zien als het organiseren van het leren van leerlingen

Effectieve manieren die de beginners gebruikte om met de stress om te gaan waren onder andere: het stellen van grenzen aan het gedrag van de studenten, goede relaties met studenten hebben, proactief zijn, emotionele grenzen stellen en het gebruik maken van hun sociale netwerk. Daarnaast waren afspraken met hun coach, observatie en feedback door de coach en werkdruk vermindering effectief. Bovendien hadden de docenten die docent bleven een hoog gevoel van bekwaamheid en beschreven ze het lesgeven in termen van het organiseren van leren van hun leerlingen.

Beperkingen van het onderzoek in dit proefschrift

Een eerste beperking betreft de representatie van de steekproeven. In hoofdstuk 1 werden twee steekproeven gebruikt, waarvan de docenten werkzaam waren op scholen uit de noordelijke provincies van Nederland. Deze steekproeven verschilden van het nationale bevolkingsprofiel met betrekking tot de denominatie, de verstedelijking en de sociaal-economische achtergrond. Daarnaast was in de steekproef die in hoofdstuk 3 werd gebruikt het aantal vrouwelijke docenten (57.3%) hoger dan in de landelijke populatie van middelbare docenten (46.7%; Ministerie van Onderwijs, Cultuur en Wetenschap, 2014) en ook het percentage gekwalificeerde docenten was hoger (100%) dan in de landelijke populatie (88.2%). Desalniettemin zien we deze verschillen niet als problematisch omdat ze

klein zijn en onze resultaten overeenkomen met eerder onderzoek en daarom als representatief kunnen worden gezien voor onderzoek naar stress van beginnende docenten.

Deelname aan de onderzoeken in dit proefschrift op vrijwillige basis. Daarom zijn er wellicht heel gestreste docenten geweest die niet de energie hebben gehad om de vragenlijsten in te vullen. Dit is ten dele ondervangen doordat we in de laatste studie negen docenten die veel stress ervaarden hebben geïnterviewd en we daardoor daar toch een beeld van hebben gekregen.

Een derde beperking heeft betrekking op hoe de inductieprogramma's op de scholen werden uitgevoerd. Wanneer een school een inductieprogramma voor beginnende docenten aanbiedt betekent dit, zoals eerder beschreven, niet automatisch dat de inductie-elementen correct worden geïmplementeerd. Hiermee moet rekening worden gehouden bij het interpreteren van de resultaten in hoofdstuk 4. In hoofdstuk 4 wordt de invloed van de inductie-elementen op stress bij de beginnende docenten onderzocht. Hierbij is alleen ondervraagd of het inductie-element aan de beginnende docent werd aangeboden, niet in hoeverre dit element correct is geïmplementeerd. Een suggestie voor vervolgonderzoek is daarom om niet alleen te bevragen of het is aangeboden, maar ook hoe het is aangeboden en in hoeverre de beginner gebruik heeft gemaakt van dit inductie-element.

Een laatste beperking betreft de timing en de frequentie waarmee de data is verzameld. In hoofdstuk twee, drie en vier van dit proefschrift was de data van de beginnende docenten verzameld aan het eind van het schooljaar. Het eind van het schooljaar is vaak de meest stressvolle periode in het jaar voor docenten en daarmee zou de data die op dat moment verzameld is wellicht niet helemaal representatief zijn voor andere momenten van het schooljaar. Daarnaast kan het ook zo zijn dat de stresslevels van een docent binnen dezelfde periode varieert. Bij het interpreteren van de resultaten van hoofdstuk 4, waarin stress over een periode van drie jaar gemeten is, moet daarmee rekening worden gehouden.

Implicaties voor de praktijk

Aan het eind van hoofdstuk 6 zijn implicaties van dit proefschrift voor de praktijk geformuleerd. Allereerst willen we scholen aanbevelen om inductieprogramma's aan te bieden aan de beginnende docenten op hun school. Hierbij is het belangrijk om de elementen correct te implementeren. Werkdrukreductie kan worden geïmplementeerd door reductie van 20% op de lesgeefuren van de beginnende docenten tijdens de eerste drie lesgeefjaren te geven. Daarnaast door de docenten geen mentor van een klas te laten zijn tijdens hun eerste lesgeefjaar.

