Personality-related Competencies of (Prospective) Teachers

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Dedicated to

My Wife Yi and Our Children

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Preface

This thesis presents three publications of empirical studies. The publications and their results are an integral part of the project "MORE" (Meaningful Occupational REflection) - a sub-project of "KOLEG2 - Kooperative Lehrerbildung Gestalten 2", a project at the University of Regensburg, which is a part of the "Qualitätsoffensive Lehrerbildung", a joint initiative of the Federal Government and the *Länder* with the aim of improving the quality of teacher training. The program is funded by the Federal Ministry of Education and Research.

The aim of the project MORE at the University of Regensburg is an aptitude assessment (see recommendations of the KMK - Conference of Ministers of Education, 2013), called "MORE-ONLINE", in the sense of supporting deliberating on the professional goal of teaching against the backround of an ongoing task to enable the development of personality-related competencies of teachers, which are preconditions for teachers' well-being and an optimal support of students.

As a general basis for the MORE-ONLINE, a reflection model regarding personality-related competencies of teachers was developed according to the current state of research. Under the overarching framework of the MORE project and the personality model, three content areas **(Study 1, 2 & 3)** were selected and empirically examined in more detail. The goals of **Study 1 & 2** were to answer the core questions resulting from the literature research on the basis of current psychological theories. Furthermore, a tool for clarifying necessary development tasks of teacher students was empirically investigated by an experiment to evaluate its effectiveness (**Study 3**).

The three studies in this work have been published in peer-reviewed journals in the last few months and are reproduced in the accepted version with the approval of the publisher. The contributions of the co-authors to the three studies are shown on page six. The references of the three studies were integrated into one reference list at the end of this work. Otherwise, the manuscripts of the three publications remain unchanged.

Contributions

Study 1 - Teacher Well-Being: Teachers' Goals and Emotions for Students Showing Undesirable Behaviors Count More Than That for Students Showing Desirable Behaviors

Study idea: Markus Forster, & Christof Kuhbandner

Study design: Markus Forster

Statistical analysis: Markus Forster, Christof Kuhbandner, & Sven Hilbert

Manuscript writing: Markus Forster, & Christof Kuhbandner

Manuscript revision: Markus Forster, & Christof Kuhbandner

Study 2 - Are Student Teachers' Global Expected Emotions Regarding Their Future Life as a Teacher Biased Towards Their Expected Peak Emotions?

Study idea: Markus Forster, & Christof Kuhbandner

Study design: Markus Forster

Statistical analysis: Markus Forster

Manuscript writing: Markus Forster, & Christof Kuhbandner

Manuscript revision: Markus Forster, & Christof Kuhbandner

Study 3 - The Promotion of Functional Expected Teaching-Related Emotions Through Expressive Writing

Study idea: Markus Forster

Study design: Markus Forster, & Christof Kuhbandner

Statistical analysis: Markus Forster

Manuscript writing: Markus Forster, & Christof Kuhbandner

Manuscript revision: Markus Forster, & Christof Kuhbandner

1. Introduction

1.1 MORE ONLINE (A new Aptitude Assessment)

"[T]hose who become highly effective and are sustained in the profession bring more than academic ability into their daily work" (Watt et al., 2017, p. 18). It is generally assumed (e.g., COACTIV model of teachers' professional competence; Baumert & Kunter, 2006, 2011, 2013) that a "successful teacher" should have not only skills in the area of knowledge and ability but also personality-related competencies (e.g., cognitive/motivational/emotional competence). From this point of view, the main question arises: How to develop personality-related competencies of teacher students be furthered?

In the past, researchers mainly focused on how to recruit the most capable candidates for the teaching profession and it was assumed that quantified criteria could be applied. Consequently, and due to the expectations placed on the teaching profession by many different actors (e.g., parents, scientists, and politicians), university aptitude selection procedures (e.g., mandatory assessment centers) for identifying "suitable" or "unsuitable" teacher students have been repeatedly discussed. Proponents such as Oser (2006) support such a selection process for the following three reasons: (1) higher learning motivation and greater social acceptance can be gained from the success in the admission procedure, (2) trainers can set more teaching-specific, optimal and desirable goals for the students, and (3) greater social recognition of the teaching profession can be created inside and outside the school family. However, some arguments against such procedures include: (1) experience with admission procedures in other academic courses (Rothland & Terhart, 2011), (2) legal aspects of free choice of profession (article 12, Basic Constitutional Law of Germany), (3) moderate prognostic validity, objectivity, and reliability of selection interviews (Foerster & Faust, 2006), (4) numerus clasus as a questionable criterion, as it says nothing about communicative ability and resilience (Rauin et al., 1994) and is year-dependent (Rothland & Terhart, 2011), as well as (5) a large number of possible applicants for economic, financial, personal reasons would turn out to be unrealistic and disproportionate.

As a result, interim solutions are being offered for those interested in the teaching profession, for example, optionally completing an internship with appropriate qualifications aptitude interview at the end, using a voluntary online self-assessment (OSA) (e.g., CCT: Career Counseling for Teachers or Fit for the Teaching Profession; Mayr et al., 2016), which includes primarily instruments designed for self-reflection, or enabling interested students to acquire study/job information, and if necessary, to adjust unrealistic study/job expectations (for an overview, see Thiele & Kauffeld, 2019; Mayr & Nieskens, 2015). In Germany, the

Conference of Ministers of Education (2013) recommends every university to have some aptitude assessment procedures. In addition to teaching knowledge and skills, many universities also offer students a kind of OSA and increasingly consider the benefits of promoting the personal-related competencies of teaching students to stabilize or increase present and future well-being so that students can deal better with themselves, others and future professional requirements (e.g., Hoidn, 2015).

The central aim of this work is to provide insights that go beyond the previous knowledge on the relevant support in teacher training. However, the MORE project (i.e., MORE-ONLINE & the MORE-Model) is the overarching framework, and must therefore first be described. Interestingly, there is still a gap in offering a kind of OSA to teacher students at the University of Regensburg. There is a lack of a procedure which clarifies and/or develops the personal-related competencies of teacher students. There is a need for voluntarily offered aptitude assessments (e.g., OSA) that can support the deliberation (e.g., a reflection process) on the professional goal of teaching against the backround of developing personally related competencies which will take the previously mentioned arguments into account and enable a detailed professional reflection, which is essential for high-quality teacher training.

With a view to the teacher training anchored procedures for aptitude assessment which are coming into shape in many locations (for an overview see Nieskens, 2013), the added value of an OSA for the University of Regensburg, called MORE-ONLINE, is an **in-depth** focus on current psychological theories and a resulting framework (i.e., MORE-MODEL) tailored to the teaching profession for the personality-related competencies of teachers, which in turn serves as the foundation for the development of suitable tools for clarifying and/or developing personal-related competencies. **On the surface**, MORE-ONLINE is a combination of four integrated components:

1. A one-day kick-off event targeting the networking of the first, the second, and the third phase of teacher training for professional reflection and exchanges among each other
2. An online platform with appropriate tools for teacher students to conduct in-depth professional reflection and to receive individual feedback
3. A course-related advisory service/coaching for teacher students
4. A particular course for teacher students to strengthen their emotional competence.

Furthermore, MORE-ONLINE aims, in particular, at making tangible the high social relevance of the teaching profession and thus creating an intrinsically oriented motivational situation as the foundation of sustainable training of professional personality-related competencies. Because the individually pursued learning and developmental goals are based on

an awareness of the changeability of both personal and social competencies, the fit between personal dispositions and values should be achieved in combination with professional requirement profiles based on existing reflection tools (e.g., CCT - Career Counseling for Teachers, SeLF: Self-exploration of the teaching profession with film impulses, Kriesche, 2016). Therefore, expectations (e.g., "What are the expectations for prospective teachers?") must be clarified first, from different perspectives (e.g., teachers, parents, scientists). However, due to the inherent potential for development in teacher training, MORE-ONLINE is intended for all students to make individual offers for critical reflection of one's own career choice and to clarify the personal fit.

1.2 The MORE-MODEL (The Heart of the new Aptitude Assessment)

Previous findings indicate that supported reflection during teacher training predicts job satisfaction and success (e.g., Hanfstingl & Mayr, 2007). In particular, there is consensus that the process of aptitude assessment is an ongoing task across the various stages of teacher education (Weyand, 2011). In terms of content, empirical research shows that intrinsic motivation is fundamental for sustainable and viable teacher training (e.g., Oelkers, 2007). The basic assumption of an aptitude assessment like MORE-ONLINE is to support personality development of prospective teachers and helps them to build a coherent picture of the tasks associated with the teaching profession. Furthermore, it aims to help teacher students to develop individually values that are in harmony with the current general conditions in the school area. Based on numerous empirical evidence (for an overview, see Thrash et al., 2012), individual personality development is considered functional when the self-concept and personal goals, the current needs and motives, and the experienced emotions of a person are in harmony. The question arises, whether individual personality development is a precondition for (future) teachers' well-being.

The health and well-being of teachers is a popular area of research. As a definition in this work, well-being is a combination of subjective (Diener, 1994; Diener et al., 1999) and psychological well-being (Ryff & Keyes, 1995). Referring to the definition of subjective well-being, Galinha and Pais-Ribeiro (2011) distinguish among three categories, namely cognitive factors (such as life satisfaction domains), affective factors (such as positive or negative state/trait affect), and contextual factors such as life events (such as occupational well-being). Ryff and Keyes (1995) define psychological well-being in six key dimensions (Autonomy, Environmental Mastery, Personal Growth, Positive Relations with Others, Purpose in Life, and Self-Acceptance). However, most studies focus on the perspective of stress and burnout models.

Nevertheless, the lack of stress or burnout does not automatically mean a high level of well-being. Furthermore, from a psychological perspective, it is more reasonable to try to reach a result like well-being (to have approaching goals) than to try to avoiding a result like burnout (to have avoidance goals). The former tend to be more specific regarding the direction, more controllable, more obstacle-free, more suspicious, and relieved rather than joyful when someone successfully avoids the result. Therefore, the basic attitude can be decisive as to whether one is more approach-oriented or avoidance-oriented.

In general, the theoretical conceptualizations proposed in previous competence models are very interesting (for a more detailed explanation, see 1.2.2). Nevertheless, as a scientific orientation framework for MORE-ONLINE, based on the current state of knowledge on the functioning of the human psyche the MORE-MODEL (see figure 1), an extended model of personality-related competencies of teachers, was developed.

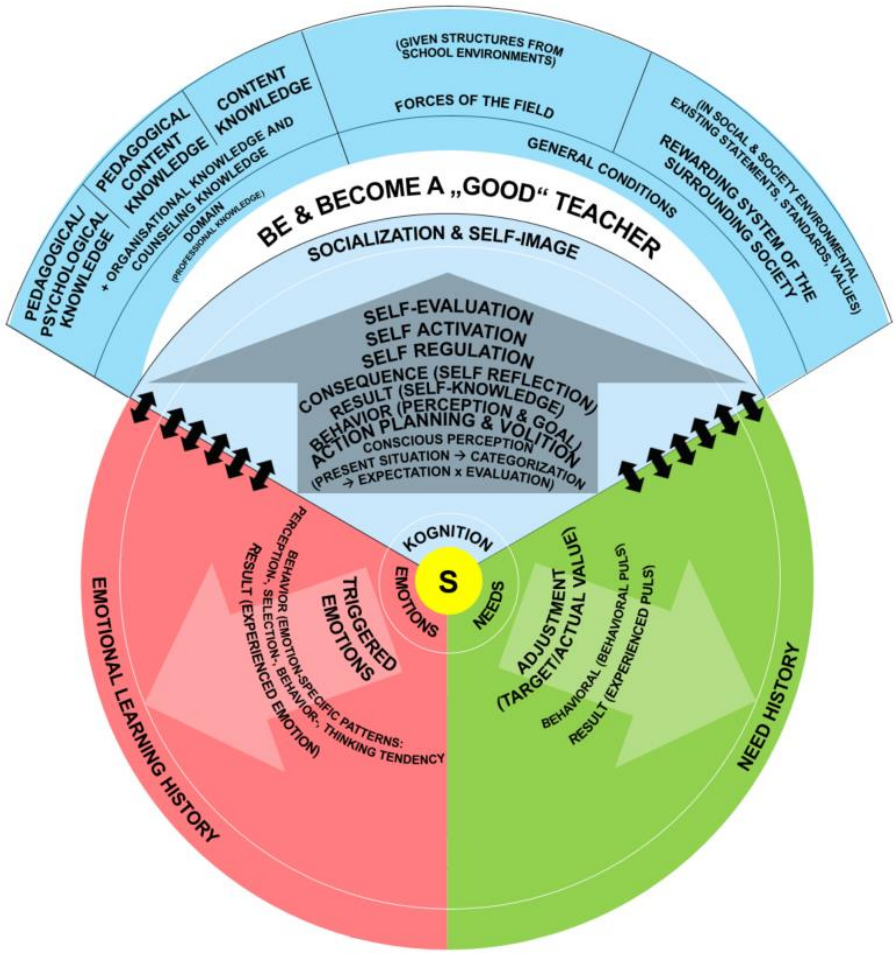

Figure 1: Deriving a framework model of personality-related competencies of (prospective) teachers

The core elements are four psychological instances, each of which influences the experience and behavior of people in an independent way (needs, emotions, cognition,

socialization & self-image) and develops against the background of a person's individual life. Furthermore, important for the development of the elements at the level of individuals are experience of reward and punishment, beliefs, norms, values, which existing in the social and societal environment, and the given structures of school environments (e.g., parents, local school community members, students, government). The previous ideas about the “teacher´s personality” differed in research on the teaching profession (for an overview, see Mayr, 2014). However, an underlying assumption of the MORE-Model is that there exists no generally optimal personality profile. Instead, a high level of personality-related competence is characterized by the fact that the various psychological instances are in harmony and coherent with the domain-specific professional knowledge, the socially and socially applied values, and the given structural framework is developed.

The general aim was to design a framework model for the personality-related competencies of teachers based on current psychological theories, which is also didactically easy to illustrate and applicable for teacher students. Another goal was to use the model as a foundation to develop various tools for clarifying the suitability for the job during the teacher training course and to allow and promote reflection on the professional goal of teaching in the context of the continuous development of personal competencies.

1.2.1 Importance of Reflection

"Study without reflection is a waste of time; reflection without study is dangerous" (Confucius, Analects (551-479 BCE)). Althhough the term of “reflection” has been discussed in teacher education for a long time (for an overview, see Anderson, 2020), an definition is difficult. As a definition in this work, reflection is critical thinking (see, Banegas & Villacañas de Castro, 2016). The decisive factor for a teacher to make improvement in necessary competences is personal reflection at the level of personal competencies. They are often considered changeable and learnable but proved otherwise for teacher students by some studies (Weyand, 2012). Reflection requires a change in perspective and content as well as the ability of abstracting and distancing from oneself (Häcker & Rihm, 2005). In view of this, it should be possible, especially during the first phase of teacher training, to practice these reflection processes and reflection habits and to integrate them into a reflective pedagogical attitude. Of course, a solid pedagogical attitude can only arise from further development of one's teaching profession and professional practice. Based on current psychological theories, a personality-related professional framework MORE-MODEL is required to provide guidance and to help teacher students in the reflection process. A distinction can usually be made between the reflection of

the fit between the individual personality structure and the aspirational profile associated with the profession from the environment (e.g., expectations of competence; KMK, 2013). One of the underlying assumptions of expertise is the idea that there is neither a generally optimal personality profile on the part of the "successful" teacher nor a generally valid profile on the part of the professional requirements. Overview work (e.g., Herzog & Makarova, 2014) shows that the requirements for the teaching profession vary considerably from one researcher to another in the area of education (e.g., Grosso de Leon, 2001; Reynolds, 1992; Jegede et al., 2000), so a uniform picture cannot be drawn here. Nevertheless, to reflect in the sense of the MORE-MODEL means to focus first on the exploration of one's unique personality structure, and then on integrating and harmonizing the internal personality and the requirements of the outer world.

1.2.2 Attempts in Teacher Research to Take Personal Factors into Account

Personal competencies have already been incorporated into most models of teacher professionalism, in most cases, evidence-based theoretical considerations of a teacher's personality from a psychological perspective are integrated. The most common current models of professionalism/expertise/personality in teacher education research are introduced below.

One of the best-known models in teacher research is the so-called "Big Five" model (John & Srivastava, 1999). Actually a model that was developed independently of the teaching area and only applied to it. However, despite the validated questionnaires used to measure the personality traits postulated by the model, it is a very rough conceptual resolution that can only provide an approximate first orientation about the individual peculiarities of a person’s experience and behavior and is far from concrete teacher-student interactions. The model provide a very general characterization of a person's personality. But individual differences in personality may be described at more than one level (McAdams, 1995). In teaching, the relationship between relevant personality factors and job success or satisfaction is relatively small and, in particular, more limited to extreme forms of certain personality factors such as neuroticism (e.g., Mayr & Neuweg, 2011, Mayr, 2014). Furthermore, it seems very implausible that there could be a particular teacher personality profile that is ideal for all students who may differ in their personality as well as in their expectations of a "good" teacher (Beishuizen et al., 2001).

A significant theoretical and empirical contribution to clarify central concepts and to promote the discussion about the professionalization of teaching is made by the COACTIV project (Kunter et al., 2013), which shows that there are correlations between personal

competencies of teachers and teaching quality. The corresponding COACTIV model of teachers' professional competence (Baumert & Kunter, 2006, 2011, 2013) is worth mentioning because it takes a more differentiated perspective on the interindividual differences among teachers. However, concerning the personal factors postulated there, it contains a distinction between beliefs/values/goals, motivational orientation, and self-regulation.

Interestingly, Zierer (2015) developed an integrative model of educational expertise based on the theoretical framework of the didactic triangle (containing, among other things, subject matter competence, didactic competence, and pedagogical competence), including mind frames (Hattie, 2012) as a kind of attitudes. Zierer et al., (2018) point out that attitudes, being a very complex construct, are generally challenging to teach and are just as difficult to measure. However, these kinds of attitudes can serve as an orientation.

Kuhl, Schwer, and Solzbacher (2014) referred to a concept of professional-pedagogical attitude necessary for teachers which needs to be filled with psychological content because an empirically applicable definition of "attitude" has, in their opinion, not yet been achieved satisfactorily. Such a definition should promote changing opportunities and teachability of attitudes. Compared to the models mentioned above, this concept is more closely related to the theoretical foundation of personality and motivation psychology (e.g., PSI-theory, Kuhl, 2001).

Influenced by the previous models, the general goal was to design a framework for personality-related competencies based on current psychological theories, including didactic considerations and the model's applicability for teacher students concerning the four integrated components of MORE-ONLINE.

1.2.3 The Framework for the Personal Growth of an Advanced Model about Personality-related Competencies of Teachers

The overall MORE-MODEL (see Figure 1) contains, in addition to personality-related competencies (the inner circle), specific parts and general conditions (outer circle) of the domain. This dissertation focuses on the former. Nevertheless, a general explanation provides a brief insight.

In 1996, Gardner, Csíkszentmihályi, and Damon (2001) started a long-term research project, which includes more than 1200 semi-structured in-depth interviews in nine different professions with the target to find an explanation of good work. Furthermore, a diamond-shaped model (consisting of four elements: domain-specific professional knowledge, the forces of the field that operate on the domain, larger reward system of the surrounding society, competencies regarding the individual worker; Gardner, 2007) was created for conceptualizing good work, in

which the teachers' competencies as "domain-specific professional knowledge" (Gardner, 2007, p. 7) (e.g., general pedagogical/psychological knowledge, content knowledge, and pedagogical content knowledge, organizational knowledge, and counseling knowledge; see, COACTIV model of teachers' competence, Baumert & Kunter, 2006, 2013) can be located. Furthermore, the given structural framework of the school environment (e.g., parents, local school community members, students, government) as "the forces of the field that operate on the domain" (p. 7) and the socially applied values (e.g., beliefs, norms, and values within family, partnership, groupings) as "larger reward system of the surrounding society" (p. 7) can also be located. Eventually, the model contains both the knowledge and necessary "competencies regarding the individual worker" (p. 7) that should arise through promoting the development of personality-related competencies of teachers.

If these four elements in alignment, good work is most likely (Gardner, 2007), and more specifically to be created. It can also be called "excellent (high technical quality), ethical (responsible, considers its impact on society), and engaging (meaningful to the individual worker) (Fischman & Gardner, 2009, S. 75)" work. In summary, from a more practical perspective, there are three steps to reach the highest level of good work: First, becoming an expert in a profession through deliberate practice, taking instructions from a mentor, supporter, or sponsor, and carrying on for about 10.000 hours (Ericsson, 1998). Second, being engaged with perseverance and interest in the long term (Duckworth et al., 2007; Duckworth et al., 2009) and experiencing flow (Beard, 2014). Third, being ethical, e.g., to contribute to society and do something meaningful or live a meaningful life.

However, regarding the MORE-MODEL, it is important to illustrate the transfer to the teaching profession, and to give a precise definition of the "competencies regarding the individual worker" and the standards (arising from personality-related competencies of teachers), which are to be developed and/or promoted through the process of a **M**eaningful **O**ccupational **RE**flection**.** The goal for (prospective) teachers is to find an answer to the question “What inspires me personally about the profession of a ‘teacher’?” by understanding underlying psychological functional principles that are accessible through self-awareness (“Who am I actually?”), self-reflection (“Who do I want to be?”, “Why do I want to be like this?”), self-regulation (“How do I get there?”), self-regulation activation (e.g., “Do I want to change my behavior?”), self-assessment, and renewed holistic reflection (see, 1.2.1 Importance of reflection). The prerequisite for thinking about these questions is the knowledge about one’s own perception, attention and basic psychological systems. The following is an explanation of what is meant by knowledge about it.

