UNIVERSITY OF AMSTERDAM

UvA-DARE (Digital Academic Repository)

From general to student-specific teacher self-efficacy

Zee, M.

Publication date
2016
Document Version
Final published version

Link to publication

Citation for published version (APA):
Zee, M. (2016). *From general to student-specific teacher self-efficacy*.

General rights
It is not permitted to download or to forward/distribute the text or part of it without the consent of the author(s) and/or copyright holder(s), other than for strictly personal, individual use, unless the work is under an open content license (like Creative Commons).

Disclaimer/Complaints regulations
If you believe that digital publication of certain material infringes any of your rights or (privacy) interests, please let the Library know, stating your reasons. In case of a legitimate complaint, the Library will make the material inaccessible and/or remove it from the website. Please Ask the Library: https://uba.uva.nl/en/contact, or a letter to: Library of the University of Amsterdam, Secretariat, Singel 425, 1012 WP Amsterdam, The Netherlands. You will be contacted as soon as possible.

UvA-DARE is a service provided by the library of the University of Amsterdam (https://dare.uva.nl)

Download date:26 Jun 2022

CHAPTER 2

TEACHER SELF-EFFICACY AND ITS EFFECTS ON CLASSROOM PROCESSES, STUDENT ACADEMIC ADJUSTMENT AND TEACHER WELL-BEING: A SYNTHESIS OF 40 YEARS OF RESEARCH

This study integrates 40 years of teacher self-efficacy (TSE) research to explore the consequences of TSE for the quality of classroom processes, students' academic adjustment, and teachers' psychological well-being. Via a criteria-based review approach, 165 eligible articles were included for analysis. Results suggest that TSE shows positive links with students' academic adjustment, patterns of teacher behavior and practices related to classroom quality, and factors underlying teachers' psychological well-being, including personal accomplishment, job satisfaction, and commitment. Negative associations were found between TSE and burnout factors. Last, a small number of studies indicated indirect effects between TSE and academic adjustment, through instructional support, and between TSE and psychological well-being, through classroom organization. Possible explanations for the findings and gaps in the measurement and analysis of TSE in the educational literature are discussed.

Zee, M., & Koomen, H. M. Y. (2016). Teacher self-efficacy and its effects on classroom processes, student academic adjustment and teacher well-being: A synthesis of 40 years of research. *Review of Educational Research.* Advance online publication. doi:10.3102/0034654315626801

INTRODUCTION

Ever since the seminal work of the Rand corporation in the late 1970s (Armor et al., 1976), studies on teacher self-efficacy (TSE) have been popping up like daisies in a spring field (Klassen, Tze, Betts, & Gordon, 2011). This increase of research can be largely ascribed to the notion that TSE beliefs, or teachers' self-referent judgments of capability, are relevant for a range of adjustment outcomes at different levels of classroom ecology. Using various measures and definitions, studies imply that teachers with an assured sense of self-efficacy set the tone for a high-quality classroom environment by planning lessons that advance students' abilities, making efforts to involve them in a meaningful way, and effectively managing student misbehavior (Chacon, 2005; Woolfolk, Rosoff, & Hoy, 1990). Next to affecting the classroom quality, TSE has also been found to exert influence over student and teacher outcomes. On the student side, TSE has shown some links to academic achievement, motivation, and self-efficacy (Midgley, Feldlaufer, & Eccles, 1989; Thoonen, Sleegers, Peetsma, & Oort, 2011; Ross, 1992). On the teacher side, positive TSE beliefs have been demonstrated to result in improved psychological well-being in terms of higher levels of job satisfaction and commitment, and lower levels of stress and burnout (Aloe, Amo, & Shanahan, 2014; Collie, Shapka, & Perry, 2012; Klassen & Chui, 2011).

The broad range of multileveled consequences of TSE speaks to the growing complexity of this construct since its introduction some four decades ago. Still, consensus has not yet been reached about which particular role TSE plays at different levels of classroom ecology. Most reviews and critiques of the TSE literature have predominantly focused on key conceptual and methodological issues surrounding research on teachers' capability beliefs, or have proposed alternative paradigms and frameworks to broaden and clarify this construct (e.g., Henson, 2002; Klassen et al., 2011; Labone, 2004; Tschannen-Moran, Woolfolk Hoy, & Hoy, 1998; Wheatley, 2005; Woolfolk Hoy, Hoy, & Davis, 2009; Wyatt, 2014). Only two authors have extended this scope, also putting emphasis on the potential consequences of TSE (Ross, 1998; Woolfolk Hoy et al., 2009). Although these two reviews have been extensive, they have been either narrative in nature, or could not yet cover the substantial body of evidence on the consequences of TSE that has been published in the last decade. Consequently, they essentially fail to render a more *systematic* and *updated* account of TSE and its consequences. The purpose of the present review study, therefore, is to provide an up-to-date, critical review of forty years of research on TSE and its consequences for the quality of classroom processes, students'

academic adjustment, and teachers' psychological well-being. We aim to go beyond previous reviews by not only focusing on outcomes related to teaching and learning, but also on teachers' welfare. Thereby, we provide a more detailed description of TSE and its consequences across grades.

Before discussing the main findings and conclusions, we will first provide an overview of the foundational tenets of TSE to elucidate the complexities surrounding its meaning and measurement. Inspired by the seminal work of Woolfolk Hoy and colleagues (2009) and Pianta, La Paro, and Hamre (2008), we will next describe a process-oriented model of TSE. This model is used heuristically to synthesize empirical research to explore the consequences of TSE for outcomes at different levels of classroom ecology, and to reveal potential gaps in our current understanding of this complex construct.

THEORY AND MEASUREMENT OF TEACHER SELF-EFFICACY

The foundational tenets of TSE have, historically, fallen between the two stools of locus of control (Rotter, 1966) and social-cognitive theory (Bandura, 1977). As with other social-psychological frameworks, the emphasis in these two theories is on *human agency* – the idea that individuals are able to exercise control over actions that affect their lives (e.g., Bandura, 1986, 1997). Rotter's (1966) attribution-based theory of locus of control is probably one of the best known examples of this viewpoint. Drawing on previous empirical work, Rotter conceptualized locus of control as a *generalized* expectancy for control of reinforcement that individuals develop in relation to their environment (e.g., Rotter, 1966). Individuals, Rotter assumed, generally differ in their perceptions of whether outcomes are contingent upon sheer luck, fate, or others (*external control*), or a result of their own actions (*internal control*). Such perceptions are considered to be largely determined by person-environment transactions that reinforce individuals' actions, such as receiving a reward after successful task performance. These reinforcers, in turn, may serve as (dis)incentives for particular behaviors in future situations (Rotter, 1966). Evidently, those who believe their environment to be responsive to their actions – and hence develop a more internal locus of control – are the most likely to become "happy, healthy, wealthy, and wise" (Lachman, 2006, p. 283).

Over the years, Rotter's theory has laid the groundwork for many studies and scales, including the first measure of TSE in the 1970s (see Tschannen-Moran & Woolfolk Hoy, 2001). Using locus of control as a conceptual base, Rand researchers (Armor et al., 1976; Berman &

McLaughlin, 1977) formulated two simple items to assess teachers' beliefs about their abilities to bring about positive student change above the effects of child and environmental features. Although these items only constituted a small part of the Rand studies, they have been relatively important in laying an empirical foundation for inquiry into students' achievement gains. Thereby, this two-item instrument rapidly gained momentum toward new and more comprehensive measures of TSE in relation to student outcomes (e.g., Dellinger, 2005; Tschannen-Moran & Woolfolk Hoy, 2001). Among those instruments, Teachers' Locus of Control (Rose & Medway, 1981), Responsibility for Student Achievement (Guskey, 1981), and the Webb Efficacy Scale (Ashton, Olejnik, Crocker, & McAuliffe, 1982) can be considered the most prominent.

