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**The Development of Strain and Resources in Beginning Teachers:
Predictors, Interrelations, and Individual Differences**

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1 Theoretical Background

Being a teacher seems to involve quite a risk nowadays. Not only has the media increasingly reported on burnout and stressed teachers within the last decade (Brenninkmeijer, Van Yperen, & Buunk, 2001), further research has confirmed these claims and asserted that working as a teacher is particularly stressful, leading to strain and decreased psychological and physiological well-being (de Heus & Diekstra, 1999; Johnson et al., 2005). In comparison to other occupations, teachers report the highest level of self-perceived work-related strain (Hakanen, Bakker, & Schaufeli, 2006; Schaufeli, 2003; Smith, Brice, Collins, Matthews, & McNamara, 2000; Unterbrink et al., 2007). As a consequence of this high strain, which leads to high levels of burnout when experienced over time (Evers, Tomic, & Brouwers, 2004), teacher attrition occurs more frequently (Friedman, 1993; Schaufeli & Enzmann, 1998; Tsouloupas, Carson, Matthews, Grawitch, & Barber, 2010). This is especially true for beginning teachers—up to 50% leave the profession within the first five years (see Chang, 2009; Hong, 2010; Ingersoll, 2012). These high attrition rates of beginning teachers are associated with high financial costs for further recruiting and managing teachers as well as disruptions of program continuity and planning, which impacts school effectiveness (Hong, 2010).

The studies presented in this paper analyze teacher education and well-being in Germany, where attrition rates are lower than the international average (OECD, 2005). Most likely, the low attrition rates of beginning teachers in Germany are due to the benefits of high income and job security as well as the high job specialization in Germany's educational system. However, there is evidence for an increase of strain and burnout throughout the first practical experiences for beginning teachers in Germany (Christ, 2004; Klusmann, Kunter, Voss, & Baumert, 2012), and attrition is one possible symptom of strain (Friedman, 2006; Jalongo & Heider, 2006). Further, Germany's educational system suffers from high premature retirement (Bauer et al., 2007). The reasons for this retirement are predominately due to psychiatric and/or psychosomatic disorders—typical symptoms of high occupational strain (Hastings & Bham, 2003). These symptoms develop over a long time period, indicating that the strain must have been experienced over a long time. Moreover, there is an increasing lack of qualified teachers in Germany (Eurydice Network, 2012), making it even more important to investigate and prevent teacher attrition in beginning teachers.

Thus, the teacher situation in Germany represents a worldwide phenomenon, allowing us to expect that the conclusions we draw from our studies can be generalized to an international level. The difficult first years of teaching are internationally referred to as “reality shock” (Friedman, 2000; Klusmann et al., 2012).

When looking at the reasons for high strain or reality shock in beginning teachers, researchers have identified classroom disturbances as a major stressor (e.g., Carson, Plemmons, Templin, & Weiss, 2011; Evertson & Weinstein, 2006; Rieg, Paquette, & Chen, 2007). The ability to manage or prevent classroom disturbances or student misbehavior is termed “classroom management skills” (Evertson & Weinstein, 2006). Additionally, teachers’ self-beliefs represent the central resource that drives teacher perceptions of stressors and the strategies they employ in attempting to manage them (Parker, Martin, Colmar, & Liem, 2012).

Hence, we propose teacher self-efficacy, particularly in classroom management, as an important resource to prevent strain. Thus far, however, research has focused primarily on how classroom management strategies affect teachers’ quality of instruction and thereby, among other outcomes, students’ achievement (for an overview, see Wang, Haertel, & Walberg, 1993). The studies presented in this paper contribute to this literature by further emphasizing the importance of classroom management skills in decreasing classroom disruptions as a prerequisite for high-quality instruction.

Another major element in the literature demonstrates that successful teachers perceive less strain and experience higher levels of well-being (Klusmann, Kunter, Trautwein, Lüdtke, & Baumert, 2008). To date, results on the relationship of teacher self-efficacy and strain or burnout are inconsistent (e.g., Brouwers & Tomic, 1999, 2000; Schwarzer & Hallum, 2008). Our studies aim to connect to these research findings by further analyzing the importance of beliefs in one’s own classroom management skills for decreasing classroom disruptions as a prerequisite step to engendering less strain and higher well-being.

In addition, we attempt to show how stress levels can be reduced to prevent reality shock. Our studies aim to show that good classroom management skills lead to higher well-being. Thus, if higher well-being is related to good classroom management skills, these two research strands are highly interdependent and should not be considered independently of each other, as has been the case thus far

(Klusmann et al., 2008). Further, there is still a need to investigate individual differences in the development of strain and burnout, as job stress will not lead to burnout for everyone (Carson et al., 2011), and to investigate the development of teacher self-efficacy (Pas, Bradshaw, & Hershfeldt, 2012) as well as the relationship of self-efficacy and burnout (Hultell, Melin, & Gustavsson, 2013).

The present studies provide a stepwise approach to further investigate the occupational situation of beginning teachers regarding strain and personal resources. The first study deals with the change of emotional exhaustion and teacher self-efficacy in beginning teachers. The question is whether these changes are interrelated and can be predicted by other variables, such as professional knowledge.

The second and third study further detail the stress development process of beginning teachers by attempting to detect individual differences and mediating variables within the stress development process. That is, a moderated mediation is proposed where self-efficacy in classroom management predicts emotional exhaustion via classroom disturbances, but the strength of this prediction depends on the levels of self-efficacy in classroom management. The fourth and last study supplements these observational studies with an experimental approach. Here, the classroom management skills of beginning teachers are actively manipulated by providing classroom management training and comparing its long-term effects on classroom management skills and well-being to those of stress management training or no training at all. However, before further elaborating on the four studies of this dissertation, the following sections provide a short theoretical and empirical review of teachers' strain and resources as well as their development and interrelation. Based on this review, we derive the research questions.

1.1 Teachers' Strain

Due to the high attrition rates of beginning teachers (Ingersoll, 2012) and research indicating increasing stress levels after the first teaching experiences (Christ, 2004, Klusmann et al., 2012), it is of particular importance to investigate the occupational situation of beginning teachers. The identification of potential reasons for and consequences of beginning teachers' strain and its development will allow for a theoretical explanation of the reality shock phenomenon. Further, in a following step based on these findings, it will be possible to identify resources and measures that can be implemented to prevent the development of strain. In line with several

other stress researchers' assumptions (for an overview, see Bakker & Demerouti, 2007), the following studies define job strain as a "result of a disturbance of the equilibrium between the demands employees are exposed to and the resources they have at their disposal" (Bakker & Demerouti, 2007, p. 310). Thus, job stressors or demands per se are not valued as negative; it is the inability to adequately deal with them which leads to a decrease in well-being.

Beginning Teachers' Major Life Transition and Reality Shock

The job entry phase of beginning teachers has been regarded as a phase of a major life transition (Klusmann et al., 2012; Tynjälä & Heikkinen, 2011). Teacher education in Germany, as opposed to many other countries, includes an additional element of teacher education, the so-called "referendariat," the goal of which is to bridge the gap of university education and employment as an actual teacher. The *referendariat* is an induction program to prepare teacher candidates for their role as teachers and is characterized by a relatively strong integration of practical and theoretical elements (Kunter, Scheunpflug, & Baumert, 2011). Thus, German teacher education consists of two phases—the time at university as well as the *referendariat*. During the university phase (four to five years), student teachers attend general courses on psychology, pedagogy, sociology, and so forth, and study at least two teaching subjects such as Mathematics and Biology. The second phase (one to two years), as mentioned above as the *referendariat*, is the practical training phase. This practical training phase is the focus of this dissertation and our associated studies. In this phase, teacher candidates attend courses in general principles and methods of teaching and in specific methods of teaching their subjects (six to eight hours per week) in special teacher colleges. Concurrently, they are allocated to schools where, after observing other teachers' instructions, they gradually start to teach their first lessons independently (around 10 hours a week) after approximately two to six months.

However, international research indicates that, regardless of the differences in the organizational aspects of teacher preparation programs worldwide, all teacher preparation programs are alike in that beginning teachers learn to employ their theoretical knowledge within a practical context and seem to have difficulties with this transition (e.g., Friedman, 2000; Klusmann et al., 2012; Stokking, Leenders, De Jong & Van Tartwijk, 2003; Veenman, 1984).

This challenging time is often referred to as reality shock (Huberman, 1998; see also Study IV) or praxis shock (Veenman, 1984), which leads to the collapse of the ideals or expectations developed during teacher education following a teacher's first confrontation with classroom reality (Friedman, 2000). Stokking et al. (2003) points out three major reasons for this shock and subsequent teacher burnout: working as a teacher might be too demanding; beginning teachers have false expectations of classroom reality; and there is a lack of sufficient preparation for beginning teachers. Further, they conclude that adequate teacher preparation can reduce the negative effects of the first two reasons and prevent the last.

Friedman (2000) proposes that reality shock consists of different phases. After an initial "slump" or the shock itself, exhaustion or fatigue follows as a reaction to this slump. Eventually, an adaptive phase can occur after the beginning teacher lowers his expectations of his own abilities (Friedman, 2000). However, predominantly, the results of experiencing the reality shock are strain or burnout (Klusmann et al., 2012; Veenman, 1984).

Burnout

Burnout reflects a prolonged and occupational-specific form of strain as the result of repeated, long-term exposure to stressors. To date, a common definition and an established and empirically testable theoretical mode of burnout are still missing (Byrne, 1999). However, according to the most common conceptualization of Maslach, Jackson, and Leiter (1996; see also Maslach, 1999), burnout consists of three dimensions: *emotional exhaustion*, meaning feelings of being emotionally drained and fatigued; *depersonalization*, meaning a callous or cynical attitude—in this case, mostly towards the teacher's students; and reduced *personal accomplishment*, meaning a person's negative evaluation of his own abilities and achievements. This three-dimensional factor structure was validated in numerous studies for various subpopulations and across occupations (Bakker, Demerouti, & Schaufeli, 2002; Byrne, 1994, 1999; Leiter & Schaufeli, 1996). Indeed, the multidimensional structure of burnout has also been successfully applied to teaching populations (Byrne, 1991; 1994). Teacher burnout has been linked to negative outcomes such as illness, turnover, and attrition (Maslach et al., 1996; Schaufeli & Enzmann, 1998).

Within the dimensions of burnout, emotional exhaustion has been regarded

by several authors as the central dimension (see Cropanzano, Rupp, & Byrne, 2003; Klusmann et al., 2008; Peterson et al., 2008). As an empirical reason Cropanzano et al. (2003) suggested that some researchers reported that emotional exhaustion has stronger relationships to important outcome variables than the other dimensions of burnout (Lee & Ashford, 1996; Schaufeli & Enzmann, 1998). Conceptually, Cropanzano et al. (2003) reported the work of Schaufeli and Enzmann (1998), who found that individuals who state being “burnt out” are mostly referring to feelings of emotional exhaustion. Moreover, emotional exhaustion can be clearly distinguished from other psychological concepts (Cropanzano et al., 2003), and Maslach and Leiter (1999) concluded that emotional exhaustion seems to represent the first stage of burnout, followed by depersonalization, while diminished accomplishment develops independently. Taking into consideration that the participants of the present studies had just begun their teaching career, if they had already experienced symptoms of burnout, the chances are high that this would be due to emotional exhaustion.

Among all professions, burnout seems to decrease with increasing work experience (Maslach, Schaufeli & Leiter, 2001; Schaufeli & Enzmann, 1998). However, results of research on the comparison of beginning and experienced teachers’ burnout are inconsistent (see also Study I). When directly comparing different groups of teachers depending on their level of experience, some researchers found no difference between less experienced and more experienced teachers (Klusmann et al. 2012; Pas et al., 2012). Others found that beginning teachers reported lower classroom stress and emotional exhaustion than more experienced teachers (Hong, 2010; Klassen & Chiu, 2011; Kokkinos, 2007). Kokkinos (2007), for example, found emotional exhaustion to be higher for teachers with more than 10 years of experience than those with fewer than 10 years of experience. However, these contradictory findings could be explained by the findings of Guarino, Santibañez, and Daley (2006), who found evidence for a U-shaped relationship rather than a linear increase between teacher attrition and age as well as years of teaching experience. Taking into consideration that attrition can be viewed as a symptom of high burnout (Jalongo & Heider, 2006), these findings can be interpreted with regard to varying burnout levels. Thus, there is a high level of burnout at the beginning of the teacher career which decreases to mid-level but increases again at the end of the teacher career. Depending on which level of experience is compared, there is no difference or higher levels of burnout among more experienced teachers.

When focusing on the longitudinal development of strain in beginning teachers, results seem inconsistent as well. Nevertheless, when comparing these studies, it is important to consider the status and varying levels of experience of beginning teachers as well as the time lag between the measurement points at which they are compared. Thus, there is a reported decrease (Fives, Hamman, & Olivarez, 2007) of emotional exhaustion in student teachers during their first student-teaching experience (12-month practicum). Conversely, other researchers (Goddard, O'Brien, Goddard, 2006; Hultell et al., 2013; Klusmann et al., 2012) found an increase of emotional exhaustion over two to three years among newly practicing teachers. However, in a similar sample, Gavish and Friedman (2010) found that emotional exhaustion remains stable over the first year of practical experience as a new teacher. It is important, however, to (Gavish & Friedman, 2010) note that—most likely due to prior practical experiences—there is already a very high value of emotional exhaustion of their sample to begin with. In a German sample, Klusmann et al. (2012) reported that emotional exhaustion increases during the first year of *referendariat*. These findings are based on a similar sample as our studies with hardly any prior practical experiences and are thus of particular importance. Hultell et al. (2013) found an overall small increase for burnout over the first three years of actual teaching experience in a Swedish teacher sample. However, by clustering seven different subgroups, they found individual development patterns within this change. These subgroups showed different variations of increase, decrease, and stability of burnout. Thus, rather than examining only average effects, it is of major importance to take individual differences into account when investigating the development of burnout or well-being.

Further, when interpreting longitudinal findings on burnout and job experience, a survival effect or “healthy-worker effect” (Schaufeli & Enzmann, 1998) should be considered. Thus, only those who remain healthy will continue working and be available for such surveys. This can lead to biased results, with a tendency of levels of burnout being lower in the investigated sample than in the actual population.

Classroom Disturbances as Major Reasons for Teachers' Strain

To identify the reasons for teacher strain and burnout, Borg and Riding (1991) distinguished four major dimensions of teacher stress: students' misbehavior, time/resource difficulties, professional recognition needs, and poor colleague relations. Further analyses showed that only student misbehavior and a new factor, named "workload," could significantly predict teacher stress (Boyle, Borg, Falzon, & Baglioni, 1995). Other, more recent studies confirmed these findings and emphasized that classroom disturbances and especially disruptive student behavior are major predictors of teachers' strain (e.g., Bakker, Hakanen, Demerouti, & Xanthopoulou, 2007; Boyle et al., 1995; Chang & Davis, 2009; Evers et al., 2004; Ferguson, Frost, & Hall, 2012; Friedman, 2006; Kokkinos, 2007; Krause, 2004; Spilt, Koomen, & Thijs, 2011). Thus, Kokkinos (2007) showed that managing student behavior and time demands accounted for the highest amount of variance in emotional exhaustion. Further, a review by Spilt et al. (2011) revealed that burnout arises because of issues regarding the social-psychological aspects of teaching, such as managing student behavior, and, thus, teacher-student relationships. Friedman (2006), in his review of teacher stress, found that similar factors, as indicated by Spilt et al. (2011), rather than instructional teaching problems (e.g., low academic student achievement, difficulty in teaching new material), predicted teacher strain. Beyond one's dispositional affect, frequently dealing with student misbehavior was the only explored job stressor that positively predicted teachers' levels of emotional exhaustion (Carson et al., 2011).

The relationship of student misbehavior and teachers' strain seems to be particularly problematic for inexperienced teachers; that is, beginning teachers perceive managing student behavior as overly challenging (Evertson & Weinstein, 2006; Jones, 2006; Rieg et al., 2007). A review by Jones (2006), dealing with beginning teachers' perceived biggest threats, revealed student misbehavior and disturbances as being the most salient. Moreover, Veenman (1984) reviewed approximately 100 studies investigating the perceived problem areas of beginning teachers, finding that, although there seems to be a large variety of potential problems, the foremost problems are perceived to be associated with student discipline or classroom disturbances. Taken together, these findings indicate that classroom disturbances and student disruption seem to be major predictors of teacher stress and strain, particularly for beginning teachers.

1.2 Teachers' Resources

Research on teachers' well-being has traditionally focused on teachers' stressors, strain, and its consequences. Recently, however, researchers have highlighted the importance of also taking positive aspects into account, such as potential resources that can prevent or buffer the negative consequences of strain and demands (Bakker, Demerouti & Euwema, 2005; Hobfoll, 2001). A theoretical model of increasing popularity in this regard is the Conservation of Resources Theory (COR; Hobfoll 1989; 2001). The main assumption of COR is that people aim to obtain, retain, foster, and protect whatever they value (resources). Further, COR states that psychological strain occurs in cases of anticipated or actual resource loss. Job resources are defined as "those objects, personal characteristics, conditions, or energies that are valued in their own right, or that are valued because they act as conduits to the achievement or protection of valued resources" (Hobfoll, 2001, p. 339). Based on our assumptions above, such a resource should enable beginning teachers to deal with their major stressor—classroom disturbances. We propose classroom management to be such a resource.

Classroom Management

Evertson & Weinstein define classroom management as "the actions teachers take to create an environment that supports and facilitates both academic and social-emotional learning" (Evertson & Weinstein, 2006, p. 4; see also Study IV). Therefore, classroom management is more than just establishing and sustaining classroom discipline; it also entails preventive strategies such as establishing clear rules and monitoring student behavior as well as creating a pleasant and learner-friendly environment. However, to achieve high-quality instruction, it is necessary to minimize classroom disturbances to make a disturbance-free lesson a major goal of classroom management (Evertson & Weinstein, 2006; Lewis, 1999). Kounin (1970), for instance, showed that teachers with good classroom skills are able to minimize disturbances by constant monitoring and by demonstrating to the class that they are aware of what is happening. In addition, these teachers are able to anticipate and deal with problematic student behavior adequately, thereby decreasing the risk of a serious disruption (Brophy, 1983; Kounin, 1970). Indeed, as a result of their meta-analysis, Wang et al. (1993) proposed classroom management as well as teacher-student interactions (academic and social) as important predictors of student learning.

However, Wang et al. (1993) suggested that this effect is due to a decrease in discipline problems, such as off-task behavior. In effect, teachers with effective classroom management skills are able to spend more time on instruction, thus leading to enhanced student achievement, as they need less time to take care of discipline problems (Wang et al., 1993). Thus, the proficient use of classroom management skills and techniques affects student achievement through the enhanced use of instructional time (for an overview, see Wang et al., 1993). Further, a study by Voss, Kunter, and Baumert (2011) showed the important role played by the pedagogical/psychological knowledge (PPK) of beginning teachers, including knowledge of classroom management, enabling a high quality of instruction. The results revealed that PPK is positively related to the quality of a teacher's instruction as perceived by students. That is, students of beginning teachers with high PPK reported fewer classroom disturbances than did students of those with low PPK (Voss et al., 2011). PPK can be imparted to beginning teachers during their academic studies (Terhart et al., 2012). Further, adequate and flexible classroom management strategies enable freedom of teaching with a wide range of teaching styles that are adaptable to intended learning aims and complex learning environments, such as classroom activities and students' characteristics (Emmer & Stough, 2001; Freiberg & Lapointe, 2006).

Other research on classroom management focuses on the interpersonal relationship of students and teachers (Wubbels, Brekelmanns, den Brok, & van Tartwijk, 2006; den Brok, Brekelmanns, & Wubbels, 2004). This aspect is viewed as considerably important with regard to teacher well-being (Spilt et al., 2011). Wubbels, Brekelmanns, & Hooymayers (1993) defined a *Model for Interpersonal Teacher Behavior, MITB* (see Figure 1.1), in which they differentiate the two independent dimensions of influence, or Dominance–Submission, and proximity, or Cooperation–Opposition, based on the prior work of Leary (1957). The proximity dimension refers to the degree of harmony in which students and teachers interact, while the influence dimension refers to the level of teachers' control over what is going on in their classrooms (den Brok, Tartwijk, Wubbels, & Veldman, 2010). Based on these dimensions, Wubbels et al. (2006) further distinguished eight different teacher behavior types, e.g., DC leadership, SO uncertain, DO strict, etc. (see Figure 1.1).