The perception of the environment presumably takes place on several levels. We have internal mental maps to reinterpret the representations at the previous level. The consequence is that we prefer consciously perceiving what our inner maps already contain, even if other interpretations are also possible. The mental image contained in the map, which best matches the pattern of perceived building elements, is finally put over and consciously perceived (Riesenhuber & Poggio, 1999). Furthermore, only a tiny section of the overall situation is consciously perceived, and people can sometimes even be blind to things outside their focus of attention. Our consciousness is a filter that only allows a small part of the multitude of sensory stimuli to flow into us for further processing. If several objects are present, we can only perceive a particular section of the situation in the form of consciously experienced mental images at a certain point in time (Kuhbandner & Schelhorn, 2020).

Furthermore, there are three basic psychological systems by which our organism controls its behavior on the basis of its perceptions. According to the theory named the triune concept of the brain (Kral & MacLean, 1973), a simple organizing theme of the brain structure, our brain has not grown continuously through a phylogenetic evolution and has developed several times by leaps and bounds. A new system, created with each new development, tries to influence our behavior in a completely new way. These three behavioral control systems are the need system (i.e., basal ganglia and brain stem), the emotional system (i.e., limbic system), and the rational system, including the self-concept (i.e., neocortex). They do not always work well together (e.g., conflicting with each other), and a particular system can be (generally) in the foreground. Even if the basal ganglia, and the brainstem, are more related to needs, there is evidence that the need system includes functions related to cognition (Stocco et al., 2010) and emotion (Venkatraman et al., 2017).

In summary, each of the three systems mentioned above controls our behavior in its own way. Therefore, the knowledge about it (e.g., general and self-related knowledge), the acquisition of competencies for perception, regulation (e.g., emotion regulation in the present moment), and changeability (e.g., of emotional reaction habits) that facilitate and reflect on dealing with the three systems are key elements for personal development (Kuhbandner & Schelhorn, 2020).

In order to grow personally, ongoing clarity about one´s inner life through reflection and the occupational circumstances is necessary, deliberating what might be meaningful for one´s job and life. According to Martela and Steger (2016), people talk about three distinct classes of perceptions when they provide information about the circumstances that make their life meaningful: 1) past-related, that is, whether there is coherence and life is experienced as a

continuous meaningful story; 2) present-related, that is, whether there is a purpose in life, and having achieved an overarching goal, a general orientation, so to speak, like a mission; and 3) future-related, that is, meaning a kind of emotional, social evaluation of one's existence. Finally, research have shown, that the awareness that small changes by the individual while doing the job, can make the job more meaningful (Wrzesniewski & Dutton, 2001).

1.3 Study Overview and Summary of the Research Questions

The More project and the personality model behind it were described in the previous pages. This should outline the overarching framework in which the following three studies are embedded. Consequently, three content areas were selected and empirically examined in more detail. The general goal was to answer the core questions resulting from the literature research on the basis of current psychological theories (**study 1 & 2**), and to scientifically investigate the development of a tool for the study-related aptitude assessment (i.e., for clarifying necessary development tasks) in the teacher training course in the sense of supporting reflection processes on the professional goal of teaching against the backround of the continuous development of personal competencies by an experiment to evaluate its effectiveness (**study 3**).

In **study 1,** it was investigated if the principle of 'bad is stronger than good' also holds for the influence of teachers' goals and emotions on their well-being. Across a broad range of psychological phenomena, it has been found that the psychological effects of bad events (e.g., failures, being rejected by others, receiving criticism) outweigh those of good events (e.g., success, being valued by others, receiving praise; for reviews, see Baumeister et al., 2001; Vaish et al., 2008), a principle which has been summarized in the often-cited quotation 'bad is stronger than good' (Baumeister et al. 2001, p. 323). Based on the previous evidence and the main motive shown in the research on the motivation of teacher students to choose the teaching career (i.e., the joy of working with children and young people, for an overview, see Rothland, 2011), this study investigated whether this motive needs differentiating between children and young people showing undesirable behaviors and children and young people showing desirable behaviors. Furthermore, it was examined whether the “bad is stronger than good” phenomenon also explains this differentiation. This was done by measuring teachers' goals and emotions for students showing undesirable behaviors ("bad") and asking if they contribute more to their well-being than teachers' goals and emotions for students showing desirable behaviors ("good"). For this purpose, measuring teachers’ subjective, occupational, and psychological well-being was issued.

Study 2 investigate whether teacher students realistically assess future job-relevant situations in the context of their expected emotions of joy (e.g., pleasure) and worry (e.g., discomfort), and whether there is a "peak-end effect" (Kahneman, 2000). Expected functional emotions in relation to later professional practice can be decisive for student teachers to achieve their targeted motivation. However, there are possible cognitive errors which could make such realistic assessment more difficult (e.g. peak-end effect). An overall judgment of emotional experiences can be distorted in that it does not result from the average but from certain individual assessments. This could be motivationally functional or dysfunctional in terms of positive and negative emotions. Therefore, an experiment was designed about 14 events which might occur in the future everyday working life as a teacher (such as tasks, situations, experiences), followed by an emotional evaluation of these events and the future professional life as a whole. After each of the 14 short events, both the expected future joy (i.e., pleasure) and worry (i.e., discomfort) related to the individual events of the professional life and that related to the professional life of a teacher as a whole was measured. This short exercise (about 20 minutes) should be able to identify emotional peaks, relevant job-related future events of teacher students and how their evaluations contribute to the overall evaluation by using pictures with verbal explanations. The latter making it possible to better imagine events that will arise in the future job and to visualize a possible congruence with the future expectations more easily.

The aim of the **Study 3** is to evaluate an "expressive writing" tool which supports students in their job-related personal development and the further development of personal competencies during their time at university. Emotional well-being in later professional practice is a motivational goal in teacher training. For this purpose, the students must develop competencies within the framework of their teacher training courses to achieve this goal. The development of functionally expected teaching-related emotions is critical as these will later play a major role in one's well-being. The main question was if "expressive writing" (Pennebaker, 1997) can be a helpful instrument to be used by teacher students concerning their professional, functional expected emotions (joy and fear) to initiate reflections about to-be-acquired emotional competencies and to induce a more active involvement in their future professional life. In three consecutive days, teacher students were randomly assigned to one of two groups of expressive writing. However, an experimental group wrote about a future school event they feared most, and a future school event they most looked forward whereas an control group wrote about a walk in the forest and a city park. In the end the effects of expressive writing on the affective state of teacher students, expected emotions concerning the events they wrote about, changes in their views about their future professional life as a teacher, and their

motivation to use expressive writing in the long run, concerning the future professional life as a teacher were evaluated.

2. Peer-Reviewed Studies

2.1 Study 1 - Teacher Well-Being: Teachers' Goals and Emotions for Students Showing Undesirable Behaviors Count More Than That for Students Showing Desirable Behaviors

This is a pre-copy-editing, author-produced version of an article published 2022 in Frontiers in Psychology (section Educational Psychology) following peer review. The official citation that should be used in referencing this material is Forster M, Kuhbandner C and Hilbert S (2022) Teacher Well-Being: Teachers' Goals and Emotions for Students Showing Undesirable Behaviors Count More Than That for Students Showing Desirable Behaviors. Front. Psychol. 13:842231. doi: 10.3389/fpsyg.2022.842231.

Abstract

Previous findings indicate that the goals of teachers and their experienced emotions when interacting with students play an important role for their well-being. However, studies on the psychological impact of events have shown that the impact of bad events is stronger than the impact of good events. Thus, it may be that teachers' goals and emotions for students showing undesirable behaviors (e.g., students who disrupt the class, do not finish their work, and have a negative attitude to learning) contribute more to their well-being than teachers' goals and emotions for students showing desirable behaviors (e.g., students who pay attention in class, do their work on time, and have a positive attitude to learning), a distinction that has not been made in previous research. To examine this question, we measured teachers' goals and emotions for students showing desirable and undesirable behaviors, and their affective, evaluative, occupational, and psychological well-being (N = 250). The results showed that teachers' well-being was relatively strongly related to their goals and emotions for students showing undesirable behaviors: The higher the goals and the more positive the emotions, the higher the reported well-being. By contrast, the goals and emotions for students showing desirable behaviors were unrelated to teachers' well-being. These results demonstrate that the principle of "bad is stronger than good" holds also for the influence of teachers' goals and emotions on their well-being.

Keywords: teacher goals, teacher emotions, teacher well-being, negativity bias, occupational well-being

INTRODUCTION

The essential role of teacher well-being in education has been increasingly recognized across the last years (McCallum et al., 2017). Based on the view that well-being of teachers is not only

the absence of negative emotions and stress but also the presence of positive emotions and personal and professional flourishing (Huppert, 2009; Kern et al., 2014), it has been shown that teacher well-being has a positive impact on students' learning and development. For instance, teacher well-being has been shown to be associated with higher academic gains of students (Caprara et al., 2003; Briner and Dewberry, 2007; Duckworth et al., 2009), to be an important precondition for the improvement of the well-being of students (Coleman, 2009; McCallum and Price, 2010; Sisask et al., 2014), the quality of teaching (for a review, see Hascher and Waber, 2021), and to enhance the professional motivation of teachers (McCallum, 2020). Experiencing well-being is also crucial for teachers themselves. Beyond the fact that well-being is a desirable good in itself, well-being is a precondition for teachers to experience teaching as a rewarding profession involving meaningful and important work, which prevents for the danger of loss to the profession (Pillay et al., 2005).

Given the important role of teacher well-being in education, recent studies have tried to identify factors that influence the well-being of teachers both at the level of general school conditions, such as job crafting (Dreer, 2022) and trust in colleagues (Huang et al., 2019), and the level of teacher-student interactions, such as student behavior (Aloe et al., 2014; Aldrup et al., 2018), experienced emotions when working with students (Spilt et al., 2011), or teacher goals (Rüprich and Urhahne, 2015), for reviews see (Acton and Glasgow, 2015; McCallum et al., 2017).

However, there is a basic principle of psychological functioning that may play an important role regarding the influence of many factors but has been neglected in the research on teacher well-being. Across a broad range of psychological phenomena, it has been found that the psychological effects of bad events (e.g., failures, being rejected by others, and receiving criticism) outweigh those of good events (e.g., success, being valued by others, and receiving praise), a principle that has been summarized in the often-cited quotation "bad is stronger than good" (Baumeister et al., 2001, p 323; for reviews, see Baumeister et al., 2001, Vaish et al., 2008).

This psychological principle may also play an important role for the experienced well-being of teachers. In their daily work, teachers are confronted with both good and bad events, experiencing teaching sometimes as influential, meaningful, and emotionally rewarding but sometimes also as uninfluential, meaningless, and emotionally stressful. However, despite of having both good and bad teaching experiences, the experienced well-being may be negatively biased due to the principle that bad experiences are given more weight than good experiences. For instance, although a teacher may actually successfully reach her/his educational goals for a

large number of students and experience positive emotions when doing so, her/his well-being may nevertheless be low as soon as there are a few students for whom educational goals are difficult to reach and experienced emotions are negative.

The principle that bad is stronger than good has already been proven in a variety of fields, such as interpersonal interaction (Gottman, 1994), decision making (Kahneman and Tversky, 1979), learning (Miller, 1944), and teacher-student feedback (Coleman et al., 1987). However, while it has been shown that teachers´ goals and emotions when interacting with students do generally play a role for teacher well-being (e.g., Rüprich and Urhahne, 2015; Dreer, 2021), the question of whether teachers´ goals and emotions for students showing undesirable behaviors ("bad") count more for teacher well-being than teachers´ goals and emotions for students showing desirable behaviors ("good") has largely been neglected in the field of teacher research.

The aim of the present study was to examine whether the principle of bad is stronger than good plays a role in the experienced well-being of teachers. To examine this question, we measured the goals and experienced emotions of teachers for students showing desirable behaviors (i.e., students who pay attention in class, do their work on time, are well organized, and have a positive attitude to learning) and students showing undesirable behaviors (i.e., students who disrupt the class, do not finish their work, are unorganized, and have a negative attitude to learning), and determined the contributions of teachers' goals and emotions for students showing desirable vs. undesirable behaviors to the teachers' well-being.

Following previous operationalizations of well-being as a multifaceted construct encompassing elements of different psychological processes (Keyes, 2002; Seligman, 2012), teacher well-being was measured in terms of experienced positive and negative emotions (i.e., affective well-being), satisfaction with life (i.e., evaluative well-being; Diener et al., 1999), personal flourishing (i.e., psychological well-being; Ryff and Keys, 1995), and occupational functioning (i.e., occupational well-being; Van Horn et al., 2004). Whereas the experienced emotions of teachers are one of the main factors contributing to their affective well-being, the goals of teachers are one of the main factors determining their teaching-related evaluative, psychological, and occupational well-being. In fact, measuring only affective well-being without taking into account goal-related well-being may provide an incomplete picture of teacher well-being because a teacher may experience a high degree of affective well-being despite having dysfunctional goals and thus suboptimal psychological and occupational well-being.

MATERIALS AND METHODS

Participants

In total, 250 secondary German teachers (165 women and 85 men) voluntarily participated in the study. The sample was recruited *via* advertisements at schools, social media, and personal contacts. To increase the motivation to participate, all participants received automated personal feedback at the end, and they could take part in a raffle to win vouchers worth 30 euros. The mean age of teachers was 44.39 years (ranging from 23 to 66 years, *SD* = 10.63), and on average, they have been working as a teacher for 15.85 years (ranging from 1 to 43 years, *SD* = 9.67). Most of the teachers worked full-time (64.0%) or part-time (34.8%). A 24% of them taught in lower track schools, 16.4% in intermediate track schools, 46.4% in comprehensive schools, 9.6% in technical college or higher vocational school, and 3.6% in other secondary schools. Reports on the teaching subjects revealed that German was most frequent (*n* = 83; 33.2%), followed by mathematics (*n* = 70; 28.0%), English (*n* = 60; 24.0%), history (*n* = 40; 16.0%), sport (*n* = 28; 11.2%), biology (*n* = 26; 10.4%), and a distribution across other subjects (e.g., chemistry, economy and law, physics, geography, music, French, and art; most of the teachers taught more than one subject). Although the sample was not designed to represent all teachers in Germany, a comparison with official statistical data (Statistical Offices of the Federal and State Governments, 2020; Federal Office of Statistics, 2022) showed that the sample characteristics closely match the distribution of demographical data for teachers in Germany regarding gender, age, working time, and subjects taught.

The study was conducted in accordance with the Helsinki Declaration and the University Research Ethics Standards of the University of Regensburg. All participants provided written informed consent. In Germany, these types of psychological studies do not require ethical approval of an Ethics Committee (see https://www.dfg.de/foerderung/faq/geistes_sozialwissenschaften/).

Material and Procedure

Self-report data were collected using the online platform SoSci Survey (Leiner, 2018). The study consisted of two phases. In the first phase, participants' affective, evaluative, psychological, and occupational well-being was measured, using well-established questionnaires (see below). Directly afterward, the second phase followed in which the participants' goals and experienced emotions for students showing desirable behaviors and students showing undesirable behaviors were measured. Participants were instructed to put themselves mentally in the situation of a new school year where they will meet a new class of 16 students. They were told that the class will contain two types of students. To avoid an

oversimplification, it was emphasized that the distinction of two types of students is an oversimplification, and that in reality far more complex manifestations and mixed forms of these simplified types are found, and that we do not claim that there could be any kind of an "ideal student." To avoid conceptual priming effects, the types of students were neutrally labeled as "type 1" and "type 2." The exact instruction was (original in German):

> "Please mentally put yourself in the situation that a new school year is beginning. On the next page you will get to know your new students briefly, who exhibit personalities which you may have already experienced in a similar way in your real teaching life. In order to simplify the presentation, in the following, a distinction is made between two types of students. We are aware that in school practice there are far more complex manifestations and mixed forms of these simplified types, and we do not claim that there could be any kind of "ideal student." Type I students are those who follow the lessons and participate. You can describe them with the adjectives diligent, ambitious, active thinking, or interested. Type II students are those who are less likely to follow or participate in class. They can be described with the adjectives lively, dominant, behaviorally problematic, aggressive, hyperactive, or disinterested."

To introduce the class, participants were first shown the eight pictures of the students showing desirable behaviors at the same time for 30 s and second the eight pictures of the students showing undesirable behaviors at the same time for 30 s. The development of the photographs of the two types of students was based on a study by Hörstermann et al. (2010) where a cluster analysis of teacher students' cognitive representation of student types is reported which revealed 10 clusters of student types. One of the clusters describes a type showing desirable behaviors (cluster description of behavioral characteristics: cooperating, working fast, attentive, concentrated, neat appearance, high performing, diligent, helpful, interested, and motivated) and the other nine clusters describe types showing undesirable behaviors (cluster descriptions of behavioral characteristics: talking a lot, dominant, cheeky, disruptive, attention seeking, aggressive, hyperactive, dreamy, lazy, uninterested, unmotivated, and insecure). Based on these descriptions, eight photographs of students showing desirable behaviors in a classroom situation and eight photographs of students showing undesirable behaviors in a classroom situation were developed. To control for possible effects of gender, photographs of four male and four female students were used for each of the types. The students wore neutral blue or gray clothing and were photographed against the same background. A detailed description of the individual photographs can be found at https://osf.io/jbsqf/ (document: description photographs of students).

After the introduction of all students, participants' educational goals were measured separately for students showing desirable and undesirable behaviors using an established questionnaire (see below). Before working on the respective questionnaires, participants were

shown the respective students a second time until participants pressed a button in order to start the questionnaire. Subsequently, experienced emotions for the students were measured. Participants were shown the photographs of the 16 students for 5 s each in random order. After each presentation, their experienced emotions were measured using a combined version of the affect grid (Russell et al., 1989) and the self-assessment manikin (Bradley, 1994; for details, see below).

Measures

Affective Well-Being

Affective well-being was measured using the German version (Breyer and Bluemke, 2016) of the Positive and Negative Affect Schedule (PANAS; Watson et al., 1988), a self-report measure consisting of 10 positive (e.g., "enthusiastic"), and 10 negative adjectives (e.g., "distressed"). Participants responded on a five-point Likert scale ranging from 1 (not at all) to 5 (extremely) to describe how often they usually are in the respective emotional states. In the present sample, reliability on the 10 positive and negative items was high (Cronbach's alphas = 0.84/0.86).

Evaluative Well-Being

Evaluative well-being was measured using the German version (Glaesmer et al., 2011) of the Satisfaction With Life Scale (SWLS; Diener et al., 1985), a self-report measure consisting of five statements reflecting a positive evaluation of one's life quality (e.g., "I am satisfied with my life."). Participants responded on a seven-point Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree). In the present sample, reliability was high (Cronbach's alphas = 0.85).

Psychological Well-Being

Psychological well-being was measured using the 18-item version of Ryff's Psychological Well-Being Scale (PWB; Ryff et al., 2010), a self-report measure consisting of 18 statements reflecting the six areas of psychological well-being (the statements were adapted so that they referred to the context of teaching): autonomy (e.g., "I judge myself as a teacher by what I think is important, not by the values of what others think is important."), environmental mastery (e.g., "I am good at handling the professional responsibilities of everyday life as a teacher."), personal growth (e.g., "I think it is important to have new teaching experiences that challenge how I think about myself and the world."), positive relation with others (e.g., "At school, I am perceived as a giving person, willing to share my time with others."), purpose in life (e.g., "Some teachers wander aimlessly through life, but I am not one of them."), and self-

acceptance (e.g., “I like most parts of my personality.”). The original 54-item version of Ryff’s PWB questionnaire (Ryff, 1989) has been translated into German by Risch (2008),
and the 18 items corresponding to the 18-item version of the questionnaire were used. Participants responded on a scale ranging from 1 (strongly disagree) to 7 (strongly agree). The total score was computed as the mean across all items. In the present sample, reliability was high (Cronbach’s alphas = 0.76).

Occupational Well-Being

Occupational well-being was measured using the job satisfaction scale of the Subjective Aspects of the Teaching Profession questionnaire (Dann et al., 2014), a self-report measure consisting of 12 statements (e.g., “I really enjoy my work as a teacher”). Participants responded on a four-point Likert scale ranging from 1 (does not apply to me in any way) to 4 (applies to me completely). In the present sample, reliability was high (Cronbach’s alphas = 0.85).

Teacher Goals

The participants’ goals for students showing desirable and undesirable behaviors were measured using the four student-related scales of the Questionnaire for the Assessment of Teacher Goals (FELZ; Rüprich and Urhahne, 2015), consisting of the scales consideration of individual differences, student engagement, relationship with students, and learning impact, a self-report measure consisting of four statements per scale. The statements were adapted so that they referred to either the group of the previously shown students showing desirable and undesirable behaviors [e.g., “In my job as a teacher, I strive to promote this type of students individually” (scale consideration of individual differences); “In my job as a teacher, I strive to hold interesting lessons for this type of students” (scale student engagement); “In my job as a teacher, I strive to build a trusting relationship with this type of students” (scale relationship with students); and “In my job as a teacher, I strive to be a teacher from whom this type of students learn a lot” (scale learning impact)]. Participants responded on a five-point Likert scale ranging from 1 (I do not agree) to 5 (I agree completely). The total score was computed as the mean across all items. In the present sample, reliability was estimated to be high (Cronbach’s alpha = 0.94).