As refinements of the original Rotter-based construct started to appear, however, so a number of issues regarding their relevance to TSE began to arise. These issues came barely one year after the efforts of the Rand Corporation, with the work of Bandura (1977, 1986, 1997). Building strongly on Rotter's theory, Bandura argued that individuals' behaviors are not only influenced by generalized expectancies for control but also by these individuals' perceived capabilities, or *self-efficacy,* to perform those behaviors in particularized domains. To reinforce this assertion, Bandura (1977) made a distinction between response-outcome expectancies and self-efficacy expectations. Generally, response-outcome expectancies refer to individuals' estimates "that a given behavior will lead to certain outcomes" (Bandura, 1977, p. 193). These outcome expectancies can be assumed to be operationally equivalent to Rotter's construct, as they both determine whether the social environment is perceived to be reactive to personal actions or not (see Kirsch, 1985). With self-efficacy expectations, Bandura seems to go beyond such perceived environmental contingencies. He argued that although persons may *know* that certain achievements result in desired outcomes, this information becomes virtually useless when they lack the beliefs they have the abilities to produce such actions. For instance, teachers' judgment that scaffolding may increase student learning (*outcome expectation*) can act as a motivator to making significant use of this teaching strategy. Yet scaffolding strategies are unlikely to be initiated unless teachers believe they have the skills and capabilities to selectively support their students where needed (*self-efficacy*). Thus, for Bandura (1997), personal self-efficacy beliefs seem to be the most important cause of human behavior. As the predictor of outcome expectancies, they help persons decide which courses of action they ought to pursue and whether to persist in the face of environmental adversities. Also, they determine how persons interpret their thoughts, actions, and emotions in given situations.

Bandura's addition to Rotter's theory has had an enormous impact on TSE research. In the first place, most researchers have, since his writings, underscored the need to differentiate between self-efficacy and outcome expectancies (e.g., Dellinger, Bobbett, Olivier, & Ellett, 2008; Gibson & Dembo, 1984). Of particular note are the early efforts of Gibson and Dembo (1984), who have performed much work in this area. In an attempt to develop a new measure of TSE, they found modest evidence for two independent factors that assumedly resembled self-efficacy and response-outcome expectancies. These factors, which were labelled as personal teaching efficacy (PTE) and general teaching efficacy (GTE), respectively, have been confirmed and used by many researchers until the late 1990s (e.g., Emmer & Hickman, 1991, Hoy & Woolfolk, 1993; Riggs & Enochs, 1990; Soodak & Podell, 1993). After that time, the popularity of Gibson and Dembo's Teacher Efficacy Scale (TES) has faded somewhat, due to issues with the construct and content validity of the general teaching efficacy factor (e.g., Pajares, 1997; Tschannen-Moran & Woolfolk Hoy, 2001; Woolfolk & Hoy, 1990).

A second consequence of Bandura's socio-cognitive framing is that scholars started to conceptualize TSE as *task* or *situation-specific* rather than *generalized*, as Rotter does. By moving away from the idea that self-efficacy is an omnibus trait, it is acknowledged that TSE beliefs may vary according to different types of tasks, students, and circumstances in class (Ross, Cousins, & Gadalla, 1996; Tschannen-Moran et al., 1998). Such particularized self-efficacy scales have been argued to have higher predictive validity, due to the variations in TSE that occur across different tasks and domains (Bandura, 1997). The majority of the current instruments and conceptualizations of TSE are therefore based on the breadth of teachers' role in the classroom and not solely on student outcomes. In the often used Teachers' Sense of Efficacy Scale (TSES; Tschannen-Moran & Woolfolk Hoy, 2001), for instance, TSE is treated as a task-specific, three-dimensional construct reflecting instructional strategies, classroom management, and student engagement. This Bandura-based instrument – developed in reaction to the partial invalidity of Gibson and Dembo's TES – has been described as "superior to previous measures of teacher efficacy in that it has a unified and stable factor structure" (Woolfolk Hoy & Burke Spero, 2005, p. 354). Indeed, investigators using either the 24-item or 12-item TSES have reported satisfactory reliability and construct validity evidence for this instrument, across grades and several countries (e.g., Klassen et al., 2009; Tschannen-Moran & Woolfolk Hoy, 2001).

In addition to the TSES-dimensions, other educational researchers have developed separate self-efficacy scales for literacy (Tschannen-Moran & Johnson, 2011), science (Riggs & Enochs, 1990), inclusive practices (Malinen et al., 2013), technology (Sang, Valcke, van Braak, & Tondeur, 2010), and discipline (Brouwers & Tomic, 2000), or extended the scope of TSE to the organizational (Friedman & Kass, 2002) or cultural domain (Siwatu, 2007). Together, these studies recognize that TSE is reflected in multiple specific components of teachers' profession, and that the strength of TSE can fluctuate between teaching tasks, roles, students, and over time.

CONSEQUENCES OF TEACHER SELF-EFFICACY

Thus far, a mounting body of theoretical and empirical work has demonstrated the complex ways in which TSE may affect outcomes at different levels of classroom ecology. In the late 1970s, student-level investigations first started to appear, focusing on TSE as a potential direct determinant of students' achievement and motivation. This research focus was evidently encouraged by the Rand studies (e.g., Armor et al., 1976), which specifically hypothesized high TSE to be beneficial for student learning. Subsequent investigators in the 1980s and beyond have complemented this earlier work, turning their attention to direct consequences of TSE at the teacher-level. Spurred by Bandura's (1986) notion that self-efficacy not only affects behaviors and actions but also thoughts and feelings, these researchers have opened new lines of inquiry on factors associated with teachers' psychological well-being (e.g., Klassen & Chiu, 2010, 2011; Skaalvik & Skaalvik, 2007).

Aside from investigators that posited a direction of causal influence from TSE to student-level and teacher-level outcomes, classroom-oriented studies have suggested that TSE might rather have an indirect effect on such outcomes. The idea behind this assumption is that TSE, as a personal characteristic, mainly affects student and teacher outcomes through patterns of teacher behavior and practices that define the quality of the classroom environment (Guo, McDonald Connor, Yang, Roehring, & Morrison, 2012; Midgley et al., 1989; Woolfolk Hoy & Davis, 2005). Gibson and Dembo (1984), for instance, underscored that highly self-efficacious teachers "persist longer, provide a greater academic focus in the classroom, and exhibit different types of feedback than teachers who have lower expectations concerning their ability to influence student learning" (p. 570).

To add to the complex nature of TSE, other researchers additionally believe that TSE judgments may act on raising the classroom quality by exerting reciprocal influences over teachers' feelings of well-being and personal accomplishment (e.g., Bandura, 1997; Brouwers, Evers, & Tomic, 2001; Goddard, Hoy, & Woolfolk Hoy, 2004). Such personal emotions and cognitions are believed to inform and alter future TSE beliefs and accompanying behaviors, which, in turn, affect both the classroom environment and student performance (Goddard et al., 2004). This system of triadic reciprocal causality (Bandura, 1986), in which the classroom environment, teachers' behavioral patterns, and their cognitions influence each other dynamically, calls attention to the need for critical exploration of the role that the quality of *classroom processes* plays in the relationships among TSE, students' academic adjustment, and teachers' well-being.

A HEURISTIC FRAME TO LINK TSE TO OUTCOMES AT VARIOUS LEVELS OF CLASSROOM ECOLOGY

Recently, Woolfolk Hoy and colleagues (2009) developed a process-oriented framework that may help researchers to advance understanding of the complex ways in which TSE affects outcomes at various levels of classroom ecology. In this global framework, TSE is suggested to have various types of consequences for a range of classroom processes at both student and teacher levels, including instructional actions, behavioral expectations, and emotional classroom dynamics. As such, these types of consequences resemble the theoretically driven and empirically supported classroom quality framework of Pianta and colleagues (CLASS; Pianta & Hamre, 2009; Pianta et al., 2008). Today, the CLASS is one of the leading frameworks for research on the quality of classroom processes, not least because of its emphasis on *teacher supports and practices* related to the well-established major domains of instructional support, classroom organization, and emotional support.