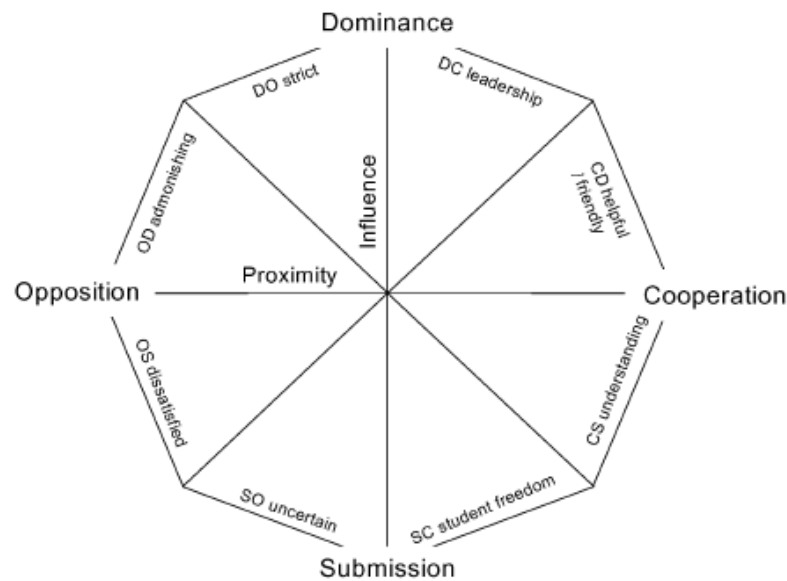


Figure 1.1. Model for Interpersonal Teacher Behavior (den Brok, Fisher, & Koul, 2005, p.7)

Based on the eight behavior types, Wubbels et al. (2006) identified several profiles of teaching styles as perceived by students and teachers. Furthermore, they found evidence of a change in the interpersonal behavior of teachers with increased years of teaching experience towards students (Brekemanns, Wubbels, & den Brok, 2002). Beginning teachers showed less leadership and more uncertain behaviors, which the authors related to the higher level of classroom disturbances. However, after approximately five years of teaching experience, authoritative teaching styles increased (Wubbels et al., 2006). These teaching styles can affect student outcomes very differently: Research shows that more authoritative or directive teacher behavior led to higher cognitive achievement while higher cooperative teacher behavior led to higher student motivation (den Brok et al., 2004; den Brok, Fisher, & Scott, 2005). Therefore, it is of particular importance to create awareness of these interpersonal behavioral effects in beginning teachers and to increase their behavioral repertoire (Wubbels et al., 2006).

Classroom Management Training

Based on the assumptions above, it can be concluded that classroom management skills are considered to be very important for beginning teachers. However, researchers pointed out that there are still very few opportunities for beginning teachers to enhance their classroom management skills (Evertson & Weinstein, 2006; Jones, 2006; Ophardt & Thiel, 2008). In their review of classroom

management training, Freiberg and Lapointe (2006) considered nearly 800 programs and interventions for teachers which focused on preventing and solving discipline problems within the classroom (see also Study IV). Most of these, however, had not had any empirical analysis of the program's effectiveness or longitudinal sustainability, so they had not been sufficiently evaluated. Even so, the authors identified 40 research-based programs that matched their criteria (Freiberg & Lapointe, 2006). Four common topics were identified: (a) moving beyond discipline—referring to a shift from punishment to an emphasis on student learning and self-control; (b) school connectedness—referring to the inclusion of students and parents in events, activities, and decisions that affect the learner; (c) caring and trust; and (d) a positive school and classroom climate (for details, see Freiberg & Lapointe, 2006). Evidence showed that all of these 40 programs were effective within their intended area. They covered a wide range of different target groups, models, goals, and characteristics, from programs to prevent bullying or aggressive behavior to fostering student motivation and self-worth (Freiberg & Lapointe, 2006).

Although initially developed for experienced teachers, one of the two programs with a specific curriculum for new or beginning teachers, identified by Freiberg and Lapointe, 2006, is the “Classroom Organization and Management Program” (COMP; Emmer & Evertson, 2008; Emmer, Evertson, Sanford, Clements, & Worsham, 1982; Emmer, Evertson, & Worsham, 2002). According to Jones (2006), COMP is very well researched and most frequently implemented of all programs. The program is dedicated to four major principles:

- 1) “preventing rather than intervening,
- 2) management and instruction are integrally related,
- 3) students are active participants in the learning environment, and
- 4) professional collaboration supports changes in teaching practice” (Evertson & Harris, 1999, pp. 65–67).

The main benefit of COMP is that it considers the uniqueness of situations, classes, and schools, e.g., urban versus rural school areas. COMP provides the basic skills enabling the participant to decide how to (re)act and behave by analyzing the situation of students and materials in the classroom and creating procedures based on these analyses that allow the successful interaction of students and materials (Evertson & Harris, 1999). Studies on the effectiveness of the training (for an overview, see Evertson & Weinstein, 2006) showed strong empirical evidence that

teachers who participated in COMP workshops had classroom environments with fewer disturbances and more instructional time than teachers who did not participate. Such an environment is conducive to students' learning and, hence, their students realized greater gains in academic achievement (Evertson & Harris, 1999).

However, empirical studies that focus on the effects of classroom management interventions targeting teachers' well-being are rare. An exception is an early study by Sharp and Forman (1985). They investigated the effects of classroom management training on teacher anxiety and teachers' (verbal) classroom behavior. To further validate these effects, they compared their classroom management training with stress-inoculation training and a control group, which received no training at all. Their results revealed that both groups that received training showed significantly less school-related anxiety and improved classroom behavior (such as adequately dealing with minor disturbances) in comparison to the "non-trained" control group, although the classroom management training group showed somewhat higher levels on the latter. However, Sharp and Forman (1985) focused solely on anxiety measures and neglected other possible negative effects on well-being, such as emotional exhaustion. Additionally, they did not consider any effects on positive indicators of well-being, such as increased engagement, while positive resources have become of increased importance in stress research (Hobfoll, 1989, 2001). Further, they only conducted one post measure, which makes it impossible to draw conclusions on the possible long-term effects of the training. Finally, their study comprised teachers with a mean of approximately 11 years of experience, whereas, as reviewed above, beginning teachers in particular would profit from classroom management programs. However, so far, we are not aware of any studies that investigate the effect of classroom management trainings on beginning teachers' well-being.

Thus, having high-level classroom management skills at their disposal should equip teachers with the necessary courses of action to prevent and manage upcoming disturbances. Nonetheless, possessing these skills alone is insufficient; teachers also need to be able to utilize them adequately. Consequently, classroom management skills *in addition to* teacher self-beliefs in these skills, such as teacher self-efficacy, are critical determinants of stress management.

Teacher Self-Efficacy

Self-efficacy refers to a person's belief or perception of his own capability to successfully undertake the actions required to complete a given task (Bandura, 1997). For Bandura, doubts based on low self-efficacy overrule a sufficient set of skills in a specific area. Consequently, beliefs of one's own personal efficacy, rather than one's actual level of skill, determine whether certain behaviors will be initiated, how much effort will be invested, and how long such behaviors will be sustained in the face of obstacles and aversive experiences (Bandura, 1977). Further, in case of setbacks, an individual with high self-efficacy tends to recover more quickly than one with low self-efficacy (Schwarzer & Hallum, 2008). Bandura defines four major sources of self-efficacy: enactive mastery experiences, vicarious experiences (in comparison with others), verbal persuasion and social influences, and physiological and affective states (Bandura, 1997). In turn, efficacy beliefs regulate human functioning and behavior (Bandura, 1986).

Despite the initial global conceptualization of self-efficacy, Bandura's theory highlights the multifaceted structure of self-efficacy, which consists of numerous distinct domains (Bandura, 1997; O'Mara, Marsh, Craven, & Debus, 2006). This is of critical importance when research aims to assess efficacy beliefs, as having high beliefs in one domain does not necessarily imply having high beliefs in other domains. Thus, a multidimensional perspective should be applied, where self-efficacy is assessed with a domain-specific rather than a global measure (O'Mara et al., 2006; Pajares & Schunk, 2001).

For the present studies we will focus on the domain of teacher self-efficacy, which is defined as the teacher's beliefs in his own ability to achieve educational goals or specific teaching tasks, such as student engagement or learning (Skaalvik & Skaalvik, 2007; 2010; Tschannen-Moran & Woolfolk Hoy, 2001, Tschannen-Moran, Woolfolk Hoy & Hoy, 1998). Individuals with a high sense of teacher self-efficacy expect to be able to improve students' behavior and achievement despite difficulties such as adverse environmental influences, while those with low teacher self-efficacy expect that they have little possibility of making an impact on students' motivation and intellectual development. Further, teachers with high self-efficacy spend more time on academic activities and the development of students (for an overview, see Bandura, 1997; Tschannen-Moran & Woolfolk Hoy, 2001). Hence, teacher self-efficacy has been related to student outcomes such as students' achievement and

motivation (for an overview, see Tschannen-Moran & Woolfolk Hoy, 2001). Additionally, teacher self-efficacy has positively been linked to teachers' commitment (Klassen & Chiu, 2010) as well as job satisfaction (Caprara, Barbaranelli, Borgogni, & Steca, 2003) and teachers' instructional quality (Tschannen-Moran & Woolfolk Hoy, 2001). Moreover, and integral to the present studies, self-efficacy has been related to teachers' well-being and, in particular, to strain and burnout (e.g., Friedman, 2006; Jex & Bliese, 1999; Schwarzer & Hallum, 2008; Skaalvik & Skaalvik, 2007).

Self-efficacy in Classroom Management

Teacher self-efficacy can be distinguished in distinct domains (Tschannen-Moran & Woolfolk Hoy, 2001; O'Neill & Stephenson, 2011). In their important paper on the construct of teacher self-efficacy, Tschannen-Moran & Woolfolk Hoy (2001) suggest self-efficacy for instructional strategies, self-efficacy for classroom management, and self-efficacy for student engagement as distinct domains based on the results of factor analyses. The present Studies II – IV focus on self-efficacy in classroom management, which refers to “teachers' beliefs in their capabilities to organize and execute the courses of action required to maintain classroom order” (Brouwers & Tomic, 2000, p. 242). This domain of teacher self-efficacy has become increasingly important in research on teacher self-efficacy throughout the last three decades (O'Neill & Stephenson, 2011).

Recent research by Skaalvik and Skaalvik (2007) has confirmed the single factor structure of self-efficacy in classroom management. For beginning teachers, the most widely used measure in this regard is the Teachers' Sense of Efficacy Scale (TSES) by Tschannen-Moran and Woolfolk Hoy (2001; for an overview of applications, see O'Neill & Stephenson, 2012), which we also utilized in the present studies.

The Development of Teacher Self-efficacy within the First Years of Teaching Experience

Bandura (1997) claimed that in general, self-efficacy shows high levels of stability over time. However, self-beliefs such as teacher self-efficacy are most malleable within the first years of teaching (Fives et al., 2007; Woolfolk Hoy & Burke-Spero, 2005), making the development of self-efficacy in beginning teachers an important

field of interest. Nevertheless, research on the development of teacher self-efficacy over time is scarce (Klassen & Chiu, 2010). When comparing the levels of beginning and experienced teachers' self-efficacy (see also Study I), most researchers agree that experienced teachers report higher levels of self-efficacy than less-experienced teachers (Giallo & Little, 2003; Pas et al., 2012; Tschannen-Moran & Woolfolk Hoy, 2007; Wolters & Daugherty, 2007). However, when applying a large sample, Wolters & Daugherty (2007) found very few effects in this regard. Further, Giallo & Little (2003) compared student teachers to practicing teachers (with less than three years of experience) and reported low levels of self-efficacy in classroom management for both groups. Contrary to these findings, Skaalvik and Skaalvik (2007) found a negative relationship of years of experience and teacher self-efficacy. It is important to note, however, that Skaalvik and Skaalvik's (2007) sample included teachers of various ages and levels of experience. Thus, they report a mean age of 45 and a mean of 14 years of experience. In line with these findings, Klassen and Chiu (2010) found a nonlinear relationship of years of experience and teacher self-efficacy where, after initially increasing from 0 to 23 years of experience, teacher self-efficacy declines steadily through the years until the end of the teaching career. Therefore, the results of a comparison of inexperienced and more experienced teachers may vary, depending on the stage of their career.

When analyzing the development of teacher self-efficacy in beginning teachers, there seems to be evidence for a small increase of teacher self-efficacy across the first years of teaching (Fives et al., 2007; Hultell et al., 2013; Woolfolk Hoy & Burke-Spero, 2005). When comparing self-reported competency at the beginning and end of a student teaching internship, Gröschner, Schmitt, and Seidel (2013) found a small increase as well. In a similar study, Fives et al. (2007) also found evidence for an increase of teacher self-efficacy for student teachers during a school practicum. The most important results for the present studies in this regard are those of Woolfolk Hoy and Burke-Spero (2005). They measured teacher self-efficacy at three time waves: the beginning of the teacher preparation program, the end of student teaching, and after the first year of employment as a teacher (cf. Woolfolk Hoy & Burke-Spero, 2005). Their findings indicated an initial increase of efficacy during teacher preparation and student teaching followed by decreasing levels of self-efficacy after the first year of teacher employment. However, Woolfolk Hoy and Burke-Spero (2005) applied four different self-efficacy scales. They found a slight

overall increase across the three measurement points for two of these scales, while on the other two scales, the level of self-efficacy returned to a similar level as on the first measurement. These findings further stress the importance of the multifaceted nature of teacher self-efficacy and to take into account that focusing on different domains of teacher self-efficacy, as different teacher self-efficacy measures do, can affect study results.

For an adequate application of these results on the present studies, we suggest that both phases (student teaching and the first year of teacher employment) correspond to the first year of *referendariat*, which provides evidence for the assumption of stability, or only a very small increase of teacher self-efficacy over time within the present studies. However, Pas et al. (2011) in a sample including experienced and novice teachers, found that preparedness rather than years of experience to be a significant predictor of self-efficacy and burnout. Thus, in their study, participants who felt more prepared reported higher initial levels of teacher self-efficacy as well as a larger increase over time. Overall, empirical results provided evidence for stability or only a small increase of self-efficacy during the first few years of teaching experience.

The Relationship of Emotional Exhaustion and Teacher Self-efficacy

Although some researchers have already investigated the relationship of burnout and self-efficacy (Brouwers & Tomic, 1999), the results remain inconsistent (see Study II and III). According to Bandura (1997), in line with other researchers (e.g., Brouwers & Tomic 1999; Maslach, 1999; Skaalvik & Skaalvik, 2007; 2010), there should be a reciprocal relationship of burnout and self-efficacy. Yet other researchers suggest that teacher self-efficacy predicts burnout (e.g., Brouwers & Tomic, 1999; Skaalvik & Skaalvik, 2007; Schwarzer & Hallum, 2008; Wudy & Jerusalem, 2011), and that this relationship is mediated by teacher-specific stressors such as student misbehavior, workload, or role ambiguity (Betoret, 2009; Schwarzer & Hallum, 2008). Although researchers have proposed the need to study questions of causality in this field, respective studies are scarce (Skaalvik & Skaalvik, 2010). Exceptions that apply longitudinal study designs, e.g., Brouwers and Tomic (2000) and Schwarzer and Hallum, (2008). Schwarzer and Hallum (2008) revealed earlier teacher self-efficacy to predict later burnout in a cross-lagged-panel analysis. Brouwers and Tomic (2000), on the other hand, found low levels of teacher self-

efficacy to precede two of the three burnout dimensions, namely depersonalization and personal achievement. However, they found emotional exhaustion to predict teacher self-efficacy cross-sectionally rather than longitudinally (Brouwers & Tomic, 2000). Including classroom disturbances in their model, they propose that “high levels of student disruptive behavior lead to a low level of teachers’ self-efficacy in classroom management, which lead to a higher level of teacher burnout, which in turn leads to a higher level of student disruptive behavior, further reducing the level of teachers’ self-efficacy” (Brouwers and Tomic 2000; S.241). Thus, the relationship of self-efficacy and burnout seems to be complex.

While the research above proposes a linear relationship of self-efficacy and burnout, other research and theories provide evidence in favor of a moderating role of personal resources (e.g., self-efficacy) in the stress process. In particular, the well-established Job Demands Resources (JD-R) Model (Bakker & Demerouti, 2007; Bakker, Demerouti, De Boer, & Schaufeli, 2003) found support for its proposed effects across a range of occupational settings (Bakker & Demerouti, 2007; Hakanen et al., 2006). First, the model shows a direct effect of job demands on an employee’s health (e.g., high workload leading to psychological strain) as well as a direct positive effect of the employee’s resources on motivation. But additionally and more importantly, the model shows interaction effects of job demands on motivation and job resources on strain (the so-called “buffering effect”; Bakker & Demerouti, 2007; see Figure 1.2). Jex and Bliese (1999) confirmed this buffering effect of self-efficacy on the relationship of stress and strain.

Except for an attempt by Fives et al. (2007), the relationship of the development of teacher self-beliefs and emotional exhaustion has not been investigated so far. In addition, Fives et al. (2007) did not investigate a direct effect of change in teacher self-efficacy on change in burnout; nor did they investigate the prediction of change in one variable through earlier levels of the other. Thus, there is still need to further disentangle the relationship of emotional exhaustion and teacher self-efficacy, in particular with regard to the dynamic aspect of change.

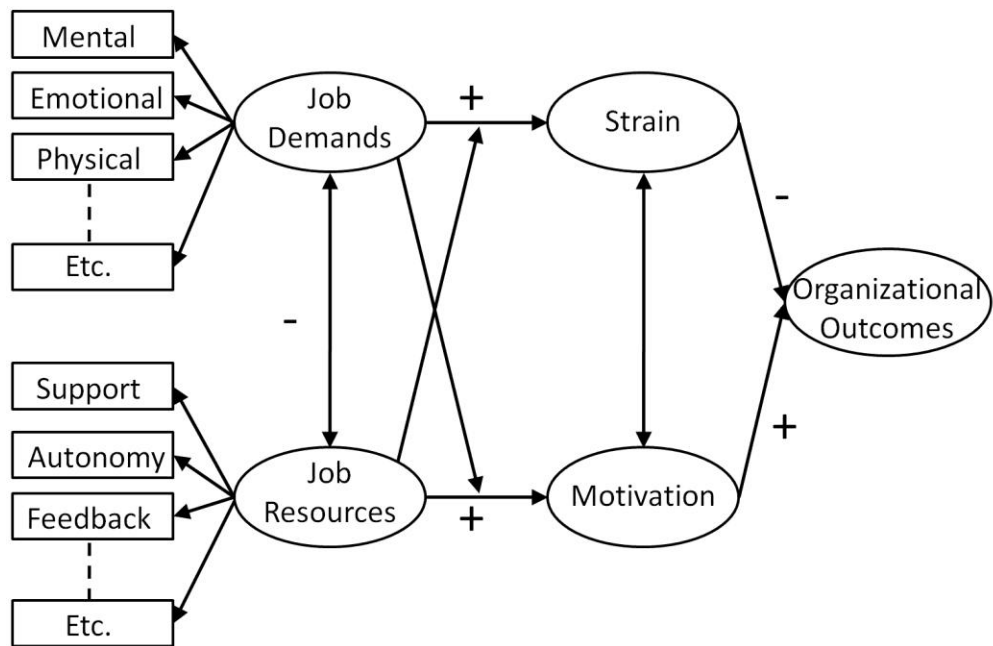


Figure 1.2. The JD-R Model by Bakker and Demerouti (2007).

1.4 Summary

Based on this theoretical review, it can be assumed that the first experiences of beginning teachers at school are characterized by the so-called reality shock (Friedman, 2000; Huberman, 1998), which is associated with high strain and potential burnout, particularly emotional exhaustion (Klusmann et al., 2012). The major source of this strain has been identified as classroom disturbances or student misbehavior (e.g., Bakker et al., 2007; Evertson & Weinstein, 2006; Ferguson et al., 2012; Friedman, 2006; Jones, 2006; Kokkinos, 2007; Spilt et al., 2011). Thus, teacher self-efficacy, and in particular its sub-domain, self-efficacy in classroom management, should be a valuable resource for beginning teachers to help manage this stressor and create a disturbance-free environment (Friedman, 2006; Jex & Bliese, 1999; Schwarzer & Hallum, 2008; Skaalvik & Skaalvik, 2007; Tschannen-Moran & Woolfolk Hoy, 2001). Prior research suggests an inverse reciprocal relationship of self-efficacy and burnout, where high levels in one variable are associated with having low levels in the other (Brouwers & Tomic, 1999; 2000). While reciprocal effects are most likely (Bandura, 1997; Maslach, 1999), research on causal relationships of self-efficacy and burnout, and emotional exhaustion, in particular, is still needed (Skaalvik & Skaalvik, 2010). In this regard, it is important to include the multidimensionality of teacher self-efficacy, as different measures of teacher self-efficacy might generate different results (O'Mara et al., 2006; Pajares &

Schunk, 2001). Moreover, research on the longitudinal development of both constructs (and specifically, their interaction) is still needed. Individual differences within this development need to be investigated (Carson et al., 2011). Further, to date, there is still a lack of possible intervention programs that could enhance self-beliefs in teaching and classroom management skills (Evertson & Weinstein, 2006; Jones, 2006), which could help beginning teachers control the major stressor of classroom disturbances and thus maintain their well-being.