Experienced Emotions

Experienced emotions were measured using a combined version of the affect grid (Russell et al., 1989) and the self-assessment manikin (Bradley, 1994). As depicted in **Figure 1**, an affect grid was shown on the screen which assesses experienced emotions on the dimensions of valence and arousal. Participants could move a cross across the grid, which resulted in respective changes in the manikin shown on the right side of the grid. That is, moving

the cross along the valence axis changed the figure from frowning (negative) to smiling (positive), and moving the cross along the arousal axis changed the figure from eyes wide open and an explosive-like burst over the abdomen (high arousal) to eyes closed and a small pin prick over the abdomen (low arousal). The position of the cross on the grid on the valence dimension was converted in a valence score valence (−100 = extremely negative and +100 = extremely positive) and an arousal score (−100 = extremely low arousal and +100 = extremely high arousal).

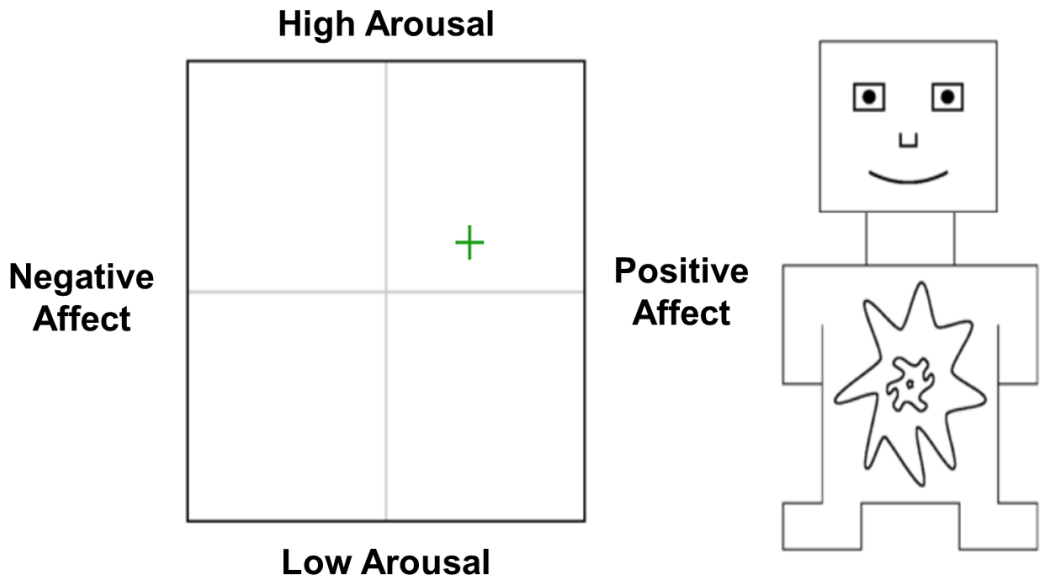

Figure 1. **Illustration of the measurement of experienced emotions.** An affect grid was shown (left side) which assesses experienced emotions on the dimensions of valence and arousal. Participants could move a cross across the grid, which resulted in respective changes in the manikin shown on the right side of the grid.

RESULTS

Table 1 shows the means and SDs for the measured variables as well as the correlations between all variables. Teacher goals for students showing desirable and undesirable behaviors did not differ, $t(249) = 0.4$, $p = 0.655$, $d = 0.03$. Experienced emotions were more negative for students undesirable behaviors than for students showing desirable behaviors, $t(249) = 31.5$, $p < 0.001$, $d = 1.99$, and more arousing for students showing desirable behaviors than for students showing undesirable behaviors $t(249) = 2.6$, $p = 0.010$, $d = 0.16$.

To examine the effects of teacher goals and emotions on teacher well-being, multiple regression analyses were conducted with affective (positive and negative affect), evaluative, psychological, and occupational well-being as the dependent variables and (1) teacher goals for students showing desirable and undesirable behaviors as independent variables, and (2) teacher emotions (valence and arousal) for students showing desirable and undesirable behaviors as

independent variables. Results are shown in **Table 2** (effect of teacher goals) and **Table 3** (effect of teacher emotions).

Table 1. *Correlations and Descriptive Statistics*

	1	2	3	4	5	6	7	8	9	10	11
1. Affective well-being (positive affect)		**−0.18****	**0.43****	**0.49****	**0.51****	**0.23****	**0.35****	0.06	**0.13***	0.00	0.02
2. Affective well-being (negative affect)			**−0.41****	**−0.45****	**−0.36****	**−0.13***	**−0.23****	−0.03	−0.12	0.05	0.02
3. Evaluative well-being				**0.44****	**0.45****	**0.16***	**0.17****	0.11	0.11	−0.02	0.05
4. Psychological well-being					**0.70****	**0.34****	**0.46****	0.02	**0.20****	−0.02	**0.13***
5. Occupational well-being						**0.15***	**0.29****	0.10	**0.14***	0.00	0.06
6. Goals (desirable behaviors)							**0.66****	0.06	0.06	**0.23****	0.11
7. Goals (undesirable behaviors)								0.02	**0.21****	0.03	**0.14***
8. Experienced emotional valence (desirable behaviors)									−0.09	0.12	**0.15***
9. Experienced emotional valence (undesirable behaviors)										0.04	−0.03
10. Experienced emotional arousal (desirable behaviors)											−0.02
11. Experienced emotional arousal (undesirable behaviors)											
M	3.51	1.60	5.52	5.46	3.06	4.05	4.04	54.46	26.53	−19.47	18.68
SD	0.56	0.54	0.94	0.60	0.48	0.51	0.64	20.14	33.42	29.39	33.70

p values are not corrected for multiple testing. Significant correlations are printed in bold.
**Indicates p < 0.05; **Indicates p < 0.01.*

Table 2. *Results of Regression Analyses Predicting Level of Affective, Evaluative, Psychological, and Occupational Well-Being From Teacher Goals for Students Showing Desirable and Undesirable Behaviors*

Measure	*B*	95% CI		*SE B*	*β*	*t*	*p*
		LL	*UL*				
Affective well-being (positive affect; $R^2 = R^2_{adj} = 0.12$)							
Goals (desirable behaviors)	−0.01	−0.18	0.16	0.09	−0.01	−0.13	0.89
Goals (undesirable behaviors)	0.31	0.17	0.45	0.07	0.36	4.47	<0.001
Affective well-being (negative affect; $R^2 = R^2_{adj} = 0.05$)							
Goals (desirable behaviors)	0.04	−0.13	0.21	0.09	0.04	0.46	0.65
Goals (undesirable behaviors)	−0.22	−0.36	−0.08	0.07	−0.25	−3.07	0.002
Evaluative well-being ($R^2 = R^2_{adj} = 0.03$)							
Goals (desirable behaviors)	0.16	−0.14	0.47	0.15	0.09	1.06	0.29
Goals (undesirable behaviors)	0.16	−0.08	0.41	0.12	0.11	1.33	0.19
Psychological well-being ($R^2 = 0.21$; $R^2_{adj} = 0.20$)							
Goals (desirable behaviors)	0.07	−0.11	0.25	0.09	0.06	0.77	0.44
Goals (undesirable behaviors)	0.40	0.25	0.54	0.07	0.42	5.52	<0.001
Occupational well-being ($R^2 = 0.09$; $R^2_{adj} = 0.08$)							
Goals (desirable behaviors)	−0.07	−0.22	0.08	0.08	−0.07	−0.90	0.37
Goals (undesirable behaviors)	0.26	0.14	0.38	0.06	0.34	4.19	<0.001

CI, confidence interval; LL, lower limit; UL, upper limit; β, standardized regression coefficient; t, t-value; p, probability of committing a Type-I-Error; and p values are not corrected for multiple testing.

Table 3. *Results of Regression Analyses Predicting Level of Affective, Evaluative, Psychological, and Occupational Well-Being From Experienced Emotional Valence and Arousal for Students Showing Desirable and Undesirable Behaviors*

Measure	*B*	95% CI		*SE B*	*β*	*t*	*p*
		LL	*UL*				
Affective well-being (positive affect; $R^2 = 0.02$; $R^2_{adj} = 0.01$)							
Experienced emotional valence (desirable behaviors)	0.002	−0.002	0.01	0.002	0.07	1.07	0.29
Experienced emotional valence (undesirable behaviors)	0.003	0.00	0.01	0.001	0.14	2.22	0.03
Experienced emotional arousal (desirable behaviors)	0.00	−0.002	0.002	0.001	−0.01	−0.16	0.87
Experienced emotional arousal (undesirable behaviors)	0.00	−0.002	0.002	0.001	0.01	0.22	0.82
Affective well-being (negative affect; $R^2 = 0.02$; $R^2_{adj} = 0.01$)							
Experienced emotional valence (desirable behaviors)	−0.001	−0.01	0.002	0.002	−0.05	−0.82	0.41
Experienced emotional valence (undesirable behaviors)	−0.002	−0.01	0.00	0.001	−0.13	−1.99	0.05
Experienced emotional arousal (desirable behaviors)	0.001	−0.001	0.003	0.001	0.07	1.02	0.31
Experienced emotional arousal (undesirable behaviors)	0.00	−0.002	0.002	0.001	0.02	0.36	0.72
Evaluative well-being ($R^2 = 0.03$; $R^2_{adj} = 0.01$)							
Experienced emotional valence (desirable behaviors)	0.01	0.00	0.01	0.003	0.12	1.88	0.06
Experienced emotional valence (undesirable behaviors)	0.004	0.00	0.01	0.002	0.12	1.94	0.05
Experienced emotional arousal (desirable behaviors)	−0.001	−0.01	0.002	0.002	−0.04	−0.66	0.51
Experienced emotional arousal (undesirable behaviors)	0.001	−0.003	0.004	0.002	0.03	0.54	0.59
Psychological well-being ($R^2 = 0.06$; $R^2_{adj} = 0.04$)							
Experienced emotional valence (desirable behaviors)	0.001	−0.003	0.004	0.002	0.02	0.31	0.76
Experienced emotional valence (undesirable behaviors)	0.004	0.002	0.01	0.001	0.20	3.26	0.001
Experienced emotional arousal (desirable behaviors)	−0.001	−0.003	0.002	0.001	−0.03	−0.51	0.61
Experienced emotional arousal (undesirable behaviors)	0.002	0.00	0.01	0.001	0.13	2.05	0.04
Occupational well-being ($R^2 = 0.03$; $R^2_{adj} = 0.02$)							
Experienced emotional valence (desirable behaviors)	0.003	−0.001	0.01	0.002	0.10	1.62	0.11
Experienced emotional valence (undesirable behaviors)	0.002	0.00	0.01	0.001	0.15	2.36	0.02
Experienced emotional arousal (desirable behaviors)	0.00	−0.002	0.002	0.001	−0.02	−0.24	0.81
Experienced emotional arousal (undesirable behaviors)	0.001	−0.001	0.002	0.001	0.05	0.72	0.47

CI, confidence interval; LL, lower limit; UL, upper limit; β, standardized regression coefficient; t, t-value; p, probability of committing a Type-I-Error; and p values are not corrected for multiple testing.

The results depicted in **Tables 2, 3** show, as illustrated in **Figure 2** (effect of teacher goals) and **Figure 3** (effect of teacher emotions), that affective, psychological, and occupational well-being depended on the height of teachers' goals and experienced emotions for students showing undesirable behaviors.

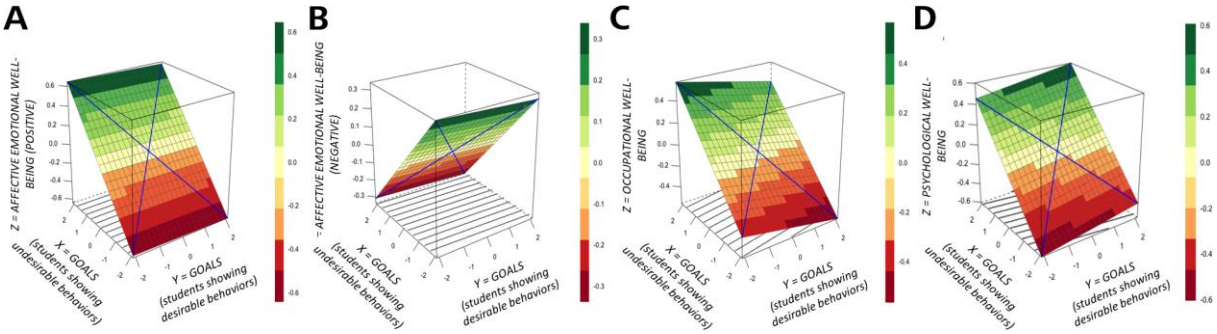

Figure 2. **Response surface analysis plots: Links between teacher goals for students showing desirable and undesirable behaviors on (A) affective well-being (positive affect), (B) affective well-being (negative affect), (C) occupational, and (D) psychological well-being**. The vertical Z-axis in the 3-D figures refers to the level of well-being on a scale of -0,4-0,4 (A); -0,3-0,3 (B); -0,6-0,6 (C); -0,6-0,6 (D). The higher the value, the higher the level of well-being. The color chart next to each figure denotes the numerical implication of the different hues. The X- and Y-axes reflect the values in experienced emotions for students showing desirable and undesirable behaviors, respectively. All values are standardized through z-transformations.

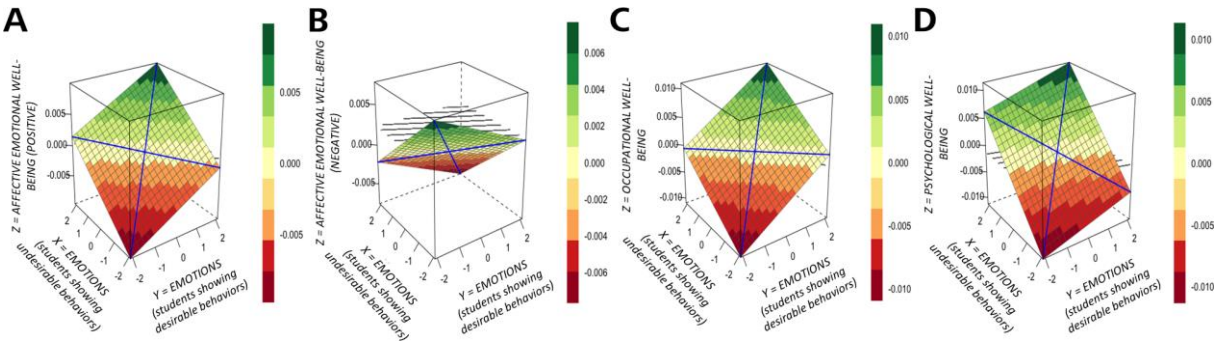

Figure 3. **Response surface analysis plots: Links between teacher emotions (experienced emotional valence) for students showing desirable and undesirable behaviors on (A) affective well-being (positive affect), (B) affective well-being (negative affect), (C) occupational, and (D) psychological well-being**. The vertical Z-axis in the 3-D figures refers to the level of well-being on a scale of -0,005-0,005 (A); -0,005-0,005 (B); -0,010-0,010 (C); -0,010-0,010 (D). The higher the value, the higher the level of well-being. The color chart next to each figure denotes the numerical implication of the different hues. The X- and Y-axes reflect the values in experienced emotions for students showing desirable and undesirable behaviors, respectively. All values are standardized through *z*-transformations.

Descriptively, the effect was stronger for teacher goals than for teacher emotions. By contrast, neither teachers' goals nor experienced emotions for students showing desirable behaviors did influence any of the well-being measurements.

Numerous findings have shown that the psychological impact of bad events is stronger than the psychological impact of good events. The present findings indicate that this holds also true for the well-being of teachers. Teachers' affective, occupational, and psychological well-being were relatively strongly related to their goals and experienced emotions for students showing undesirable behaviors: the higher the goals and the more positive the experienced emotions, the higher the reported well-being. By contrast, the goals and experienced emotions for students showing desirable behaviors were unrelated to the teachers' well-being.

The finding that teachers' goals and emotions for students showing undesirable behaviors have a higher impact on teacher well-being than teachers' goals and emotions for students showing desirable behaviors is in line with numerous findings demonstrating the principle of "bad is stronger than good" in a variety of psychological domains (Baumeister et al., 2001). The common explanation is that a higher psychological impact of bad events compared to good events is adaptive because the costs of failure of adequate responding to bad events can be much higher than the costs of failure of adequate responding to good events (Baumeister et al., 2001). For instance, while a failure to respond adequately to a snake can have fatal consequences, a failure to respond adequately to a pleasant object can possibly be corrected at the next attempt. Consistent with such a hypothesis, numerous studies have shown

that bad objects are more efficiently and preferably processed (Ohman et al., 2001; Dijksterhuis and Aarts, 2003; Nasrallah et al., 2009; Kuhbandner et al., 2011).

In fact, a similar mechanism may explain the present finding that teachers' goals and emotions for students showing undesirable behaviors have a higher impact on their well-being than teachers' goals and emotions for students showing desirable behaviors. When judging their well-being, teachers may more strongly focus on their experiences with students showing undesirable behaviors so that their experienced well-being may be mainly determined by the experiences they make with these students. Experiencing more positive emotions when interacting with students showing undesirable behaviors and being able to pursue higher goals for these students will thus result in higher experienced well-being. Due to the focus on students showing undesirable behaviors, experiences with students showing desirable behaviors may contribute less to one's experienced well-being, and even if a teacher experiences positive emotions and pursues high goals when interacting with students showing desirable behaviors, this may not matter when there are students showing undesirable behaviors who elicit negative emotions and for whom no high goals are pursued. That is, even if a teacher actually successfully achieves high goals for a large number of students and experiences positive emotions when doing so, the well-being of a teacher can still be low if there are some students for whom educational goals are difficult to achieve.

From an applied perspective, the present finding opens up new ways to increase the well-being of teachers. On the one hand, well-being may be increased by giving more weight to goals and emotions for students showing desirable behaviors when judging ones' well-being. On the other hand, well-being may be increased by helping teachers to establish high goals and experience more positive emotions when interacting with students showing undesirable behaviors. To achieve the latter, it is important to make teachers aware that it is important to pursue high goals not only for students showing desirable behaviors but also for students showing undesirable behaviors, and to help them to develop skills to reach high goals for students showing undesirable behaviors. Furthermore, from a motivational perspective, it could be essential to supplement the most frequently mentioned motive for teaching "Because I like to work with children and adolescents" (Rothland, 2011) by the phrase "both with students showing desirable behaviors and with students showing undesirable behaviors."

At first glance, the results of the present study seem to suggest that the impact of teacher goals on teacher well-being is stronger than the impact of teacher emotions. In fact, the effect of teacher emotions was small, and when correcting for multiple testing, the effect of teacher emotions for students showing undesirable behaviors on some of the well-being measures no

longer reached conventional levels of significance. However, it is important to note that, although both goals and emotions were measured with reference to the same sets of specific pictures of students, goals and emotions were measured in different ways. Teacher goals were measured using a questionnaire which assesses one's general goals for students showing desirable and undesirable behaviors (e.g., "In my job as a teacher, I strive to hold interesting lessons for this type of students"). By contrast, teacher emotions were assessed by measuring the participants' experienced emotions for the specific set of students shown on the pictures. That is, whereas goals were measured in a more trait-like manner, emotions were measured in a more state-like manner. Since state measures are more prone to situational effect which may introduce stronger situation-specific variance, the observed stronger effects of goals compared to experienced emotions may reflect the fact that goals were measured more trait-like and emotions measured more state-like.

Another reason for the observed stronger effects of goals compared to experienced emotions may be that experienced emotions were measured using pictures of students showing desirable or undesirable behaviors. Emotional experiences may be stronger when elicited in real-life classroom situations and may thus play a larger role for teacher well-being as suggested by the measured emotional responses to pictures of classroom situations. Furthermore, another potential limitation of the present study is that the data were collected in an online environment which allows only limited control. Accordingly, further examining the relationship between the goals and emotions of teachers and their well-being in real-life situations may be an interesting avenue for future research.

There is a relatively large body of research indicating that goals (i.e., explicit motives) and emotions (i.e., implicit motives) are often largely unrelated (for a meta-analysis, see Köllner and Schultheiss, 2014). This is also supported by the present study where the height of goals and the valence of experienced emotions were uncorrelated for students showing desirable behaviors and only slightly correlated for students showing undesirable behaviors. Regarding the effects on well-being, there is evidence that a congruency between implicit and explicit motives is associated with elevated well-being (for a review, see Thrash et al., 2012). Accordingly, examining whether this may also be true for the relationship between teachers' goals and emotions for students and their experienced well-being is an interesting research question. However, examining this question with the present data is problematic since, as described above, goals were measured in a more trait-like manner, whereas emotions were measured in a more state-like manner. Accordingly, it is difficult to draw valid conclusions

about the interplay of goals and emotions based on the present data. Examining this issue is an interesting avenue for future research.