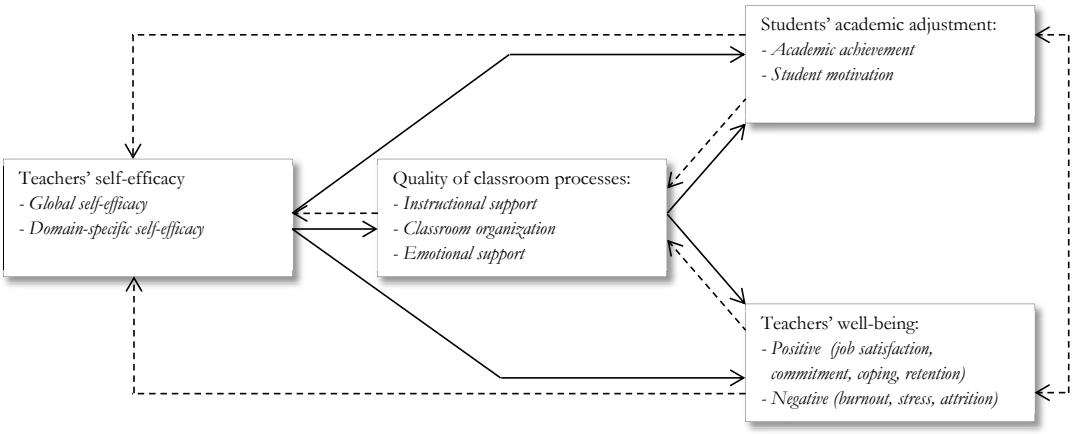
The domain of instructional support generally reflects the degree to which teachers are able to advance students' meta-cognitive skills, apply their thinking to real-world situations, scaffold for struggling students, and expand on their understanding (Hamre & Pianta, 2010; Pianta et al., 2008). The domain of classroom organization includes teaching practices such as providing clear directions, rules, and expectations, focusing students' attention toward learning objectives, and preventing instances of misconduct (Pianta et al., 2008). Emotional support, finally, comprises such interpersonal and affective classroom dynamics as student–teacher relationships, teachers' sensitivity, and regard for student perspectives (Hamre & Pianta, 2010). Over time, these efficacy-influenced processes are presumed to mainly affect students'

academic adjustment (Hamre & Pianta, 2010; Woolfolk Hoy et al., 2009). Yet, given Bandura's model of triadic reciprocal causation, TSE may also have consequences for teachers' well-being, either directly or indirectly.

As the triad of domains of the CLASS-framework specifically encompass teacher supports and practices, they may be helpful in identifying and further organizing the various classroom processes that are at play in the association between TSE and student and teacher outcomes. Inspired by this framework, we therefore propose a heuristic model for presenting the results of our review study. Using this model, we will first review empirical studies on the direct associations among TSE and the quality of classroom processes (i.e., instructional support, classroom organization, and emotional support), students' academic adjustment (i.e., student motivation and academic achievement), and teachers' well-being (e.g., burnout, stress, job satisfaction, commitment, and attrition and retention). Second, we will explore evidence on the mediating role of classroom processes on the association between TSE and student adjustment and teacher well-being. Figure 1 provides an overview of these hypothesized relationships.

FIGURE 1

Heuristic Model of Teacher Self-Efficacy in Relation to Classroom Processes, Academic Adjustment, and Teacher Well-Being



Note. Solid lines symbolize expected associations that will be examined in the present review. Hypothesized reciprocal effects (dashed lines) displayed in the model will not be part of this study.

METHOD

LITERATURE SEARCH

To comprehensively identify relevant studies on the consequences of TSE, we used a criteria-based review approach to search articles from 1976 to March 2014. This time span was set as research on TSE only started to increase after the work of the Rand Corporation (e.g., Armor et al., 1976). Potentially eligible articles were collected iteratively from the Internet databases of PsycInfo, ERIC, and Google Scholar in three stages. During the first stage, we employed an a priori scoping search to define separate sets of key words to locate articles referring to TSE in relation to the dimensions of the classroom-based framework. To operationalize TSE, we only included such subject terms as "teach* self-efficacy", "teach* efficacy", "academic optimism", "teach* sense of (self-)efficacy". Other types of self-beliefs, including locus of control, self-concept, self-worth, self-esteem, perceived competence, and outcome expectations, were not entered as search terms, as these beliefs, rather than cognitive judgments of capability, reflect affective reactions (Bandura, 1997). In the second stage, the TSE search terms were subsequently combined with key words referring to classroom quality, students' academic adjustment, and teachers' psychological well-being, using the Boolean operators "AND" and "OR". A search of these descriptors lead us to detect tens of thousands of journal articles, dissertations, book chapters, and conference proceedings. Therefore, in the third stage, we further limited the source type to empirical, English language articles published in peer-reviewed journals. To be included, full-text versions had to be available. After adding these restrictions, separate searches for each dimension of the framework in relation to TSE were performed, producing 768 results for classroom processes, 910 results for students' academic adjustment, and 710 results for teachers' well-being.

INCLUSION CRITERIA

There were five criteria for the inclusion of publications in our review. First, each empirical article was required to specifically focus on *preservice* or *inservice teachers' individual* self-efficacy. As such, studies investigating self-efficacy beliefs of principals, teaching assistants, mentors, or school counselors were not included in this review. Likewise, articles were excluded if they reported solely on collective or school-level (aggregated) TSE. Second, all articles had to address a direct or indirect relationship between TSE and at least one factor associated with students' academic adjustment, teachers' well-being, or hypothesized classroom processes. Accordingly, we only reported on direct and indirect effects of TSE, leaving out potential

interaction terms of TSE and other variables described in the selected studies, as well as associations in which TSE served as a mediator. Third, studies were considered relevant if they used quantitative empirical data. Although we initially included qualitative data as well, the small body of retrieved qualitative research appeared to be diverse in terms of study focus, sample size, teaching context, design, and primary study outcomes. These large differences made it difficult to compare and critically appraise these articles, and to determine their relevance in light of the quantitative studies included in the review. Also, most qualitative research dealt with a specific study population, thereby potentially limiting their generalizability and influence. It is for this reason that we decided to focus on quantitative empirical research, and excluded qualitative work from analysis. Fourth, quantitative studies were required to use psychometrically sound, Bandura-based instruments to identify TSE. This criterion resulted, among others, in the exclusion of articles using only Gibson and Dembo's (1984) general teaching efficacy scale, or other instruments measuring outcome expectancies. Last, the samples of the studies were allowed to include special education, preschool, elementary school, high school, and higher education teachers and/or students. Hence, no limits were set with regard to school type.

Irrelevant papers were removed, and appropriate articles were identified based on information provided in the abstract or, when the abstract was not available, the title. In case of doubt, the full text was consulted. Key journals and references of articles that met our criteria were subsequently hand-searched, to locate additional studies. The application of these criteria ultimately resulted in 165 articles for analysis.

RESULTS

Following the heuristic model provided in Figure 1, this section provides a thematic analysis of the literature on TSE. As the reviewed studies generally evaluated various combinations of variables, the consequences of TSE for each of the outcomes are discussed separately. Table 1 offers a framework for these main outcome domains and their dimensions, and summarizes the number of studies and mean sample size per dimension. First, consequences of TSE on teacher behaviors and practices that define instructional, classroom organizational, and emotional aspects of classroom processes are discussed. The results for each of these major classroom domains, categorized into subthemes, are displayed in Appendix 1. Next, studies investigating the direct and indirect links between TSE and student adjustment are reviewed,

including academic achievement and motivation. These studies are reported in Appendix 2. Studies on the direct and indirect association between TSE and teachers' well-being are discussed last. The results for each aspect of teachers' well-being can be found in Appendix 3. Please note that we do not provide a standardized, statistical overview of the strength of relationships between TSE and student and teacher outcomes in the classroom, due to the heterogeneous nature of the reviewed studies in terms of sample sizes, analytical methods and rigor, and instruments used.