Ondersteuning van effectief lesgeefgedrag kan worden gegeven door de beginnende docent regelmatig te observeren en van feedback te voorzien. Daarnaast, door de beginner van een coach te voorzien die regelmatig met de docent afspreekt om opvattingen (over lesgeven en het leren van leerlingen), ervaringen, vragen en zorgen te bespreken.

Tenslotte kan het ondersteunen van enculturatie in de school gedaan worden door de docent te informeren over de schoolcultuur en het schoolklimaat.

Daarnaast is ons advies aan docenten om een gezonde balans tussen werk en privé na te streven. Dit kan bereikt worden door: (1) duidelijke grenzen aan te geven met betrekking tot de hoeveelheid werkuren, bijvoorbeeld door te stoppen nadat je gecontracteerde uren erop zitten, (2) tijd te nemen op weer op te laden, bijvoorbeeld door niet in de weekenden te werken en door sporten onderdeel te maken van de werkweek om 'je hoofd leeg te maken', (3) gebruik te maken van een sociaal netwerk, bijvoorbeeld door ervaringen te delen met andere beginnende docenten, collega's, vrienden of familie, en (4) werkdrukreductie. Daarnaast kunnen de volgende hulpbronnen helpen bij het omgaan met ongewenst leerlinggedrag: (1) duidelijke grenzen stellen met betrekking tot het leerlinggedrag in de klas, (2) hulp zoeken bij de coach, bijvoorbeeld door geobserveerd te worden en feedback te ontvangen, en (3) gebruik te maken van een sociaalnetwerk om je ervaringen, zorgen en vragen mee te delen.

Dankwoord

Het dankwoord, misschien wel het belangrijkste en waarschijnlijk het meest gelezen deel van mijn proefschrift. Vijf jaar heb ik mogen werken aan mijn onderzoek over stress bij beginnende docenten in het voortgezet onderwijs. Dit alles was nooit mogelijk geweest zonder de ondersteuning van velen van jullie.

Voor diegene die alleen het dankwoord leest, wil ik je toch iets meegeven van de rest van mijn proefschrift. We blijven daarom in het thema 'stress' en ik schrijf mijn dankwoord aan de hand van het stressmodel dat in mijn proefschrift veel aan bod komt; het Job Demands-Resources model van Bakker en Demerouti. Dit model gaat ervan uit dat zowel negatieve stress (bijvoorbeeld frustratie), als positieve werkgerelateerde resultaten (bijvoorbeeld het voltooien van dit proefschrift), ontstaan door een interactie van het individu (in dit geval ik) en zijn/haar omgeving (in dit geval jullie). Er moet volgens het model een balans zijn tussen de uitdagingen die iemand krijgt en de hulpbronnen die hij/zij daarbij kan gebruiken. Is er genoeg uitdaging en genoeg hulp dan volgen positieve werkgerelateerde uitkomsten. Is er te weinig uitdaging, of te weinig ondersteuning bij de uitdagingen dan ontstaat negatieve stress.

Uitdaging was er zeker genoeg. Het verzamelen van heel veel data bij docenten en leerlingen, het trainen van docenten om data te verzamelen, het analyseren van data, het schrijven van academische papers, pogingen om die papers te publiceren en het presenteren van de resultaten op nationale en internationale congressen. Oh ja, en toen was er nog dat ene incidentje waardoor ik maandenlang mijn hoofd niet kon gebruiken. Maar gelukkig waren er voor mij ook meer dan genoeg hulpbronnen die ik hieronder graag wil benoemen.