The present findings indicate that teachers' goals and experienced emotions for students showing undesirable behaviors contribute more to their well-being than teachers' goals and emotions for students showing desirable behaviors. An open question is, however, which factors may explain why teachers differ in the height of their goals for students showing undesirable behaviors. One possibility is that teachers with higher goals and more positive emotions for students showing undesirable behaviors have a higher ability to regulate the problematic behavior of these students. Another possibility is that teachers with higher goals and more positive emotions for students showing undesirable behaviors had less contact so far with students showing highly undesirable behaviors. In fact, such factors may contribute to the observed finding that teacher with higher goals and more positive emotions for students showing undesirable behaviors show higher well-being. Although examining this issue is an important avenue of future research, this does not concern the main finding of the present study that teachers' goals and experienced emotions for students showing undesirable behaviors contribute more to their well-being than teachers' goals and emotions for students showing desirable behaviors.

In conclusion, the present findings indicate that the psychological principle of "bad is stronger than good" holds also for the influence of teachers' goals and emotions on their well-being. Whereas teachers' goals and emotions for students showing undesirable behaviors had a relatively strong impact, their well-being was entirely independent of their goals and emotions for students showing desirable behaviors. From an applied perspective, it may thus be helpful to make teachers aware of the psychological principle of "bad is stronger than good," and to help them to realize that the setting of high goals for students showing undesirable behaviors is an important ingredient for their teacher well-being.

2.2 Study 2 - Are Student Teachers' Global Expected Emotions Regarding Their Future Life as a Teacher Biased Towards Their Expected Peak Emotions?

Abstract

Having functional expected emotions regarding one's future life as a teacher is important for student teachers to maintain their motivation to choose a career as a teacher. However, humans show several biases when judging their emotional experiences. One famous bias is the so-called peak-end effect which describes the phenomenon that overall affective judgments do not reflect the average of the involved emotional experiences but the most intense and the most recent of the involved emotional experiences. Regarding student teachers' expected positive emotions, such a bias would be functional since their motivation to become a teacher is enhanced. However, regarding student teachers' expected negative emotions, such a bias would be dysfunctional since their motivation to become a teacher would be decreased. The aim of the present preregistered study was to examine whether student teachers' expected future teaching-related emotions show a peak-end effect. Student teachers viewed 14 common events that could part of a typical everyday routine of a teacher and rated their expected emotional pleasure and discomfort for each of the events. Afterward, they were asked to rate their overall expected emotional pleasure and discomfort when looking at their future professional life as a whole. Results showed that expected pleasure was much larger than expected discomfort regarding both overall, peak, and average ratings. No peak-end effect was observed for overall expected discomfort which reflected the average expected discomfort across events. By contrast, overall expected pleasure was biased toward expected peak pleasure experiences. These findings indicate that student teachers judge their expected overall affect in a functional way: realistically when dealing with negative emotions but through rose-colored glasses when dealing with positive emotions.

Keywords: teacher emotions, teacher education, peak-end rule, affective forecasting, affective bias

INTRODUCTION

Expectations about the future emotions experienced in their later professional life as a teacher is one of the main motivational forces that motivates student teachers to invest in the acquisition of teaching-related competencies (Richardson and Watt, 2016). From a functional perspective, expecting positive emotions is advantageous since positive emotions broaden the mindset (Fredrickson, 2004) which is crucial for a deeper engagement with the to be acquired teaching-related competencies. Regarding expected negative emotions, foreseeing emotionally challenging situation in a realistic way is important to derive which competencies have to be acquired to master the challenging situations and prevent future negative emotions. However, it would be disadvantageous if one is overwhelmed by situations that are particularly emotionally challenging because this may lead to unrealistically high expected negative emotions. Such emotional dynamics may induce avoidance motivation and thus impede the acquisition of teaching-related competencies and undermine the motivation to become a good teacher (Hsieh et al., 2007).

It is known from research that when it comes to evaluating the global affective pleasure or discomfort of episodes, people's evaluations do not reflect the average of the involved emotional experiences but are biased toward the emotional experiences that are outstanding. For instance, in the seminal study by Fredrickson and Kahneman (1993), participants were shown series of plotless short film clips with emotionally negative and positive contents of varying intensity, and they were asked to provide continuous ratings of experienced affect while watching each film. Afterward, they were asked to evaluate the overall experienced pleasure or discomfort. Results showed that the overall evaluations were well predicted by the most intense affect rating and the affect rating for the final film clip. The phenomenon that overall affective evaluations of episodes can be well predicted by the experienced peak affect intensity and the affect experienced at the end of the episode is called the peak-end effect and has been replicated several times for different types of emotional episodes, such as aversive sounds (Schreiber and Kahneman, 2000) or payment sequences (Langer et al., 2005), and even for real-life experiences such as unpleasant medical procedures (Redelmeier and Kahneman, 1996) or pain experienced during childbirth (Chajut et al., 2014; for reviews, see Fredrickson, 2000; Kahneman, 2000). In particular, in terms of real-life applications, it has been demonstrated that the peak-end effect can be successfully applied to improve people's behavior (Redelmeier et al., 2003).

The peak-end effect may also play an important role when student teachers try to estimate the emotional pleasure and discomfort associated with their future professional life as a teacher. The everyday work of a teacher consists of several different tasks and events that

trigger both positive and negative emotions of different intensities. If the evaluations of the overall expected future emotional pleasure and discomfort are influenced by the peak-end effect, student teachers' evaluations should be biased toward their expected peak affective experiences. Regarding expected overall pleasure, this would be beneficial since the true overall pleasure would be overestimated so that the motivation to become a teacher is enhanced. However, regarding expected overall emotional discomfort, this would be dysfunctional since the true overall discomfort would be overestimated so that the motivation to become a teacher is decreased. If so, an important part of teacher education would be to help teachers be aware of such fallacies of the affective forecasting of one's future professional life.

The aim of the present study was to examine whether student teachers' evaluations of their expected future emotions show a peak-end effect. Student teachers were shown pictures of 14 common events that could part of a typical everyday routine of a teacher accompanied by spoken explanations. For each of the events, they were asked to rate their expected future pleasure and discomfort. After viewing all 14 events, they were asked to rate their expected pleasure and discomfort when looking at their future professional life as a whole. If student teachers evaluate their overall expected future emotional pleasure and discomfort in a more functional way, their evaluations should mirror the average pleasure and discomfort across the 14 events. If their overall expected future emotional pleasure and discomfort are influenced by the peak-end effect, their overall evaluations should be biased toward the respective expected peak affective experiences.

MATERIALS AND METHODS

Participants

The experiment was preregistered (see https://doi.org/10.17605/OSF.IO/92ZKA) with a target sample size of 64 student teachers. Participants were recruited through advertisements at online social networks or online courses at the University of Regensburg and were paid four Euros for full participation. One participant had to be excluded due to not being a student teacher. The mean age of the remaining 63 participants (40 women and 23 men) was 21.98 years (ranging from 18 to 29 years, *SD* = 2.16), 28.6% were primary school student teachers, and 68.2% were secondary school student teachers (lower track schools: 9.5%, intermediate track schools: 19.0%, comprehensive schools: 39.7%, and others: 3.2%). The mean number of studied semesters was 4.94 semester (ranging from 2 to 7 semester, *SD* = 2.18). More detail information about the sample of participating student teachers (e.g., studies subjects) can be found at https://osf.io/h92fy/. The study was conducted in accordance with the Helsinki

Declaration and the University Research Ethics Standards of the University of Regensburg. All participants provided written informed consent. In Germany, these types of psychological studies do not require ethical approval of an Ethics Committee (see https://www.dfg.de/foerderung/faq/geistes_sozialwissenschaften/).

Material

Fourteen teaching-related events that are commonly part of the daily routine of the professional life of a teacher were chosen and individually presented in the form of a sequence of a possible daily routine of the professional life a teacher, starting at the morning and ending in the evening (for a description, see **Table 1**). Each event was illustrated by a drawing and accompanied by an oral description of the event (for an example, see **Figure 1**, left panel). There was a version with a female and a male teacher, and participants initially chose which version they would like to see.

Table 1. *Description of the evaluated teaching-related events*

Event	*Title and description*
Event 1	**Getting up and morning routine.** The teacher introduces her/himself and begins to describe her/his daily work, describing how her/his morning routine works during the week.
Event 2	**The way to school.** Expression of thoughts on the way to school and on arriving at school. A brief characterization of welcoming pupils follows. Afterward, the teacher walks into the teachers' room.
Event 3	**In the teachers' room.** Working in the teachers' room and emphasizing the weekly working hours, as well as a short conversation with another teacher colleague about awarding oral grades and an upcoming grade conference.
Event 4	**Parent-teacher talk (doorstep).** On the way to the classroom, there is an encounter with a parent who wants to talk about a pupil. The teacher now describes how important parent talks are in general and how they often proceed. However, she also emphasizes that such conversations in the corridor usually have to be postponed to another time so that the lesson time is not affected.
Event 5	**Starting a lesson.** Description of the pupils in terms of their activity in the classroom and starting the lesson with a blackboard write-up and an interactive quiz. This is followed by a brief explanation of the background of why an interactive quiz is being conducted.
Event 6	**A noisy school lesson.** Description of a restless lesson during the morning and explanation of how the teacher usually deals with it.
Event 7	**A very good school lesson.** Description of a very good lesson in which all pupils are motivated and generate many lesson inputs.
Event 8	**Planning a school trip with the class.** In the last hour of class, a school trip is planned together with the class. The school bell ends the lesson and heralds the break.
Event 9	**Conflict on the schoolyard.** During the teacher's break supervision, an argument breaks out between two pupils, and the teacher quickly tries to clarify and settle the dispute.
Event 10	**The poster project.** In afternoon lessons, the class works on a poster project, and the posters are hung up together in the hallway. The principal walks by in the hallway and compliments the posters, even though he/she was not initially enthusiastic about the project.
Event 11	**Preparation of the next lessons.** After the last lesson, the teacher starts preparing the next lessons in the teachers' room. The teacher says that sometimes he/she asks other colleagues if they could observe his/her lessons and give him/her feedback on the lessons to become a better teacher.
Event 12	**Development of new teaching concepts**. The teacher plans the next lessons and constantly compares the contents with the syllabus, material distribution plan, and sequence plan. In doing so, he/she describes the three main questions to be asked. This is followed by a description of the related research and copying of worksheets.
Event 13	**Correcting schoolwork.** Correcting exams and describing one's own thoughts on the good and bad work. After 4 o'clock in the afternoon, the teacher packs up his or her things and leaves the school.
Event 14	**Parents' phone call & future events.** The teacher has a telephone conversation with the parents at 6p.m. Afterward, the teacher looks at his/her diary and describes everything that will happen at school next month.

The selection of the events was based on a well-established tool ("SeLF": https://www.self.mzl.lmu.de/self-starten-sie-hier/) which aims to help student teachers to get realistic insights into the different events that are part of the everyday work of a teacher and the associated requirements (Kahlert and Kriesche, 2016). This tool offers 16 short film clips about different teaching-related events that commonly occur during the working day of a teacher. The

events created for the present study (drawings depicting the events, accompanied by oral descriptions) were presented pre-experimentally to various teachers who provided informal feedback, based on which the events were improved to ensure that the used event descriptions matched the real everyday working life of teachers as closely as possible. An effort was made to choose common teaching-related events that elicit both positive and negative emotions. All drawings and the durations of the oral descriptions can be found at https://osf. io/h92fy/.

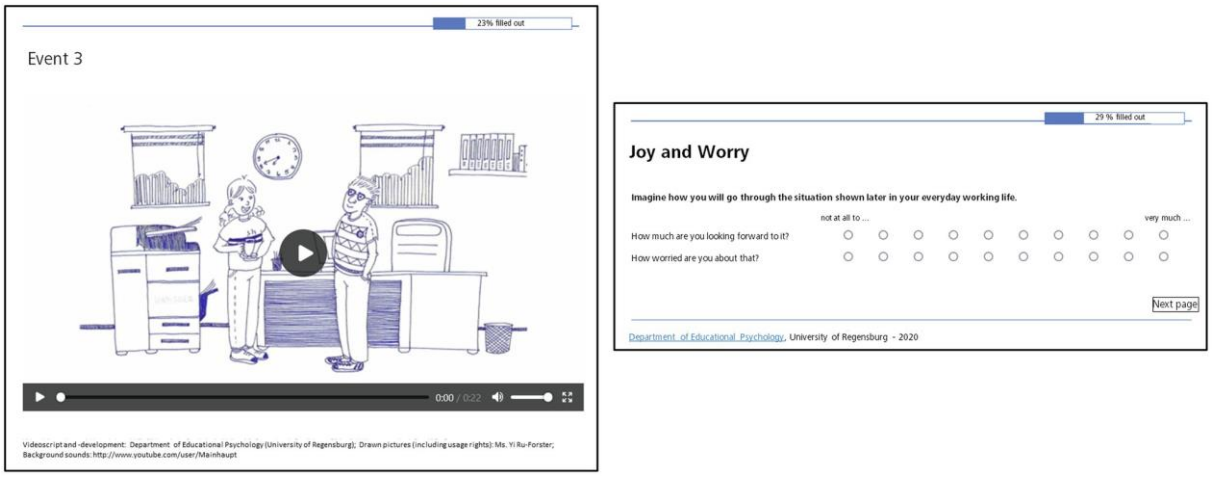

Figure 1. **Evaluation procedure**. Student teachers evaluated 14 common events that could part of a typical everyday routine of a teacher and rated their expected emotional pleasure and discomfort for each of the events. Each event was visualized by a drawing (for an example, see left side of the figure) and accompanied by an oral description. Participants were asked to imagine how they will experience the respective event in the future, and to rate how much they are looking forward to experiencing this event in the future (i.e., expected emotional pleasure) and how much they are worried about experiencing this event in the future (i.e., expected emotional discomfort) on a 10-point Likert-scale ranging from 1 ("not at all") to 10 ("very much"; see right side of the figure). Reproduced with permission from Yi Ru-Forster, who designed the materials specifically for this study. These are available on request by the corresponding author.

Procedure

The study was conducted online *via* SoSci Survey (Leiner, 2021). At the beginning, the participants were instructed that the aim of the study was to illustrate the tasks, expectations, and framework conditions of their future everyday life as teachers to enable a more realistic assessment of one's future professional practice. The following instruction was given (original in German):

> "In the following, we will show you scenes with the aim to illustrate the tasks, expectations, and framework conditions of the everyday professional life of teachers in order to enable you to make a more realistic assessment of your future professional practice. A possible daily routine with situations from the everyday working life of a teacher, from getting up to going to bed, will be shown. After each scene, we will ask

you for a personal evaluation in which we encourage you to think about your expected future joy and worry regarding the respective situation."

Then, the sequence of the 14 events was shown. After each of the events, participants were asked to imagine how they will experience the respective event in the future, and to rate how much they are looking forward to experiencing this event in the future (i.e., expected emotional pleasure) and how much they are worried about experiencing this event in the future (i.e., expected emotional discomfort) on a 10-point Likert-scale ranging from 1 ("not at all") to 10 ("very much"; for an illustration, see **Figure 1**, right panel). After providing their ratings, the participants started the presentation of the next event by a mouse click.

After the presentation and evaluation of all 14 events, the participants were asked to imagine their future professional life as a teacher as a whole, and to rate how much they are looking forward to it (i.e., overall expected emotional pleasure) and how much they are worried about it (i.e., overall expected emotional discomfort) using the same 10-point Likert scales as described above. The exact instruction was (original in German):

"You have now imagined how the typical day-to-day routine of a teacher may look like. If you finally look at your future professional life as a teacher as a whole: How much are you looking forward to it [worried about it]?"

RESULTS

Affective Ratings

The expected emotional pleasure and discomfort rated for each of the future teaching-related events and for the future professional life as a teacher as whole is shown in **Figure 2A** (expected emotional pleasure) and **Figure 2B** (expected emotional discomfort). The dashed horizontal lines show the average affective ratings across events, the underlaid squares show the event with the expected peak affect and the event evaluated at the end of the sequence.

The three teaching-related events that were associated with the highest expected emotional pleasure were "A very good lesson" (M = 9.16, SD = 1.35), "Planning a school trip with the class" (M = 8.90, SD = 1.47), and "The way to school" (M = 8.67, SD = 1.23). The three teaching-related events that were associated with the highest emotional discomfort were "Development of new teaching concepts" (M = 5.08, SD = 2.53), "Parent-teacher talk (doorstep)" (M = 4.84, SD = 2.40), and "A noisy school lesson" (M = 4.78, SD = 2.47). For the expected peak affective experience, expected emotional pleasure was much higher than expected emotional discomfort (emotional pleasure: M = 9.71, SD = 0.63; emotional discomfort: M = 6.97, SD = 2.18), $t(62) = 9.98$, $p < 0.001$, $d = 1.26$. For the mean across events,

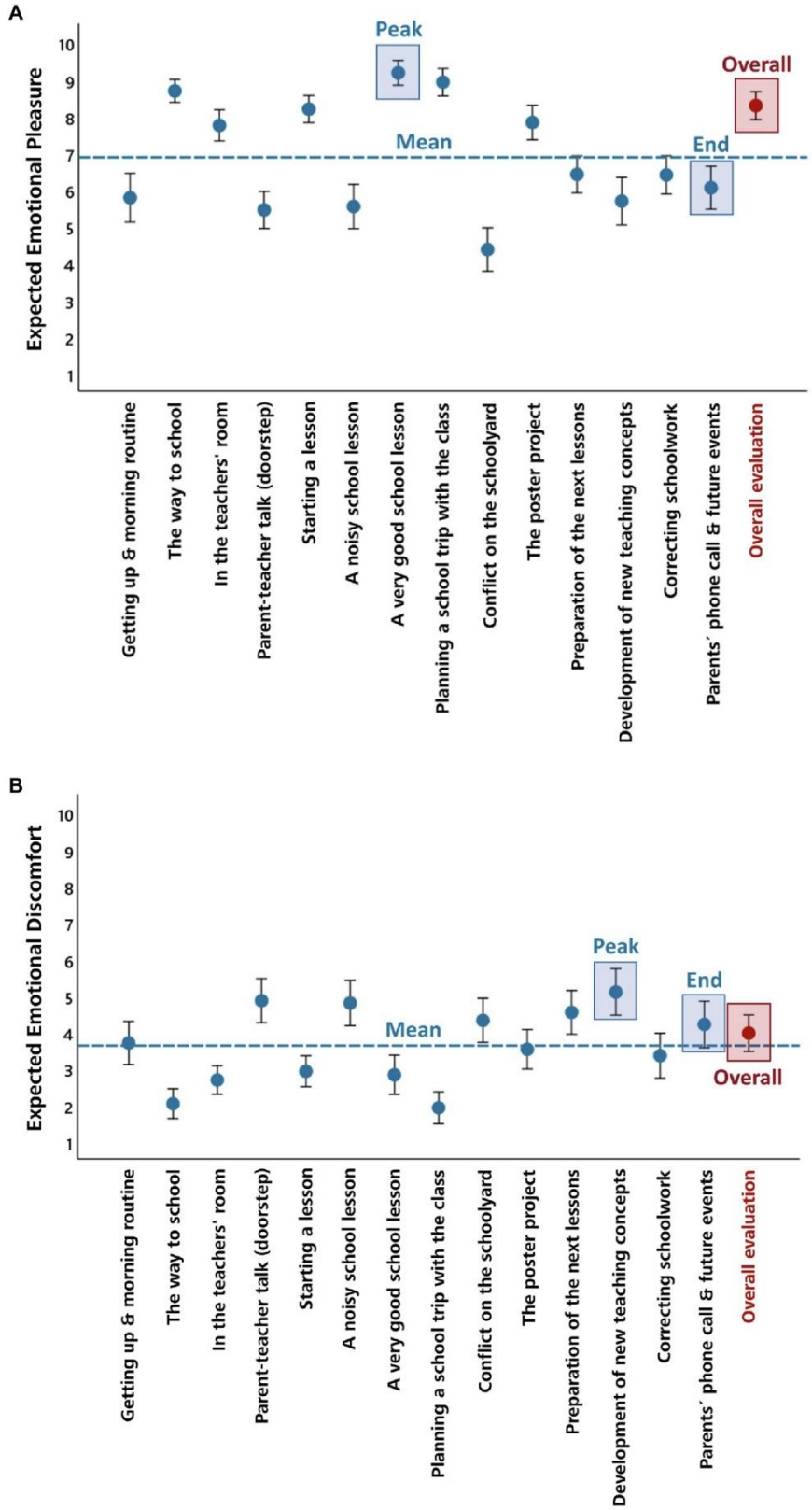

Figure 2. **Affective ratings**. The mean expected emotional pleasure (A) and mean expected emotional discomfort (B) for each of the fourteen evaluated teaching-related events (blue colors) and for the future professional life as a teacher as whole (red color) is shown. The dashed horizontal lines show the average affective experience across events, the underlaid squares show the event with the peak expected affect and the event evaluated at the end of the sequence. Error bars represent 95% confidence intervals.

expected emotional pleasure was much higher than expected emotional discomfort as well (emotional pleasure: $M = 6.86$, $SD = 1.04$; emotional discomfort: $M = 3.61$, $SD = 1.31$), $t(62) = 13.79$, $p < 0.001$, $d = 1.74$. For the expected overall emotional pleasure and discomfort, expected emotional pleasure was much higher than expected emotional discomfort as well (emotional pleasure: $M = 8.27$, $SD = 1.51$; emotional discomfort: $M = 3.95$, $SD = 1.98$), $t(62) = 12.10$, $p < 0.001$, $d = 1.52$.