TABLE 1

Overview of Study Outcomes, Domains, and Dimensions

Main outcome	Domain	Dimension	*N* studies	*Mdn* sample size (range)
QCP	Instructional Support	Overall Instructional support	8	166 (19 – 631)
		Support for literacy and math	9	94 (40 – 346)
		Implementation of instructional practices	8	79 (20 – 537)
	Classroom Organization	Classroom behavior management	17	182 (33 – 983)
		Inclusive practices and referral decisions	14	188 (55 – 1,623)
		Instructional management	26	302 (8 – 2,132)
	Emotional Support	Overall emotional climate	3	67 (49 – 1,043)
		Student-teacher relationships	7	152 (75 – 597)
		Regard for student perspectives	3	96 (75 – 336)
SAA	Students' achievement	Overall achievement	8	222 (80 – 2,184)
		Math achievement	4	307 (19 – 1,329)
		Literacy achievement	6	67 (20 – 1,075)
		Achievement in other subjects	4	214 (18 – 450)
	Students' motivation	Motivational behaviors, beliefs	11	80 (58 – 1,329)
TWB	Negative well-being	Teacher burnout	23	404 (49 – 2,249)
		Teacher stress and coping	6	109 (30 – 479)
	Positive well-being	Teacher satisfaction	21	366 (30 – 1,212)
		Teacher commitment	12	726 (109 – 26,257)
		Teacher attrition and retention	9	192 (66 – 1,214)

Note. QCP = Quality of classroom processes; SAA = Students' academic adjustment, TWB = Teachers' well-being.

CONSEQUENCES OF TSE FOR CLASSROOM PROCESSES – INSTRUCTIONAL SUPPORT

Scholars suggest that the instructional behaviors, practices, and strategies teachers employ to encourage students' cognitive development may, in part, be determined by their self-efficacy (e.g., Tschannen-Moran & Woolfolk Hoy, 2001). This possibility was explored in 25 survey studies (see Appendix 1). Of these studies, more than half used samples with less than 100 teachers. Moreover, around 70% of the 25 reviewed articles on instructional support relied on simple correlations and global measures of TSE, making it difficult to determine whether particular domains of TSE have similar patterns of effects on teachers' instructional support. Given these methodological choices, it is perhaps not surprising that teachers' overall levels of instructional support, and particularly those of *preservice* teachers, have not been found to be affected by their self-efficacy (Guo, Piasta, Justice, & Kadaverek, 2010; Pakarinen et al., 2010). Yet there are indications that *inservice* TSE contributes to a range of general instructional practices. Among others, these include process-oriented instruction and differentiation, the number of goal changes made, the ability to connect to students' lives and employ effective teaching strategies, and their choices of differentiated instructional strategies supporting inclusive education (Allinder, 1995; Martin, Sass, & Schmitt, 2012; Thoonen, Sleegers, Oort, Peetsma, & Geijsel, 2011; Wertheim & Leyser, 2002; Weshah, 2012). Rigorous structural equation modeling (SEM) results from Geijsel, Sleegers, Stoel, and Kruger (2009), furthermore, showed that efficacious teachers frequently engage in professional learning activities, such as keeping up to date with the profession, trying out new approaches to improve their practices, and changing their practice to promote process-oriented student learning.

INSTRUCTIONAL SUPPORT FOR LITERACY AND MATH

Besides overall support, nine studies (see Appendix 1) specifically considered the importance of TSE for the employment of strategies to maximize students' *literacy and mathematics development*. Regarding math, Brown (2005) pointed out that early childhood teachers' self-efficacy did not result in more observed mathematics instructional practices, although self-efficacious teachers did rate the importance of math higher than colleagues without such beliefs. Largely similar, longitudinal results from Holzberger, Philipp, and Kunter (2013) showed that TSE is unrelated to students' subsequent assessment of the level of cognitive activation or individual learning support. Instead, a reverse effect of instructional quality on TSE was revealed, with students' experience of cognitive activation and teachers' ratings of classroom management predicting subsequent TSE (ibid.). This is in line with Bandura's notion

of triadic reciprocal causation, suggesting that teachers' instructional support and TSE may affect one another reciprocally.

The small-scale correlational studies focalizing literacy reveal that efficacious *preservice* teachers generally have more knowledge of using expository text as a reading tool (Yildirim & Ates, 2012). Yet these self-efficacious preservice teachers have not been found to use more reading strategies than less efficacious educators while teaching their students to read (Haverback, 2009). Efficacy in *inservice teachers*, in contrast, has been shown to contribute both to the quality of their instructional (literacy) support, and the instructional literacy environment in preschool (Guo, Sawyer, Justice, & Kaderavek, 2013; Justice, Mashburn, Hamre, & Pianta, 2008). Language modeling, one key dimension of instructional support, was unrelated to early childhood teachers' self-efficacy (Justice et al., 2008).

In three small, cross-sectional studies, the relationship between domain-specific TSE beliefs and the use of various language strategies in high school was investigated (Chacon, 2005; Eslami & Fatahi, 2008; Yilmaz, 2011). In the largest study (N = 104), TSE for engagement, classroom management, and instruction all correlated positively with communication- and grammar-oriented strategies, but did not affect teachers' preference for one specific type of strategy (Chacon, 2005). A study by Yilmaz (2011; N = 54) failed to replicated these results. Eslami and Fatahi (2008; N = 40) only found positive correlations between dimensions of TSE and communicatively oriented language strategies. Together, these results suggest that the consequences of TSE for teachers' instructional (literacy) support become more evident when teachers gain experience.

IMPLEMENTATION OF INSTRUCTIONAL PRACTICES

Despite the effectiveness of instructional practices for students' development, not all teachers feel capable of implementing and using such practices in class. More specifically, teachers with high general self-efficacy have been demonstrated to perceive the implementation of new instructional methods as more important and congruent with their own practices. They experience less self-survival, task, and impact concerns, and more pedagogic conceptual change, irrespective of grade (Ghaith & Shaaban, 1999; Ghaith & Yaghi, 1997; Lee, Cawthon, & Dawson, 2013). Turning to domain-specific TSE, Dunn, Airola, Lo, and Garrison (2013) found that TSE for data-driven decision making is positively related to collaboration concerns, suggesting that efficacious teachers more often work with colleagues to improve and increase

use of data-driven decision making in class. Even in the context of physical education, high-school TSE in teaching daily lesson plans and student-centered teaching styles has been found to positively affect teachers' attitude and intention toward curriculum implementation (Gorozidis & Papaioannou, 2011).

Next to attitudes toward implementation, results of three intervention studies show that efficacious teachers are likely to more frequently implement and use subject-specific instructional practices in class (Cantrell & Hughes, 2008; Eun & Heining-Boynton, 2007; Lakshmanan, Heath, Perlmutter, & Elder, 2011). Cantrell and Hughes (2008) explored the relationship between TSE and implementation of a content literacy approach among sixth- and ninth-grade teachers. They found that TSE before implementation was correlated with teachers' observed implementation at the start of the content literacy program, but not after, suggesting TSE to be more important during the initial implementation phase. Likewise, Eun and Heining-Boynton (2007) were interested in the effects of an English-as-a-Second-Language Professional Development Program on TSE and classroom practices of K-12 teachers. They revealed that teachers with high self-efficacy were more likely to use the instructional knowledge and skills acquired from professional-development programs than educators with low self-efficacy.

Regarding science teaching, standards-based professional development programs have been shown to have potential to positively affect TSE and, consequently, teachers' implementation of reformed science teaching in upper elementary classrooms (Lakshmanan et al., 2011). Although these studies imply that TSE may be crucial to teachers' implementation fidelity, some caution is warranted when making inferences from these results. Specifically, the sample sizes of these three intervention studies were relatively small (N = 22, 79, and 90, respectively), and control groups were not included in these investigations.