Het ministerie en de vele scholen

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ondersteuning van groot belang is bij het begeleiden van een PhD-student. Ridwan, wat heb je mij statistisch uitgedaagd. Waar ik in mijn eerste PhD-jaar nog angstvallig de basisbeginselen van statistiek ging herhalen (thank you Andy Field, you are a legend), draaide ik in mijn laatste jaar blind multivariate latente groeicurve analyses. Ik heb je soms vervloekt als je weer met een nieuw softwarepakket of nieuwe analyses kwam aanzetten, maar achteraf kan ik je alleen maar dankbaar zijn voor het feit dat je me zo hebt uitgedaagd. Dat vloeken deed ik overigens vaak bij Peter. Peter, ondanks dat jij officieel geen begeleider van me was heb je mij ontzettend geholpen bij mijn statistische knooppunten, dank daarvoor! Klaas, mijn promotor, professor, baas. Klaas, jij zag in mij iets wat ik in mijzelf niet zag, een goede onderzoeker die ook nog eens sociaal is. Ik durf met zekerheid te zeggen dat zonder jou dit proefschrift er niet was geweest. Je gaf mij vertrouwen in mijn eigen kunnen, veel vrijheid en goede koffie. Wat ik enorm aan jou waardeer is je toegankelijkheid, informele houding, humor en onuitputtelijke vertrouwen dat het wel goed komt. Naast de wetenschappelijke kennisoverdracht zorgde je er ook voor dat ik me staande kon houden in het wetenschappelijke wereldje. Met als mooiste herinnering je truc tijdens een after-party van een congres. *“Je loopt gewoon mee de kroeg in met de rest, loopt een rondje en loopt dan weer naar buiten. Iedereen is zat, niemand heeft het door, kun jij morgen weer helder om 09:00 uur presenteren”* en zo geschiedde.

Succesmomentjes

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About the author

Ruth Harmsen was born in Almelo on April 17, 1987. She graduated from the pre-university education (vwo) at 'CSG Het Noordik' in 2005, where after, she moved to Groningen to study psychology at the University of Groningen. During her final year of her Bachelor's degree she received a scholarship (Erasmusbeurs) to study abroad at the University of Surrey in Guildford (United Kingdom) where she studied psychology for one semester. Once she finished her Bachelor's degree she went traveling for six months to explore Asia, Australia and South America. In 2010 she attended the Master programme 'Instruction, Learning and Developmental Psychology' at the University of Twente from which she graduated cum laude in 2011. She then worked abroad for two years at Bristol Grammar School, before returning to the University of Twente to become a Junior Researcher in 2013 for nine months. In 2014 she started her PhD at the University of Groningen. The results of her PhD project are presented in this dissertation.

List of publications

Articles in peer-reviewed journals

- Harmsen, R., Helms-Lorenz, M., Maulana, R., & van Veen, K. (2019). The longitudinal effects of induction on beginning teachers' stress. *British Journal of Educational Psychology*, 89, 259-287. doi: 10.1111/bjep.12238
- Harmsen, R., Helms-Lorenz, M., Maulana, R., & van Veen, K. (2018). The relationship between beginning teachers' stress causes, stress responses, teaching behaviour and attrition. *Teachers and Teaching*, 24(6), 626-643.
doi:10.1080/13540602.2018.1465404
- Harmsen, R., Helms-Lorenz, M., Maulana, R., van Veen, K., & van Veldhoven, M. (2018). Measuring general and specific stress causes and stress responses among beginning secondary school teachers in the Netherlands. *International Journal of Research & Method in Education*, 1-18. doi:10.1080/1743727X.2018.1462313
- Lazonder, A. W., & Harmsen, R. (2016). Meta-analysis of inquiry-based learning: Effects of guidance. *Review of Educational Research*, 86(3), 681-718.
doi:10.3102/0034654315627366
- Van der Meij, H., Van der Meij, J., & Harmsen, R. (2015). Animated pedagogical agents effects on enhancing student motivation and learning in a science inquiry learning environment. *Educational Technology Research and Development*, 63(3), 381-403.