1.5 Structure and Hypotheses

Four empirical studies on teacher self-efficacy and teacher well-being will be presented followed by a composite discussion of all studies. Taken together, the studies present a stepwise approach to analyzing the details of the interrelation of beginning teachers' strain and resources and, based on these analyses, show how to develop empirical and practical implications.

Study I provides a first glance at the occupational situation of beginning teachers with regard to their strain and resources. Thus, it deals with the longitudinal development of teacher self-efficacy and emotional exhaustion of beginning teachers over one year by applying latent change score models (Ferrer & McArdle, 2010).

- First, based on theoretical assumptions on the development of beginning teachers' self-beliefs and well-being, Study I investigates whether emotional exhaustion—as a major indicator of teachers' strain—and teacher self-efficacy—as a major teacher resource—increase, decrease, or remain stable over time. This change is assessed during the first year of *referendariat*. Based on prior research (e.g., Klusmann et al. 2012), we expect that emotional exhaustion should increase, while teacher self-efficacy should only slightly increase or remain stable (e.g., Woolfolk Hoy, & Burke-Spero, 2005)
- Second, we test if broad educational knowledge, as one domain of professional knowledge gained during the university phase of teacher training, can predict the change of teacher self-efficacy and emotional exhaustion during *referendariat*. Based on Klusmann et al.'s (2012) findings regarding knowledge of classroom management, it is assumed that high levels of broad educational knowledge lead to a lower increase of emotional exhaustion and a higher increase of teacher self-efficacy. We further

investigate whether different sub-domains of broad educational knowledge predict these changes differently.

- Third, as previous results are inconsistent (Brouwers & Tomic, 2000; Skaalvik & Skaalvik, 2007), we investigate the interaction of teacher self-efficacy and emotional exhaustion by analyzing if prior teacher self-efficacy predicts change in emotional exhaustion, and vice versa. But more importantly, we investigate if change in one variable predicts change in the other, as research literature addresses a reciprocal relationship (e.g., Bandura 1997) of both variables.

We further investigate the initial findings of Study I and examine two studies on individual differences of the stress-development process of beginning teachers. Based on theoretical and empirical evidence, it is suggested that self-efficacy in classroom management, a sub-domain of teacher self-efficacy, predicts emotional exhaustion via classroom disturbances. Moreover, this proposed mediation should depend on the level of self-efficacy in classroom management, resulting in a moderated mediation. Study II is based on a large sample size and, thus, enables latent analyses of this moderated mediation and group comparisons. Study III is based on a smaller sample, but applies longitudinal data to provide further evidence for the proposed stress-development process where prior self-efficacy in classroom management predicts later classroom disturbances and exhaustion. The two studies complement each other. The aims of these studies are to:

- Investigate the proposed stress process, where self-efficacy in classroom management predicts emotional exhaustion via classroom disturbances. This mediation is based on theoretical assumptions of the self-efficacy theory (Bandura, 1997) and is supported by empirical findings (e.g., Beterot, 2009).
- Determine if the strength of the suggested mediation depends on individual levels of self-efficacy in classroom management. This moderation effect is based on the assumptions of established stress models (Bakker & Demerouti, 2007; Hobfoll, 2001) and supported by empirical findings of Jex and Bliese (1999). Based on a similar moderated mediation model by Schwarzer and Hallum (2008), the mediation should be stronger for individuals with lower levels of self-efficacy in classroom management.

- Identify whether important covariates, such as years of experience, gender, or school type affect the moderated mediation model (Byrne, 1999).

After mainly observing the situation and possible influences of the situation of beginning teachers in Study I-III, We conduct a fourth study where the classroom management skills of beginning teachers are experimentally manipulated by providing classroom management training at the very beginning of *referendariat*. In this study, we compare a classroom management training group with a group that has received stress management training to measure any effects related merely to increased attention. Further, we compare both training groups with a control group without any training. The levels of classroom management skills and well-being are assessed prior to training, four months after training, and approximately one year after training.

- First, the study aims to evaluate the short-term (four months after) and long-term (one year after) effectiveness of classroom management training compared to stress management training, and no training with regard to classroom management skills. It is assumed that classroom management training is superior to stress management training, or no training based on the effectiveness studies of similar trainings (Emmer & Evertson, 2008) and the early findings of Sharp and Forman (1985).
- Second, the short- and long-term effects of classroom management training with regard to teacher well-being are assessed and compared to those of stress management training, and no training. We assume that classroom management training has comparable effects as stress management training and that both are superior to no training based on early findings of Sharp and Forman (1985).

Last, we provide a brief overview of all the studies' results followed by a joint discussion regarding the empirical and theoretical implications of the studies. The chapter concludes with an outlook on future research.

In brief, this dissertation aims to answer the following research questions:

How does beginning teachers' occupational well-being develop over the first year of *referendariat* with regard to

- a) strain, e.g., emotional exhaustion and
- b) resources, e.g., self-beliefs?

Do any variables influence the development of beginning teachers' occupational well-being with regard to

- a) predictors, e.g., professional knowledge, prior well-being, or change in well-being,
- b) mediators, e.g., stressors such as classroom disturbances, and
- c) moderators, e.g., self-efficacy in classroom management and/or school type?

Is it possible to actively manipulate the development of beginning teachers' occupational well-being through strengthening resources with regard to

- a) stress management skills and
- b) classroom management skills?

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2 Study I: Investigating Longitudinal Changes in Beginning Teachers' Self-efficacy and Emotional Exhaustion: Can They be Predicted by Professional Knowledge?¹

Abstract

While much research focuses on teacher self-efficacy, burnout, and their interaction, there is a scarcity of studies investigating any change of these variables, particularly regarding how this change can be predicted. To fill this void, we specify latent change score models of teacher self-efficacy and emotional exhaustion using a sample of German beginning teachers. Additionally, we investigate whether professional knowledge gained during teacher education can predict change in these variables. Overall, our results reveal an increase of emotional exhaustion and a smaller increase of teacher self-efficacy during the first year of the beginning teachers' induction. Prior emotional exhaustion seems to predict change in teacher efficacy rather than vice versa; large change in one variable is related to small change in the other. Those domains of professional knowledge closely related to teaching itself buffer the increase of emotional exhaustion, but not of teacher self-efficacy.

Keywords: emotional exhaustion, self-efficacy, latent change, beginning teachers, professional knowledge

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2.1 Theoretical Background

Research on teachers' occupational stress or strain and resources thus far has been dedicated to their ante- and consequences. Further, many studies have revealed results concerning how these stress variables and resources are related and influence each other. However, even when models are based on longitudinal data, predictions of change often rely on static approaches, where predictions of change often rely on variables at Time Wave One predicting outcomes at a later time to explain individual change (Reuter et al., 2010). This study aims to integrate and expand these static approaches by investigating how teachers' stress and resources change over time and how these changes are influenced by another and professional knowledge. This dynamic type of analysis offers a direct approach to assess change and can be realized by employing so-called latent change score models which integrate the advantages of other longitudinal SEM models, such as latent growth models or autoregressive models (for details, see Ferrer & McArdle, 2010; McArdle & Hamagami, 2001; Parker, Lüdtke, Trautwein, & Roberts, 2012).

The current research will apply this analysis of change in teachers' strain and resources in a sample of German teacher candidates during their first year of practical teacher training after having finished the university phase of theoretical teacher training. From a research perspective, this first year of practical training is a particularly interesting time, as the teacher candidates have completed their studies and have thus gained some professional knowledge. At this time, they are faced with the reality and increasing demands of professional behavior within an actual classroom and its accompanying lessons.

First, we investigate the development of emotional exhaustion as a typical stress symptom. Emotional exhaustion is considered to be the central dimension of teacher burnout (Cropanzano, Rupp, & Byrne, 2003; Klusmann, Kunter, Trautwein, Lüdtke, & Baumert, 2008), which reflects a prolonged and occupation-specific form of strain as the result of repeated long-term exposure to stressors (Byrne, 1999; Farber, 1991). Second, we investigate the development of teacher self-efficacy as one of the most important resources that protect against the negative effects job strain (Dicke et al. 2014; Schwarzer & Hallum, 2008). Self-efficacy is a critical self-belief that relates to individual perceptions of one's capabilities to successfully undertake the actions required to complete a given task (Bandura, 1997).

An important feature of our study is the inclusion of broad educational knowledge as an additional predictor for emotional exhaustion and self-efficacy. This not only introduces an objective achievement indicator in our change model; it also allows us to investigate how changes in beginning teachers' stress levels and resources could be influenced by an important domain of teachers' professional knowledge. Thus, the present study highlights the role of professional knowledge not only for teaching behavior (Kunter, Kleickmann, Klusmann, & Richter, 2011; Voss & Kunter, 2011; Voss, Kunter, & Baumert, 2011) but also for teachers' well-being (Klusmann, Kunter, Voss, & Baumert, 2012) and self-beliefs. Findings demonstrating a protective buffering effect of professional knowledge on emotional exhaustion or positive effects of professional knowledge on self-efficacy are of major importance, as such knowledge can be imparted to candidate teachers during their studies (Terhart et al., 2012). Thus, measures fostering teacher well-being and self-beliefs could already be employed in the early stages of teacher education, thus preventing later strain and burnout.

We apply a latent change score approach, which also allows us to review the interrelationship of emotional exhaustion and teacher self-efficacy. So far, research on the development of emotional exhaustion and teacher self-efficacy during first teaching experiences is inconsistent and scant. Further, although many researchers have found evidence for a relationship of burnout and teacher self-efficacy (e.g., Brouwers & Tomic, 2000; Friedman, 2006; Schwarzer & Hallum, 2008; Skaalvik & Skaalvik, 2007), the association of changes in both variables over time have rarely been investigated. Thus, the need remains to further disentangle the relationship of emotional exhaustion and teacher self-efficacy, in particular with regard to the dynamic aspect of change. This is important as it takes the most likely reciprocal nature (Bandura, 1997) of these variables into account. Thus, it should be very interesting to investigate how even small changes in one variable directly affect changes in the other variable (Ferrer & McArdle, 2010; McArdle & Hamagami, 2001) rather than the static approach, in which one variable at Time Wave One predicts change in the other over time (i.e., auto-regressive cross-lag models).

Changes in Beginning Teachers' Occupational Situation

When investigating changes in teachers' occupational situations, it is particularly interesting to examine the phase of the likeliest biggest transition—the job entry phase (Klusmann et al., 2012; Tynjälä & Heikkinen, 2011). There are, of course, big differences in teacher preparation programs worldwide (OECD, 2005; Bauer & Prenzel, 2012). While there is a somewhat direct entry from university education (which in parts already includes small practical elements) to the teaching career in most countries, German teacher education consists of an additional educational element, an induction program called *referendariat* (see the Method section for details). This induction program is characterized by a relatively strong integration of practical and theoretical elements (Kunter, Scheunpflug, & Baumert, 2011). Nevertheless, as international research indicates in most programs worldwide, in the transition phase, most beginning teachers learn to utilize their theoretical knowledge in a practical context and seem to struggle with this transition (e.g., Friedman, 2000; Klusmann et al., 2012; Stokking, Leenders, De Jong, & Van Tartwijk, 2003; Veenman, 1984). Thus, the first months and years of being a teacher are often associated with the so-called “reality shock” (Huberman, 1989), which refers to the collapse of ideals or expectations developed during a teacher's education following a teacher's first confrontation with classroom reality (Veenman, 1984). As a result of this confrontation, strain and, as a consequence, teacher attrition can occur (Klusmann et al., 2012; Veenman, 1984).

Teacher's Occupational Strain: Emotional Exhaustion

Teacher attrition rates, particularly for beginning teachers, are a worldwide issue (Jalongo & Heider, 2006; OECD, 2005)². Importantly, a large part of this attrition has been attributed to high levels of stress, burnout, and the demands inherent in teaching. In the present research, we focus on teacher burnout, which reflects a prolonged and occupation-specific form of strain as the result of repeated long-term exposure to stressors leading to, e.g., emotional exhaustion as a central component of burnout. Cropanzano et al. (2003) suggest both empirical and

² The present study was conducted in Germany, where early teacher attrition is comparably low (OECD, 2005). This is most likely due to the benefits of high income and job security, which are extraordinarily high in Germany. Nevertheless, the underlying causes of attrition—reality shock and increasing levels of strain among beginning teachers—are prevalent in Germany as well (for an overview, see Klusmann et al., 2012).

conceptual reasons for considering emotional exhaustion as the central component of burnout. Empirical evidence shows that emotional exhaustion has stronger relationships to important outcome variables than other dimensions of burnout, namely personal achievement and depersonalization (Lee & Ashford, 1996; Schaufeli & Enzmann, 1998). Conceptually, Schaufeli and Enzmann (1998) indicate that when people report being “burnt out,” they are usually referring to feeling emotionally exhausted.

Teachers’ Occupational Resources: Teacher Self-efficacy

The present study aims not only to investigate changes in beginning teachers’ strain, i.e., emotional exhaustion, but also changes in beginning teachers’ resources, in line with recommendations of stress researchers (Bakker, Demerouti & Euwema, 2005; Hobfoll, 2001). Teacher beliefs such as self-efficacy are viewed as a major resource for teachers (Schwarzer & Hallum, 2008) and are highly influenced during the first years of teaching (Fives, Hamman, & Olivarez, 2007; Woolfolk Hoy & Burke-Spero, 2005).

Self-efficacy refers to a person’s belief or perception of his own ability to successfully undertake the actions required to complete a given task (Bandura, 1997). For Bandura, expectations of self-efficacy, rather than the actual level of skill, determines whether certain behaviors will be initiated, how much effort will be invested, and how long the behavior will be sustained in the face of obstacles and aversive experiences (Bandura, 1997). However, it is important to consider the multifaceted structure of self-efficacy (Bandura, 1997). Having high beliefs in one domain does not necessarily imply having high beliefs in other domains, which stresses the critical importance of assessing self-efficacy from a multidimensional perspective (O’Mara, Marsh, Craven, & Debus, 2006; Pajares & Schunk, 2001). Teacher self-efficacy is such a domain and refers to a teacher’s beliefs in his own ability to achieve educational goals or specific teaching tasks, such as student engagement or student learning (Skaalvik & Skaalvik, 2007; 2010; Tschannen-Moran & Woolfolk Hoy 2001, Tschannen-Moran, Woolfolk Hoy & Hoy, 1998). High teacher self-efficacy has been related to several positive outcomes, such as instructional quality, students’ achievement and motivation (Tschannen-Moran & Woolfolk Hoy, 2001), teachers’ job satisfaction (Caprara, Barbaranelli, Borgogni, & Steca, 2003), and commitment (Klassen & Chiu, 2010). Most importantly for the

present study, however, self-efficacy has been linked to teachers' well-being and in particular teachers' levels of burnout (e.g. Friedman, 2006; Jex & Bliese, 1999; Schwarzer & Hallum, 2008; Skaalvik & Skaalvik, 2007).

Changes of Beginning Teachers' Emotional Exhaustion

Research on the changes of teachers' strain can be distinguished in research comparing beginning teachers to more experienced teachers and research that focuses on the longitudinal development of beginning teachers. In the former case, research evidence suggests that there is no difference between beginning and experienced teachers' burnout (Klusmann et al. 2012; Pas, Bradshaw, & Hershfeldt, 2012). Moreover, Klassen and Chiu (2011) found that classroom stress was lower for beginning teachers. However, these findings could be explained by results of a study by Guarino, Santibañez and Daley (2006). Guarino et al. (2006) found evidence for a U-shaped relationship between teacher attrition and age or years of teaching experience. As attrition can be viewed as a symptom of high burnout (Jalongo & Heider, 2006), these findings can be interpreted as teachers having a high level of stress at the beginning of the career, which then decreases over time only to increase again at the end of the career.

Results on the longitudinal development of strain in beginning teachers are inconsistent. However, it is of course important to take into account what kinds of beginning teachers and which time differences are considered in these studies. Thus, while some authors (Goddard, O'Brien, & Goddard, 2006) report increases of emotional exhaustion over two years of newly practicing teachers, Fives et al. (2007) reported a decrease of emotional exhaustion in student teachers during their student-teaching experience (12-month practicum). Further, Gavish and Friedman (2010) found, in a similar sample as Goddard et al. (2006), that emotional exhaustion remains stable over the first year of practical experience as a new teacher. Nevertheless, the authors explained that their sample included teachers with a very high level of emotional exhaustion from the outset, most likely the result of prior practical experiences. Finally, the findings of Klusmann et al. (2012) concerning the German teacher induction program (*referendariat*), which provides minimal prior practical experiences, indicate that emotional exhaustion increases within the first year of *referendariat*.

Changes of Beginning Teachers' Self-efficacy

In contrast to research on teacher burnout, research on the relationship of years of experience and teacher self-efficacy is scarce (Klassen & Chiu, 2010). In his general conception of self-efficacy, Bandura (1997) assumes high stability over time. Again, we separate between findings comparing beginning teachers' self-efficacy with that of experienced teachers and findings longitudinally investigating the development of self-efficacy in beginning teachers. Regarding the comparison of beginning and experienced teachers' self-efficacy, research indicates that experienced teachers report higher levels of self-efficacy (Pas et al., 2012; Tschannen-Moran & Woolfolk Hoy, 2007; Wolters & Daugherty, 2007). However, with a very large sample, Wolters and Daugherty (2007) found only very small effects in this regard. Further, Klassen and Chiu (2010) found a nonlinear relationship of years of experience and teacher self-efficacy. After an increase of teacher self-efficacy from 0 to 23 years of experience, teachers' self-efficacy declined again to the end of the teaching career. Thus, when comparing beginning teachers to experienced teachers, results vary, depending on the teachers' particular stage in their careers.

When analyzing the development of teacher self-efficacy in beginning teachers, Woolfolk Hoy and Burke-Spero (2005) found an initial increase of self-efficacy during teacher preparation and student teaching followed by decreasing levels of self-efficacy after the first year of actual experiences as an employed teacher. For two out of four self-efficacy scales, they found a slight overall increase from a first to a third measurement, which is in line with similar findings by Fives et al. (2007). For the other two scales, the level of self-efficacy returned, after increasing from the first to the second measurement, to a similar level as on the first measurement (Woolfolk Hoy & Burke-Spero, 2005). Applying these findings to the present study, we suggest both phases—teacher preparation and the first year as an actual, employed teacher—together to reflect the first year of *referendariat*, which would provide evidence for the assumption of stability, or only very little increase of teacher self-efficacy over time. Interestingly, in a sample including both experienced as well as novice teachers, Pas et al. (2012) found preparedness rather than the actual years of experience to be a significant predictor of self-efficacy and burnout, showing that teachers who feel more prepared report higher initial levels of teacher self-efficacy as well as a larger increase over time. Overall, empirical results provide

evidence for stability or only a slight increase of self-efficacy over at least the first few years of teaching experience.

The Association of Change of Emotional Exhaustion and Change of Teacher Self-efficacy

Of course, when investigating strain and self-efficacy, it is important to acknowledge that they cannot be considered independent from each other (Bandura, 1997). Indeed, many researchers found evidence for relationships of burnout and teacher self-efficacy (e.g., Brouwers & Tomic, 2000; Dicke et al., 2014; Friedman, 2006; Jex & Bliese, 1999; Schwarzer & Hallum, 2008; Skaalvik & Skaalvik, 2007). While most of this research suggests that self-efficacy predicts burnout or, in particular, emotional exhaustion (e.g., Dicke et al., 2014; Skaalvik & Skaalvik, 2007; Schwarzer & Hallum, 2008; Wudy & Jerusalem, 2011), others have found evidence that the relationship is far more complex (Brouwers & Tomic, 2000; Jex & Bliese, 1999). Jex and Bliese (1999) showed that self-efficacy seems to moderate the impact of stressors on burnout. In a longitudinal study, results of Brouwers and Tomic's (2000) indicate that earlier teacher self-efficacy predicted depersonalization and personal achievement, which are two of three dimensions of burnout. However, their results also indicate that in turn, earlier emotional exhaustion predicts teacher self-efficacy (Brouwers & Tomic, 2000). Including classroom disturbances in their model, they even propose that "high levels of student disruptive behavior lead to a low level of teachers' self-efficacy in classroom management, which leads to a higher level of teacher burnout, which in turn leads to a higher level of student disruptive behavior further reducing the level of teachers' self-efficacy" (Brouwers & Tomic 2000; p.241), which further emphasizes the complex nature of the relationship.