CONSEQUENCES OF TSE FOR CLASSROOM PROCESSES – CLASSROOM ORGANIZATION

Classroom organization is generally perceived as a domain of classroom processes related to how well teachers manage students' behavior and instructional time, and provide lessons and materials that maximize learning opportunities (Pianta et al., 2008). Within this domain, three particular dimensions can be distinguished that account for links between TSE and classroom processes: behavior management, inclusive practices and referral decisions, and instructional management. Statistical analyses in research that investigated the links between TSE and these

dimensions (n = 55; see Appendix 1) mostly included application of simple correlations, regression methods, or analysis of variance (37 studies). Studies employing multilevel analysis (4 studies), SEM (12 studies) or longitudinal analysis (2 studies) were less common. Although some investigations focused on specific student populations (e.g., students with emotional and/or behavioral difficulties; Almog & Shechtman, 2007; Liljequist & Renk, 2007; Yoon, 2004), most studies did not include corrections for confounding by students' or teachers' personal characteristics.

CLASSROOM BEHAVIOR MANAGEMENT

The notion that TSE shows links with the ability to organize and manage students' behavior and time is particularly consistent with small-scale, correlational research on teachers' ability to cope with students' social-emotional behavior (n = 4). For instance, Lilejequist and Renk (2007) found that *preservice* teachers with a high sense of personal self-efficacy report higher levels of control over externalizing behavior, but seem more bothered by students' internalizing behavior than teachers with a low sense of self-efficacy. Moreover, in elementary school, self-efficacious *inservice* teachers have been shown to cope better with different problem behaviors, including low achievement, social rejection, shyness, disobedience, hostility, hyperactivity (Almog & Shechtman, 2007), and students' bullying behavior (Yoon, 2004). Conversely, when teachers' efficacy is hampered by student behavior, they may develop a critical attitude toward their own teaching abilities (Lambert, McCarthy, O'Donnell, & Wang, 2009).

Potentially, teachers' perceived ability to cope with challenging students may partly determine which classroom management behaviors, strategies, and styles they ultimately adopt. Considering the *preservice* context, general TSE has been demonstrated to be beneficial to lesson presenting, questioning, and classroom management behaviors (Saklofske, Michayluk, & Randhawa, 1988). Preservice teachers with high personal and classroom management efficacy have also been found to use more positive strategies (i.e., increasing desirable student behavior) and external strategies (i.e., referring a disruptive student) than poorly efficacious teachers (Emmer & Hickman, 1991). Whether or not these behavior management strategies are effective depends on these teachers' TSE as well (Wertheim & Leyser, 2002).

Some cross-sectional studies suggest that the positive consequences of TSE for preservice teachers' classroom management styles and strategies likely extend to the *inservice* context (e.g.,

Dussault, 2006; Morris-Rothschild & Brassard, 2006). In elementary school and beyond, TSE has been shown to positively contribute to teachers' behavior, instructional, people, and overall classroom management strategies (Abuh-Tineh, Khasawneh, & Khalaileh, 2011) and their proactive approaches to managing student–teacher conflict. These include, among others, their integrating, compromising, and obliging styles (Morris-Rothschild & Brassard, 2006). In high school, TSE has furthermore been positively linked to several organizational citizenship behaviors of teachers, such as altruism, courtesy, and conscientiousness (Bogler & Somech, 2004; Dussault, 2006; Ngidi, 2012). The only study that took a longitudinal approach to studying TSE did not find any association between TSE and classroom management across time, despite reporting significant correlations (Holzberger et al., 2013). Thus, these studies generally imply that proactive behavioral management strategies are most likely to be employed by teachers with high self-efficacy. These modest findings are consistent across grade and context.

Complementing the corpus of research on classroom management strategies and behaviors, primarily older research (n = 4) from the 1990s underscores that TSE might influence teachers' beliefs about student control (Hoy & Woolfolk, 1990; Martin & Sass, 2010; Woolfolk & Hoy, 1990; Woolfolk et al., 1990). Woolfolk and Hoy (1990) investigated *preservice* teachers' efficacy in relation to their beliefs about control and motivation. Initially, their findings indicated that TSE was unrelated to teachers' pupil control ideology and motivational beliefs. Canonical correlations, however, revealed that TSE was positively related to a control orientation that rejects teacher control of students but accepts the schools' control of teachers. Two other studies indicated that although preservice teachers tend to become more custodial and controlling in their orientations (Hoy & Woolfolk, 1990), more experienced sixth-and seventh-grade teachers may adopt a less custodial pupil control ideology when their self-efficacy is high (Woolfolk et al., 1990). A more recent study of Martin and Sass (2010) discovered that teachers who express high self-efficacy beliefs for instructional strategies, engagement, and classroom management generally take a less directive approach in implementing tactics to manage instruction, irrespective of grade. Probably, TSE is associated with more humanistic attitudes about classroom control, at least for more experienced elementary school teachers.

INCLUSIVE PRACTICES AND REFERRAL DECISIONS

Several studies (n = 6; see Appendix 1) focusing on teachers' *attitudes toward inclusive practices* have revealed that elementary school teachers with resilient self-efficacy beliefs perceive

themselves as more successful in teaching students with disabilities (Brownell & Pajares, 1999) and feel more comfortable in accepting responsibility for these students' difficulties (Brady & Woolfson, 2008). Moreover, self-efficacious teachers have been shown to be less anxious about (Soodak, Podell, & Lehman, 1998), and to have more positive attitudes toward inclusive education and socio-cultural diversity than inefficacious teachers (Ahsan, Sharma, & Deppeler, 2012; Gao & Mager, 2011; Malinen et al., 2012). These associations, ranging from .11 to .36 (*Mdn* = .20), hold across grades, and in samples of preservice and inservice teachers.

Next to the indication that self-efficacious teachers are more tolerant toward problematic students, they may also be less likely to exclude such students from their class. Eight studies (see Appendix 1) have identified teachers' referral decisions as potential consequences of TSE in elementary school, although the results are somewhat mixed. Four studies failed to provide support for the assumption that TSE relates to decisions to refer children to special education (Egyed & Short, 2006; Soodak & Podell, 1993; Tejeda-Delgado, 2009), or exclude them from school (Gibbs & Powell, 2012). Results from one longitudinal study even suggested that having low self-efficacy in the fall may result in a reduction in subsequent student referrals to the student support team (Pas, Bradshaw, Hershfeldt, & Leaf, 2010).

Contrary to these five studies, some findings from earlier research indicated that (special education) teachers who express high self-efficacy beliefs are less likely to perceive children as problematic, refer them for special education placement, or seek referral or consultation assistance (Hughes, Barker, Kemenoff, & Hart, 1993; Meijer & Foster, 1988). Teachers with high TSE have also been found to be more likely to accept interventions suggested by consultants (DeForest & Hughes, 1992). Note, however, that these studies used less rigorous methods than the five studies that failed to establish relations between TSE and teachers' referral decisions. Moreover, teachers' decision to refer may not only denote students' placement in special education, but also to teachers' ability to identify special needs. Hence, both the study's methodological characteristics, and the potential ambiguity in the meaning of teachers' referral decisions may explain these mixed findings.

INSTRUCTIONAL MANAGEMENT

It is commonly believed that students learn more when teachers make use of tools that actively involve and cognitively inspire students in class (e.g., Hamre & Pianta, 2010). Consistent with this notion, various instructional learning formats as consequences of TSE have been

considered in seven studies. The existing body of strictly correlational evidence suggests that preservice teachers with high self-efficacy for engagement, instructional strategies, and classroom management are likely to use a learner-centered and constructivist approach in their teaching, while teachers with low efficacy prefer to use traditional learning formats (e.g., Dunn & Rakes; 2011; Temiz & Topcu, 2013). Also, high- and low-efficacy preservice teachers have been shown to differ in time spent in whole class versus small-group instruction and use of criticism (Gibson & Dembo, 1984). The beneficial value of TSE for preservice teachers' learner-centered approaches coincides with research performed in the elementary school context and beyond, suggesting that high efficacy teachers not only hold constructivist learning conceptions (Eren, 2009), but are also likely to more often use learner-centered, constructivist instruction (Nie, Tan, Liau, Lau, & Chua, 2013; Ngidi, 2012) and teach more supplemental activities (Ransford et al., 2009). Moreover, Nie and colleagues found that TSE may explain about one third more of the variance in constructivist instruction than in didactic approaches to teaching. Hence, it is reasonable to suggest that high TSE leads to more student-centered, constructivist approaches to instruction among pre- and inservice teachers. These types of learning formats are likely to make the most of students' interest, engagement, and ability to learn.