Peak-End Effect

As can be seen in **Figures 2A,B**, overall expected affect was closer to the expected peak affective experience for emotional pleasure (*M*Difference Peak-Overall = 1.44, *SD* = 1.49) compared to emotional discomfort (*M*Difference Peak-Overall = 3.02, *SD* = 1.79), $t(62) = -5.03$, $p < 0.001$, $d = 0.63$. By contrast, overall expected affect was closer to the mean across the evaluated events and closer to the affect expected for the event evaluated at the end of the sequence for emotional discomfort (*M*Difference Overall- Mean = 0.34, *SD* = 1.28; *M*Difference Overall-End = −0.24, *SD* = 2.17) compared to emotional pleasure (*M*Difference Overall-Mean = 1.41, *SD* = 1.18; *M*Difference Overall-End = 2.24, *SD* = 2.09), $t(62) = 4.31$, $p < 0.001$, $d = 0.54$, and $t(62) = 5.30$, $p < 0.001$, $d = 0.67$. These findings indicate that overall expected emotional pleasure was biased toward expected peak pleasure, whereas overall expected emotional discomfort was mainly determined by the average expected discomfort across the evaluated events.

Table 2. *Rating Results: Correlations and descriptive statistics*

	1	2	3	4	5	6	7	8	9	10
1. Overall discomfort		**0.77****	**0.63****	**0.57****	**0.67****	**−0.31***	−0.24	0.04	−0.11	−0.09
2. Mean discomfort			**0.78****	**0.61****	**0.78****	−0.18	**−0.26***	−0.02	−0.14	−0.14
3. Peak discomfort				**0.57****	**0.87****	−0.13	**−0.30***	0.15	−0.19	−0.14
4. End discomfort					**0.90****	−0.25	**−0.30***	0.09	**−0.49****	**−0.42****
5. Peak-end discomfort						−0.21	**−0.34****	0.13	**−0.40****	**−0.33****
6. Overall pleasure							**0.62****	0.24	**0.47****	**0.49****
7. Mean pleasure								**0.43****	**0.59****	**0.65****
8. Peak pleasure									0.20	**0.44****
9. End pleasure										**0.97****
10. Peak-end pleasure										
M	3.95	3.61	6.97	4.19	5.58	8.27	6.86	9.71	6.03	7.87
SD	1.98	1.31	2.18	2.55	2.09	1.51	1.04	0.63	2.32	1.26

**indicates p<0.05; **indicates p<0.01 and p values are not corrected for multiple testing. Significant correlations are printed in bold.*

To further explore the existence of a peak-end effect, a regression analysis was performed to analyze how much variance in overall expected affect was explained by the mean across the evaluated events, by the expected peak affective experience, and by the event evaluated at the end of the sequence. First, Pearson correlation coefficients were calculated, which are shown in **Table 2**. For expected emotional discomfort, overall expected discomfort was correlated with the mean discomfort across events, the peak discomfort, the end discomfort, and the mean

between peak and end discomfort, and was most highly correlated with the mean discomfort across events.

For expected emotional pleasure, overall expected pleasure was most highly correlated with the mean across the evaluated events as well. However, surprisingly, overall expected pleasure was not correlated with the expected peak pleasure experience. This finding must be interpreted taking into account the fact that almost all participants had rated the maximum value for their expected peak pleasure experience (79.4% of participants) so that expected peak pleasure showed hardly any variance across participants (*SD* = 0.63). The consequence is that even if overall expected pleasure was highly determined by the expected peak pleasure, both values would only weakly be correlated because the occurrence of correlations presupposes that variables show a certain amount of variation.

Table 3. *Results of regression analysis predicting level of expected overall emotional discomfort from mean expected discomfort, peak expected discomfort, and end expected discomfort.*

Parameter	*B*	95% CI		*SE B*	*β*	*t*	*p*
		LL	*UL*				
Mean expected discomfort	0.99	0.57	1.41	0.21	0.65	4.72	<0.001
Peak expected discomfort	0.04	−0.20	0.28	0.12	0.04	0.31	0.76
End expected discomfort	0.11	−0.05	0.27	0.08	0.14	1.36	0.18

CI, confidence interval; LL, lower limit; UL, upper limit; β, standardized regression coefficient; t, t value; p, probability of committing a Type-I-Error; and p values are not corrected for multiple testing.

Due to the small variance of expected peak pleasure across participants, the results of a regression analysis cannot be validly interpreted. Because of this, a regression analysis was performed only for expected emotional discomfort to compare the contributions of expected mean discomfort across events, expected peak discomfort, and end discomfort to explain the variance in expected overall emotional discomfort. The results are shown in **Table 3**. Only the expected mean discomfort across events turned out to be a significant predictor, with the model explaining 61.1% of the variance, indicating that overall expected discomfort was strongly determined by the mean expected discomfort across the evaluated events.

DISCUSSION

When evaluating the overall global affective pleasure or discomfort of episodes, people's evaluations often do not reflect the average of the involved emotional experiences but the most intense and the most recent of the involved emotional experiences (for reviews, see Fredrickson, 2000; Kahneman, 2000). The present study examined whether such a peak-end effect occurs also when student teachers predict their affective experiences elicited in their future

professional life as a teacher. The results showed that student teachers' evaluations of the overall expected affect are strongly biased toward the expected peak affect for emotional pleasure but only weakly for emotional discomfort. In the latter case, the overall expected discomfort was mainly determined by the average expected discomfort across the evaluated teaching-related events.

Regarding previous research on the peak-end effect, the present findings demonstrate that overall affective evaluations of episodes are not only biased toward peak affective experiences when people evaluate past episodes but also when people predict the affective experiences elicited by future episodes. Such a finding is interesting because previous research has shown that the biases found for remembered affective experiences are not necessarily also found for predicted future affective experiences (Levine et al., 2018). However, the present results further indicate that a bias toward expected peak affective experiences when evaluating the overall affective consequences of future episodes seems not to be a general effect found for any type of affective forecasting. A bias toward the peak was only found when evaluating the expected overall pleasure but not when evaluating the expected overall discomfort.

Such a finding is in line with previous findings showing that the peak-end effect is not a general phenomenon that occurs for any type of episodes. For instance, it has been shown that for global affective evaluations of the previous day (Miron-Shatz, 2009) or for global affective evaluations of musical pieces (Schäfer et al., 2014); the average intensity across experienced moments can play even a larger role than the peak and end experiences. To explain such findings, it has been suggested the heterogeneity of the involved experiences may play a role: when a to be evaluated episode consists of more complex and heterogeneous experiences, the overall expected affect may reflect more the average across experiences than peak and end experiences (Kemp et al., 2008; Strijbosch et al., 2019).

Since the teaching-related events evaluated in the present study are also complex and heterogeneous events, this may explain the absence of a peak-end effect for expected emotional discomfort. In particular, this may also provide an explanation for the finding that a peak effect was found only for expected emotional pleasure but not for emotional discomfort. As shown in several studies, negative affective experiences are more heterogeneous than positive affective experiences (for a review, see Unkelbach et al., 2019), a phenomenon that has been made famous by the opening line of Leo Tolstoy's Anna Karenina: "All happy families are all alike; each unhappy family is unhappy in its own way." Accordingly, due to the higher degree of heterogeneity, the overall evaluation of negative affective experiences may be less affected by the peak-end effect than the overall evaluation of positive affective experiences.

Regarding the occurrence of an end effect, it is important to note that the sequence of the evaluated events followed the order of how the respective events occur during a typical day of the professional life of a teacher. Consequently, all participants evaluated the events in the same order, and the last event represented the event that occurs at the end of the daily routine. Since it is assumed that overall evaluations of episodes are biased toward peak and end events because these events are outstanding, this may explain why no end effect was observed in the present study. Participants may have mentally classified the last event as the event that naturally ends the working day of a teacher, which may have led to the experience that this event is not outstanding.

The reason for presenting the to be evaluated events in the order of how the respective events occur during a typical day was that the present study focused on the question of whether a peak-end effect occurs when student teachers imagine the emotional pleasure and discomfort associated with their future everyday working life as a teacher. Accordingly, it remains to be shown whether the present findings can be generalized to situations where students imagine emotional events that are not commonly occurring in their later everyday working life. Examining this issue would be an interesting avenue for future research.

From an applied perspective, the fact that when student teachers assess the emotional pleasure and discomfort associated with their future professional life only overall expected pleasure is biased toward the expected peak affect but not overall expected discomfort is beneficial for the motivation to become a teacher. Regarding expected overall emotional pleasure, a bias toward the expected peak pleasure is functional because the average pleasure is overestimated so that the motivation to become a teacher is enhanced. Regarding expected overall emotional discomfort, the absence of a bias toward the expected peak discomfort is functional because the average displeasure is not overestimated and thus the motivation to become a teacher not decreased.

However, despite the obvious motivational functionality of student teachers' evaluations of their future teaching-related affective experiences, it is important to note that the expected overall pleasure overestimated the average pleasure across the events that are part of the daily routine of the later professional life of a teacher. Thus, to avoid later disappointments, it seems nevertheless important to help student teachers to develop a realistic view of all parts of their later professional life as a teacher, and to develop competencies that maximize the future positive affect and minimize the future negative affect.

Beyond the actual research question of the present study, the findings are also interesting in terms of which parts of the professional life of a teacher are expected by student teachers to

be emotionally rewarding and which are expected to be emotionally challenging. Regarding emotionally challenging events, the highest rated events were development of new teaching concepts, parent-teacher talk, a noisy school lesson, preparation of the next lessons, conflict on the schoolyard, and parents' phone call, which closely resemble previous findings indicating that classroom discipline, motivating students, dealing with individual differences, relationship with parents, organization of class work, and dealing with problems of individual students are among the most important problems mentioned by teachers at the beginning of their profession (Veenman, 1984). Regarding emotionally rewarding events, the highest rated events were a very good school lesson, planning a school trip with the class, the way to school, starting a lesson, the poster project, in the teachers' room, which mainly mirrors the main motive in choosing a career as a teacher (Rothland, 2011), namely, the joy of working with children and young people.

The results also show that the judgments of emotional pleasure and discomfort associated with a specific event vary across participants. Such interindividual differences in expected future emotions may stem from different pre-existing emotional experiences with the respective event. Furthermore, expected future emotions of student teachers' may additionally vary as a function of the extent to which a future teaching-related event, and the coping with the related requirements, was part of the teacher education. With regard to the present analysis of the occurrence of a peak-end effect, such interindividual differences do not introduce any problematic bias since it does not matter which of the judged events is experiences as the one that elicits the most intense emotions. However, when interpreting the intensity of emotions associated with specific events, pre-existing experiences have to be taken into account.

Regarding interindividual differences, previous research has shown that states of anxiety or depression can modulate affective ratings (e.g., Teismann et al., 2020). Accordingly, one potential limitation of the present study is that participants' states of anxiety or depression were not assessed. However, although it has been shown that students sometimes experience higher levels of anxiety and depression (e.g., Ramón-Arbués et al., 2020), the reasons for such mental problems are typically not the later job requirements, but instead the experience of high demands during study and performance pressure (Fabricius et al., 2019). Thus, since the present research question focused on affective experiences associated with events that are part of their future work, mental problems stemming from study-related aspects such as high study demands may have played only a minor role in the present study.

Both for expected peak affective experience, for the mean across events, and for the expected overall affect, ratings for emotional pleasure were higher than for emotional

discomfort. Such a pattern mirrors the typical finding in studies examining affective ratings that affective ratings are higher for positive than for negative experiences. A prominent example is the ratings of positive and negative affect using the PANAS scales. For instance, in the validation study (Watson et al., 1988), participants provided higher affect ratings for positive than for negative affect items regardless of the used time frame. Similarly, regarding ratings in the domain of emotional wellbeing, a finding that is found throughout the world is that most people's affect is primarily pleasant (e.g., Diener and Diener, 1996). Regarding possible explanations, it has been speculated, for instance, that the internal neutral set point is shifted toward the positive range of affective scales (Headey and Wearing, 1992), or that people's emotional assessments are biased toward positive evaluations due to motivational reasons because positive affect energizes approach tendencies which are important for long-term survival (Diener and Diener, 1996).

In conclusion, the present study demonstrates that student teachers' expected affective experiences regarding their future life as a teacher are biased toward expected peak emotions, but only for expected pleasure and not for expected discomfort. For expected discomfort, the expected overall affect reflected the average expected discomfort across the evaluated teaching-related events. These findings indicate that student teachers seem to judge their expected overall affect in a functional way: realistically when dealing with negative affective experiences but through rose-colored glasses when dealing with positive affective experiences.

2.3 Study 3 - The Promotion of Functional Expected Teaching-Related Emotions Through Expressive Writing

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Abstract

The aim of the present preregistered study was to examine whether expressive writing can help teacher students to develop functional expected teaching-related emotions. In a variation of James W. Pennebaker´s expressive writing paradigm, 129 teacher students were randomly assigned to write on three consecutive days either about the future teaching-related events that personally trigger the greatest fear and joy (treatment group: $n = 67$) or about a walk in a forest and a city park (control group: $n = 62$). In both groups, expected teaching-related positive emotions increased and expected teaching-related negative emotions decreased with increased writing sessions. After the writing sessions, the treatment group reported a stronger change in their view about their future professional life as a teacher, a more active personal involvement with their future professional life, and an increased motivation to use expressive writing in the future. These results demonstrate that expressive writing is a promising tool to promote teacher students' expected teaching-related emotions.

Keywords: expressive writing, expected future teaching-related emotions

Introduction

Developing functional expected teaching-related emotions and deriving which competencies have to be acquired to reach emotional well-being in their future professional life is a core element of teacher training. Therefore, the aim of the study was to evaluate whether expressive writing may be a suitable method to promote teacher students' development of functional expected teaching-related emotions, to initiate reflections about to-be-acquired emotional competencies, and to induce a more active involvement with their future professional life.

Expressive writing is a method where individuals write about emotional events and express their thoughts and feelings surrounding it. The method has been developed primarily by James W. Pennebaker in the late 1980s (Pennebaker, & Beall, 1986; Pennebaker et al., 1988; Pennebaker, & Chung, 2011; Pennebaker, 1997). In the original version of the expressive

writing paradigm, termed the Written Emotional Disclosure paradigm, participants are randomly assigned to one of two groups. In the experimental group, participants are instructed to write about past emotional negative experiences (i.e., traumatic or negative life experiences) and to express their thoughts and feelings surrounding it. In the control group, participants are asked to write about a non-emotional topic (e.g., a particular room). Typically, participants repeatedly write about the respective topics for around 15-20 minutes per writing session over several consecutive days. Research has shown that expressively writing about negative experiences has many benefits across a range of health and non-health outcomes: It can decrease depression and lowering depressive symptoms (Krpan, et al., 2013; Gortner, et al., 2006), decrease blood pressure (McGuire, 2005) and lead to a reduction in consultations Pennebaker, & Francis, 1996) or absenteeism from work (Francis, & Pennebaker, 1992). Moreover, the use of the expressive writing in educational fields can improve the physical health of undergraduates (Yang, et al., 2015), increase students' exam performance (Park et al., 2014) and reduce test anxiety (Shen et al., 2018), and improve teachers' physical health (Ashley et al., 2013).

Research has also shown that not only writing about negative experiences but also writing about positive experiences can be beneficial for physical and psychological well-being. Expressively writing about positive experiences can enhance positive mood (Burton, & King, 2004), reduce depression and perceived stress reactivity (Allen et al., 2020), lead to better subjective well-being (King, 2001), can promote physical and psychological health benefits (Smith et al., 2018; King, & Miner, 2000), and reduce teachers' anxiety (Round et al., 2022). In particular, there is even some evidence that writing about positive experiences may be more beneficial for overall well-being than writing about negative experiences (Jones, & Destin, 2021; Wong et al., 2021), although there are also contradictory findings (Kloss, & Lisman, 2002).

Taken together, expressively writing about emotionally positive and negative experiences seems to be a promising technique to enhance physical and psychological well-being. However, the general effect sizes are difficult to evaluate from the current state of research. Although a large number of existing meta-analyses suggests that both physical and psychological health is improved (Smyth, 1998; Frisina et al., 2004; Frattaroli, 2006; Van Emmerik et al., 2013), other meta-analyses have failed to support the efficacy of expressive writing (Meads, & Nouwen, 2005; Harris, 2006; Mogk et al., 2006; Travagin et al., 2015; Reinhold et al., 2018). Thus, it remains to be explored whether the mixed findings might be due to the number of participants and writing sessions, the specificity of the topic, additional

support, or something else. Nevertheless, the largest meta-analyses from Frattaroli (2006) showed that expressive writing promotes psychological health, physical health, and overall functioning.

Furthermore, studies such as those by Bain et al. (1999) have shown that the writing of journal articles about cognitive and experiential topics can increase teacher students' reflectivity. Accordingly, there may even be more potential in expressive writing in the context of teacher training in that writing may be helpful to become aware of teaching-related joys or problems one was previously unaware of. Furthermore, expressive writing may help to deal with unsolved problems that trigger unwanted brooding, which hinders to see the positive aspects of teaching (O'Connor, & Williams, 2014) and introduces a risk factor for experiencing depressed and anxious moods (Nolen-Hoeksema, 2000). Finally, expressive writing may help to clarify necessary personal competencies that should be acquired to enhance the positive side and minimize the negative side of teaching, a hypothesis that is supported by studies showing that mental event simulation can benefit problem-solving (Rivkin, & Taylor, 1999).

Taken together, the described findings suggest that expressive writing may be a suitable method to improve teacher students' expected teaching-related emotions, to initiate reflections about to-be-acquired emotional competencies, and to induce a more active involvement with their future professional life. Since, to our knowledge, the use of expressive writing in teacher training has not been examined in previous research, the aim of the present study was to examine the effects of expressive writing in teacher training.

Teacher students were randomly assigned to either an expressive writing group where they wrote on three days in a row ten minutes each about the future teaching-related event they feared most and the future teaching-related event they looked forward to the most, or to a control group where they wrote about a walk in the forest and a city park. We measured the effects of expressive writing on their affective state regarding their future everyday professional life as a teacher, their expected emotions regarding the events they had written about, on changes in their views about their future professional life as a teacher, and on their motivation to use expressive writing in the long run.

We hypothesized that participants in the expressive writing group show an improvement in their overall affective state regarding their future everyday professional life as a teacher (i.e., decreased negative affect and increased positive affect), a decrease in experienced fear regarding the fearful future teaching-related event they had written about, and an increase in experienced joy regarding the joyful future teaching-related event they had written about. In addition, we expected that after the writing exercise, teacher students in the expressive writing

group compared to the control group are more motivated to use the writing exercises in the long term, and show are more active personal involvement with their later professional life.

Method

Participants

The experiment was preregistered (https://osf.io/8skfa). The preregistered target sample size was 128 participants. Initially, 171 participants completed the writing session on the first day, 150 participants on the second day, and 148 on the third day. As the writing sessions had to be completed on three consecutive days according to our preregistration, a sample of 129 German teacher students (104 women, 24 men, 1 without specification) remained for analysis. The mean age was 21.21 years (ranging from 18 to 31 years, *SD* = 2.30), 45.7 % were primary school teacher students and 52.7 % were secondary school teachers (lower track schools: 8.5 %, intermediate track schools: 9.3 %, comprehensive schools: 34.9 %; others: 1.6 %). Participants were paid 15 Euros for full participation. The study was conducted in accordance with the Helsinki Declaration and the University Research Ethics Standards of the University of Regensburg. All participants provided written informed consent. In Germany, these types of psychological studies do not require ethical approval of an Ethics Committee (see https://www.dfg.de/foerderung/faq/geistes_sozialwissenschaften/).

Design

A mixed factorial design was used with the within-subjects factor of measurement time (4 levels: before the first writing session, after each of the three writing sessions) and the between-subjects factor of group (expressive writing group versus control group). The assignment of participants to groups was random.

Material and Procedure

The study was conducted online via SoSci Survey (Leiner, 2020). An overview about the procedure of the study is provided in Fig 1. Both experimental groups wrote on three consecutive days in two writing blocks of 10 min each about two topics. The expressive writing group wrote about the events of their future everyday professional life which personally triggers fear and joy (for details, see below), the control group wrote about a walk in a forest or a city park. In the expressive writing group, half of the participants started with the joy topic and the other half with the fear topic, in the control group, half started with the forest topic and the other half with the city park topic.