Manuscript submitted for publication

- Harmsen, R., van Veen, K., & Verkade, A. (2019) Stayers and leavers: investigating stress causes, coping resources and beliefs of stressed beginning secondary school teachers. Manuscript submitted.

Conference contributions

- Harmsen, R., Verkade, A., Van Veen, K. (2019, July). *Wat hebben beginnende docenten nodig om stressvolle situaties de baas te blijven? [What do beginning teachers need to cope with their work stress?]*. In (Chair), *Beleven beginnende docenten gelijke en gepaste begeleiding op de werkvloer? [Do beginning teachers experience apt support at their job?]*. Symposium conducted at the Onderwijs Research Dagen [Educational Research Days], Heerlen, the Netherlands.
- Harmsen, R., Helms-Lorenz, M., Maulana, R., & Van Veen, K. (2017, June). Stressontwikkeling bij beginnende docenten en de invloed van inductiearrangementen [Beginning teachers' stress development and the influence of induction arrangements]. In G. Schellings (Chair), *De begeleiding van startende leraren: concerns van starters en het leren van begeleiders [Supporting beginning teachers: their concerns and how their supervisors learn]*. Symposium conducted at the Onderwijs Research Dagen [Educational Research Days], Antwerp, Belgium.
- Harmsen, R., Maulana, R., Helms-Lorenz, M., & Van Veen, K. (2017, April). *Beginning teachers' perceived stress: Causes, responses, and relationships with teaching behaviour and attrition*. Paper presented at the annual meeting of the American Educational Research Association (AERA), San Antonio, Texas, United States.
- Harmsen, R., Helms-Lorenz, M., Maulana, R., Van de Grift, W. (2015, June). *Stressoorzaken, school-/beroepsverlating en pedagogisch-didactisch handelen [Stress causes, attrition and teaching quality]*. Poster presented at the Onderwijs Research Dagen [Educational Research Days], Leiden, the Netherlands.
- Harmsen, R., Helms-Lorenz, M., Maulana, R., & Van de Grift, W., (2014, November). *Refinement and evaluation of a questionnaire measuring stress: A Rasch modelling approach*. Round table session at the Interuniversitair Centrum voor Onderwijswetenschappen (ICO) International Fall school, Blankenberge, Belgium.
- Harmsen, R., & Lazonder, A. W. (2014, June). *Ondersteuning voor onderzoekend leren bij kinderen en volwassenen: Een meta-analyse [Supporting Inquiry Learning: A Meta-Analysis]*. In J. Van Driel (Chair), *Hulp nodig? Het effectief ondersteunen van onderzoekend leren [Need help? Supporting Inquiry Learning]*. Symposium conducted at the Onderwijs Research Dagen [Educational Research Days], Groningen, the Netherlands.
- Van der Meij, H., Van der Meij, J., & Harmsen, R. (2013, August). *Supporting students' motivation and learning with an Animated Pedagogical Agent*. Symposium conducted

at the European Association for Research on Learning and Instruction (EARLI),
Munich, Germany.

Van der Meij, H., Van der Meij, J., & Harmsen, R. (2011, September). *Animated Pedagogical Agents: Do they enhance student motivation and learning in inquiry learning*. Poster presented at the European Association for Research on Learning and Instruction (EARLI), Exeter, England.

Other research activities

Harmsen, R. (2017). *Zo verminder je stress bij beginnende docenten*. Article in the teacher magazine *Didactief*.

Harmsen, R. (2017). Presentation at the opening session of the Onderwijs Research Dagen [Educational Research Days]. *Begeleidersprijs 2017*. Antwerp, Belgium.

Harmsen, R. (2017). Presentation at the opening of the pre-conference of the Onderwijs Research Dagen [Educational Research Days]. *VPO pre-conference 2017*. Antwerp, Belgium.

Board activities

2017-2018; Doctoral and Early Career Network representative World Education Research Association (WERA)

2016-2017; Chair VOR Promovendi Overleg (VPO)

2015-2016; General board member VPO