Classroom goal structures

TSE has been identified as a potential factor in the management of students' behavior in multiple lines of research (e.g., Abuh-Tineh et al., 2011; Morris-Rothschild & Brassard, 2006). Yet, consideration has also been given to the role that self-referent thoughts play in the management of students' self-regulation skills. This particular strand of investigations has been largely inspired by the theoretical underpinnings of classroom goal theory. Situated within a socio-cognitive view of motivation, proponents of this theory posit that teachers, through their use of instructional strategies, establish classroom goal structures that are believed to underlie students' own goal orientations and subsequent motivation for learning (Meece, Anderman, & Anderman, 2006). In six studies (see Appendix 1) a case is made for considering TSE as one of the mechanisms behind such classroom goal structures, three of which focus on the preservice context (Capa-Aydin, Sungur, & Uzuntiryaki, 2009; Eren, 2009, 2012). Together, these investigators have found an assortment of self-regulation strategies among teachers who experience high self-efficacy. These include teachers' goal setting, intrinsic interest, mastery and performance goal orientations, self-instruction, emotional control, self-evaluation, self-reaction, help-seeking, planned effort and persistence, leadership aspirations, and aspects of their

professional development. Similarly, globally efficacious inservice teachers tend to more frequently create mastery goal structures in their classroom than less efficacious teachers, both in the elementary and secondary grades (Cho & Shim, 2013; Deemer, 2004; Midgley, Anderman, & Hicks, 1995).

Studies on domain-specific TSE (e.g., Rubie-Davies, Flint, & McDonald, 2011) show less conclusive results, however. Outcomes of one study suggest that only teachers' self-efficacy for instructional strategies leads to a more mastery-focused classroom environment (Ciani, Summers, & Easter, 2008). In two other studies (Rubie-Davies et al., 2011; Wolters & Daugherty, 2007), teachers who felt efficacious in both their instructional and engaging strategies were found to employ instructional strategies thought to foster students' mastery goal orientations. Unexpectedly, TSE for classroom management showed negative correlations with mastery goal structures in both studies, although this effect was likely due to a suppressor. Overall, TSE was not related to performance goal strategies, except for Cho and Shim's (2013) research, in which TSE was identified as a positive predictor of both teachers' mastery and performance approach goals. Thus, it can be suggested that TSE is positively associated with mastery approaches. Whether TSE is also a stable predictor of performance approach goals and other self-regulation strategies has yet to be clarified.

Technology use in the classroom

One specific instructional tool that helps teachers to differentiate in the classroom and has potential to provide learning environments that relate to students' world, is technology use (Godfrey, 2001). Therefore, it is perhaps not surprising that in a growing corpus of research (n = 10) the link between TSE and teachers' technology use has been considered. The focus of most of this research has been on preservice teachers (e.g., Sang et al., 2010; Teo, 2009). These researchers have used large samples and structural equation models in cross-sectional designs and their findings generally suggest that (computer) TSE may positively affect teachers' perceived usefulness, ease of use, and attitude toward computer use (Wong, Teo, & Russo, 2012) which, in turn, may contribute to their prospective use of technology in class (Chen, 2010; Sang et al., 2010). Similarly, Teo (2009) assessed preservice teachers' computer self-efficacy along dimensions of basic teaching skills, advanced teaching skills, and technology for pedagogy, and revealed that TSE for teaching skills and for technology for pedagogy served as predictors of traditional and constructivist use of computers and technology.

In the (upper) elementary and secondary grades, computer TSE – either general or specific – may positively impact teachers' attitude toward technology (Rohaan, Taconis, & Jochems, 2012), their attitude toward web-based instruction (Lee & Tsai, 2010), and their motivation to use web-based professional development (Kao, Wu, & Tsai, 2011). In two studies (Mueller, Wood, Willoughby, Ross, & Specht, 2008; Vannatta & Fordham, 2004) the positive relationship between TSE and classroom technology use could not be confirmed. Last, Ahmad, Basha, Marzuki, Hisham, and Sahari (2010) assessed direct and indirect effects of faculty member's computer self-efficacy on technology use. Their results indicated that computer self-efficacy was an important determinant in affecting faculty members' use of computer technology. Thus, for technology and computer use in the classroom to move forward, teachers need to perceive themselves as self-efficacious, especially in using computers and technology.

CONSEQUENCES OF TSE FOR CLASSROOM PROCESSES – EMOTIONAL SUPPORT

Central to any conceptualization of classroom processes is teachers' capability to establish caring relationships with students, acknowledge their opinions and feelings, and create settings in which students feel secure to explore and learn (Pianta et al., 2008). Although TSE may potentially be involved in such social-emotional classroom dynamics, this possibility has only been considered in 13 studies (see Appendix 1), focusing on overall emotional climate, student–teacher relationship quality, or regard for student perspectives.

OVERALL EMOTIONAL CLIMATE IN THE CLASSROOM

In three large cross-sectional studies, observational methods were used to measure *overall* emotional climate in preschool and Grade 5 (Guo et al., 2010; 2012; Pakarinen et al., 2010). According to one of these studies (Guo et al., 2012), fifth-grade teachers with high self-efficacy are more likely than poorly efficacious educators to create a supportive environment characterized by warmth, responsiveness, enthusiasm, teacher support, and effective use of instructional time. In the preschool context, however, consensus has not been reached on whether highly self-efficacious teachers provide their students with higher levels of emotional support (Guo et al., 2010; Pakarinen et al., 2010).

STUDENT-TEACHER RELATIONSHIP QUALITY

Turning to interpersonal student–teacher relationships, seven correlational studies have shown mixed results as to whether high TSE increases the quality of teachers' relationship with individual students (e.g., de Jong et al., 2013; Mashburn, Hamre, Downer, & Pianta, 2006). These ambiguous findings may partly be due to the studies' selected outcome variables and methods of data analysis. Generally, TSE did not appear to be correlated with the quality of student–teacher relationships when total scores of teacher-perceived relationship quality were used and the nested structure of the data was not taken into account (Chung, Marvin, & Churchill, 2005; Hardré & Sullivan, 2008). In another Dutch study among *preservice* teachers, de Jong et al. (2013) also failed to establish significant links between Tschannen-Moran and Woolfolk Hoy's (2001) dimensions of TSE and relationship quality, in terms of control and affiliation. Notably, reliability coefficients of two self-efficacy dimensions in this study were below the threshold of .70. Only in Jimmieson, Hannam, and Yeo's (2010) study, TSE has been shown to be a positive correlate of child-perceived student–teacher relationships in elementary and middle school.

Researchers have also made a case for the usefulness of focusing on the unique, dyadic student–teacher relationship dimensions of closeness and conflict. First, using a large sample and a multilevel design, Mashburn et al. (2006) found that self-efficacious teachers were more likely to have close, but not less conflictuous relationships with regular preschool students. When explicitly focusing on problematic students, however, Hamre, Pianta, Downer, and Mashburn (2008) found less efficacious preschool teachers to be experiencing higher degrees of conflict with their students than would be expected based on their judgments of students' problem behaviors. Last, Yoon (2002) failed to confirm that high TSE is associated with high-quality relationships. In her research of K-5 teachers, TSE only accounted for 2% of the total variance in student–teacher conflict and closeness.