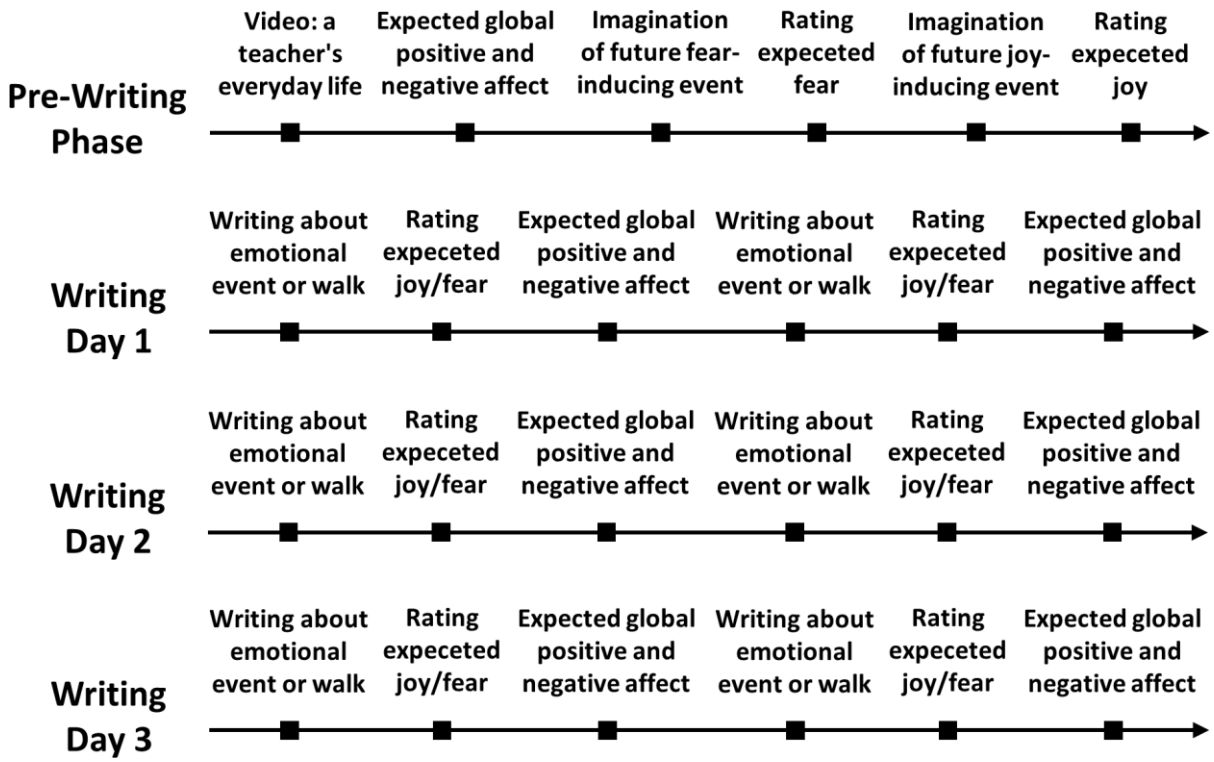

Fig 1. **Illustration of the procedure of the study**. In an initial pre-writing phase, inspired by a video illustrating a teacher's everyday working life, participants were asked to rate their expected global positive and negative affect when imagining their future professional life as a teacher, and to think about and emotionally rate the teaching-related events they are most afraid of and most looking forward to. In three subsequent writing phases taking place on three consecutive days, participants were either asked to expressively write about the teaching-related events they are most afraid of and most looking forward to (expressive writing group), or to write about a walk in a forest and a city park (control group). After each of the writing sessions, participants were asked to rate their expected fear and joy associated with the teaching-related event they are most afraid of and most looking forward to, and to rate their expected global positive and negative affect associated with their future professional life as a teacher.

In both groups, at the beginning of the experiment, a video about a teacher's everyday life was shown in order to activate a comprehensive picture of the future professional practice. The video contained 15 different scenes about teaching-related events (e.g., starting a lesson, parent-teacher talk, conflict on the school yard, correcting school work at home) which were illustrated by drawings and accompanied by oral explanations (for details, see https://osf.io/n6e3y/files/). Next, in both groups, participants were asked to imagine what their future professional life as a teacher will look like, and which emotions they are experiencing when doing so (i.e., expected global positive and negative affect; for details, see below). After that, in both groups, participants were asked to think about which event in their future professional life as a teacher they are most afraid, and which event they are most looking forward to, and to enter the respective events in bullet points in a textbox. After entering the event they are most afraid of, their expected fear was measured, and after entering the event they are most looking forward

to, their expected joy was measured (i.e., expected event-related fear and joy; for details see below).

Then, the experimental manipulation took place. In the expressive writing group, participants were asked to write about the both events they had previously entered. After writing about the fear-related event, expected fear was measured again, and after writing about the joy-related event, expected joy was measured again. In the control group, participants were asked to write about a walk in a forest or a city park. The guiding considerations were to choose a task where participants are asked to write about a topic as well. Furthermore, the topic should be unrelated to one's future professional life as a teacher but still motivating enough to write about it on three days in a row.

After writing about a walk in a forest, respectively after writing about a walk in a city park, half of the participants were asked to assess their expected fear regarding the fear-related event they had previously entered, the other half were asked to assess their expected joy regarding the joy-related event they had previously entered. Additionally, after each individual writing block, expected global positive and negative affect regarding their future professional life as a teacher was measured again.

The writing procedures on the second and third days were identical to the procedure on the first day. The participants were asked to write about the same events they had written on the first day, and after writing, the expected fear and joy and the expected global positive and negative affect regarding their future professional life as a teacher was measured again. Finally, after finishing the final writing session and the emotional ratings on the third day, the participants were asked to assess whether the writing sessions have changed their view about and their involvement with their future professional life as a teacher, and whether they are motivated to use expressive writing in the future (for details, see below).

In terms of teaching the method of expressive writing, we followed the typical instruction used in the expressive writing paradigm (Allen et al., 2020) and adapted it accordingly. The following instruction was given in the expressive writing group:

> "We would now like to ask you to reflect more deeply about the feelings and sensations you will encounter in your everyday professional life as a teacher. In the following, we would like to ask you to write about your deepest thoughts and feelings in relation to your greatest fear [joy] about your future profession as a teacher. Break away from expectations and explore your deepest emotions and thoughts. Please write about whether this fear [joy] could (1) be useful to you, (2) how you could cope with [promote] the fear [joy] if it occurs in later everyday working life, and (3) what preventive measures you will take to cope with [promote] it in a meaningful way during the course of your studies. Do not worry about spelling, sentence structure, grammar, or style."
> In the control group, the following instruction was given:

> "We investigate the relationship between the written description of an environment and the expected emotions that could arise in future everyday professional life as a teacher. Please write about a walk in the city park [forest] and describe what you see, hear, feel and/or touch there. Please describe as many details as possible and as objectively as possible. Do not worry about spelling, sentence structure, grammar, or style."

Measures

Expected Global Positive and Negative Affect

The global positive and negative affect experienced when imagining their future professional life as a teacher was measured with the GESIS Panel (Breyer, & Bluemke, 2016), the German version of the Positive and Negative Affect Schedule PANAS (Watson et al., 1988), which consists of 20 items describing different feelings and emotions (ten positive items, e.g., "enthusiastic", and ten negative items, e.g., "distressed"). The participants were asked to assess to what extent they feel the respective emotions when imagining their future professional life as a teacher on a five point Likert scale ranging from 1 (not at all) to 5 (extremely). To measure positive and negative affect, the means across the ten positive and negative items were calculated. In the present sample, reliability on the ten positive and negative items was high (Cronbach's alphas = .92/.85).

Expected Event-Related Fear and Joy

The expected fear and joy when imagining the event in their future professional life one is most afraid of, respectively most looking forward to, was measured at four different levels of emotional functioning. Emotional intensity was measured with the item "How intense is your expected fear [joy] when imagining the fear-inducing [joy-inducing] event?", controllability of the emotional event was measured with the item "To what extent will you be able to control the occurrence of the fear-inducing [joy-inducing] event in your future everyday professional life?", the expected emotional burden (fear-inducing event), respectively the expected positive motivational activation (joy-inducing event), was measured with the item "How much will the fear-inducing [joy-inducing] event burden you [positively motivate you] in your future professional life?", and the role the expected emotion induced by the imagined event will play in future professional life in comparison with all other expected future emotions was measured with the item "Compared to all other emotions you will experience later in the course of your job, how much space will the fear [joy] induced by the event take in your future everyday professional life". The first three items were rated on seven point Likert scales ranging from 1 (very low) to 7 (very high), the fourth item on a ten point percent scale ranging from 1 (10%) to 10 (100%).

Motivation to Use Expressive Writing in the Future

The motivation to use expressive writing in the future was measured with a scale consisting of the following four items, rated on five point Likert scales ranging from 1 (no) to 5 (yes): "Do you think expressive writing makes sense?"; "Did you find expressive writing helpful?"; "Can you imagine using expressive writing outside the study?"; "Can you imagine using expressive writing in the long term"?. In the present sample, reliability was high (Cronbach's alpha = .90).

Change in the View About the Future Professional Life

The change in the view about one's future professional life was measured with a scale consisting of the following seven items, rated on five point Likert scales ranging from 1 (no) to 5 (yes): "Do you have the impression that something has changed in you as a result of the writing sessions?"; "Did the writing sessions help you to develop different views about your future professional life as a teacher with regard to fear-inducing events?"; "Did the writing sessions help you develop different views about your future professional life as a teacher with regard to joy-inducing events?"; "Did the writing exercises make you think more about your future professional life as a teacher?"; "Do you now, after the writing sessions, think differently about your future professional life as a teacher?"; "Do you now, after the writing sessions, feel different about your future everyday working life as a teacher?"; "Did the writing exercises motivate you to prepare yourself more actively for your future professional life as a teacher (e.g., selecting certain courses, etc.)?". In the present sample, reliability was high (Cronbach's alpha = .86).

Statistical Analyses

To examine the effects of expressive writing, separate analyses of variances (ANOVAs) with the within-subjects factor of measurement point (before the first writing session, after each writing session on days one, two, and three) and the between-subjects factor of group (expressive writing group, control group) were conducted.

Results

Expected Global Positive and Negative Affect

The course of expected positive and negative affect experienced when imagining one's future professional life as a teacher across writing sessions as a function of experimental group is shown in Fig 2.

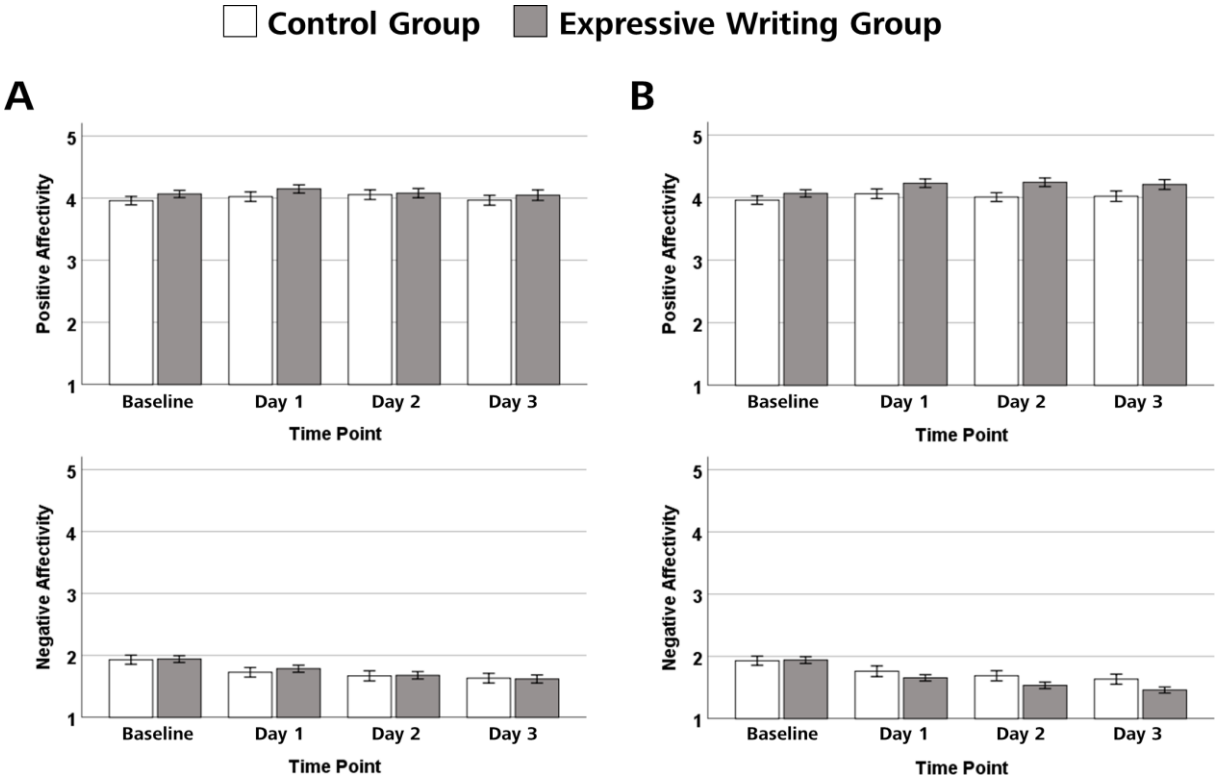

Fig 2. Effects of expressive writing on expected positive and negative affect regarding future professional life as a teacher. The panels in (A) show the expected positive and negative affect after writing about the future teaching-related event one is most afraid of, the panels in (B) show the expected positive and negative affect after writing about the future teaching-related event one is most looking forward to. The heights of the bars show mean positive and negative affect as a function of group (expressive writing group vs. control group) and measurement point (baseline vs. day 1 vs. day 2 vs. day 3). Error bars represent standard errors.

Comparing the effects of writing about the fear-inducing event and writing about a walk in the city park/forest revealed a weak and marginally significant main effect of measurement point for positive affect, Greenhouse–Geisser $F(2.59, 329.24) = 2.51$, $p = .067$, $\eta_p^2 = .019$, and a strong significant main effect for negative affect, Greenhouse–Geisser $F(2.18, 276.96) = 49.38$, $\varepsilon = 0.727$, $p < .001$, $\eta_p^2 = .280$. Both for positive and for negative affect, there were neither main effects of group, Greenhouse–Geisser $F(1, 127) = 0.79$, $p = .375$, $\eta_p^2 = .006$, and Greenhouse–Geisser $F(2.59, 329.24) = 2.51$, $p = .067$, $\eta_p^2 = .019$, nor interactions between measurement point and group, Greenhouse–Geisser $F(2.59, 329.24) = 0.77$, $p = .496$, $\eta_p^2 = .006$, and Greenhouse–Geisser $F(2.18, 276.96) = 0.59$, $p = .570$, $\eta_p^2 = .005$. Trend analyses showed that for negative affect, there was a linear trend, $F(1, 127) = 74.5$, $p < .001$, $\eta_p^2 = .370$, and a quadratic trend $F(1, 127) = 16{,}18$, $p < .001$, $\eta_p^2 = .113$, indicating that negative affect decreased with an increased number of writing sessions.

Comparing the effects of writing about the joy-inducing event and writing about a walk

in the city park/forest revealed a significant main effects of measurement point for positive affect, Greenhouse–Geisser $F(2.44, 309.54) = 7.57$, $p < .001$, $\eta_p^2 = .056$, and neither a main effect of group, Greenhouse-Geisser $F(1, 127) = 3.44$, $p = .066$, $\eta_p^2 = .026$, nor an interaction between measurement point and group, Greenhouse-Geisser $F(2.44, 309.54) = 1.54$, $p = .212$, $\eta_p^2 = .012$. Trend analyses showed that there was a linear trend, $F(1, 127) = 5.43$, $p = .021$, $\eta_p^2 = .041$, a quadratic trend, $F(1, 127) = 14.04$, $p < .001$, $\eta_p^2 = .100$, and a cubic trend for positive affect, $F(1, 127) = 4.86$, $p = .029$, $\eta_p^2 = .037$, indicating that positive affect increased with an increased number of writing sessions.

For negative affect, there was a main effect of measurement point, Greenhouse–Geisser $F(2.37, 300.99) = 68.95$, $p < .001$, $\eta_p^2 = .352$, no main effect of group, Greenhouse-Geisser $F(1, 127) = 1.49$, $p = .225$, $\eta_p^2 = .012$, and a significant interaction between measurement point and group, Greenhouse-Geisser $F(2.37, 300.99) = 4.04$, $p = .013$, $\eta_p^2 = .031$. For both the expressive writing group and the control group, trend analyses showed linear trends, $F(1, 66) = 98.55$, $p < .001$, $\eta_p^2 = .599$, and $F(1, 61) = 29.32$, $p < .001$, $\eta_p^2 = .325$, and quadratic trends, $F(1, 66) = 17.39$, $p < .001$, $\eta_p^2 = .209$, and $F(1, 61) = 5.09$, $p = .028$, $\eta_p^2 = .077$, indicating that negative affect decreased with an increased number of writing sessions in both groups. As indicated by the effect sizes, the decrease in negative affect was larger in the expressive writing group than the control group.

Expected Event-Related Fear and Joy

The course of expected fear and joy elicited by the event in future professional life one is most afraid of, respectively most looking forward to, across writing sessions as a function of experimental group is shown in Fig 3. Fig 3A shows the courses for expected intensity, Fig 3B the courses for expected controllability, Fig 3C the courses for expected emotional burden (fear) and expected positive motivational activation (joy), and Fig 3D the courses for the expected role the elicited emotions will play in in future professional life comparison with other expected emotions.

Emotional Intensity

For expected fear, there was a significant main effects of time, Greenhouse–Geisser $F(2.41, 305.4) = 43.47$, $p < .001$, $\eta_p^2 = .255$, no significant main effect of group, Greenhouse–Geisser $F(1, 127) = .13$, $p = .718$, $\eta_p^2 = .001$, and no significant interaction between time and group, Greenhouse–Geisser $F(2.41, 305,4) = 1.73$, $p = .171$, $\eta_p^2 = .013$. Trend analyses showed that there was a linear trend $F(1, 127) = 81.70$, $p < .001$, $\eta_p^2 = .391$, indicating fear decreased with increased writing repetitions. For expected joy, there was a significant main effect of time,

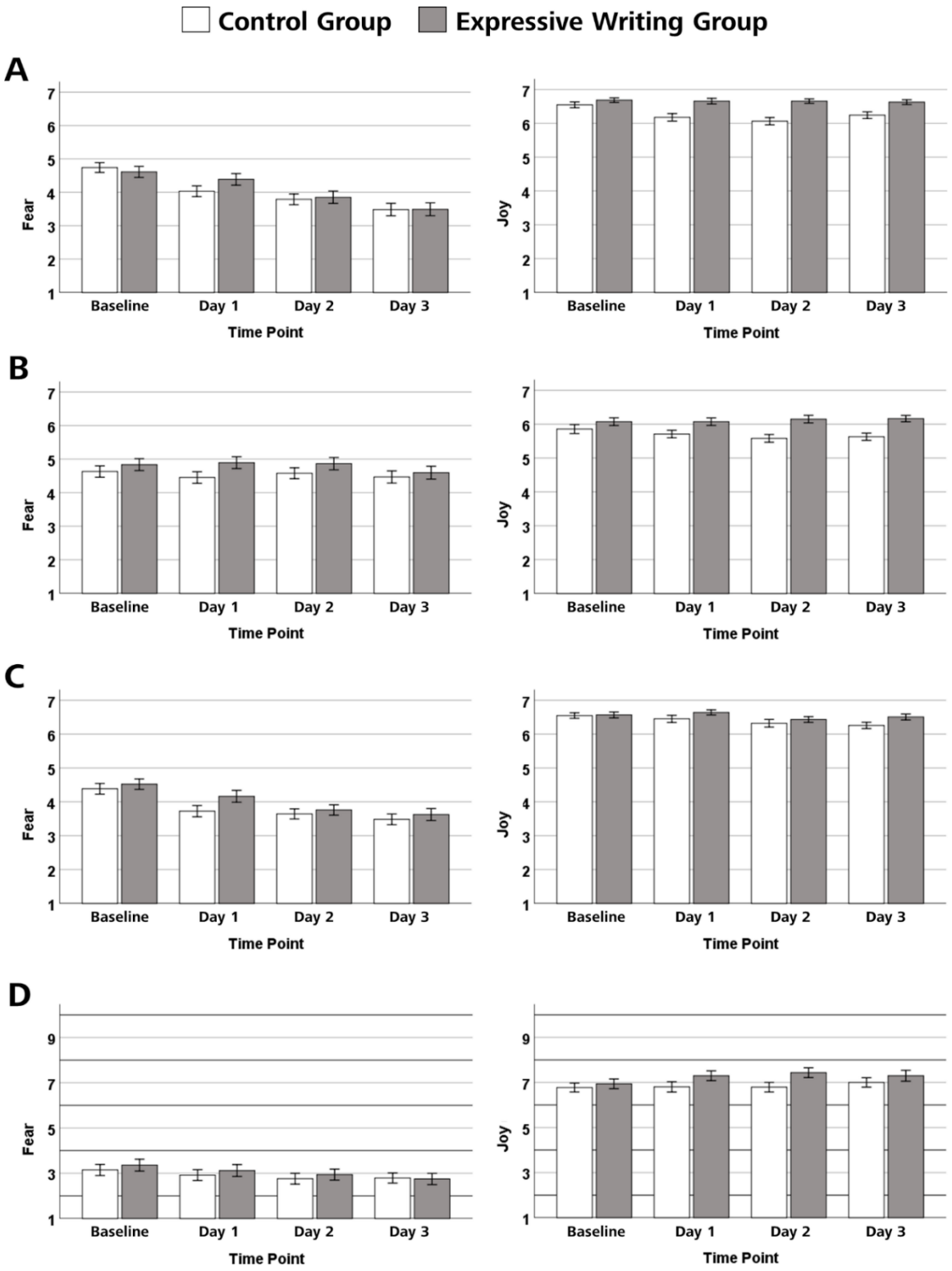

Fig 3. Effects of expressive writing on expected fear and joy elicited by the events one is writing about. The panels in (A) show the intensity of the expected fear and joy, the panels in (B) show the expected controllability of the fear-inducing and joy-inducing events, the panels in (C) show the expected emotional burden (fear) and the expected positive motivational activation (joy), and the panels in (D) show the expected role the elicited emotions will play in future professional life in comparison with other expected emotions. The heights of the bars show the respective means as a function of group (expressive writing group vs. control group) and measurement point (baseline vs. day 1 vs. day 2 vs. day 3). Error bars represent standard errors.