The interaction of changes over time in teachers' self-efficacy and emotional exhaustion has rarely been investigated. An exception is a study by Fives et al. (2007), which attempted to investigate changes in teacher self-efficacy together with changes in burnout. However, the authors did not investigate the effects of the variables on the change of each other, nor did they investigate the effects of change in teacher self-efficacy on change in burnout. Thus, there is still need to further disentangle the relationship of emotional exhaustion and teacher self-efficacy, in particular with regard to the dynamic aspect of change.

Professional Knowledge as a Predictor of Teachers' Strain and Resources

In addition to investigating the association of change of emotional exhaustion and change of teacher self-efficacy, the present study also aims to identify other potential predictors of teachers' strain and self-efficacy in line with recommendations of Pas et al. (2012). Recent findings from a longitudinal study showed that knowledge of classroom management, as a particular domain of professional pedagogical/psychological knowledge, explained individual differences in emotional exhaustion where beginning teachers with high knowledge reported less increase of emotional exhaustion after one year (Klusmann et al., 2012). Put simply, the authors found pedagogical/psychological knowledge to act as a buffer within the development of emotional exhaustion. Pedagogical/psychological knowledge is one domain of professional knowledge (Voss et al., 2011). Research on the predictive power of broad educational knowledge which represents a domain of teachers' professional knowledge is scarce (Terhart et al., 2012). Broad educational knowledge reflects all educational, pedagogical, and psychological knowledge domains imparted during teachers' university phase (Kunina-Habenicht et al., 2012; for details, see Kunina-Habenicht et al., 2014). Based on Klusmann et al.'s (2012) findings, it should be interesting to investigate if and how the different domains of this broad approach to teachers' non-content knowledge are related to later well-being.

The Present Study

The research presented here combines previous findings by investigating changes in beginning teachers' emotional exhaustion levels as a major stress symptom, and teachers' self-efficacy as one of the most important resources, and how these changes interact. Additionally, we explore the predictive power of professional knowledge on this change. In doing so, we focus on knowledge of learning and development, knowledge of instruction, and knowledge of educational theory as distinguished domains of broad educational knowledge, and thus, as major components of teachers' professional knowledge (Kunina-Habenicht et al., 2012; Terhart et al. 2012). We investigate if knowledge, which is closer related to the teachers' main professional teaching tasks (that is, knowledge on learning and development and knowledge on instruction), has a stronger buffering effect on well-being than more theoretical knowledge, such as knowledge on educational theory. Further, we employ latent change score models, which allow us to directly assess

change, include predictor variables of change, and relate change in one variable to change in another variable (Ferrer & McArdle, 2010; McArdle & Hamagami, 2001; Parker et al., 2012).

Based on these assumptions, we first predict emotional exhaustion to increase over one year, while self-efficacy should only slightly increase. Latent change score models decompose the variable of the second time wave into an intercept (the score at the first time wave) plus an unobserved change score (see Figure 2.1; McArdle & Prindle, 2008). Thus, it is possible to investigate cross-lags and the relationship of change. This enables us to investigate our second hypothesis, in which we expect earlier teacher self-efficacy and emotional exhaustion to predict later change in the respective other variable. Further, change in one variable should influence change in the other. Third, we hypothesize high levels of the different domains of broad educational knowledge, gained during teacher studies, to buffer the increase of emotional exhaustion and to boost the potential increase of teacher self-efficacy. In particular, based on the assumptions above, we expect knowledge on learning and development and knowledge on instruction to show stronger buffering (on emotional exhaustion) and boosting (on teacher self-efficacy) effects than knowledge on educational theory.

2.2 Method

Participants

Participants were teacher candidates working in German schools. There are two phases of teacher education in Germany. The first phase takes place at university and has a duration of four to five years. In this phase, student teachers attend general courses on psychology, pedagogy, sociology, and so forth, and study their teaching subjects. The second phase, *referendariat*, is entered after university education, but before the actual teaching career starts. This induction program has a duration of approximately two years. During this phase, the beginning teachers are allocated to schools where they gradually begin to teach (after about two to six months) after observing other, more experienced teachers giving lessons. During part of this time, they attend seminars outside their schools. Data of these teacher candidates in their *referendariat* were collected as part of the BilWiss Study (Broad Pedagogical Knowledge and the Acquisition of Professional Competencies in Teacher

Candidates; Terhart et al., 2012). Within the scope of the multiple-matrix design of the BilWiss Study, a random sample received the scales that are relevant for the present study. To obtain longitudinal data, a reduced random subsample receives the scales approximately one year later. In effect, there are missings completely at random (MCAR) at the Time Wave One and Two. Thus, missing data were handled using the full integrated maximum likelihood (FIML) approach (see Enders, 2010), enabling to include all participants who had filled in at least one scale at one time wave. Coverage rates varied from .063 -.593.

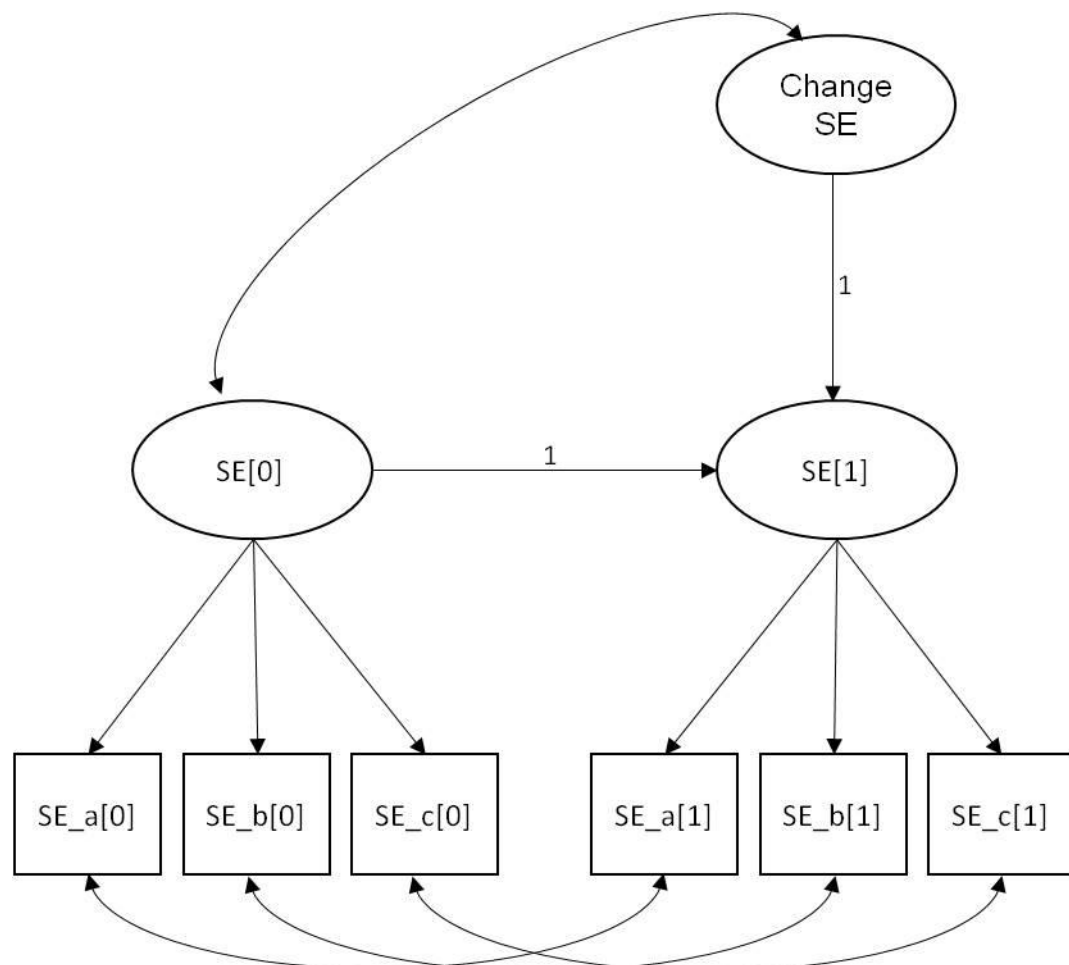


Figure 2.1. The Latent Difference Score Model of Teacher Self-Efficacy. SE = Teacher self-efficacy; SE_a, SE_b, SE_c = Manifest item parcels of teacher self-efficacy; [0] = at Time Wave One; [1] = at Time Wave Two.

The sample of this study ($N = 1,740$) consisted of 28.3% male and 69.0% female teacher candidates, with a mean age of $M = 27.58$ years, $SD = 4.34$. Of the sample, 23.2% taught at primary schools, 28.2% at vocational high school tracks (e.g., “Realschule,” “Hauptschule,” or “Gesamtschule”), and 45.6% at university

high school tracks (“Gymnasium”). The teacher candidates were approached during seminars outside their schools, where they completed the BilWiss test and questionnaire battery. Participating in the data collection was voluntary. Nevertheless, the participation rate was very high (> 90%) at Time Wave One, indicating a representative sample of teacher candidates in the federal state in which the study was conducted.

Measures

Emotional Exhaustion was measured with a short version of the emotional exhaustion subscale of the German version (Enzmann & Kleiber, 1989) of the Maslach Burnout Inventory (MBI; Maslach, Jackson, & Leiter, 1996). Items (e.g., “I feel emotionally drained from my work as a teacher candidate”) were measured on a 4-point Likert scale with sufficient Cronbach’s alpha reliability (see Table 2.1).

Teacher self-efficacy was measured with the teacher self-efficacy scale of Schmitz and Schwarzer (2000). The scale was developed in line with recommendations to assess the self-efficacy domain specifically (Bandura, 1997; O’Mara et al., 2006). Items (e.g., “I am convinced that I am able to successfully teach all relevant subject content to even the most difficult students”) were measured on a 4-point Likert scale with sufficient Cronbach’s alpha reliability (see Table 2.1). Due to the large number of items of this scale, item parcelling was used to create a smaller number of item parcels per scale, resulting in three parcels with four items each and two parcels with three items each. The item parcels were developed by combining the highest loading items into one parcel, the second-highest loading items into another parcel, and the lowest-loading items into the remaining parcel.

Broad educational knowledge was measured concerning three areas: learning and development, instruction, and educational theory (for examples of the content of these scales, see Appendix). The test was scaled based on Item-Response Theory (for details, see Lohse-Bossenz, Kunina-Habenicht, Dicke, Leutner, and Kunter, 2013; Kunina-Habenicht et al., 2014).

Latent Change Analysis

We utilized a dynamic method for assessing change in large part based on the work of McArdle and colleagues (Ferrer & McArdle, 2010; McArdle, 2001; McArdle & Hamagami, 2001; for similar methods, see also Reuter et al., 2010; Steyer, Eid, & Schwenkmezger, 1997). Latent change score or latent difference score models integrate diverse advantages, (e.g., allowing cross and lagged paths, investigating individual differences) of other longitudinal SEM models, such as cross-lagged panel models or latent growth curve models and can be used as a dynamic and direct approach to assess change (for details, see Ferrer & McArdle, 2010; McArdle & Hamagami, 2001; Parker et al., 2012). In these models, change is conceptualized as “the basis of the sequential influences of one variable on another over time” (McArdle & Prindle, 2008, p.704). Thus, change is operationalized by defining all variables at the second time wave as the sum of the score at the first time wave and the unobserved change score (McArdle & Prindle, 2008; see Figure 2.1).

Moreover, these models allow assessing of various kinds of change, e.g., additive or multiplicative change over time, and it is possible to include predictor variables of change. The critical advantage of these models, however, is to relate change in one variable to change in another variable (McArdle & Hamagami, 2001). Models that include these predictors and relations of change are called bivariate change models. In the present study, the bivariate change models included auto-regression paths as well as crossed regression paths from the variables at Time Wave One to the change score variables, the correlation of both variables at Time Wave One, and a correlation of change scores (see Figure 2.2). In a next step, we then introduced other covariates as predictor variables in this bivariate model, allowing us to further investigate the prediction of change.

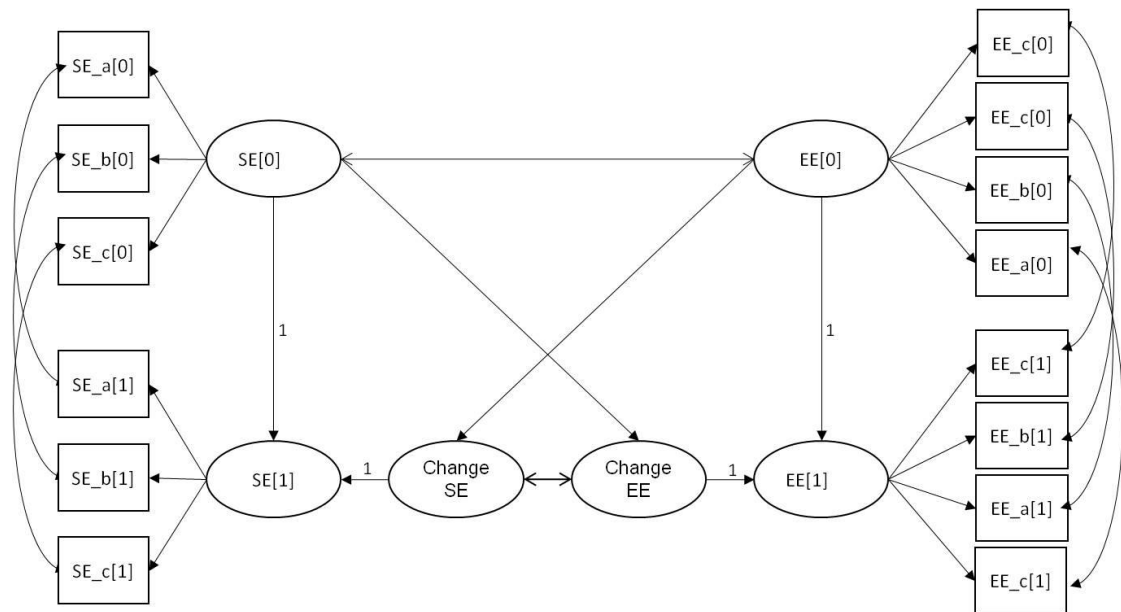


Figure 2.2. The Bivariate Latent Difference Score Model of Teacher Self-Efficacy and Emotional Exhaustion. SE = Teacher self-efficacy; EE = Emotional exhaustion; SE_a, SE_b, SE_c = Manifest item parcels of teacher self-efficacy; EE_a, EE_b, EE_c, EE_d = Manifest variables of emotional exhaustion; [0] = at Time Wave One; [1] = at Time Wave Two.

Goodness of Fit

As model fit indices, CFI, TLI, and RMSEA are reported, in addition to the χ^2 value. These measures of fit were included as the χ^2 value depends on sample size, where even small amounts of misfit can lead to significant χ^2 values when sample sizes are moderate to large (Chen, 2007) and therefore can lead to misinterpretations (false model rejection or acceptance). For the RMSEA, values $\leq .05$ are taken to reflect a good fit, values between .05 and .08 an adequate fit, and values between .08 and .10 a mediocre fit, whereas values $> .10$ are not acceptable (Browne & Cudeck, 1993). For TLI and CFI, values of .90 or higher are considered satisfactory fit, while values above .95 are considered excellent fit (McDonald & Marsh, 1990; Hu & Bentler, 1999). As the present study included a group comparison, model comparisons followed the suggestions of Cheung and Rensvold (2001) and Chen (2007), stating that a change of $\geq -.010$ in CFI or of $\geq .015$ in RMSEA indicates non-invariance between a model in which parameters across groups (that is, school types) are free to take on unique values and a model in which they are constrained to be equal.

2.3 Results

Descriptives

Descriptive statistics, Cronbach's alpha reliabilities and correlations of the latent variables are presented in Table 2.1. As expected, the variables correlated significantly, high, and positive with themselves at different time waves. The correlations of the variables with each other were significant, medium, and negative at the same and at different time waves. However, as an exception, the correlation of emotional exhaustion at Time Wave One with teacher self-efficacy at Time Wave Two was rather small and not significant. The reliability of all scales ranged from .68 to .78 (see Table 2.1 for details).

Table 2.1
Alpha Reliabilities, Descriptive Statistics, and Latent Intercorrelations of Variables

		No. of Items	Rel- iability	<i>M</i> (latent mean)	SD	1	2	3
1	Emotional Exhaustion T1	4	0.74	2.17	0.48	-		
2	Emotional Exhaustion T2	4	0.79	2.51	0.70	0.711**	-	
3	Teacher Self- efficacy T1	10	0.68	3.01	0.24	-0.521**	-0.428**	-
4	Teacher Self- efficacy T2	10	0.72	3.08	0.27	-0.199	-0.326**	0.696**

Note. ** = correlation is significant at $p < 0.001$. All reliabilities, means, standard deviations (*SD*) and correlations were estimated based on FIML, which corrects for missing data.

Invariance over Time

In the first stage of our analysis, we tested measurement invariance over time and across gender for both variables. Measurement invariance over time is a prerequisite for the ability to set up latent change score models (McArdle & Prindle, 2008; Van de Schoot, Lutgig, & Hox, 2012). We additionally tested for invariance of gender to increase power and rule out confounding effects of gender. Three models were initially compared regarding fit indices (see Method Section) to test for longitudinal and gender measurement invariance. The first model allowed for factor

loadings and intercepts of both variables to be estimated freely, while the second model held factor loadings invariant and the third model assumed invariance for factor loadings and intercepts. As recommended by Marsh et al. (2010), we added correlated residuals for matching items over time to account for a possible inflation of test-retest correlations of latent factors. Results regarding the freely estimated model indicate a good fit $\chi^2 = 264$, $df = 136$, $p < .001$, CFI = .94, TLI = .92 RMSEA = .03. When factor loadings are constrained to be equal over time and across groups (gender), model fit slightly improves (see Table 2.2 for details), which indicates invariance of factor loadings over time and groups. Additionally, fixing intercepts to be invariant over time and across groups resulted in decreased fit as indicated by CFI, TLI, and RMSEA ($\Delta CFI > .01$, $\Delta TLI > .01$, $\Delta RMSEA > .015$), indicating possible non-invariance of intercepts. Due to this decrease of model fit when assuming complete invariance of intercepts over time and across groups, we identified those item intercepts which contributed to misfit based on modification indices. Based on this identification, we freed the most contributing intercepts and then tested for partial invariance. Thus, we freed one intercept, which was constrained for observed variables over time, for each variable and tested the model again. When assuming only partial intercept invariance, that is, allowing one intercept of each variable to be estimated freely over time but not across groups, model fit increased again ($\Delta CFI < .01$, $\Delta TLI < .01$, $\Delta RMSEA < .015$). This indicates good support for factor invariance over time and across groups as well as intercept invariance across groups and partial intercept invariance over time with regard to the cut-off values for evaluating invariance (Cheung & Rensvold, 2001; Chen, 2007). Thus, freeing further intercepts was not necessary.

Univariate Latent Change Score Models

After testing for measurement invariance over time in both variables, the second stage of our analysis was to set up univariate latent change score models of emotional exhaustion and teacher self-efficacy. These models allowed us to investigate the amount of decrease or increase of the variable of interest over time. Further, it is possible to investigate variance in this change.

Table 2.2

Model Fit: CFA Including Both Variables (Emotional Exhaustion and Teacher Self-efficacy) With Invariance over Time and Gender

Model and constraints	<i>df</i>	χ^2	RMSEA	CFI	TLI
CFA Configural	136	264	.03	.94	.92
M1 – FL	142	262	.03	.94	.93
M2 – FL, Inter	157	341	.04	.92	.90
M3 – FL, Inter-partial	155	298	.03	.93	.92

Note. CFA Configural = Model without any constraints; M1-FL = Model including constrained factor loadings; M2-FL, Inter = Model including constrained factor loadings and intercepts; M3-FL, Inter-partial = Model including constrained factor loadings and intercepts over gender and constrained factor loadings and partly constrained intercepts over time (one intercept freed per variable).