REGARD FOR STUDENT PERSPECTIVES

Also part of teachers' emotional support is their willingness and ability to place emphasis on students' interests, motivations, and points of view (Pianta et al., 2008). In two cross-sectional studies of Hardré and Sullivan (2008, 2009), high school teachers with a healthy sense of self-efficacy for diagnosing motivational problems were found to take such perspectives into account by using relevance, value, and internally focused strategies that emphasize interpersonal relatedness with their students and making the educational content more

meaningful to them. However, teachers' usage of autonomy supportive interpersonal styles was not predicted by TSE. Other conclusions were reached by Leroy, Bressoux, Sarrazin, and Trouilloud (2007), who found that fifth-grade teachers' self-efficacy was positively related to the creation of an autonomy supportive climate. Thus, focusing on slightly different outcome variables, these three studies reveal that teachers' regard for student perspectives is positively predicted by TSE.

SYNTHESIS OF RESULTS

Taken together, results from studies on the consequences of TSE for classroom processes indicate that high-efficacy teachers, and especially those with more experience, tend to effectively cope with a range of problem behaviors, use proactive, student-centered classroom behavior strategies and practices, and establish less conflictuous relationships with students. Contrary to preservice teachers, tenured educators who believe in their capabilities also use more diverse instructional strategies, differentiate more frequently, change their goals according to students' needs, and are more positive about the implementation of such instructional strategies. Probably, more experienced educators with high self-efficacy may have become more sensitized to students' signals, needs, and expectations, and are thereby better able to provide them with adequate supports in class. Yet studies revealing a curvilinear association between TSE and experience indicated this beneficial by-effect of experience may not last (e.g., Klassen & Chui, 2010; Wolters & Daugherty, 2007). This underscores the importance of longitudinal studies investigating the development of TSE over teachers' careers.

CONSEQUENCES OF TSE FOR STUDENTS' ACADEMIC ADJUSTMENT

The most common consequence of TSE for student outcomes was based on students' achievement, including overall school grades, literacy and math performance, and achievement in some other subjects. Of the 23 reviewed studies (see Appendix 2), most were cross-sectional in nature, except for four studies that relied on a longitudinal design (Caprara, Barbaranelli, Steca, & Malone, 2006; Guo et al., 2010, 2012; Midgley et al., 1989). In another three studies, hierarchical regression techniques were used to account for the nested data structure (Guo et al., 2010; Jimmieson et al., 2010; Reyes et al., 2012). The sample sizes of the studies varied extensively, ranging from less than 20 (Allinder, 1995; Ross, 1992) to more than 2,000 (Caprara et al., 2006). Despite the idea that TSE fluctuates across teaching tasks, none of the reviewed

investigations used domain-specific instruments to measure the construct of teacher self-efficacy. Given the divergences in sample size and methodological rigor, which may potentially have an impact on the parameters estimated, the consequences of TSE for students' academic adjustment should be interpreted with caution.

OVERALL ACHIEVEMENT

In several studies (see Appendix 2), TSE has been assessed in relation to students' overall academic performance, only one of which did not find an association between TSE and achievement, as measured by school type (Chong, Klassen, Huan, Wong, & Kates, 2010). In the elementary school context, studies by Chang (2011) and Woolfolk Hoy, Hoy, and Kurz (2008) explored the association between Academic Optimism – a latent variable comprising TSE – and students' achievement scores, and uncovered a substantial positive relationship. Next to achievement scores, *perceived* achievement and academic climate have been shown to be positively affected by TSE in middle school, although the reported coefficient was small (Chong et al., 2010; Jimmieson et al., 2010). Consistent findings were also reported in four studies conducted in high school, indicating that students whose teachers had higher TSE benefited more in terms of their academic achievement than students whose teachers had a lower sense of efficacy (Caprara et al., 2006; Hardré et al., 2006; Mohamadi & Asadzadeh, 2012; Mojavezi & Poodineh Tamiz, 2012). Caprara et al. (2006) proposed a longitudinal model with TSE as a positive contributor to students' achievement when previous levels of achievement are controlled for. Hence, these studies imply that TSE may predict students' overall performance in elementary, middle, and high school. Note, however, that coefficients are generally modest (*Mdn* = .27), ranging from .02 to .78.

MATH ACHIEVEMENT

Moving to the consequences of TSE for students' math performance, there are four empirical studies to suggest that teachers with high self-efficacy are more likely to facilitate students to develop their mathematical competence than teachers with low self-efficacy (Allinder, 1995; Hines, 2008; Midgley et al., 1989; Throndsen & Thurno, 2013). When considering students' grade level, however, these findings are less straightforward. For instance, Midgley et al. (1989) revealed that *within-year changes* in students' perceived performance in mathematics during the transition from elementary to middle school were positively predicted by TSE, although the coefficients across years were nonsignificant. Moreover, Throndsen and Turno (2013) found a small but positive correlation between TSE and math performance across Grades 2 and 3.

When investigating the associations between TSE and math achievement separately for each grade, significant correlations were only found for second-graders. Given that students' math achievement across years does not seem to vary as a function of TSE, it is possible that other teacher characteristics, including knowledge, skills, and experience, may be more important to students' math achievement than teachers' sense of self-efficacy.

LITERACY ACHIEVEMENT

Compared to other subjects, the associations between TSE and students' literacy in elementary school and beyond are relatively inconsistent in the literature (n = 6; see Appendix 2). Coefficients range from .02 to .76, with the highest value emerging from Cantrell, Almasi, Carter, and Rintamaa's (2013) study. Together with Guo et al. (2012), these researchers are the only ones to demonstrate that TSE is related to students' literacy outcomes in Grades 5, 6 and 9. Guo et al. (2010), in a study on preschool, and Heneman, Kimball, & Milanowski (2008) and Reyes et al. (2012) in studies on elementary teachers, failed to confirm the hypothesized association between TSE and students' reading and writing achievement. Moreover, teachers' predictions of students' success in reading has not been shown to depend on their levels of self-efficacy in elementary and middle school (Tournaki & Podell, 2005).

It is interesting to note that children's literacy outcomes are less often predicted by TSE than their achievement in other subjects, and math in particular. This failure of prediction might, amongst others, be due to the studies' methodological characteristics. Studies focusing on literacy have more often relied on student measures of achievement, compared to other subjects. Thereby, they accounted for overestimation of coefficients due to shared source variance, which probably reduced the impact of TSE on students' literacy outcomes to non-significance. Also, teachers' perceptions of student achievement have been shown to be generally more biased than test scores or grades (Kuncel, Credé, & Thomas, 2005). Consequently, self-efficacious teachers may also judge their students' performance to be higher than their actual achievements, thereby biasing the results of studies in which the same informants were used. This issue of common source variance, and the inclusion of more reliable achievement measures, may warrant further consideration.

ACHIEVEMENT IN OTHER SUBJECTS

Four studies were identified that focused specifically on subjects other than literacy or math (Angle & Moseley, 2010; Lumpe, Czerniak, Haney, & Beltyukova, 2012; Ross, 1992; Ross,

Hogaboam-Gray, & Hannay, 2001). All studies, except for the investigation of Ross et al. (2010), were performed in the upper elementary grades and beyond, using cross-sectional designs and revealing only small associations (*Mdn* = .13). Regarding students' science achievement, Lumpe and colleagues (2012) showed that when fourth- and sixth-grade teachers feel more efficacious in teaching science, their students' science scores are higher as well. Together with outcome expectations and hours of professional development, however, TSE in this study only explained 4% of the total variance in students' science performance. In the context of history, Ross (1992) examined links between TSE, contact with assigned coaches, and students' history achievement in a sample of Grades 7 and 8 history teachers. Teachers who interacted more with their coaches and felt more confident about their teaching abilities were more likely to positively affect their students' achievement than colleagues who had less contact with their coaches or perceived themselves as less self-efficacious. Notably, both constructs accounted for 57% of the variance in students' achievement. Angle and Moseley (2010) aimed to unravel differences between the self-efficacy beliefs of high school biology teachers whose students' biology achievement either exceeded or fell below the state proficiency level. Their results indicated that students' biology achievement did not vary according to how confident teachers were in teaching biology. One study investigating computer literacy (Ross et al., 2001) turned its focus toward very young children. Following up on the seminal study of Midgley et al. (1989), these authors distinguished an upward trajectory, in which students moved from a poorly efficacious to a highly efficacious teacher, and a downward trajectory, comprising students who shifted in exactly the opposite direction. They found that students developed their computer skills most in the upward trajectory, when students moved from a lower- to a higher-efficacy teacher. Also, TSE was directly related to students' advanced computer skills, accounting for a total of 7% of the variance in computer skills. This handful of studies is thus indicative of associations between TSE and achievement in subjects other than literacy and math.