$F(3, 381) = 5.05$, $p = .002$, $\eta_p^2 = .038$, a significant main effect of group, $F(1, 127) = 20.41$, $p < .001$, $\eta_p^2 = .138$, and a significant interaction between time and group, $F(3, 381) = 3.80$, $p = .010$, $\eta_p^2 = .029$. Separate trend analyses showed a linear trend, $F(1, 61) = 7.20$, $p = .009$, $\eta_p^2 = .106$, and a quadratic trend in the control group, $F(1, 61) = 14.33$, $p < .001$, $\eta_p^2 = .190$, indicating that joy decreased with increased writing repetitions in the control group. By contrast, in the expressive writing group, no significant trends were observed, all *p*s > .504, indicating that joy remained stable across writing sessions.

Controllability

For expected fear, there was neither a significant main effect of time, Greenhouse–Geisser $F(2.63, 333.45) = 1.03$, $p = .375$, $\eta_p^2 = .008$, nor a significant main effect of group, Greenhouse–Geisser $F(1, 127) = 1.88$, $p = .173$, $\eta_p^2 = .015$, nor a significant interaction between time and group, Greenhouse–Geisser $F(2.63, 333.45) = 0.54$, $p = .630$, $\eta_p^2 = .004$. For expected joy, there was no significant main effect of time, Greenhouse–Geisser $F(2.78, 353.49) = 0.52$, $p = .658$, $\eta_p^2 = .004$, , and no significant interaction between time and group, $F(2.78, 353.49) = 1.87$, $p = .139$, $\eta_p^2 = .015$. However, there was a significant main effect of group, Greenhouse–Geisser $F(1, 127) = 12.28$, $p = .001$, $\eta_p^2 = .088$, indicating that, overall, expected joy was higher in the expressive writing group than in the control group. Separate trend analyses showed a linear trend in the control group, $F(1, 61) = 4.46$, $p = .039$, $\eta_p^2 = .068$, indicating that controllability for expected joy decreased with increased writing repetitions in the control group. By contrast, in the expressive writing group, no significant trends were observed, all *p*s > .442, indicating that joy-related controllability remained stable across writing sessions.

Emotional Burden (Fear) and Positive Motivational Activation (Joy)

For expected fear, there was a significant main effect of time, Greenhouse–Geisser $F(2.62, 333.21) = 29.46$, $p < .001$, $\eta_p^2 = .188$ and neither a significant main effect of group, Greenhouse–Geisser $F(1, 127) = 1.18$, $p = .280$, $\eta_p^2 = .009$, nor a significant interaction between time and group, Greenhouse–Geisser $F(2.62, 333.21) = 1.12$, $p = .337$, $\eta_p^2 = .009$. Trend analyses showed that there was a linear trend, $F(1, 127) = 57.02$, $p < .001$, $\eta_p^2 = .310$, and a quadratic trend, $F(1, 127) = 7.46$, $p = .007$, $\eta_p^2 = .056$, indicating that the expected emotional burden decreased with an increased number of writing sessions. For expected joy, there was a significant main effect of time, $F(3, 381) = 4.17$, $p = .006$, $\eta_p^2 = .032$, and neither a significant main effect of group, $F(1, 127) = 2.11$, $p = .149$, $\eta_p^2 = .016$, nor a significant interaction between time and group, $F(3, 381) = 1.06$, $p = .367$, $\eta_p^2 = .008$.

Expected Role in Comparison with Other Expected Emotions

For expected fear, there was a significant main effect of time, Greenhouse–Geisser $F(2.50, 317.71) = 8.75$, $p < .001$, $\eta_p^2 = .064$, and neither a significant main effect of group, Greenhouse–Geisser $F(1, 127) = 0.18$, $p = .673$, $\eta_p^2 = .001$, nor a significant interaction between time and group, Greenhouse–Geisser $F(2.50, 317.71) = 0.71$, $p = .522$, $\eta_p^2 = .006$. Trend analyses showed that there was a linear, $F(1, 127) = 18.23$, $p < .001$, $\eta_p^2 = .126$, indicating that the expected role the fear-inducing event will play in future professional life in comparison with other expected emotions decreased with an increased number of writing sessions. For expected joy, there was a significant main effect of time, Greenhouse–Geisser $F(2.64, 335.67) = 3.37$, $\eta_p^2 = .026$, and no significant main effect of group, Greenhouse–Geisser $F(1, 127) = 1.97$, $p = .163$, $\eta_p^2 = .015$. The interaction between time and group was marginally significant, Greenhouse–Geisser $F(2.64, 335.67) = 2.20$, $p = .096$, $\eta_p^2 = .017$. Separate trend analyses showed a linear trend, $F(1, 66) = 3.46$, $p = .067$, $\eta_p^2 = .050$, and a quadratic trend in the expressive writing group, $F(1, 66) = 7.73$, $p = .007$, $\eta_p^2 = .105$, indicating that the expected role of joy increased with increased writing repetitions in the expressive writing group. By contrast, in the control group, no significant trends were observed, all *p*s > .084.

Motivation to Use Expressive Writing in the Future

The motivation to use expressive writing in the future was higher in the expressive writing group, $M = 3.47$, $SD = 0.91$, compared to the control group, $M = 2.74$, $SD = 0.96$, $t(127) = 4.41$, $p < .001$, $d = 0.78$. 71.6 % of the participants in the expressive writing group rated their motivation to use expressive writing in the future above the scale midpoint, indicating that the majority of participants found the expressive writing task so useful that they can imagine using it in the future. To provide a more fine-grained picture, in Table 1, means, standard deviations as well as the results of separate *t*-test for comparisons between the expressive writing group and the control group are shown for the four individual items of the scale.

Table 1. *Motivation to use writing exercises in the future. Means, standard deviations, and results of separate t-test for comparisons between the expressive writing group and the control group are shown for the four individual items of the scale (scales ranging from ranging from 1 = no to 5 = yes).*

		Mean	*SD*	*t*	*p*	*d*
Item 1: Do you think these writing exercises make sense?	Treatment group Control group	3.93 3.19	0.88 0.94	4.58	< .001	0.82
Item 2: Did you find these writing exercises helpful?	Treatment group Control group	3.90 2.95	1.08 1.00	5.16	< .001	0.91
Item 3: Can you imagine using the writing exercises outside the study?	Treatment group Control group	3.25 2.58	1.12 1.21	3.28	.001	0.58
Item 4: Can you imagine continuing using the writing exercises in the long term?	Treatment group Control group	2.79 2.24	1.16 1.18	2.66	.009	0.47

Change in the View About One's Future Professional Life

The expressive writing group reported a stronger change in the view about their future professional life as a teacher, $M = 3.44$, $SD = 0.80$, compared to the control group, $M = 2.70$, $SD = 0.85$), $t(127) = 5.06$, $p < .001$, $d = 0.90$. To provide a more fine-grained picture, in Table 2, means, standard deviations as well as the results of separate *t*-test for comparisons between the expressive writing group and the control group are shown for the seven individual items of the scale.

Table 2. *Change in the view about one's future professional life. Means, standard deviations, and results of separate t-test for comparisons between the expressive writing group and the control group are shown for the seven individual items of the scale (scales ranging from ranging from 1 = no to 5 = yes).*

		Mean	*SD*	*t*	*p*	*d*
Item 1: Did the writing exercises make you think more about your future professional life as a teacher?	Treatment group Control group	3.87 2.89	0.98 1.34	4.69	< .001	0.84
Item 2: Do you now, after the writing exercises, think differently about your future professional life as a teacher?	Treatment group Control group	2.72 2.34	1.20 1.12	1.84	.067	0.33
Item 3: Do you now, after the writing exercises, feel different about your future everyday working life as a teacher?	Treatment group Control group	2.90 2.37	1.21 1.06	2.61	.010	0.47
Item 4: Did the writing exercises motivate you to prepare yourself more actively for your future professional life as a teacher (e.g., selecting certain courses, etc.)?	Treatment group Control group	3.63 2.90	1.17 1.25	3.40	.001	0.61
Item 5: Do you have the impression that something has changed in you or has already changed as a result of the writing exercises?	Treatment group Control group	3.78 2.85	1.13 1.19	4.53	< .001	0.81
Item 6: Did the writing exercises help you develop different views about your future professional life as a teacher? (e.g., fear)	Treatment group Control group	3.58 2.89	1.06 1.22	3.47	.001	0.61
Item 7: Did the writing exercises help you develop different views about your future professional life as a teacher? (e.g., joy)	Treatment group Control group	3.58 2.65	1.21 1.23	4.36	< .001	0.76

Discussion

The present findings suggest that expressive writing may be a promising way to promote teacher students' expected future teaching-related emotions. Writing on three consecutive days for ten minutes each about the future teaching-related event one is most afraid of and the future teaching-related event one is most looking forward to promoted the functionality of expected teaching-related emotions and changed the view about one's future professional life as a teacher in a functional way.

As hypothesized, regarding positive and negative affect associated with one's future professional life as a teacher, expressive writing brought about an improvement in that expected global negative affect decreased and expected global positive affect increased with increased writing sessions. Furthermore, as hypothesized, with increased writing sessions, the expected emotional burden due to the fear-inducing event one had written about decreased, and the expected emotional reward due to the joy-inducing event one had written about increased. Beyond these emotional effects, after the expressive writing sessions, as hypothesized, teacher students in the expressive writing group compared to the control group reported a more active

personal involvement with their future professional life and a stronger motivation to use expressive writing in the future. In addition, teacher students in the expressive writing condition reported a stronger change in their view about their future professional life as a teacher.

These findings support previous findings showing that expressive writing is a helpful technique to promote the functional reprocessing of and coping with past negative events and to increase the benefits from past positive events (for reviews, see, e.g., Pennebaker, & Chung, 2011; Frattaroli, 2006). Going beyond previous findings, our study demonstrates that expressive writing cannot only promote the functional dealing with emotions elicited by past events but also the functionality of expected emotions elicited by future events. In particular, since teacher students reported additionally a change in their view about and a more active involvement with their future professional life, the present findings demonstrate that expressive writing is not only helpful regarding expected emotions but also regarding cognitions about one's future professional life, which is in line with previous findings indicating that writing can promote reflection (Bain et al., 1999).

While the present findings indicate that not only writing about past emotional experiences but also writing about expected future emotional experiences can be beneficial for psychological well-being, there are a number of differences between past emotional experiences and expected future emotional experiences such as, for instance, differences in the intensity of elicited emotions or differences in the ability to imagine past versus future events, which could make a difference in terms of the effects of expressive writing. Examining potential differences in the effects of expressive when writing about past versus expected future experiences may be an interesting avenue for future research.

An interesting finding of the present study beyond the effects of expressive writing is that also writing about an unrelated event after having imagined future emotional events can have positive effects on expected future emotions. Especially with regard to future fear-inducing events, writing about a walk in a park or a forest decreased the expected global negative affect and the expected emotional burden due to future fear-inducing events to the same extent than expressive writing. Such a finding suggests that imagining and writing down future fear-inducing events once and writing afterwards about unrelated topics may be sufficient to promote functional expected emotions, a finding which supports evidence showing the existence of nonconscious emotional reappraisal processes (Yuan et al., 2015). Since numerous studies have shown that walking in nature or viewing pictures of nature can improve psychological functioning (Berman et al., 2008), the observed improvement in expected emotions after writing about a walk in a park or a forest may also be related to such nature-

induced effects, which may be an interesting question for future research. Nevertheless, regarding teacher training, the use of expressive writing is favorable over writing about unrelated topics due to the additional beneficial effects of expressive writing on the view of and the involvement with the future professional life as a teacher, and the increased motivation to use expressive writing in the long term.

When comparing the effects of expressive writing for the fear-inducing and the joy-inducing events, the beneficial effect of expressive writing on expected emotions were stronger for the fear-inducing than for the joy-inducing events. However, rather than reflecting the possibility that expressive writing may be more effective for fear-inducing than for joy-inducing events, it may alternatively be that this finding reflects a ceiling effect in the joy condition. Expected joy regarding the future teaching-related event one is most looking forward to was already largely at ceiling at baseline (e.g., mean intensity of joy at baseline: 6.55 on a scale of 1 = very low to 7 = very high) so that few room for improvement was left. By contrast, since improvement in the case of fear means a decrease in intensity, there was much more room for improvement regarding the future teaching-related event one is most afraid of (mean intensity of fear at baseline: 4.74 on a scale of 1 = very low to 7 = very high). To clarify whether expressive writing may be similar or even more effective for joy-inducing than for fear-inducing events, further research is necessary where joyful events are used that are less emotionally intense.

A final interesting observation is that the participants showed a more active involvement with their later professional life and a higher motivation to use expressive writing in the long term despite writing about fear-inducing future teaching-related events. This finding is important because it shows that expressively writing about future fear-inducing events does not induce avoidance behavior but increase the willingness to invest resources to solve the underlying problem. However, since the participants in the present study wrote both about joy-inducing and fear-inducing topics, it may be that concurrently writing about positive topis of future life may be an important precondition that writing about negative topics does not lead to avoidance behavior, a question that requires further research.

In conclusion, the present study provides evidence that expressive writing may be a very promising way to promote teacher students' expected teaching-related emotions. Regarding teacher training, beyond the beneficial effects on expected emotions and on the view of and involvement with later professional life, it is noteworthy that expressive writing is a very feasible technique which only takes little time and can easily be implemented in an online environment without the need to provide individual support. Thus, expressive writing may be

an effective and feasible tool to help teacher students to become better teachers.

3. General Discussion

3.1 Summary of Findings

Since teacher students are confronted with a wide variety of positive and negative events concerning their later professional life, the results of **study 1** are particularly important for their future well-being. The goals and emotions of teachers (who work in school) in response to students showing undesirable and desirable behaviors were measured by asking whether they contributed to their well-being (subjective, occupational, and psychological well-being). To be more precise: Can the psychological phenomenon 'bad is stronger than good' (Baumeister et al., 2001) be confirmed for goals and emotions of teachers regarding their students, and if so, what influence does it have on the well-being of the teachers?

In **study 1**, teacher goals for students showing undesirable and desirable behaviors did not differ. Furthermore, experienced emotions were significantly more negative for students showing undesirable behaviors than for students showing desirable behaviors, and more arousing for students showing desirable behaviors than for students showing undesirable behaviors. Multiple regression analyses were conducted to examine the effects of teacher goals and emotions on teacher well-being, resulting in the links between teacher goals for students showing undesirable and desirable behaviors on affective well-being (positive affect), affective well-being (negative affect), occupational well-being, and psychological well-being, resulting in the links between teacher emotions for bad and good students on affective well-being (positive affect), affective well-being (negative affect), occupational well-being, and psychological well-being.

The results have shown that affective, psychological, and occupational well-being depended on the level of teachers' goals and experienced emotions for students showing undesirable behaviors. Descriptively, the effect was stronger for teacher goals than for teacher emotions. By contrast, neither teachers' goals nor experienced emotions for students showing desirable behaviors influenced any well-being measurements.

Negative experiences with students might therefore be far more significant than is previously assumed. The well-known 'negativity bias' might therefore be a characteristic of the attention control of teachers. The results of **study 1** confirm a general principle, called 'bad is stronger than good'. This has not yet been proven in the research on well-being and teacher goals and emotions about students in school. The reason may be that for students showing undesirable behaviors (i.e., students who disrupt the class, do not finish their work, stay unorganized, and have a negative attitude to learning) educational goals may be more difficult to achieve. Therefore, the well-being of a teacher depends more on them than on the students

showing desirable behaviors (i.e., students who pay attention in class, do their work on time, stay well organized, and have a positive attitude to learning). This is important because (prospective) teachers can understand the situation better if the psychological principle 'bad is stronger than good' is made cognizant, and thus realize that setting high goals for students showing undesirable behaviors is particularly important for their (future) well-being as teachers.

First of all, **Study 2** investigated whether the overall expected emotional pleasure and discomfort were biased towards their peaks, also known as the peak-end effect. The findings indicate that the overall expected affect was closer to the expected peak affective experience for emotional pleasure compared to emotional discomfort. By contrast, the overall expected affect was closer to the mean across the evaluated events and closer to the affect expected for the event evaluated at the end of the sequence for emotional discomfort. The result was that overall expected emotional pleasure was biased towards expected peak pleasure whereas overall expected emotional discomfort was mainly determined by the average expected discomfort across the evaluated events. These calculations could be partially solidified by a regression analysis of expected peak pleasure (because of the small variance of expected peak pleasure across participants, the results of a regression analysis cannot be validly interpreted), which had the goal of analyzing how much variance in the overall expected affect was explained by the mean across the evaluated events, by the expected peak affective experience, and by the event evaluated at the end of the sequence.

Furthermore, **study 2** identified specific job-related future events of teacher students (peaks) that may help clarify possible options of improving teacher students' motivation and preparation in teacher education. The results of the affective ratings (i.e., expected emotional pleasure and discomfort rated for each of the future teaching-related events and the future professional life as a whole) have shown that events on an emotional level concerning expected emotional discomfort (i.e., development of new teaching concepts, parent-teacher talk (doorstep), a restless school lesson, preparation of the next lessons, conflicts on the schoolyard, parents' phone call and future events, and getting up and morning routine) or expected emotional pleasure (i.e., a very good lesson, planning a school trip with the class, the way to school, beginning of lessons, the poster project, in the teachers' room) are more important than other evaluated events. For the expected peak affective experience, for the mean across events, and for the expected overall emotional pleasure and discomfort, expected emotional pleasure was significantly higher than expected emotional discomfort.

Teacher students need the opportunity at the university to acquire competencies that can be acquired and which can facilitate the attainment of emotional well-being in later professional

life. To this aim, the employment and development of functional expected teaching-related emotions is expedient. It is essential to emphasize that the functions of expressive writing, which has not been examined in previous research, as a suitable method to improve teacher students' expected teaching-related emotions, can be confirmed by the results of **study 3**. The results show that expressive writing can be a way to obtain (further) personality-related competencies (i.e., promoting expected future teaching-related emotions). By asking the teacher students to write for 20 minutes on three consecutive days about one future teaching-related events that may trouble them most and please them most, the functionality of the expected teaching-related emotions can be promoted. The global negative affect on the imagination of future professional life and the expected emotional burden from the troubling event decreased with more writing sessions. At the same time, the global positive influence of imagining future professional life and the expected emotional reward from the joy-inducing event increased with more writing sessions. Teacher students in the expressive writing group reported more changes in their view about their future professional life as a teacher, as compared to the control group, who wrote about a walk in a city park and a forest. The motivation to use expressive writing in the future was higher in the expressive writing group, as compared to the control group.

3.2 Theoretical Considerations and Open Questions

Consequently, the results of the three studies raise several theoretical considerations and questions: First, do high goals for disruptive students play a major role in teacher well-being or do they depend more on classroom competencies and context factors? Second, when is the awareness of cognitive bias functional, or, to put it another way, when is a realistic assessment functional concerning the emotions to be expected in a professional teaching career? Third, how does unrelated writings and writings about past experience influence expected emotions?

3.2.1 Do High Goals for Students Showing Undesirable Behaviors Play a Major Role in Teacher Well-being, or do They Depend on Classroom Competencies and Context Factors?

Study 1 has shown that teachers' goals for students showing undesirable behaviors contribute more to their well-being than those for students showing desirable behaviors. However, the question how important high pursued teacher goals for students showing undesirable behaviors are remains unanswered. It might be interesting to know whether high goals for students showing undesirable behaviors play a major role in teacher well-being. More specifically, the

question is how much do high goals for students showing undesirable behaviors contribute to teachers' well-being in comparison with other teaching-related factors, such as classroom competencies that can decrease students undesirable behaviors in class, and experienced stress caused by contextual factors that influence the occurrence of students undesirable behaviors. In particular, these factors may interact and teacher well-being can be maximized if teachers adjust their goals depending on their classroom competencies and the existing contextual factors. To answer these questions, further studies would have to collect data from teachers about their goals for students showing undesirable behaviors, the number of students showing undesirable behaviors in their class, their classroom competencies, their experienced stress caused by contextual factors, the level of job satisfaction, and their psychological and subjective well-being. Teacher well-being should be expected to be highest (i) if teachers have high goals for students showing undesirable behaviors, (ii) if they have high classroom competencies which help them to achieve the high goals, and (iii) if they can teach in a context where they can achieve their pursued goals, reflected in low experienced stress caused by contextual factor.

3.2.1.1 Teacher Goals for Students Showing Undesirable Behaviors Influence Teachers' Well-being

Many current models in education of teacher professionalism or teacher attitudes (e.g., mind frames) contain goals as part of essential personal competencies (e.g., Baumert & Kunter, 2013; Zierer, 2015; Kuhl, Schwer & Solzbacher, 2014). Furthermore, there is a distinction regarding well-being between goal pursuit and goal achievement (e.g., Kaftan & Freund, 2018). The former is positively influenced by eudaimonic well-being (Thorsteinsen & Vittersø, 2018) while the latter is associated with hedonic well-being (Klug & Maier, 2015). The differentiation between hedonic (i.e., subjective, see Diener, 1994; Diener et al., 1999) and eudaimonic (i.e., psychological, see, Ryff & Keyes, 1995) well-being derives from the two general perspectives of happiness (for a review, Ryan & Deci, 2001). However, according to Locke and Latham (2006), high and challenging goals, rather than general and manageable goals, motivate performance improvement. **Study 1** shows that the higher the pursued goals for students showing undesirable behaviors compared to students showing desirable behaviors, the higher the reported well-being is. This was especially true for eudaimonic (psychological) well-being.