Emotional exhaustion. We set up a latent change score model for emotional exhaustion, and model fit was good with $\chi^2 = 71$, $df = 20$, $p < .001$, CFI = .96, TLI = .95, RMSEA = .04. However, to achieve this fit, it was necessary to free the correlation of two errors, as indicated by modification indices of an earlier model. This residual correlation was substantively meaningful, as both observed variables refer to depressive (that is, having no engagement and feeling depressed) aspects of emotional exhaustion. This residual correlation was included in all subsequent models of emotional exhaustion. The mean of the latent change variable is positive and significant with $M = .38$ ($SE = .04$), $p < .001$. This reflects that there is a significant increase of emotional exhaustion from Time Wave One to Time Wave Two. Further, emotional exhaustion at Time Wave One with $\sigma = .22$ ($SE = .02$), $p < .001$, and the latent change variable with $\sigma = .23$ ($SE = .05$), $p < .001$, showed a significant value of variance, indicating individual differences in emotional exhaustion at Time Wave One as well as in the change to Time Wave Two. By estimating plausible values for the latent change variable (Asparouhov & Muthén, 2010), we were able to determine that 56% of the sample showed no significant change, while 33% showed significant increase, and 2% showed significant decrease of emotional exhaustion.

Teacher self-efficacy. Model fit of the latent change score model for teacher self-efficacy was good with $\chi^2 = 26$, $df = 9$, $p < .001$, CFI = .97, TLI = .96, RMSEA = .04. The mean of the latent change variable was positive and significant, but very small with $M = .051$ ($SE = .018$), $p < .001$. This reflects that there is small increase of teacher self-efficacy from Time Wave One to Time Wave Two. Further, teacher

self-efficacy only showed a very small amount of variance at Time Wave One with $\sigma = .055$ ($SE = .006$), $p < .001$, and a very small significant variance in the latent change variable $\sigma = .053$ ($SE = .012$), $p < .05$. Thus, there seem to be very small, individual differences within these variables. Again, we estimated plausible values for the latent change variable, enabling us to show that 73% of the sample revealed no significant change, while 14% showed significant increase and 13% showed significant decrease of teacher self-efficacy.

Bivariate Latent Change Score Model

As a third stage, we integrated the two univariate latent change score models in one bivariate latent change score model to investigate relationships of teacher self-efficacy and emotional exhaustion in particular, regarding the dynamic relationship over time. In this model, we can test predictive effects of both variables at an earlier stage, predicting change in the other variable. Further, it allows for testing if there is a relationship between both change variables. Model fit was good with $\chi^2 = 129$, $df = 75$, $p < .001$, CFI = .98, TLI = .97, RMSEA = .02. The relationship of emotional exhaustion and teacher self-efficacy at Time Wave One was significant and negative with $\beta = -.577$, $p < .001$, similar to the relationship of change variables, which was also significant and negative with $\beta = -.636$, $p < .05$. As both change variables indicate an increase over time, this would mean that the more increase is in one of them the less is in the other (see Figure 2.3).

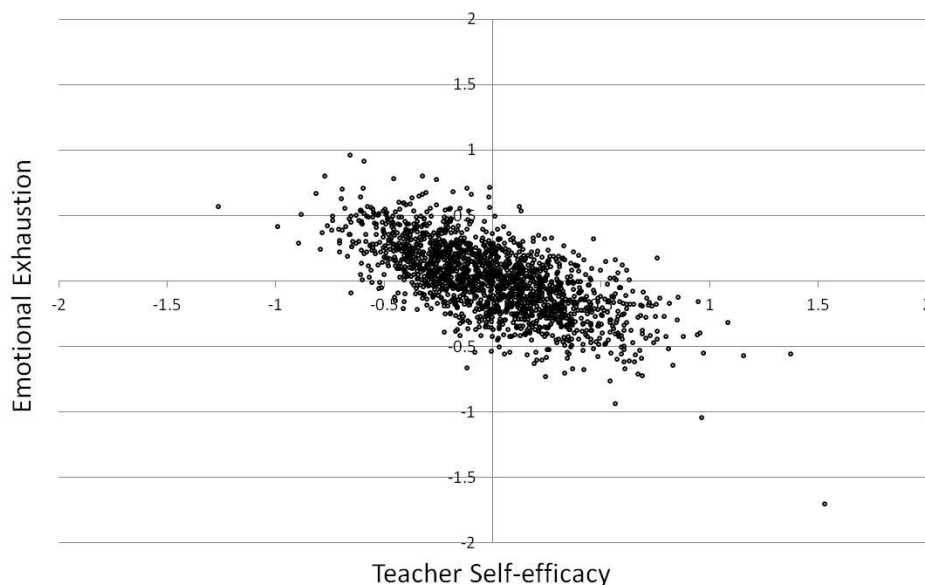


Figure 2.3. Scatter Plot of the Plausible Values Estimated for Change in Emotional Exhaustion with Change in Teacher Self-efficacy

Earlier teacher self-efficacy did not significantly predict change in emotional exhaustion with $\beta = -.176$, $p = .195$, while earlier emotional exhaustion predicted change in teacher self-efficacy with $\beta = .482$, $p < .001$. This indicates that the higher the level of emotional exhaustion at Time Wave One, the more self-efficacy increases over time (see Figure 2.4 for standardized path coefficients).

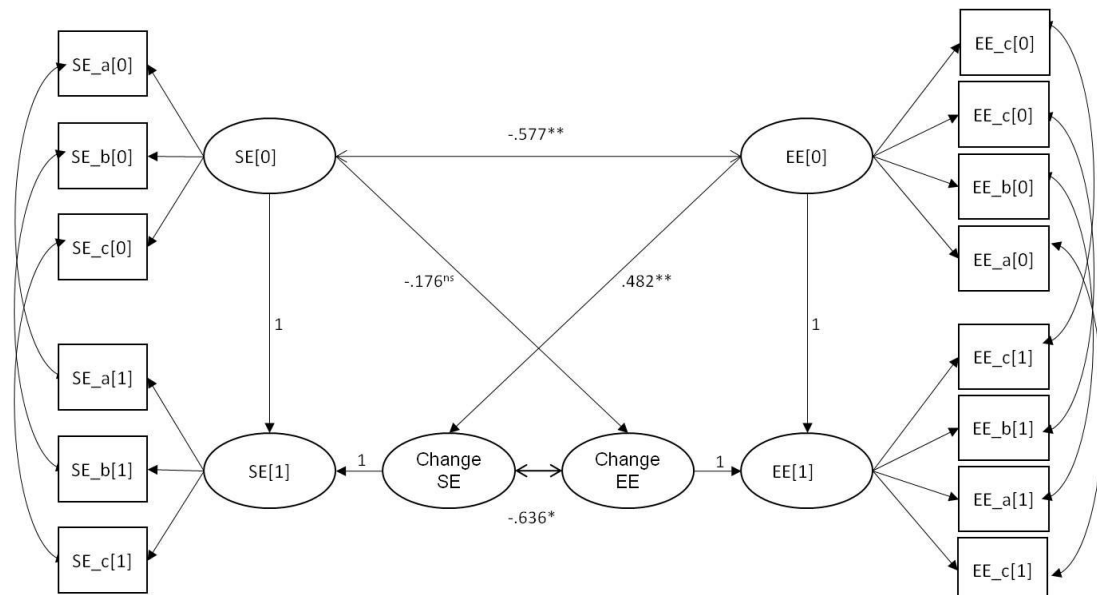


Figure 2.4. The Bivariate Latent Difference Score Model of Teacher Self-Efficacy and Emotional Exhaustion including standardized path coefficients of the structural model. SE = Teacher self-efficacy; EE = Emotional exhaustion; SE_a, SE_b, SE_c = Manifest item parcels of teacher self-efficacy; EE_a, EE_b, EE_c, EE_d = Manifest variables of emotional exhaustion; [0] = at Time Wave One; [1] = at Time Wave Two.

Predictors of Latent Change

Prior results indicate that there is only a very small change in teacher self-efficacy, which can be predicted by, e.g., emotional exhaustion. However, there was significant increase of emotional exhaustion which cannot be accounted for by teacher self-efficacy. Thus, the analysis then moved to include other possible predictors in the bivariate change model.

In line with theoretical assumptions, different domains of broad educational knowledge were included in the model as a predictor. We expected two of them to predict change of teacher self-efficacy and emotional exhaustion (i.e., learning and development, instruction) and we expected one of them *not* to predict teacher self-efficacy and emotional exhaustion (i.e., educational theory). All models including the knowledge predictors revealed excellent fit (see Table 2.3).

As expected, knowledge of learning and development negatively predicted change of emotional exhaustion $\beta = -.175, p = <.05$, but not the change teacher self-efficacy $\beta = .158, p = .104$. This indicates that the higher the level of knowledge of learning and development is at Time Wave One, the less change (that is, less increase) of emotional exhaustion occurs. Knowledge of instruction negatively predicted change of emotional exhaustion, $\beta = -.197, p <.10$, but not the change of teacher self-efficacy $\beta = -.037, p = .704$. As before, a high level of knowledge in this dimension at Time Wave One predicted a small increase of emotional exhaustion. When including knowledge of educational theory as a predictor, the prediction of change in emotional exhaustion $\beta = -.201, p = .228$ and of change in teacher self-efficacy $\beta = -.069, p = .572$, failed to reach significance.

Table 2.3

Model Fit after Introducing Different Domains of Broad Educational Knowledge as a Predictor

Knowledge domain	<i>df</i>	χ^2	RMSEA	CFI	TLI
Learning and development	87	139	.02	.96	.96
Instruction	87	125	.02	.98	.97
Educational theory	87	123	.02	.97	.96

2.4 Discussion

In the present study, we tested two latent change score models and their interaction. First, we examined change in emotional exhaustion and teacher self-efficacy in beginning teachers from the beginning of their teacher induction program at Time Wave One to Time Wave Two, which was assessed after approximately one year. Results revealed that there is an increase of emotional exhaustion and a small increase of teacher self-efficacy. Additionally, while there seem to be large individual differences in the change of emotional exhaustion, there was no significant variance in the change of teacher self-efficacy. Results of the bivariate change model including both variables indicate that prior emotional exhaustion seems to predict change in teacher self-efficacy rather than vice versa. Unexpectedly, this prediction was positive, which means that higher levels of initial emotional exhaustion predict higher change (that is, increase) of teacher self-efficacy. It is, however, important to keep in mind the small overall change (increase) of teacher self-efficacy. As expected, the different domains of broad educational knowledge

showed different predictive power concerning the change of emotional exhaustion. While high levels of knowledge on learning and development as well as knowledge on instruction buffered the increase of emotional exhaustion, knowledge on educational theory did not. As for teacher self-efficacy, none of the knowledge domains had a predictive effect.

Changes of Emotional Exhaustion, Teacher Self-Efficacy, and Their Interaction

Based on the findings of Goddard et al., (2006) and Klusmann et al. (2012), we hypothesized emotional exhaustion to increase over one year. Our results confirm this assumption. As mentioned earlier, it is of course important to consider international differences of beginning teachers' occupational situations (OECD, 2005). The present study, as well as Klusmann et al.'s (2012) study, investigated beginning teachers in Germany, so-called teacher candidates, as they undergo a very specific induction program until they are fully licensed teachers. We collected data at the very beginning of this program and one year later. Due to the organizational structure of this induction program in which the beginning teachers start by only observing other teachers' lessons and then, after four to six months, gain responsibility for their own lessons and classes, demands seem to increase during the program. Thus, the increase of emotional exhaustion can be explained based on these increasing demands. In line with this result, Klusmann et al. (2012), who assessed emotional exhaustion in all four semesters of this induction, also found emotional exhaustion to significantly increase from the first to the third semester and then decrease again to the fourth (although this decrease was not significant; Klusmann et al., 2012) which the authors interpreted as adaption to the increasing demands. This is in line with Friedman's (2000) description of the realty shock, where he proposed three stages: the slump, exhaustion and fatigue, and adjustment. These phases also indicate an initial shock following the first classroom experiences, leading to symptoms of exhaustion, but indicating that eventually, beginning teachers are able to adapt to their environment. Beginning teachers of the present study are seemingly still in the second stage of exhaustion. With this perspective, the differences to the findings of Gavish and Friedman (2010) can also be explained: Gavish and Friedman's (2010) sample seems to have entered this second stage before the conduction of the study, as prior first practical experiences are mentioned. Overall, we suggest that there is an initial increase of emotional exhaustion after the first

practical experiences. However, based on the findings of other researchers (Gavish & Friedman, 2010; Klusmann et al., 2012), this increase bottoms out with time, which would also explain the non-existing differences when comparing the overall level of strain of beginning teachers to experienced teachers (Klusmann et al., 2012; Pas et al., 2012).

Regarding teacher self-efficacy, we found a very small increase which is in line with findings by Woolfolk Hoy and Burke-Spero (2005) and Fives et al., (2007). Thus, the increasing demands of *referendariat* do not seem to affect the levels of teacher self-efficacy. However, results of the bivariate change model, which allowed relating the change of exhaustion to the change of self-efficacy, showed that the more change in one of the variables occurs, the less change in the other is expected. As participants showed a fair amount of change in emotional exhaustion, the change in teacher self-efficacy is low due to this negative correlation of emotional exhaustion and teacher self-efficacy. This effect could be explained by the reciprocal relationship of self-efficacy and emotional exhaustion (Bandura 1997; Brouwers & Tomic, 2000). If one variable is high, the other will be low. Consequently, an increase in one will result in a decrease of the other.

Additionally, our results indicate that high levels of emotional exhaustion predict higher change in teacher self-efficacy. Due to the negative correlation of both change variables, a rather technical explanation for these findings could be that those participants who already had higher levels of emotional exhaustion will most likely not report as much increase (change) of emotional exhaustion, allowing for a higher increase (change) in their teacher self-efficacy. Further, another technical possible explanation could be that individuals with high emotional exhaustion had less teacher self-efficacy at Time Wave One and, thus, more potential to feel an increase of teacher self-efficacy

From a theoretical point of view, the study of Brouwers and Tomic (2000), which also found evidence for the levels of emotional exhaustion to predict teacher self-efficacy, can provide a meaningful explanation. They explained this finding by referring to Bandura's proposed sources of self-efficacy, that is, enactive mastery experiences, vicarious experiences, verbal persuasion and social influences, and physiological and affective states. Brouwers and Tomic (2000) concluded that emotional exhaustion leads to poor occupational performance in class, which they interpreted in terms of low mastery performance, and which in turn leads to a

decrease in self-efficacy. Thus, our findings further stress the importance of considering the role of teacher self-efficacy to also being a consequence rather than only a predictor of related variables (Holzberger, Phillip, & Kunter, 2013).

Predicting Changes through Professional Knowledge

Our results also indicate individual differences in change of both variables. Therefore, it is important to find reasons for these differences to enable researchers to identify and develop interventions to prevent increasing burnout and foster teacher self-efficacy, consequently preventing teacher attrition. Based on theoretical and empirical evidence (Klusmann et al., 2012), we tested if certain domains of broad professional educational knowledge can buffer the increase of burnout and, maybe, boost any potential increase of teacher self-efficacy. Our results revealed that knowledge on learning and development and knowledge of instruction, which are more closely related to the actual teachers' occupation (that is, teaching students), had a buffering effect on the increase of emotional exhaustion. The more distal theoretical knowledge, such as knowledge on educational theory, did not show this buffering effect. This could be because knowledge concerning how students learn and how to set up high-quality instructions (i.e., domains of pedagogical / psychological knowledge) most likely enables the teacher to create an effective lesson with fewer classroom disturbances, which is in line with findings by Voss et al., (2011). Fewer classroom disturbances in turn would reduce the major stressor of beginning teachers (Evertson & Weinstein, 2006; Friedman, 2006), and less emotional exhaustion would be perceived (for an overview, see Dicke et al., 2014; Bakker, Hakanen, Demerouti, & Xanthopoulou, 2007).

On the other hand, however, our results indicate no predictive power of any knowledge domain on teacher self-efficacy. When comparing these knowledge domains to the sources of self-efficacy as postulated by Bandura (see above; 1997), it becomes clear that in order for information about performance to become a source of self-efficacy, it is necessary to be able to appraise and interpret this information. And based on this cognitive process, the information is then integrated and contributes (lowering, or strengthening) to the existing concept of self-efficacy (Bandura, 1997). Considering that the participants of the present study in the majority did not know how they scored in the knowledge test, and probably perceived the result as irrelevant for their teaching career, the level of knowledge as assessed here does not

impact the level of self-efficacy directly. However, as knowledge affects emotional exhaustion and emotional exhaustion seems to predict change in teacher self-efficacy, there might rather be a mediative effect. The finding that knowledge can buffer an increase of beginning teachers' emotional exhaustion is of particular importance, as this knowledge is imparted during university studies (Terhart et al., 2012). Therefore, measures preventing later teacher strain could be implemented in university teacher education by, e.g., ensuring that this knowledge is thoroughly imparted. It is further of great importance to acknowledge the impact of "theoretical" knowledge on later teacher behavior regarding discussions on the value of theoretical and practical content of teacher education (for an overview, see Lohse-Bossenz et al., 2013).

Strengths, Limitations, and Directions for Further Research

The present study utilized a dynamic rather than a static approach to assess changes via latent change score models, which is a major strength of the study. With this approach, we were able to successfully model changes in emotional exhaustion and teacher self-efficacy as well as their interaction by applying latent variables, thus overcoming the disadvantages of modeling on a manifest base (Nagengast et al., 2011). In addition, this state-of-the-art approach enabled us to include further predictors of change, such as professional knowledge. The application of these methods was made feasible by the availability of a large, representative sample of teacher candidates. Therefore, the common problems of typical stress research that depends on convenience samples and on the occurrence of the "healthy worker" effect (meaning only healthy workers remain within the organization and, thus, only their data is assessed) could be avoided (Zapf, Dormann, & Frese, 1996).

Yet the present study has some limitations that need to be discussed. The main variables of interest, that is, emotional exhaustion and teacher self-efficacy, were assessed via self-reports, which can implicate several limitations, as discussed by other stress researchers (Dewe & Trenberth, 2004; Lazarus, 2000; Schmitt, 1994). When investigating the perceived change of inner psychological processes such as emotional exhaustion and self-efficacy, however, self-reports should be appropriate (Crockett, Schulenberg, & Petersen, 1987; Howard, 1994). Further, by including the beginning teachers' test scores of broad educational knowledge when investigating predictors of change, the present study includes objective achievement data as well.

Nevertheless, it should be interesting to include other objective criteria reflecting strain. For example, multiple measurement methods including self-reported exhaustion but also physiological information such as cortisol levels could be utilized to validate collected data. Future research should also include more time waves to allow for even more detailed analyses of change. Based on the results of our present study, it will be particularly interesting to see how levels of emotional exhaustion and self-efficacy develop over the remaining time of the induction program and afterwards, when the participants work as full-time teachers. We also recommend examining the changes and interactions of other important variables that reflect beginning teachers' well-being (e.g., job satisfaction, engagement, intention to quit). Moreover, as mentioned, there are large international differences of teacher induction programs. Thus, future research should investigate whether the proposed model interacts with different cultural backgrounds.

Conclusion

Our research aimed to further explore changes of beginning teachers' emotional exhaustion and teacher self-efficacy as well as their interaction by applying latent change score modeling. Additionally, we aimed to investigate the predictive quality of professional knowledge gained during university. First, results indicate that there is an increase of emotional exhaustion as perceived by German teacher candidates within the first year of teaching, while teacher self-efficacy stays stable. However, results also showed that there are high individual differences within this change that need to be considered for possible interventions and further research. Second, prior emotional exhaustion seems to predict changes of teacher self-efficacy rather than vice versa, indicating a need for further discussion on the protective role of self-efficacy. Last, findings demonstrating a protective buffering effect of broad educational knowledge on emotional exhaustion are of major importance, as such knowledge can be imparted at university (Terhart et al., 2012). Thus, measures fostering teachers' well-being and self-beliefs could begin to be employed in the early stages of teacher education to help prevent later burnout.

2.5 References

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3 Study II & III: Self-efficacy in Classroom Management, Classroom Disturbances, and Emotional Exhaustion: A Moderated Mediation Analysis of Teacher Candidates³⁴

Abstract

While the roles of student misbehavior and teacher self-efficacy in teacher burnout have been investigated, there is still a pressing need to determine the processes involved and the degree to which these generalize across early career teachers. The present research integrates findings on teacher self-efficacy, occupational stressors, and emotional exhaustion. A moderated mediation model is hypothesized where self-efficacy in classroom management predicts emotional exhaustion via classroom disturbances, but the strength of this whole mediation process is moderated by teachers' level of self-efficacy in classroom management. A sample of 1,227 German teacher candidates was used to test this hypothesis in two complementary studies. Study II, based on the whole sample, utilized latent modeling and latent interactions, while Study III was based on a random longitudinal subsample of Study II. The results generally supported our assumptions; the proposed moderated mediation model proved to be statistically significant, even when introducing background covariates into the model to control for pre-existing differences. Thus, self-efficacy in classroom management predicted emotional exhaustion via classroom disturbances only when self-efficacy in classroom management was low. Implications for teacher pre-service training, based on the results, are discussed.

Keywords: moderated mediation, self-efficacy, classroom management, teacher stress

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⁴ Due to restrictions of copyright this dissertation includes the abstract of these studies only. The full article including both studies can be downloaded at <http://www.apa.org/pubs/journals/edu/>

4 Study IV: Preventing Reality Shock: The Effects of Classroom Management Training on Beginning Teachers⁵

Abstract

Research has identified beginning teachers' perceptions of being unprepared to deal with problems of student discipline or classroom disturbances as a major cause of reality shock. Despite these findings, a lack of options remain for beginning teachers to learn how to deal with such disturbances, i.e., by enhancing their classroom management skills. In this study, the longitudinal effects (pre-, post-, and follow-up) of classroom management training are investigated. Participants (N = 97) were assigned to one of two intervention groups. One group of participants received classroom management training or, alternatively, general stress management training. The other participants were assigned to a wait control group. The results revealed that the classroom management group was superior in classroom management skills. Both intervention groups were superior to the wait control group with regard to well-being. Overall, the training can be recommended as a useful supplement to teacher education to help overcome the causes of reality shock.

Keywords: reality shock, classroom management training, teacher stress, beginning teachers

⁵ Based on the manuscript: Dicke, T., Schmeck, A., Elling, J., & Leutner, D. (2013). *Preventing reality shock: Longitudinal effects of a classroom management skills training on pre-service teachers' well-being*. Manuscript submitted.

4.1 Theoretical Background

Nowadays, many economies face the situation of shortages of qualified teachers (Eurydice Network, 2012; OECD, 2005). “Reality shock,” referring to the collapse of ideals or expectations developed during teacher education following a teacher’s first confrontation with classroom reality, is a frequently used term in research on teachers’ stress (Goddard, O’Brien & Goddard, 2006; Veenman, 1984). Recently, the focus of research in this field has shifted to attrition, given that teacher attrition during the early years of teaching has been shown to be high (Guarino, Santibañez, & Daley, 2006); in fact, more than one-third of beginning teachers leave the profession within their first five years (Ingersoll, 2002). Research showed that this attrition is essentially a symptom of reality shock, stress, and lack of well-being (Friedman, 2006; Jalongo & Heider, 2006)⁶. Therefore, it can be expected that the problem of attrition could be addressed by reducing the reality shock effect, thereby decreasing strain and improving well-being (Klusmann, Kunter, Voss, & Baumert, 2012; Veenman, 1984).

Recent research showed that strain and low levels of well-being are in large part caused by student disturbances (Bakker, Hakanen, Demerouti, & Xanthopoulou, 2007; Evers, Tomic, & Brouwers, 2004; Friedman, 2006). Thus, giving teachers special training in how to manage their classroom should allow them to deal with disturbances more efficiently (Emmer & Evertson, 2008) and, in effect, increase their well-being.

We conducted an experiment with three groups who received classroom management training, stress management training, or no training, respectively, and observed the effects on short- and long-term levels of well-being and classroom management capabilities. To the best of our knowledge, this is the first study that investigates the relationship between strain and classroom management skills experimentally, allowing us to investigate causal relationships. Our results provide direct evidence of the importance of classroom management skills for preventing reality shock and retaining teachers’ well-being, thereby creating a better prepared

⁶ Early teacher attrition in Germany is, however, comparably low considering other OECD countries (OECD, 2005), most likely because the benefits of high income and job security are extraordinarily high. However, the underlying causes of attrition—reality shock and increasing levels of burnout among beginning teachers—are prevalent in Germany as well (for an overview, see Klusmann et al., 2012).

teacher workforce. In summary, our paper addresses a pressing issue in the contemporary Western economy: how to prevent strain as a symptom of reality shock and thereby retain beginning teachers by providing them with adequate classroom management skills.

Reality Shock: Teacher Candidates' Stress and Strain

The transition that beginning teachers undergo, from learning how to teach to actually starting to teach in a real classroom, has been called many names, such as “praxis shock” (Veenman, 1984), reality shock, “the survival phase” (Huberman, 1989), “transition shock” (Corcoran, 1981), and even “shattered dreams” (Friedman, 2000). All of these labels commonly refer to the collapse of ideals or expectations developed during teacher education following a teacher’s first confrontation with classroom reality. As a result of this confrontation, strain or burnout, which reflects a prolonged and occupational-specific form of strain as the result of repeated long-term exposure to stressors, can occur (Klusmann et al., 2012; Veenman, 1984). Despite differences in teacher preparation programs worldwide, all share a common factor: Beginning teachers learn to utilize their theoretical knowledge in a practical context and seem to struggle with this transition, as international research indicates (e.g. Friedman, 2000; Klusmann et al., 2012; Stokking, Leenders, De Jong & Van Tartwijk, 2003; Veenman, 1984).

Friedman (2000) described three phases that teachers experience during their first actual teaching experiences: (a) slump, (b) exhaustion and fatigue, and (c) adjustment. These phases indicate an initial shock after the first classroom experiences, leading to symptoms of exhaustion. Nevertheless, the third phase, “adjustment,” indicates that beginning teachers are able to adapt to their environment, even if this adaption requires beginning teachers to lower their expectancies.

Studies comparing beginning⁷ and experienced teachers showed that the average level of burnout does not differ between beginning and experienced teachers (Klusmann et al., 2012; Pas, Bradshaw, & Hershfeldt, 2012). Moreover, Klassen and Chiu (2010) even found that classroom stress was lower for beginning teachers. The

⁷ We employ a similar perspective to Klusmann et al. (2012), who refer to all teachers within their first years as “beginning teachers,” irrespective of whether they are fully licensed as teachers or have only a restricted license, as in the German “Referendariat” (practical teacher education; see method section for details, and cf., Veenman, 1984).

results therefore are inconsistent, as studies focusing on the development of strain in beginning teachers have shown increases (Goddard et al., 2006), decreases (Fives, Hamman, & Olivarez, 2007), or stability (Gavish & Friedman, 2010) of burnout symptoms in beginning teachers.

Classroom Disturbances

Friedman's review of teacher stress (Friedman, 2006) indicates that burnout arises because of issues regarding social-psychological aspects of teaching, classroom management issues, and problematic teacher-student relationships rather than from instructional teaching problems (e.g., low academic student achievement, difficulty in teaching new material). In particular, inexperienced teachers—i.e., beginning teachers—perceive student discipline as their most serious teaching challenge, one that they feel unprepared to cope with (Evertson & Weinstein, 2006; Jones, 2006; Rieg, Paquette, & Chen, 2007). Jones (2006) reviewed numerous studies dealing with beginning teachers' perceived biggest threats when teaching. All had similar results, with student misbehavior and disturbances being the most salient, in line with a review by Veenman (1984). Taken together, these findings indicate that classroom disturbances and student disruption seem to be major predictors of teacher stress and strain, particularly for beginning teachers.

Considering these assumptions, we consider that classroom management likely represents a very effective resource that should be able to buffer the effects of beginning teachers' job demands on strain.

Classroom Management

Classroom management is broadly defined as “the actions teachers take to create an environment that supports and facilitates both academic and social-emotional learning” (Evertson & Weinstein, 2006, p. 4). Good classroom managers choose management styles that match their instructional goals, classroom activities, and students' characteristics (Emmer & Stough, 2001). In their meta-analysis, Wang, Haertel, and Walberg (1993) identified classroom management and teacher-student interactions (academic and social) as major predictors of student learning. However, Wang et al. (1993) also point out that this effect is directly related to a decrease in discipline problems, such as off-task behavior. Thus, they conclude that teachers with effective classroom management skills spend less time on discipline problems,

enabling them to spend more time on instruction, which leads to enhanced student achievement (Wang et al., 1993). Thus, classroom management is more than just establishing and sustaining classroom discipline (Freiberg & Lapointe, 2006). But minimizing classrooms disturbances is a prerequisite for high-quality instruction, and is also a distinct aim of the overall concept of classroom management (Evertson & Weinstein, 2006; Lewis, 1999). Put simply, a good classroom manager is able to prevent undesirable classroom behavior and thereby foster desirable behavior (Emmer & Stough, 2001).

Further research conducted in the Netherlands investigated the interpersonal relationship between students and teachers as an important aspect of classroom management (Wubbels, Brekelmanns, den Brok, & van Tartwijk, 2006). The authors identify several profiles of teaching style as perceived by teachers, but more importantly, by their students. Specific teaching styles are important for student outcomes—more authoritative or directive teacher behavior, for instance, leads to higher cognitive achievement, whereas higher cooperative teacher behavior leads to higher student motivation. Due to the strong relationship between teacher behavior and student outcomes, it is important to create awareness of these interpersonal behavioral effects in beginning teachers, and to increase their behavioral repertoire (Wubbels et al., 2006).

So far, research in the field of classroom management has primarily focused on how classroom disturbances can be limited while increasing students' engagement (Emmer & Stough, 2001).

Hence, more research that addresses the concerns of teachers' classroom management skills and their ability to maintain health in spite of high demands is needed (Klusmann, Kunter, Trautwein, Lüdtke, & Baumert, 2008). Promisingly, some studies have investigated the statistical interaction of teachers' self-efficacy (in classroom management skills), stressors (e.g., classroom disturbances), and burnout (see Dicke et al., 2014, for an overview). While some researchers have found support for reciprocal relationships between teachers' self-efficacy and burnout (e.g., Brouwers & Tomic, 2000; Maslach, 1999; Skaalvik & Skaalvik, 2007), others have suggested that teacher self-efficacy *predicts* burnout (e.g., Brouwers & Tomic, 1999; Schwarzer & Hallum, 2008; Wudy & Jerusalem, 2011). Additionally, some studies have shown that this relationship is mediated by teacher-specific stressors, such as student misbehavior, workload, or role ambiguity (Betoret, 2009; Schwarzer &

Hallum, 2008). Thus, the effects of good classroom management can be considered twofold: First, it affects student behavior, which, second, thereby affects teacher well-being (e.g., by diminishing student disruptions).

There appear to be a high number of studies related to classroom management in general, yet although there is a common understanding of the general importance of classroom management skills, there still is a lack of options for beginning teachers to enhance their classroom management skills (Evertson & Weinstein, 2006; Jones, 2006; Ophardt & Thiel, 2008). Jones (2006) summed up a large number of studies with similar findings: Although classroom disturbances are the biggest threats to new teachers, these new teachers felt unprepared to deal with them and demanded more options for learning classroom management strategies within their teacher education programs.

Classroom Management Training

In their review of classroom management training, Freiberg and Lapointe (2006) identified 40 research-based programs that focused on preventing and solving discipline problems within the classroom that matched their criteria for having been sufficiently evaluated, such as empirical analysis of the program's effectiveness or longitudinal sustainability (Freiberg & Lapointe, 2006). Freiberg and Lapointe (2006) reported only two of these 40 programs as having specific curricula for new or beginning teachers. One of these is the "Classroom Organization and Management Program" (COMP; Emmer & Evertson, 2008; Emmer, Evertson, Sanford, Clements, & Worsham, 1982; Emmer, Evertson, & Worsham, 2002). Although COMP offers a special program for new teachers, it was initially developed for in-service teachers. This program seems to be the best researched and most frequently implemented of all programs (Jones, 2006). COMP is based on four major principles: "1) preventing rather than intervening, 2) management and instruction are integrally related, 3) students are active participants in the learning environment and 4) professional collaboration supports changes in teaching practice" (Evertson & Harris, 1999, pp. 65–67). COMP training is also one of the few interventions targeting classroom management skills that is based on studies investigating effectiveness issues (for an overview, see Evertson & Weinstein, 2006). The results of these studies showed strong empirical evidence that teachers who participated in COMP workshops, compared to those who did not, had classroom environments with fewer disturbances

and more instructional time, both of which are more conducive to student learning. Additionally, their students realized greater gains in academic achievement (Evertson & Harris, 1999).

Hence, although there seem to be effective classroom management programs to improve student behavior, to our knowledge, empirical studies that focus on the specific effects of classroom management interventions on indicators of well-being are still rare. One exception is a study by Sharp and Forman (1985), in which they compared the effects of stress-inoculation training, classroom management training, and no training at all on teacher anxiety and classroom behavior. The results showed that both trainings had a significant and superior effect on indicators of teachers' school-related anxiety and verbal classroom behavior, in comparison to the "no training" control group, although the classroom management training group showed somewhat higher levels on the latter.

Research Hypotheses

In this study, we chose a similar approach to Sharp and Forman (1985), comparing the effects of classroom management training to general stress management training or no training. However, in contrast to Sharp and Forman (1985), we focus on beginning teachers as participants because they are known to be the most vulnerable (e.g., Jones, 2006) and have the greatest need for supportive measures to help them handle classroom management issues due to their lack of experience. With this in mind, we developed and evaluated a training program that is able to prepare teachers adequately for their first actual classroom experiences, thereby preventing or at least reducing any kind of reality shock and signs of negative well-being.

In line with the assumptions above, classroom management training for German beginning teachers was developed. We examined the long-term effects of our classroom management training compared to general stress management training or no training. The stress management training can be viewed as a placebo-control group to rule out the effects of increased attention and altered expectancies. Further, stress management training should directly tap indicators of well-being. Thus, if the classroom management training shows similar effects, this should be strong evidence for its preventive character. Based on the theory reviewed and in particular on the early findings of Sharp and Forman (1985), our research hypotheses were as follows:

H1: Beginning teachers who participate in classroom management training will show higher values of indicators of good classroom management skills compared to beginning teachers who participate in stress management training or no training, while participants of stress management training show higher values than the no-training group.

H2: Beginning teachers who participate in classroom management training show comparable results on indicators of well-being as the participants in stress management training, while both training groups show higher indicators of well-being than beginning teachers who participate in no training. Overall, we expected our proposed effects to show stability and still be observable up to one year after the training was conducted.

4.2 Methods

Participants and Design

Ninety-seven German beginning teachers participated in our study. German teacher education consists of two phases. The first phase occurs at university and takes four to five years, during which student teachers study two teaching subjects (such as Mathematics or English) and attend further general courses on Education, Pedagogy, Psychology, Sociology, and related topics. Practical training experiences are the center of the second phase (the so-called *Referendariat*), on which we focus in this study. In this second phase, beginning teachers are allocated to schools, where they first observe other teachers during lessons and gradually start to teach their first lessons independently (approximately 10 hours a week) after about two to six months. Simultaneously, they attend courses regarding the general principles and methods of teaching (six to eight hours per week) at a teacher training college (the so-called *Studienseminar*). The German school system consists of five school types: primary school, vocational track, intermediate track, academic track, and a school which combines the latter three. The average age of our participants was 27.6 years (SD = 4.1); 69% were female. Participants were recruited through the seminars they attended at their teacher training college. Participants were assigned to a classroom management training group (n = 36), a stress management training group (n = 42), and a control group (n = 19). For organizational reasons, the classroom management

training group consisted of beginning teachers of three different school types; the control group consisted of beginning teachers of one school type; and the stress management group consisted of beginning teachers of all five different school types. The control group (a wait control group) was instructed about the general nature of the study and was scheduled for stress management training after the study was conducted.

Procedure

The classroom management training group and the stress management training group both received their training over a total of two and a half days, consisting of two days' training (eight hours each) and a three-hour follow-up session. The maximum time between the first two training days was one day; the follow-up session was conducted 12 to 14 weeks after the two initial training days. Before the training started, participants completed a pre-intervention questionnaire assessing cognitive-behavioral variables. Two days of training followed. Next, beginning teachers filled in a post-intervention questionnaire four to five months after the training was conducted, during the follow-up sessions. Finally, participants filled in the second post-intervention questionnaire 10 to 12 months after the training. For the following analyses, the data of 56 participants who had completed all pre- and post-surveys was available: classroom management training group (n = 22); stress management training group (n = 24); and control group (n = 10).

Intervention Program

As described earlier, we developed a classroom management training program for beginning teachers. The training consisted of seven modules: (1) classroom organization, (2) rules and procedures, (3) the importance of the beginning of the school year, (4) maintaining the classroom management system, (5) problematic behavior, (6) interpersonal relationships, and (7) communication. Modules (1) to (5) were adapted versions of the respective modules of "The Classroom Organization and Management Program" (COMP; Emmer & Evertson, 2008; Emmer et al., 1982; Emmer et al., 2002). In our version, we modified the COMP training to match the German school environment. However, the major difference between our classroom management training and the original COMP training is that we added an extra module, focusing on the interpersonal perspective

on classroom management. In doing so, we intended to create awareness in beginning teachers of how aspects of interpersonal behavior between teachers and students can affect student behavior and achievement. This perspective stresses the meaning of students' perceptions of the teacher's behavior, rather than the actual intention of the teacher (cf., Wubbels et al., 2006). Inexperienced teachers in particular may not be aware of the responses their behavior might trigger in students, because it is interpreted irrespective of the teacher's original intention. Further, integrating the interpersonal perspective has potential to increase the beginning teachers' behavioral repertoire and enable them to purposefully utilize specific teaching styles, depending on their current goal within the lesson (Wubbels et al., 2006). Further, this perspective stresses the role of communication skills as essential to understanding classroom management dynamics in typical school settings (Jones & Jones, 2010; Wubbels et al., 2006). Thus, we added a module dealing with communication as the subject. The main topics of the communication module (Module 7) were nonverbal communication, active listening, "I messages" (Schulz von Thun, 2008; Watzlawick, Beavin, & Jackson, 2007), and the overall importance of these topics for relationships between students and teachers.

The stress management training, based on the German AGIL training (see Hillert et al., 2012; Lehr, Sosnowsky, & Hillert, 2007) was slightly modified to match the needs of beginning teachers. AGIL training has proven its effectiveness as a stress management intervention within the clinical context, and also for experienced teachers in several studies (e.g., Lehr et al., 2007). We utilized this training as a preventive measure for beginning teachers. We adapted it for participants with less experience in the teaching context and added a time-management module, which is considered a very important resource for learners (Pickl, 2004). Last, we added a module on progressive muscle relaxation (PMR) techniques.

Measures of the Intervention Effects

In our study, we distinguish the effects of the classroom management training on indicators of classroom management skills such as self-efficacy in classroom management, classroom disturbances, and success; and indicators of well-being, such as emotional exhaustion, engagement, quality of sleep, and rumination. All indicators

were measured as self-reports. Table 4.1 and Table 4.2 show Cronbach's alphas and the number of items of all scales.

Indicators of classroom management skills

Self-efficacy in classroom management was measured with an adapted German version of the Self-Efficacy in Classroom Management subscale of the Teachers' Sense of Efficacy Scale (TSES), developed by Tschannen-Moran and Woolfolk Hoy (2001), which has also been validated for beginning teachers (Tschannen-Moran & Woolfolk Hoy, 2001) and for teachers across different cultural settings (Klassen et al., 2009). Items (e.g., "How well can you respond to defiant students?") were measured on a 6-point Likert scale.

Classroom disturbances were measured on a scale developed by Baumert et al. (2008). Items (e.g., "At the beginning of the lesson, it takes a long time until the students calm down and start to work") were measured on a 6-point Likert scale.

Perceived success was measured by three subscales of the perceived success scale developed by Grebner, Elfering, and Semmer (2010): goal achievement, prosocial success, and positive feedback. These scales assess perceived success as positive and meaningful work-related events that are based on performance. It is argued that only self-perceived success is related to well-being, and that this relation is a result of the congruence of personal goals and values with the actual achievement (Grebner et al., 2010). This might be especially true for teachers, as there are no defined standards as to what constitutes a successful teacher.

Target achievement is an important overall measure that measures whether participants perceive themselves as successful in their work. Items (e.g., "In the last two weeks of work, I have achieved good results") were measured on a 5-point Likert scale.

Prosocial success, meaning success as a desirable outcome of improving the situation for others, was also assessed. An important task for teachers is to help students achieve in school. Therefore, this dimension of success was also considered important. Items (e.g., "In the last two weeks of work, I have helped others to succeed") were measured on a 5-point Likert scale.

Positive feedback was also assessed. Positive feedback is an important source of individual success, as the beginning teachers in the current study were still within their teacher preparation program and should have been receiving feedback on a

regular basis from their fellow beginning teachers, other colleagues, mentors at school, and educators from the teacher colleges. Items (e.g., “In the last two weeks, I have received positive feedback from colleagues”) were measured on a 5-point Likert scale.