However, a large number of studies show that students' undesirable behaviors, i.e., discipline problems or disruptive student behavior may contribute to stress (e.g., Lazarus, 2000), burnout (for a review, see Chang, 2009, Smith & Smith, 2006, Hastings & Bham, 2003), or other health problems for the teacher (e.g., Lanza, 2020; Aloe et al., 2014; Krause et al.,

2013; Kyriacou, 2001; Chang, 2013; Tsouloupas et al., 2010; Kokkinos, 2007; Evers et al., 2004; Ingersoll & Smith, 2003; Blasé, 1982). According to Chang (2013), teachers' beliefs and cognitive processes influence their emotional reactions to students' disruptive behaviors. Finally, it is necessary to clarify how much the pursuit of high goals regarding disturbing students in addition to other techniques (i.e., classroom competencies, which can decrease students undesirable behaviors in class) and the extent of rated stress about external context factors (i.e., the level of satisfaction regarding the work situation at school including students undesirable behaviors) contribute to teachers' well-being.

3.2.1.2 Techniques Like Classroom Competencies Decrease Students Undesirable Behavior and Influence Teachers' Well-being

Research on classroom management, e.g., observation studies (e.g., Anderson et al., 1979) and experimental studies (e.g., Simonsen et al., 2008)), have a long history in teacher research (for a review, see, Oliver et al., 2011). Classroom management contains teacher skills to influence students' environment in class in a way that is supportive for students to learn effectively. Based on the system levels (see Bronfenbrenner, 1994), i.e., microsystem (e.g., social roles), mesosystem (e.g., the relationship between school colleagues), and macrosystem level (e.g., beliefs and knowledge about the previous levels), it can be argued that classroom management is essential for the functioning of a school (Back et al., 2016). Components of effective classroom management could be organizing the classroom, planning and teaching rules and procedures, managing student work and improving student accountability, maintaining good student behavior, planning and organizing, conducting instruction and maintaining momentum, and getting the year off to a good start (see, Classroom Organiszation and Management Program, Evertson, 1989). It is noteworthy that some components of classroom management (e.g., mental set of teachers) are more important than others (e.g. rules and routines, Evertson & Weinstein, 2013; Marzano & Gaddy, 2005).

Nevertheless, classroom intervention aims mainly to reduce disruptive, aggressive behaviors (Oliver et al., 2011). If teachers are often confronted with students' disruptive behaviors, their perceived self-efficacy in classroom management may decrease and their level of burnout increase (Brouwers & Tomic, 2000). Effective classroom management decreases disruptive behaviors (for a review, see Wang et al., 1993). Furthermore, Clunies-Ross et al. (2008) show that the use of classroom management strategies (e.g., providing an appropriate consequence) can reduce teacher stress and student misbehavior.

3.2.1.3 Stress About External Context Factors Influences Teachers' Well-being

For every profession there are so-called framework conditions which ensure a smooth workflow, some of which are not very changeable. In the teaching profession, such contextual factors (e.g., disruptive student behavior, social conflicts among colleagues, conflicts with parents, the internal organization of work, and lack of material equipment) can be summarized under the term “working situation” or “working condition at school” or “school climate”, which contains in general norms, values, and expectations that support people and make them feel comfortable (see, National School Climate Council, 2007). There is no clear definition of school climate but it can be categorized in four ways and 13 dimensions:

(a) academic (i.e., teaching and learning, leadership, professional development); (b) community (i.e., quality of relationships, connectedness, respect for diversity, partnerships); (c) safety (i.e., social and emotional safety, physical safety, discipline, and order); and (d) institutional environment (i.e., environmental adequacy, structural organization, availability of resources) (p. 321).

The four domains correlate positively with academic achievement and partly (e.g., safety) with emotional well-being (for a review, see, Wang & Degol, 2016). Despite the many framework conditions, classroom-level factors (i.e., poor classroom management and disturbing students) most valued in teachers' perception differ from students' preferred factors (i.e., student mobility, student-teacher relationship, and principal turnover) (Mitchell et al., 2010). When measuring teachers' working situations or conditions, a distinction can be made between external stress factors (e.g., parents, school administration) and the subjective evaluation of external stress factors (e.g. self-attribution). Research on the choice of professions for teachers has shown that teacher students tend to be motivated intrinsically (except for the expected security of the job) rather than by the framework conditions (i.e., school working conditions) of the teaching profession (Eberle & Pollak, 2006). Romain and Steffgen (2002) found in a study on later job satisfaction that teachers who based their choice of profession more on a favorable job profile and less on the search for amenities in training and professional life reported fewer problems and more job satisfaction in their career life. However, a good school climate (e.g., support from the principal and peers) influences teachers positively in their commitment, beliefs and retention, psychological well-being (Wang & Degol, 2016), and in general, their health (for a review, see Thapa et al., 2013).

3.2.1.4 Multiple Factors Contribute to Teachers' Well-being

Developing a model of the interaction of teacher goals, classroom competencies, and the extent of rated stress about external context factors seems promising. Past research has shown that the pursuit of teachers' goals correlated positively with classroom management and the climate in class (e.g., Rüprich & Urhahne, 2015). For Back et al. (2016), practical classroom management skills and the working situation, particularly the cooperation between colleagues, are crucial for a positive school climate. Based on the empirical studies and arguments presented in the previous paragraphs, it can be assumed that well-being arises from three factors. First, teachers have high goals (regarding students showing undesirable behaviors); second, at the same time, they have classroom competencies which help them to achieve these high goals; and third, teachers experience low stress regarding external context factors, that is, they can teach in a context where they probably can achieve these high goals.

3.2.2 When is the Awareness of Cognitive Bias Functional?

3.2.2.1 Affective Forecasting

"People's expectations about future feelings can even be the strongest predictor of their decisions about health" (Flynn et al., 2020). When people try to predict their emotions in advance (i.e., thinking about how they will feel in later situations and what influence this will have on their decisions), it is called "affective forecasting" (Wilson & Gilbert, 2005). Research on affective forecasting has a long multidisciplinary history (for an overview, see Pilin, 2021). From the field of economic research came the first impulse that people can be subject to a cognitive bias when making decisions, e.g., "the certainty effect" (Kahneman & Tversky, 2013). The most widespread explanation for these cognitive biases is that there are two cognitive systems in each individual. System 1 is more likely to be fast and automatic, but because it works imprecisely it is more prone to cognitive errors (e.g., peak-end effect/rule). System 2 is more rule-based and logical but works more inefficiently and therefore is less subject to such errors (Tversky & Kahneman, 1974; Kahneman, 2011).

3.2.2.2 Cognitive Bias and Functionality

"The greatest teacher, failure is" (Star Wars: Episode 8 - The Last Jedi, Yoda). This, however, requires that one is aware of one’s own failures and pays attention to them, which could especially be difficult when there is a cognitive failure, also known as cognitive bias. Several cognitive errors have been identified: e.g., the pygmalion effect (Rosenthal, & Jacobson, 1968), the halo effect (Nisbett, & Wilson, 1977), the Dunning-Kruger effect (Kruger, & Dunning,

1999), primacy- or recency-effect (Deese, & Kaufman, 1957), the curse of knowledge effect (Camerer et al., 1989), the peak-end effect (e.g., Kahneman et al., 1993). Such cognitive biases can lead to a large discrepancy (so-called blind spot) between self-perception and actual behavior or between self-perception and real situations. For example, in a video study of English lessons, teachers usually underestimate their own speaking time in class, i.e., the subjective assessment (on average 51% speaking time) does not correspond to the reality (68% speaking time on average, Helmke et al., 2008). Assuming that the subjective assessment is dependent, firstly, on one's inner life (systems, which controls our behavior, e.g., needs, emotions, goals, the self), secondly, on the outer environment, and thirdly, on the interaction of the inner and the outer world, it can lead to a distorted evaluation of events, which can result in a distorted emotional state. In a functional way, this can, on the one hand, be helpful in terms of motivation, but on the other, be quite harmful to one's health (e.g., psychological well-being). Therefore, it is necessary to recognize a potentially irrational or distorted assessment of situations (caused by perceptual failure) to be able to make a more rational and more accurate assessment (be aware of perceptual failure).

Thus, a perception failure or cognitive bias, like the peak-end effect, has its advantages as well as disadvantages. It appears to be a helpful heuristic, enabling persons to reduce the complexity of past or expected experience, thus facilitating decisions. However, fragmentation of a complex structure usually has disadvantages because decisions, in particular, can be bad if the prediction of expected emotions is very imprecise (Loewenstein, 2007).

For teacher students, a confrontation with their own possible emotions that may arise later in their professional life can be necessary for current questions about professional decision-making (e.g., how will I feel later in a specific school situation?), preparation for later professional motivation, and their well-being. **Study 2** showed that when teacher students assess the emotional pleasure and discomfort associated with their future professional life, overall expected pleasure is biased toward the expected peak affect. Consequently, the cognitive bias (i.e., peak-end effect) toward the expected peak pleasure can be seen as functional because the average pleasure is overestimated and the motivation to become a teacher is enhanced although it is not a realistic estimation. Regarding expected overall emotional discomfort, the absence of a cognitive bias towards the expected peak discomfort is functional because the average displeasure is not overestimated, i.e., it is a realistic estimation. Thus, the motivation to become a teacher does not decrease due to an irrational bias. Therefore, in the case of emotional pleasure, the more unrealistic assessment can be described as functional, and in the case of emotional discomfort, the realistic assessment. Regarding motivation, the peak-end

effect could function as a functional selection mechanism because experienced negative peaks or endpoints are likely to be avoided and the experienced positive peaks and endpoints are likely to be repeated in the future. It is comparable to a piece of music because for someone to decide whether to listen again, the emotional intensity at the peak and the endpoint of the song are probably enough. However, on the other hand, dealing with negative experiences, in particular, is necessary for one's psychological well-being and one's personality growth. To stick with the example, if somebody wants to play the piece of music himself, every part of the piece of music must be taken into account. Moreover, this view of every single aspect can also be considered an essential requirement for deliberate practice and thus for reaching the expert level (for an overview, see Ericsson, 1998).

To summarize, regarding expected emotional pleasure it is essential and functional to have a realistic estimation of the events occurring in the teaching profession. However, to keep the motivation high in the long term it is also functional to fall back on the cognitive error of the peak-end effect. Nevertheless, the latter is functional and enhances the motivation of students. Therefore, teacher education seems to be obliged to explain all those aspects to teacher students so that they may decide by themselves how to deal with cognitive biases.

When teacher students imagine their future job-related events, they need to be aware of a cognitive bias like the peak-end effect to have the opportunity to subject future events to a realistic fact check and to learn how to deal with possible emotions (e.g., what personal competencies do they need to be prepared for the event in question, or how to uphold their motivation?). A realistic assessment of pleasure is just as critical as that of discomfort. From a application perspective, the results of **study 2** initially appear to be a desirable optimal state if negative emotions are rated realistically and positive emotions are rated unrealistically higher as this probably leads to increased motivation.

The emphasis here is on helping teacher students make their own decisions about how they want to deal with this bias. Tacitly accepting a distortion or not pointing it out to students just because it serves a supposedly higher normative goal (higher motivated students) is rather inappropriate from the perspective of personal development. Moreover, there is also the risk of being disappointed in later professional practice if the previous assessment of positive emotions was unrealistic. Such an unrealistic assessment can therefore lead to false expectations in the long run. Nevertheless, more research is needed here. A question might be: Is there a difference in the expected positive emotions in the later profession as a teacher between students who are aware of the cognitive bias and those who are not aware of it?

3.2.3 The Influence of Unrelated Writing and Writing on Past Experienced

3.2.3.1 Writing About Something Unrelated

The effectiveness of expressive writing cannot be clearly deduced from the current state of research. Through a large number of existing meta-analyses, there is more or less evidence of regarding the efficacy of an expressive writing intervention (Smyth, 1998; Frisina et al., 2004; Frattaroli, 2006; van Emmerik et al., 2013; Meads & Nouwen, 2005; Harris, 2006; Mogk et al., 2006; Travagin et al., 2015; Reinhold et al., 2018). It remains to be explored whether the difference regarding the efficacy might be due to the number of participants and writing sessions, the specificity of the topic, additional support, or other factors. Summing up the current state of research, the efficacy of expressive writing can depend very much on the topics of writing. An interesting finding came to light in **Study 3**. Contrary to expectations, writing about a walk in a park or forest could reduced the expected global negative affect and the expected emotional burden from future fear-inducing events to the same extent as expressive writing in the treatment group. An apparent explanation could be that the topics related to nature could positively influence the emotional state. Similarly, walks in the open air have often been used unconsciously or consciously in practice as a kind of relaxation or recovery exercise, e.g. the Japanese form of forest bathing therapy, that is, Shinrin-Yoku (Tsunetsugu et al., 2010), can positively influence the psyche. Besides, the high effects in the control group could also be evidence of the existence of unconscious emotional re-evaluation processes (Yuan et al., 2015), since imagining and writing down future anxiety-inducing events once, and then writing on unrelated topics, might be sufficient to elicit anticipated functional emotions. A possible third explanation could simply be expectation effects; that is, study participants in the control group expect a benefit or an improvement from the time they invested, regardless of the topic. This may be an interesting avenue for future research.

3.2.3.2 Writing About Past Experience

What benefit could expressive writing have for teachers who write about school situations they have already experienced? Naturally, actual experiences are more powerful and could lead to different results than imagined experiences. There may be a cognitive bias regarding the future which influences the results. Furthermore, there are possible differences between past emotional experiences and expected future emotional experiences which could make a difference regarding the effects of expressive writing. In fact, there are a number of differences such as differences in the intensity of elicited emotions, differences in the ability to imagine past versus future events, or differences in the changeability of the events. Finally, the problem

of measuring emotions (for a review, see Mauss & Robinson, 2009) should be pointed out. Eventually, there is no information about the extent to which the emotional state at the time of the evaluation could have influenced the evaluation. Therefore, the effects could be even more substantial for teachers since writing also has a reflective character.

Studies such as Bain et al. (1999) showed that journal writing by teacher students could increase reflectivity, but it has not yet been clarified to what extent the tendency to reflect more on oneself and to understand oneself better (also referred to as private self-awareness according to Fenigstein et al., 1975) could be increased through expressive writing. Consequently, an interesting avenue for future research is, whether the risk of unsolved problems (e.g., lack of competence in dealing with an aspect, event, or situation which is likely to arise in (future) professional life as a teacher) and the possible excessive preoccupation with it – also known as "brooding" – could be decreased through expressive writing.

3.3 Possible Applications

Given the results from **study 1**, it makes sense for teachers to attach equal importance to the goals and emotions of their students showing undesirable and desirable behaviors to increase their well-being. Consequently, the well-being of teachers might already be strengthened preventively if, as part of university teacher training, in the earliest phase, prospective teachers can be made aware of the importance of setting high goals and experiencing more positive emotions when dealing with students showing undesirable and desirable behaviors and how they can develop special competencies to achieve these goals for students showing undesirable behaviors. Concerning students showing desirable behaviors, it can be worthwhile for teachers to give more weight to fulfilling interactions with such students to create their well-being. **Study 1** has shown that the principle of “bad is stronger than good” (for a review; see Baumeister et al., 2001) also holds for the influence of teachers' goals and emotions on their well-being. This principle applies to a wide variety of contexts and if expressed in numbers, it often differs concerning the question, how much stronger bad is than good (e.g., interpersonal interaction 1:5; Gottman, 1994; decision making 1:2; Kahneman and Tversky, 1984). A first step could be to examine how much the psychological effects of bad outweigh those of good, or, in other words, to which extent must the “good” (i.e., students showing desirable behaviors such as paying attention in class, doing their work on time, being well organized, and having a positive attitude to learning) outnumbers the “bad” (i.e., students showing undesirable behaviors such as disrupting the class, not finishing their work, being unorganized, and having a negative attitude to learning) so that the principle of “bad is stronger than good” can be

balanced? How many more good experiences does it take to reverse the consequences of the principle? Although this question needs further studying, it is essential to think about this question in practice.

A second step could be to provide a positive framing of the students showing undesirable behaviors, for example with the help of a possible preventive tool which contains several questions: What are the possible reasons that you will repeatedly deal with students showing undesirable behaviors in your later professional life? How could you develop competencies which will help you in the later day-to-day work to maintain a positive view of students showing undesirable behaviors ? How much influence could students showing undesirable behaviors have on your later well-being in everyday working life?

Furthermore, when collecting motives for choosing a career, it could be particularly productive if a distinction is made between students showing undesirable and desirable behaviors in the main motive for working with children and young people (Rothland, 2011). From an application perspective, it seems important to complete the often-cited motive for teaching "Because I like to work with children and adolescents" with the phrase "both with the students showing undesirable and desirable behaviors".

In **study 2**, the assessment of emotional joy and discomfort is associated with their future professional life. The overall expected joy is skewed toward the expected peak effect while the overall expected discomfort is not, which shows that the former can be beneficial for the motivation to become a teacher. However, to avoid disappointment in the future, it is important to support teacher students in developing a realistic view of all areas of their later professional life as a teacher and in developing competencies that maximize future positive affect and minimize future negative affect. How can teacher students be provided with tools to realistically assess their anticipated emotions concerning events in their later professional practice? For example, the setup used in **study 2** with specific relevant job-related future events and their evaluation can be used on the MORE-ONLINE platform if, at the end of the overall evaluation, the teacher students are provided with an overview of the individual event evaluations. The overall evaluation can be given to the students because this can reveal differences, broaden the realistic view when examining the peaks more closely, serve as preparation, and increase motivation. It seems particularly important that students can find out whether they are subject to a specific cognitive bias, and that they then decide how to deal with it.

The expressive writing method evaluated in **study 3** and adapted to teacher students can be integrated into the MORE-ONLINE aptitude assessment as a promising way to promote

teacher students' expected emotions for teaching. **Study 3** evaluated the development of an tool which supports students in their profession-related personal development. Moreover, the participation in the writing exercise is comfortable due to various reasons: short duration, online feasibility, without the need for a trained professional, cost-effective, free availability to a variety of students, and self-control of the working time, pace and the most relevant situational expected emotions. This tool can be implemented precisely as used in the study. Furthermore, because repeatedly writing about fears and joy of one's own future professional teacher life is more motivational than writing about a walk in the forest or city park, teacher students could benefit from dealing with other expected emotions (e.g., shame, sadness, anger) on the motivational level by continuing to use these techniques and by mentally dealing with their later professional life. Finally, it would be worthwhile to examine if the effectiveness of expressive writing depends on whether someone likes to reflect often or not.

3.4 Conclusion

3.4.1 It Is About Personality-related Competencies - Add-ons of the Present Work

This work contributes to the recruitment and training the most capable candidates for the teaching profession, in the sense of supporting reflection processes on the professional goal of teaching to enable the development of personality-related competencies of teachers. The central aim of this work was to provide insights that go beyond the previous knowledge on the relevant support in teacher training. The present dissertation investigated essential knowledge concerning personality-related competencies of teachers (e.g., cognitive/motivational/emotional competence) and their acquisition. Therefore, an overarching reflection model (the MORE-MODEL) regarding personality-related competencies of teachers was presented. Under the overarching framework of the MORE project and the personality model, three content areas **(Study 1, 2 & 3)** were selected and empirically examined in more detail. **Study 1 & 2** answered the core questions resulting from the literature research on the basis of current psychological theories. Furthermore, a tool for clarifying necessary development tasks was empirically evaluated by an experiment to evaluate its effectiveness (**study 3**). Regarding the development and promotion of teacher students' personality-related competencies, the present work provides (prospective) teachers with helpful knowledge about factors that influence their later well-being (i.e., **studies 1** and **2**), as well as a corresponding tool (i.e., **study 3**) with which they can train themselves and perhaps find out whether they are capable candidates for the teaching profession, or how they can work on the requirements or

developmental tasks for themselves. Above all, this work also demonstrates that (prospective) teachers can decisively influence their own future well-being.

3.4.2 Considerations of Prerequisites for (Prospective) Teachers

Additionally, there are still considerations which could be decisive for a meaningful acquisition of personality-related competencies. Prospective teachers should **look for an answer to the question "What is it that inspires me personally about the profession of 'teacher'?"**, while familiarizing themselves with the requirements of the profession (i.e., "1. Schools should not only impart knowledge and competencies, but also form heart and character.", Art. 131 of the Constitution of the Free State of Bavaria).

3.4.3 The Enormous Importance of Personal-related Competencies

Any private person or scientist endorsing, implementing, and / or demanding something but ignoring the broad discussion about benefits or side effects forgets that there are no guarantees in life and that it could be the own subjective perceptions, emotions, and needs that need to be questioned. Consequently, personal competencies are so elementary because, in order to develop or to promote them, a confrontation or reflection with one's own inner life (e.g., systems that control our behavior, i.e., needs, emotions, goals, the self), external life (e.g., in which homogeneous or heterogeneous environment people are and / or what homogeneous or heterogeneous content people deal with, or the occupational circumstances) and the interaction of the two areas (inner and external life), goes along with it. The acquisition of personality-related competencies is never completed, but working daily on them seems meaningful.

Especially (prospective) teachers need personal-related competencies because society entrusts them with what is most valuable, namely our children, as they accompany them for a large part of their lives. Above all, we have to enable children to explore the world as children and help them experience themselves as competent and achieve their chosen goals and appreciate them.

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