Indicators of well-being

Emotional exhaustion was measured with a short version of the emotional exhaustion subscale of the German version (Enzmann & Kleiber, 1989) of the Maslach Burnout Inventory (MBI; Maslach, Jackson, & Leiter, 1996). Emotional exhaustion is regarded as the central dimension of burnout (see Cropanzano, Rupp, & Byrne, 2003; Klusmann, et al., 2008; Peterson et al., 2008) Items (e.g., “I feel emotionally drained from my work as a teacher candidate”) were measured on a 4-point Likert scale.

Engagement was measured by the Utrecht engagement scales (Schaufeli & Bakker, 2003). Items (e.g., “When I wake up in the morning, I look forward to going to work”) were measured on a 4-point Likert scale.

Rumination means not being able to stop contemplating worrying thoughts. High rumination is associated with negative well-being. It was assessed by a scale developed by Treynor, Gonzalez, and Nolen-Hoeksema (2003). Items (e.g., “Sometimes I think I have problems others never have”) were measured on a 4-point Likert scale.

Quality of sleep was measured by a scale developed by Görtelmeyer (1986). Unhealthy sleeping behavior or bad quality of sleep is a typical symptom of high strain. Items (e.g., “How do you feel when you wake up in the morning?”) were measured on a 5-point Likert scale.

Data Analysis

The analysis consisted of several steps. First, we compared the training groups on basic characteristics and on the outcome variables to detect possible differences that were not due to the training. Second, repeated measures analyses of variance (RM-ANCOVAs) with Time Wave One as a covariate were conducted. They revealed whether there was a training effect (main effect) for Time Wave Two and Three and whether this effect was stable (non-significant time x group interaction). In a third step, planned Helmert comparisons (orthogonal) were set up

according to our hypotheses to reveal detailed differences between each group. All variables, including those that did not indicate significant differences in the prior RM-ANCOVA, were analyzed with the planned comparisons due to the planned comparisons' strong statistical power, therefore having a greater probability of detecting differences in small samples.

4.3 Results

Are the Groups Equivalent on Basic Characteristics?

A univariate analysis of variance (ANOVA) with training group as factor and age as dependent variable revealed that the groups did not differ significantly on age; $F(2, 54) = 2.33, p = .11$. Additionally, a multivariate analysis of variance (MANOVA) including all variables at Time Wave One (before the training was conducted) revealed no significant difference among all groups $F(18, 94) = 1.61, p = .07$. Chi-square analysis indicated that there were no significant differences among the groups in experience with classroom situations ($p > .05$), but there were significant differences in gender ($p < .05$) and school type ($p < .001$). However, adding gender or school type as control variables in the analyses below did not change the general structure of the results for the factor training. The different distributions of school type within the training groups are discussed later (see Discussion). Overall, we concluded that the groups were equivalent on basic characteristics.

Training effects on indicators of classroom management skills

The descriptive statistics are presented in Table 4.1. The results of the RM-ANCOVAs indicated the main effects of training on both post-time waves for self-efficacy in classroom management $F(2,52) = 4.16, p = .021$, partial $\eta^2 = .138$, and for two subscales of the perceived success scale— i.e., goal achievement $F(2,52) = 8.58, p = .001$, partial $\eta^2 = .248$, and positive feedback $F(2,52) = 4.65, p = .014$, partial $\eta^2 = .152$. Thus, depending on the treatment (classroom management training, stress management training, or no training) participants had received, they reported different levels of self-efficacy in classroom management, goal achievement, and positive feedback. There was no significant training effect over both post-time waves on classroom disturbances $F(2,52) = 1.81, p = .174$, partial $\eta^2 = .065$, and prosocial success $F(2,52) = 2.11, p = .132$, partial $\eta^2 = .075$.

Table 4.1

Scale Names, Number of Items, Reliabilities, and Descriptive Statistics of all Scales regarding Classroom Management Skills

	No. of Items	α		<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
<i>Indicators of Classroom Management Skills</i>									
				<i>CMG</i>		<i>SMG</i>		<i>CG</i>	
Self-efficacy in classroom management	8	.91 - .93	t1	4.12	0.75	4.27	0.71	4.26	0.79
			t2	4.63	0.63	4.43	0.78	3.81	0.90
			t3	4.44	0.79	4.24	0.72	3.95	1.18
Classroom disturbances	3	.79 - .90	t1	3.41	1.12	2.83	0.94	2.23	0.85
			t2	3.17	1.56	3.29	1.26	3.30	1.80
			t3	3.21	1.60	3.26	1.17	3.50	1.67
Target achievement	3	.86 - .91	t1	2.78	0.63	2.76	0.72	2.93	1.01
			t2	3.30	0.58	3.08	0.69	2.19	0.67
			t3	3.04	0.81	2.97	0.72	2.52	1.21
Prosocial success	6	.84 - .89	t1	2.51	0.50	2.22	0.61	2.31	0.85
			t2	3.04	0.57	2.76	0.65	2.20	0.70
			t3	2.89	0.82	2.65	0.45	2.65	1.05
Positive feedback	4	.75 - .78	t1	2.20	0.91	2.29	0.89	2.07	0.96
			t2	2.57	0.72	2.34	0.90	1.42	0.80
			t3	2.53	0.92	2.28	0.79	2.25	1.14

Note. α = Cronbach's alpha; t1 = Time Wave One (pre-intervention), t2 = Time Wave Two (post-intervention), t3 = Time Wave Three (post-intervention).

Table 4.2
Scale Names, Number of Items, Reliabilities, and Descriptive Statistics of all Scales Regarding Well-Being

	No. of Items	α		<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
<i>Indicators of Well-Being</i>									
				<i>CMG</i>		<i>SMG</i>		<i>CG</i>	
Emotional exhaustion	4	.82 - .90	t1	1.99	0.70	2.03	0.57	2.05	0.57
			t2	1.83	0.70	2.28	0.79	2.58	0.86
			t3	2.13	0.71	2.32	0.63	2.58	1.04
Engagement	9	.90 - .93	t1	2.02	0.54	1.90	0.50	1.61	0.76
			t2	2.20	0.50	2.00	0.66	1.43	0.78
			t3	2.10	0.47	1.86	0.57	1.51	0.94
Quality of sleep	7	.90 - .91	t1	1.76	0.78	1.57	0.71	2.06	0.75
			t2	1.66	0.67	1.65	0.86	1.27	0.62
			t3	1.94	0.81	1.65	0.81	1.44	0.71
Rumination	5	.84 - .90	t1	1.26	0.70	1.51	0.61	1.30	0.70
			t2	1.17	0.69	1.73	0.63	1.92	0.91
			t3	1.17	0.71	1.62	0.74	1.90	0.89

Note. α = Cronbach's alpha; t1 = Time Wave One (pre-intervention), t2 = Time Wave Two (post-intervention), t3 = Time Wave Three (post-intervention).

Most indicators showed non-significant time x group interactions, indicating stability of the training effect (or no training effect) over time, self-efficacy in classroom management with $F(2,52) = 1.20, p = .309$, partial $\eta^2 = .044$, classroom disturbances with $F(2,52) < 1$, and target achievement with $F(2,52) = 1.94, p = .154$, partial $\eta^2 = .069$. However, two of the success scales showed a positive time x group interaction; that is, prosocial success $F(2,52) = 3.60, p = .034$, partial $\eta^2 = .122$, and positive feedback with $F(2,52) = 5.53, p = .007$, partial $\eta^2 = .175$, indicating a possible short-term effect of the training. Based on these interaction effects, we conducted additional analyses, taking the two post-time waves into account separately. These analyses revealed that there was a significant main effect of training on the first post measure, with $F(2,52) = 5.81, p = .005$, partial $\eta^2 = .183$, but not the second post measure, with $F(2,52) < 1$ of prosocial success, indicating at least a short-term effect on this measure. Positive feedback showed similar results, with a significant main effect of training on the first post measure, with $F(2,52) = 8.95, p < .001$, partial $\eta^2 = .256$, but not the second post measure, with $F(2,52) = 1.27, p < .290$, partial $\eta^2 = .046$. This indicates that there seem to be only short-term effects for these variables.

Planned comparisons (for details, see Table 4.3) over both post-time waves first compared the classroom management training group with the mean of both of the other groups. These comparisons revealed significant differences on the $\alpha = .025$ level (one-tailed test) in favor of the classroom management training group for self-efficacy in classroom management, target achievement, and positive feedback. Further, on the $\alpha = .05$ level (one-tailed test), the classroom management training group showed significant fewer classroom disturbances and higher values of prosocial success. Thus, participating in classroom management training led to higher self-efficacy in classroom management, higher perceived success, and fewer classroom disturbances than participating in stress management training or having no training. The additional comparison of the stress management training group to the control group revealed significant differences on the $\alpha = .025$ level (one-tailed test) in favor of the stress management training group only in target achievement, and on the $\alpha = .05$ level (one-tailed test) in self-efficacy in classroom management. Participating in a stress management training therefore led to higher target achievement and higher self-efficacy in classroom management than participating in no training at all. Hence, as expected, classroom management training seems to have

superior effects in all indicators of perceived classroom management skills over stress management training or no training. That is, participants in classroom management training perceived higher classroom management skills than participants of stress management training or no training, and this effect was stable over one year. Further, stress management training had superior effects over no training in target achievement and self-efficacy in classroom management. Therefore, participants of stress management training perceived higher target achievement and self-efficacy in classroom management than did those beginning teachers who did not receive any training. This effect was also stable over one year.

Training effects on indicators of well-being

The descriptive statistics are presented in Table 4.2. The results of the RM-ANCOVAs revealed main effects of training over both post-time waves on emotional exhaustion with $F(2,52) = 4.50$, $p = .016$, partial $\eta^2 = .147$, rumination with $F(2,53) = 7.94$, $p = .001$, partial $\eta^2 = .231$, and quality of sleep with $F(2,53) = 4.60$, $p = .014$, partial $\eta^2 = .148$. That is, depending on which treatment (classroom management training, stress management training, or no training) participants had received, they reported different levels of emotional exhaustion, rumination, and quality of sleep. There was no significant effect of training, however, on engagement $F(2,52) = 2.64$, $p = .081$, partial $\eta^2 = .092$. All indicators of well-being showed non-significant time x group interactions indicating stability of training effects (or no training effects) over time: that is, emotional exhaustion with $F(2,52) = 1.65$, $p = .202$, partial $\eta^2 = .060$, rumination with $F(2,53) < 1$, quality of sleep with $F(2,53) = 1.31$, $p = .278$, partial $\eta^2 = .047$, and engagement with $F(2,52) < 1$.

Again, we conducted planned comparisons to first compare the control group with the mean of the two training groups (classroom management training and stress management training), revealing significant differences on the $\alpha = .025$ level (one-tailed test) in favor of the two training groups for all variables regarding perceived well-being (for details, see Table 4.3). That is, participants of both training groups perceived higher well-being than participants who had not participated in training to that point. This effect was stable over one year. The additional comparison of the classroom management training group to the stress management training group indicated unexpected significant differences in favor of the classroom management training group, on emotional exhaustion at the $\alpha = .050$ level (one-tailed test) and

rumination at the $\alpha = .025$ level (one-tailed test). Therefore, participants of the classroom management training reported less emotional exhaustion and less rumination than did participants of the stress management training. This effect was also stable over one year. As expected, both forms of training seemed to have positive effects on perceived well-being, while the classroom management training group showed a tendency to be superior even on emotional exhaustion and rumination.

4.4 Discussion

In the present study, we investigated the effects of classroom management training on beginning teachers' perceived classroom management skills and well-being by comparing it to the effects of stress management training (AGIL, Hillert et al., 2012) or no training at all. Results regarding the effects on classroom management variables offer strong evidence that participating in classroom management training leads to perceived higher self-efficacy in classroom management, higher target achievement, more positive feedback, fewer classroom disturbances, and more prosocial success than all other participants over both time waves.

Regarding indicators of well-being, the hypothesized superior effect of both trainings (classroom management skills and stress management) over no training can be confirmed. Participants of both trainings reported less emotional exhaustion as well as fewer ruminative thoughts, better quality of sleep, and perceived higher feelings of engagement than participants with no training in the short- and long run: that is, four to five months and approximately one year, respectively, after the training. Surprisingly, the results also revealed that participants of the classroom management training perceived less emotional exhaustion and fewer ruminative thoughts than did participants of the stress management training over both time waves. These findings are, however, in line with theoretical assumptions which declare that both trainings should be superior to no training regarding indicators of well-being, and with the classroom management training group showing higher levels in the classroom management skills indicators (Sharp & Forman, 1985).

Table 4.3

Results of the Planned Comparison Analyses of the Indicators Regarding Classroom Management Skills and Well-Being Conducted for all Three Groups and over the Second and Third Time Wave with the First Time Wave as Covariate

	<i>F</i>	<i>df</i>	<i>p</i>	partial eta ²	<i>F</i>	<i>df</i>	<i>p</i>	partial eta ²
<i>Indicators Classroom Management Skills</i>								
	CMG vs. SMG & CG				SMG vs. CG			
Self-efficacy in classroom management	7.01	(1,52)	.006	.119	3.32	(1,52)	.037	.160
Classroom disturbances	3.39	(1,52)	.036	.061	1.12	(1,52)	.148	.021
Target achievement	10.34	(1,52)	.001	.166	12.15	(1,52)	.001	.189
Positive feedback	8.81	(1,52)	.003	.145	2.56	(1,52)	.058	.047
Prosocial success	3.09	(1,52)	.043	.056	2.34	(1,52)	.065	.043
<i>Indicators of Well-Being</i>								
	CG vs. CMG & SMG				CMG vs. SMG			
Emotional exhaustion	5.41	(1,52)	.012	.094	3.75	(1,52)	.027	.067
Rumination	10.71	(1,53)	.001	.168	5.19	(1,53)	.014	.089
Engagement	4.74	(1,52)	.017	.084	0.70	(1,52)	.204	.013
Quality of sleep	9.14	(1,53)	.002	.147	0.25	(1,53)	.438	.000

Note. CMG = Classroom management training Group, SMG = Stress management training Group, CG = Control Group. According to directional hypotheses, all *p* are based on one-tailed tests.

Effectiveness of Classroom Management Training on Classroom Management Skills

Research showed that employing classroom management strategies has a positive effect on student behavior and on student discipline (for an overview, see Emmer & Stough, 2001). Additionally, the pedagogical/psychological knowledge (PPK) of beginning teachers, including their knowledge of classroom management, has been positively associated with the quality of teachers' instruction as perceived by students (Voss, Kunter & Baumert, 2011). In particular, students of beginning teachers with high PPK reported fewer classroom disturbances than did students of beginning teachers with lower PPK (Voss et al., 2011). Terhart et al. (2012) state that PPK can be imparted to beginning teachers during their studies. Thus, in our study, we attempted to impart classroom management skills during beginning teachers' pre-service by implementing classroom management training. The effects of our classroom management training on indicators of classroom management can be interpreted as very effective. The classroom management training not only positively affected dedicated classroom management training, such as self-efficacy in classroom management and classroom disturbances, but also improved beginning teachers' perceived success. This is important, as good classroom management skills seem to have a positive effect not only on instruction and thereby student achievement (Wang et al., 1993), but also on teachers' own perceived achievement. Following Klusmann et al. (2008), however, a high-quality teacher should not only have a high skill set in instructional techniques, but also should be able to cope and maintain health. Thus, high-quality teachers need to self-perceive high well-being. The effects of our trainings on well-being are discussed below, with regard to the effects of reality shock.

Classroom Management Training as a Measure Against the Symptoms of Reality Shock

Reality shock refers to the collapse of ideals or expectations developed during teacher education following a teacher's first confrontation with classroom reality (e.g., Friedman, 2000, Veenman, 1984). Looking at the descriptive means of our control group, the theoretically assumed reality shock becomes apparent. Participants in the control group began with similar values on indicators of well-being and classroom management skills as the participants in both training groups. The

indicators of well-being and classroom management skills were assessed when the beginning teachers had already completed their first few lessons, but they were still (at least occasionally) accompanied by an experienced teacher, and the number of lessons involved at that point was still small. At the second time wave, the beginning teachers had started to give lessons in their own class. At this point, the values of the control group worsened on all variables, compared to both training groups. At the third time wave, the beginning teachers had been in their programs for approximately one year and seemed to have adapted to the circumstances, as the control group shows an improvement in most variables except for classroom disturbances, emotional exhaustion, and rumination. These tendencies in the control group are in line with Friedman's (2000) assumptions of the phases of reality shock, which start with a slump, followed by exhaustion and finally adaptation. In comparison, both training groups did not show this pattern of results. Participants in the training groups showed an improvement from Time Wave One to Time Wave Two, and this development stayed stable or only slightly decreased from Time Wave Two to Time Wave Three. Further, participants of the classroom management training showed a stronger tendency for this pattern of results, as their initial improvement after the training was stronger, except for quality of sleep. Additionally, the results of the planned comparison revealed that the differences between the stress management group and the control group were not significant as indicators of classroom management skills, except for target achievement. This further stresses the superiority of classroom management training compared to stress management training or no training. Thus, our classroom management training seems to be effective in preventing beginning teachers from experiencing the symptoms of reality shock, as reflected in indicators of well-being and in self-perceived classroom management performance.

Empirical Contributions: Classroom Management as a Resource

In line with recent research, our results give further evidence of the important role that classroom management skills play in the development of strain and burnout (e.g., Brouwers & Tomic, 2000; Skaalvik & Skaalvik, 2007). That is, having a high level of classroom management skills, rather than having a high level of stress management techniques seems to have an effect on later perceived well-being. This can be interpreted as a causal relationship, where perceiving higher classroom

management skills consequently lead to perceiving less strain and higher well-being. So far, numerous studies, some of them longitudinal studies, have shown evidence for this relationship in teachers in general (Brouwers & Tomic, 1999; Evers et al., 2004; Skaalvik & Skaalvik, 2007; Schwarzer & Hallum, 2008; Wudy & Jerusalem, 2011) and for beginning teachers' knowledge of classroom management in particular (Klusmann et al., 2012). However, to our knowledge, our study is the first to use an experimental approach to investigate this causality further.

Strengths, Limitations, and Directions for Future Research

A major strength of the present study is the design, in which we experimentally manipulated our independent variable, i.e., classroom management skills. Furthermore, our study design allowed us to compare the effects of the classroom management training not only to a control group without any training, but also to another training group, which received stress management training. Not only did this rule out effects that were simply based on the attention the participants of the training groups received, it also enabled us to shed light on the causal relationship of perceived classroom management skills and well-being.

Despite its strengths, however, the study had some limitations. As several researchers have discussed, relying on self-reported data has its limitations (Dewe & Trenberth, 2004; Schmitt, 1994). However, in our case, as the participants of the current study were still beginning teachers and therefore were subject to constant evaluation until receiving their final teacher's licence, self-reported data offered anonymity and privacy within the research context (see also Dicke et al., 2014). This is likely to be important in research on beginning teachers' well-being, particularly in relation to performance-related variables. Further, a validation study comparing teacher and student ratings with the particular self-report scale on classroom disturbances that we used in the present study indicated that a valuable estimation of real classroom processes is provided through the self-reporting data process (Kunter & Baumert, 2006). Nevertheless, there is a need to expand research to include other methods (Dewe & Trenberth, 2004). For example, Klusmann, Kunter, Trautwein, and Baumert (2006) suggest a simple, objective measure where classroom disturbances are assessed through student ratings rather than teacher self-perceptions. Other constructs, such as other stressors or strain-related variables (e.g., measured cortisol levels) could be assessed via objective measures as well.

Other limitations refer to our sample. There are some difficulties in recruiting German beginning teachers for this kind of sophisticated study, as their extensive teacher preparation program does not allow for extracurricular activities. Therefore, we recruited our sample partly in collaboration with different teacher colleges, and partly through open invitation. As a result, the distribution of school type differs among groups. However, as reported in the results section, our groups did not differ in the relevant pre-test variables. Further, Klusmann et al. (2008), applying a multilevel approach, found very few differences in teachers' engagement and even less in emotional exhaustion on the school level. Hence, these motivational and affective outcomes should be investigated at an individual level: that is, the teacher rather than the school level. Other common problems of typical stress research are the dependence on convenience samples and on the occurrence of the "healthy worker effect." The latter refers to an effect where only healthy employees will be included in studies, as those who are ill are most likely to stay home or to drop out (Zapf, Dormann, & Frese, 1996). This might be an issue in the present research as well, as we do not know the reasons for the dropout rate of 42% of our participants after one year of study.

In our future studies, we will try to solve these limitations by closely cooperating with a specific teacher college with a high number of beginning teachers. Thus, we will either focus on one school type or will be able to randomize among all school types. Furthermore, a closer collaboration will enable better possibilities in keeping track of the reasons for retention and dropout. Taken together, future studies should test our findings based on a larger and homogeneous sample to allow for more sophisticated analyses. Another important matter would be to identify those training elements of classroom management training and stress management training that have the greatest effects on indicators of classroom management skills and well-being. It could also be investigated whether mixed training might achieve even better results in preventing beginning teachers from developing symptoms of reality shock.

Conclusion

The results of the present study suggest that a classroom management intervention with a rather short duration of two and a half days can have a significant effect on beginning teachers' classroom management skills and well-being, thus helping support teacher retention and further fostering the cultivation of high-quality teachers. Thus, our training can be understood as a useful supplement to German teacher education in fostering the development of high-quality teachers.

4.5 References

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5 Joint Discussion

In view of the fact of an increasing lack of teachers, which is largely due to high levels of strain, particularly of early career teachers, the present dissertation aims to further highlight the occupational situation of beginning teachers with regard to strain, thereby focusing on emotional exhaustion and its interrelation with resources. Prior research indicates that the major source of beginning teachers' strain (and in case of the present studies, emotional exhaustion) and, thus, reality shock, are classroom disturbances (Jones, 2006). Hence, high classroom management skills and, more importantly, teacher self-efficacy in classroom management, are proposed as a relevant resource which buffers the negative impact of stress (Brouwers & Tomic, 1999). However, research results on the causal ordering and development of teacher self-efficacy and emotional exhaustion are inconsistent. To further investigate this complex relationship, we conducted four studies. These studies systematically analyze the development of strain, in particular emotional exhaustion, with regard to its relationship to self-beliefs, potential predictors, moderators and mediators, as well as possibilities to actively intervene by strengthening classroom management skills.

In Study I we tested two latent change score models and their interaction. Emotional exhaustion and teacher self-efficacy in beginning teachers were assessed at the beginning of the teacher induction program and a second time after approximately one year. With these two time waves, it was possible to model change of both variables, revealing that there is an increase of emotional exhaustion and a very small increase of teacher self-efficacy. When simultaneously modeling change of both variables in a bivariate change model, results indicate that prior emotional exhaustion seems to predict change in teacher self-efficacy rather than vice versa. Adding different domains of broad educational knowledge as predictors of this change revealed different predictive power of these domains on the change of emotional exhaustion, but no predictive power of any of these domains on teacher self-efficacy. That is, high levels of knowledge on learning and development as well as high levels of knowledge on instruction buffered the increase of emotional exhaustion, while the prediction through knowledge on educational theory failed to reach significance.

In Study II and III the development of stress and strain was further investigated with regard to individual differences in the development of strain by two

studies testing a moderated mediation model. Overall, both studies reveal support for a model in which the indirect prediction of emotional exhaustion through self-efficacy in classroom management via classroom disturbances may differ among teachers, depending on their level of self-efficacy in classroom management. This so-called conditional indirect effect was statistically significant at classroom management self-efficacy levels of mean and below. Thus, the mediation was stronger at lower levels of self-efficacy in classroom management, in line with the assumptions of Schwarzer and Hallum (2008). Study II was based on a large sample with high statistical power allowing to add covariates, that is, gender and years of experience, and conducting multiple group comparisons. Although the covariates did not affect the conditional indirect effect, years of experience had a significant effect on emotional exhaustion, showing a positive linear effect, which is in line with findings of Klusmann, Kunter, Voss, and Baumert (2012) with similar participants. The multiple group comparisons for different school types were particularly important, as German school types differ among types of students taught, which can moderate the development of burnout (Byrne, 1994; 1999). However, they revealed no significant differences of model fit. Study III, employing a random longitudinal subsample of Study II in order to test the assumption that prior self-efficacy in classroom management predicts later classroom disturbances, provided further evidence for the suggested moderated and mediated stress process by revealing similar results as Study II.

In Study IV the analyses then moved to experimentally influence the classroom management skills of beginning teachers to examine its effect on well-being, in contrast to the previous observational studies. Thus, the effects of classroom management training on beginning teachers' perceived classroom management skills and well-being were investigated by comparing it to the effects of stress management training (AGIL, Hillert et al., 2012), and no training at all. Results revealed that participating in classroom management training was effective with regard to skills, as it leads to perceived higher self-efficacy in classroom management, higher target achievement, more positive feedback, fewer classroom disturbances, and more prosocial success than stress management training and no training conditions over both time waves. Regarding indicators of well-being, participants of classroom management training and stress management training reported less emotional exhaustion as well as fewer ruminative thoughts, and better

quality of sleep. These participants also perceived higher feelings of engagement than participants with no training over both time waves. These findings are in line with theoretical assumptions (Sharp & Forman, 1985). Above expectations, results further revealed that participants of classroom management training perceived less emotional exhaustion and fewer ruminative thoughts than did participants of stress management training in the short and long run.

5.1 Major Results

We proposed several joint research questions. Based on our results, we can answer these questions as follows:

How does beginning teachers' occupational well-being develop over the first year of a teacher induction program with regard to a) strain, e.g., emotional exhaustion, and b) resources, e.g., self-beliefs?

a) Strain

While all studies dealt with this question to some extent, Study I provided the most elaborate answer to this question, as its focus was the development of emotional exhaustion over one year. Latent change score models revealed a significant change, or increase, of emotional exhaustion over one year, starting at the beginning of the teacher induction program. The descriptives of Study III and IV (only in the no-training group) also indicate an increase of strain-related variables, in particular, emotional exhaustion.

b) Resources

Study I directly addressed the development of teacher self-efficacy by applying latent change score models. These models revealed a very small but significant increase of teacher self-efficacy over one year. Study IV provided further evidence for this development of resources, that is, variables related to classroom management skills such as self-efficacy in classroom management. After a decrease to the middle of the measurement period (half a year after beginning teacher induction), the means of the control group of Study IV almost returned to their initial values of the beginning of the teacher induction program, while some variables even showed a small overall increase.

Do any variables influence the development of beginning teachers' occupational well-being with regard to: a) predictors, e.g., professional knowledge, prior well-being, or change in well-being, b) mediators, e.g., stressors such as classroom disturbances, c) moderators, e.g., self-efficacy in classroom management, school type?

Foremost, Study I, Study III, and Study IV provided valuable results to answer this question.

- a) Predictors: Study I directly tapped the development process of emotional exhaustion and revealed an increase over one year in beginning teachers. Study II showed that later emotional exhaustion can be predicted by years of experience, also showing that the level of exhaustion increases as more years of experience are gained. However, this increase can be buffered by high levels of professional knowledge at the beginning of teacher induction, as Study I revealed. Further, this change of emotional exhaustion seems to be negatively related to change in teacher self-efficacy. Additionally, variance of this change was significant. Further, the results of Study III indicate that prior self-efficacy in classroom management predicts later emotional exhaustion.
- b) Mediators: The aforementioned prediction of emotional exhaustion through self-efficacy in classroom management was, however, partly mediated by the level of classroom disturbances, as Study II and III revealed. Self-efficacy in classroom management negatively predicted classroom disturbances, while in turn, classroom disturbances positively predicted emotional exhaustion. Thus, the higher the level of self-efficacy in classroom management, the fewer classroom disturbances and, consequently, less emotional exhaustion, are experienced.
- c) Moderators: Study II and III further focused on individual differences as suggested by Study I and further tested whether the strength of this prediction (emotional exhaustion predicted through self-efficacy in classroom management via classroom disturbances) depended on the levels of initial self-efficacy in classroom management. Results indicate that for individuals with low initial levels of self-efficacy in classroom management, this proposed stress-development process is much stronger.

Is it possible to actively manipulate the development of beginning teachers' occupational well-being through strengthening resources with regard to a) stress management skills and b) classroom management skills?

In answer to the first two research questions, our findings revealed individual differences in stress development. Thus, the third research question is based on how to influence and change these differences. It is answered in Study IV.

- a) Study IV revealed that participants of stress management training perceived less strain (e.g., emotional exhaustion, rumination) than participants of the control group that received no training.
- b) However, Study IV also revealed that the increase of strain variables could be actively buffered by increasing classroom management skills. Hence, participants of classroom management training showed significantly higher classroom management skills (e.g., self-efficacy in classroom management) than participants of a stress management training or a control group which received no training. Further, the participants of classroom management training showed well-being levels at least as high as the participants of stress management training, while both trainings were superior to receiving no training. Thus, participating in classroom management training seems to increase classroom management skills and stress management skills.

5.2 Empirical and Theoretical Implications

The overall theoretical and empirical implications for the development of strain and resources of beginning teachers that can be derived from the four studies of this dissertation can be discussed as follows.

Regarding the sole development of resources and strain, these studies provide further evidence that emotional exhaustion increases during the first actual teaching experience. Additionally, results of Study II show that the years of experience positively predicted emotional exhaustion, while the descriptives of Study IV's control group also indicated an increase of emotional exhaustion and other strain variables. Taken together, these findings are in line with assumptions of Goddard, O'Brien, and Goddard (2006) and, moreover, findings in German samples (Christ, 2004; Klusmann et al., 2012). The study findings also indicate the existence of the so-called reality shock (Huberman, 1989). Further, the results of Study I provide evidence for a small increase of teacher self-efficacy in line with expectations based

on Woolfolk, Hoy, and Burke-Spero (2005) and Fives, Hamman, and Olivarez (2007). Again, descriptive results of Study III and IV reveal similar results. The descriptives of Study IV, however, include one additional point in time in between (after approximately half a year). Interestingly, for the control group which received no treatment at that time and, thus, represents the average beginning teacher, the values worsen on all variables at this additional point in time. Later, at Time Wave Three, the control group shows an improvement in most variables, except for classroom disturbances, emotional exhaustion, and rumination. These tendencies in the control group are in line with Friedman's (2000) assumptions of the phases of reality shock, which start with a slump, followed by exhaustion and finally adaptation.

More importantly, however, these studies aimed to identify variables that influence the development of stress. Study I shows that the domain of broad educational knowledge, which is in turn a domain of professional knowledge, buffers the increase of emotional exhaustion. These results further stress the importance of professional knowledge, as already shown for the domain of knowledge on classroom management by Klusmann et al. (2012). Nevertheless, unexpectedly, there was no boosting effect of professional knowledge on teacher self-efficacy, which could be explained by Bandura's assumptions (1997): As participants never gained feedback concerning their knowledge levels and, thus, never appraised or interpreted them, this information could not become a source of self-efficacy. Therefore, knowledge levels did not affect a change in self-efficacy.

Study II and III successfully test a model in which emotional exhaustion was predicted by self-efficacy in classroom management, as also proposed by (Skaalvik & Skaalvik, 2007; Schwarzer & Hallum, 2008; Wudy & Jerusalem, 2011). Importantly, this prediction was mediated by a stressor known as classroom disturbances, which is in line with the assumptions of (Betoret, 2009; Schwarzer & Hallum, 2008). Thus, beginning teachers who felt better able to manage classroom disturbances also reported fewer disturbances. Two strands of research relate to these results: First, self-worth theory (e.g., Parker, Martin, Colmar, & Liem, 2012) explain that feelings of inability compound the negative effect of the actual number of disruptions, making it seem stronger than it actually is. Second, self-efficacy theory explains this relation in terms of beginning teachers' inability to utilize adequate classroom management skills to prevent classroom disturbances such that more disturbances actually occur (Bandura, 1977). In turn, more (perceived) classroom

incidents are related to stronger perceptions of emotional exhaustion, as other authors showed (e.g., Friedman, 2006).

Further, as other possible influences, moderators were examined. For this purpose, we tested whether the proposed mediation of Study II and III was moderated by levels of self-efficacy in classroom management based on the assumptions of Bakker Hakanen, Demerouti, and Xanthopoulou, (2007) and the empirical results of Jex and Bliese (1999). Results confirmed that the strength of the mediation depended on the level of self-efficacy in classroom management and thus, the conditional indirect effect. This further stresses the importance to consider individual differences of stress development (Dewe, 2004; Schwarzer & Hallum, 2008). Group comparisons of this moderated mediation revealed no additional moderating effect of school type, which is contrary to the suggestion of Byrne (1999). A possible explanation could be that beginning teachers are generally overwhelmed with their teaching experiences and are still too early in their careers to be affected by differences of student types. However, the results emphasize the important role of self-efficacy in classroom management within the stress process, as self-efficacy in classroom management simultaneously predicts and moderates the development of emotional exhaustion. Further, it becomes clear that the relationship of self-efficacy and emotional exhaustion are even more complex than had been assumed to date.

Thus, these four studies aimed to shed some light specifically on the complex relationship of strain and resources, and in particular on burnout and self-efficacy. Study I reveals that teacher self-efficacy is predicted by emotional exhaustion rather than vice versa, with higher levels of exhaustion leading to higher teacher self-efficacy. Brouwers and Tomic (2000), who found similar results, concluded that emotional exhaustion leads to poor occupational performance in class, which can be interpreted as poor mastery performance, as defined by Bandura (1997), which in turn leads to a decrease in self-efficacy. Moreover, Study I shows that a change in one variable is negatively related to change in the other, indicating a reciprocal relationship, as suggested by various authors (Brouwers & Tomic, 1999; Maslach, 1999; Skaalvik & Skaalvik, 2007).

Study II, Study III, and in part, Study IV are based on the assumption that self-efficacy in classroom management precedes emotional exhaustion, as strong theoretical (Bandura, 1997) and empirical (Schwarzer & Hallum, 2008) evidence

indicated this ordering. However, self-efficacy in classroom management is a distinct domain of the more general concept of teacher self-efficacy (O'Neill & Stephenson, 2011), which also includes other aspects that are important for the job as a teacher (Tschannen-Moran & Woolfolk Hoy, 2001). Thus, various other domains of teacher self-efficacy could interfere with the causal relationship of emotional exhaustion and teacher self-efficacy and, thus, explain the difference of these results to the theoretical assumptions of Study II and III. Further, results of the experimental Study IV indicate that increasing classroom management skills, such as self-efficacy in classroom management of beginning teachers, leads to higher well-being, such as less emotional exhaustion. Put together, although these results cannot be interpreted in the sense of strict causality, they provide important evidence for a complex, in part reciprocal and in part causal relationship of self-beliefs and emotional exhaustion. However, additional research is needed to further disentangle this highly multifaceted relationship.

5.3 Practical Implications

Several practical implications can be drawn from these studies. First, results provided further evidence of how adequately preparing beginning teachers can prevent symptoms of reality shock, as suggested by Stokking, Leenders, De Jong, and Van Tartwijk (2003). This preparation could be through imparting professional knowledge, which buffers the increase of emotional exhaustion, as shown in Study I and (Klusmann et al., 2012). This preparation could also be through classroom management training (see Study IV). Not only knowledge of classroom management was positively related to the quality of teachers' instruction as perceived by students (Voss, Kunter & Baumert, 2011), but further employing actual classroom management strategies was positively associated with student behavior and student discipline (for an overview, see Emmer & Stough, 2001). Utilizing this knowledge and these strategies can thus diminish the major stressor of beginning teachers, that is, classroom disturbances (Jones, 2006) and consequently buffer the high demands of the beginning teachers' occupational situations.

Based on the results of Study II and III, it is important, however, to take individual differences into account when implementing such interventions (Dewe, 2004), as the moderation process suggests that emotional exhaustion is predicted by self-efficacy in classroom management via classroom disruptions, depending on the

level of self-efficacy in classroom management. Therefore, the individual level of self-efficacy in classroom management will affect the effectiveness of trying to reduce emotional exhaustion through targeting classroom disruptions or self-efficacy in classroom management. Based on the results of Study II and III, which showed that mediation was stronger for individuals with low self-efficacy in classroom management, only participants with low self-efficacy would profit from any intervention targeting self-efficacy in classroom management or classroom disturbances. This implies that in order to ensure a well-balanced return on investment, beginning teachers' education or training programs need to be more closely matched to their needs.

In contrast, research on training effectiveness has shown that high levels of self-efficacy generally increase training self-efficacy (e.g., Gist, Stevens, & Bavetta, 1991). Seemingly, similar findings indicating a paradox in terms of workplace motivation (VandeWalle, 2001) can be applied here (see Study II and IV): Often, most of those who need intervention are those for whom such interventions are most difficult to implement effectively. The underlying processes of these contradictory findings should be explored in future research.

Nevertheless, the findings of these four studies suggest that imparting sufficient and adequate professional knowledge (broad educational knowledge, or knowledge of classroom management) and classroom management strategies are important supplements to teacher training in order to strengthen preparation and teaching skills and thus prevent symptoms of reality shock.

5.4 Future Research

Based on the results of these four studies, future studies could further investigate several important aspects. First, the relationship of self-efficacy and burnout, or emotional exhaustion, seems to be far more complex than already assumed so far. Future studies should gather further longitudinal and experimental data to disentangle this association. One particular focus could be to investigate how different sub-domains of teacher self-efficacy interact with the different dimensions of burnout. Based on the results of the present studies, one assumption might be that the different sub-domains of teacher self-efficacy have stronger preceding or succeeding influences. It should also be interesting to add further measurement points in this regard. This could help illustrate the most likely reciprocal relationship

(for an example, see Marsh, Gerlach, Trautwein, Lüdtke, & Brettschneider, 2007) or help detect how the influence of the variables on each other might change over time. Such analyses would also help clarify the multiple effects of teacher self-efficacy as a strain-reducing resource.

Moreover, additional measuring points would help to further explore the development over the entire teacher induction time. Luckily, within the BilWiss study (Terhart et al., 2012), which provided several parts of the present studies' data, plans are in effect to collect additional longitudinal data allowing for such analyses. As data will also be collected after beginning teachers have entered the teaching profession as fully licensed teachers, it will also be possible to examine the development throughout the beginning of the actual teaching career.

Second, future studies should include more objective measures and not so heavily rely on self-reported measures as do the present studies. For example, classroom disturbances could be assessed through simple objective measures like student or observer ratings, rather than only through teacher self-perceptions (Klusmann, Kunter, Trautwein, & Baumert, 2006). Such multiple measurement methods can also be utilized for inner-psychological aspects such as emotional exhaustion. In addition to self-reports, physiological information such as cortisol levels could be collected to validate self-reported data. It might also be possible to include pre-service teachers' achievement, such as measured in teacher-licence tests, or grade at the end of *referendariat* as a predictor for the development of the occupational strain and personal resources (e.g., in Study I).

Third, the influence of other constructs of stressors (e.g., time pressure; problems with colleagues) or strain-related variables (depression, physiological symptoms like back pain) or indicators of positive well-being (e.g., job satisfaction), could be further investigated. For Study II and III, these could, e.g., explain high emotional exhaustion perceived by teachers with high self-efficacy. Future research should also focus on the investigation of the prediction of positive outcomes (e.g., motivation, job satisfaction, commitment, etc.) instead of strain, such as burnout. Thus, the changes and interactions of other important variables that reflect beginning teachers' well-being (e.g., job satisfaction, engagement, intention to quit) need to be examined.

Fourth, the results of Study I-III, in particular, stress the importance of noting individual differences within the development of strain. These differences need to be further explored theoretically, as certain stress processes, as suggested by models of stress research (e.g., Bakker & Demerouti, 2007; Hobfoll, 2001; Karasek, 1998), will not be valid for everyone. As mentioned above, these differences also have large applied implications for, e.g., teacher training. Thus, it is important to identify other moderators that might interfere with or boost the effectiveness of interventions to ensure a well-balanced return on investment.

Fifth, referring to the results of Study IV, it is important to further explore which training components are the most effective. This should not only be done for the components of classroom management training, but also identify such components of stress management training, which also showed good results. It would be interesting to test whether a training based on the most effective components of both trainings would reveal even better results. Future research should also investigate the effectiveness of trainings beyond teacher induction training to resolve whether good classroom management skills would provide ongoing protection against strain and its consequences.

Overall, these four studies provide further insight into the development of beginning teachers' strain, in particular emotional exhaustion, and resources, in particular teacher self-efficacy. This was an important step to identify underlying processes and mechanisms of stress development. Further, results of these four studies provide several starting points to prevent strain, burnout, and symptoms of reality shock among beginning teachers. Hopefully, these results can be utilized to derive further implications in order to improve beginning teachers' occupational situations and to reduce the probability of teacher attrition or premature retirement.

5.5 References

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6 Appendix: Content of the Broad Educational Knowledge Subscales

Broad Educational Knowledge Subscales	Example Topics
Learning and Development	Academic self-concept, language development, learning theories...
Instruction	Social psychological aspects, teacher-student interaction, teaching methods...
Educational Theory	Teachers' professional ethics, economization of education, history of education...