MOTIVATION

In 11 studies (see Appendix 2), TSE was assessed in relation to students' motivation, including such aspects as student engagement, intrinsic and extrinsic motivation, academic expectations, self-efficacy, goal orientations, and school investment. Characteristic of these studies is that they had relatively small samples and were all cross-sectional in nature, except for the seminal study of Midgley et al. (1989). In half of studies the authors analyzed their data in multilevel (four studies) or SEM-designs (two studies), or used more traditional methods such as

regression analysis. Associations between TSE and aspects of students' motivation ranged from .13 to .79, with the highest associations found for total motivation and attitude scores.

The existing literature suggests that students' motivation may be more consistently predicted by their teachers' self-efficacy than their academic achievement (e.g., Thoonen et al., 2011b). During the elementary school years, students have been found to be more engaged in the classroom (Reyes et al., 2012) and academically efficacious (Ross et al., 2001) when their teachers' self-efficacy is high. In one rigorous Dutch study of Thoonen et al. (2011b), however, teachers' self-efficacy was found to be unrelated with aspects of students' motivation, including academic self-efficacy, mastery or performance-avoidance goals, intrinsic motivation, and school investment. This is perhaps not surprising, given that most reliability estimates for the motivational constructs used in this study were below the threshold of .70.

Similar to their elementary peers, middle-schoolers have been demonstrated to benefit from self-efficacious teachers in terms of higher levels of school satisfaction and confidence in their achievement at school, lower levels of psychological distress, and positive views about future learning opportunities (Jimmieson et al., 2010). Additionally, the longitudinal study of Midgley et al. (1989) lends support for the idea that TSE is associated with students' motivation during the transition from upper elementary to middle school. Specifically, students who shifted from high- to low-efficacy mathematics teachers had lower expectancies and perceived performances, and higher perceptions of task difficulty than students who were taught by highly efficacious teachers after the transition. Furthermore, variations in TSE beliefs before and after the transition to middle school were more important to low-achieving than to high-achieving students' motivational beliefs.

High schoolers whose teachers feel generally self-efficacious have been shown to display higher amounts of observed on-task behavior, increased engagement, effort and (intrinsic) motivation for school, more positive attitudes toward learning, and better opinions about their teacher (Hardré et al., 2006; Mojavezi & Poodineh Tamiz, 2012; Robertson & Dunsmuir, 2013). Other studies show that TSE may not only be directly related to teacher perceptions of their students' emotional engagement, but also indirectly affect their behavioral and emotional engagement through influence (van Uden, Ritzen, & Pieters, 2013). Turning to domain-specific TSE beliefs in high school, Hardré and Sullivan (2008) noted that teachers' efficacy beliefs for motivating and diagnosing were not associated with their perceptions of students' academic

motivation and approaches to learning. However, a later, separate study (Hardré & Sullivan, 2009), indicated that TSE for motivating and diagnosing were predictive of teachers' perceptions of student motivation, explaining almost a quarter of the variance. Thus, across educational stages and different countries, TSE seems to be a fairly robust predictor of a variety of motivational factors.

INDIRECT CONSEQUENCES

In only three relatively large studies did the authors look at the mediating role of classroom processes in the association between TSE and students' adjustment (Guo et al., 2012; Thoonen et al., 2011b; van Uden et al., 2013). Regarding achievement, Guo and colleagues (2012) pointed toward an indirect relationship of TSE with fifth-graders' literacy outcomes, via teachers' support for learning. Focusing on aspects of motivation, TSE has been shown to affect specific teacher practices, including interpersonal behavior, process-oriented instruction, and cooperative learning. These practices, in turn, may raise students' emotional and behavioral engagement (van Uden et al., 2013), and well-being in school (Thoonen et al., 2011b). Thus, this small research base provides initial evidence that teacher practices defining the classroom quality, and especially those related to *emotional support,* may canalize the effect of TSE on student outcomes. This finding corroborates prior evidence that points to the benefits of emotionally supportive teacher behaviors for encouraging students' learning, engagement, and enjoyment in their learning tasks (Reyes et al., 2012; Rimm-Kaufman & Chui, 2007).

SYNTHESIS OF RESULTS

Overall, studies suggest that TSE is modestly associated with students' academic adjustment in elementary school and beyond. Yet, aspects of students' motivation, and total motivation scores in particular, seem to be more consistently predicted by TSE than their academic achievement. Assumedly, students' motivation may be partly considered a factor determining the quality of classroom processes, and therefore, more proximal to TSE than academic performance (e.g., Woolfolk Hoy et al., 2009). Regarding achievement, TSE appears less important for middle and high schoolers' achievement in various subjects than for the attainment of elementary school children. This is perhaps not surprising, as high schoolers are taught by many teachers and see each teacher for only a small proportion of the school day (Midgley et al., 1989). Consequently, older students may be less affected by teachers' efficacy than younger children. Prior work of Guskey (1981) also revealed that secondary school

teachers feel less responsible for the successes and failures of their students than do elementary teachers. Probably, teachers' classroom mastery experiences may affect secondary school teachers' self-efficacy less than elementary teachers' capability beliefs, thereby reducing the impact of TSE on student achievement.

CONSEQUENCES OF TSE FOR TEACHERS' PSYCHOLOGICAL WELL-BEING

TEACHER BURNOUT

One imperative in understanding teachers' psychological well-being is to gain insight into how levels of burnout in teachers are buffered or exacerbated by factors such as their self-efficacy. Indeed, almost one third of the reviewed articles (n = 22) on teachers' well-being are concerned with teacher burnout (see Appendix 3). Overall, the studies on this topic were conducted in a wide variety of cultural and national settings, typically had larger sample sizes than TSE research on classroom quality and students' adjustment, and used more advanced statistical methods, including multilevel and (longitudinal) SEM. These studies may extend, therefore, the generalizability and adequacy of teachers' self-efficacy, and advance understanding of its causal pathways.

Associations between TSE and both overall burnout levels (range = –.17 to –.63; *Mdn* = –.36) and specific dimensions of burnout (range = –.09 to –.76; *Mdn* = –.25 for emotional exhaustion; range = .13 to .75; *Mdn* = .36 for personal accomplishment; range = –.16 to –.60; *Mdn* = –.33 for depersonalization) have been fairly consistent across studies. In the preservice context, teachers with high levels of self-efficacy for instructional strategies and classroom management have generally been shown to be less likely to feel emotionally exhausted and to depersonalize their students early in their student-teaching experience than less efficacious student educators (Fives, Hamman, & Olivarez, 2007). Furthermore, self-efficacy for student engagement and instructional strategies appears to be predictive of higher levels of personal accomplishment over time (ibid.).

Some insights into how TSE may relate to such aspects of burnout have been provided by Hultell, Melin, and Gustavsson (2013). Their cluster-analytic results revealed that preservice teachers' burnout levels were accompanied by decreases in TSE, low and stable levels of burnout were reflected by high TSE, stable and high levels of burnout were characterized by low TSE, and stable and moderate levels of burnout resulted from changing levels of TSE over

time. Although these findings imply that higher self-efficacy preservice teachers may be more resistant to burnout, such outcomes may not necessarily extend to their first years of teaching (Høigaard, Giske, & Sundsli, 2012).

More experienced inservice teachers with high self-efficacy, however, have been found to report lower levels of overall burnout (Brissie, Hoover-Dempsey, & Bassler, 1988; Egyed & Short, 2006; Friedman, 2003) and specific burnout dimensions, with negative associations between TSE and emotional exhaustion and depersonalization, and positive associations between TSE and personal accomplishment (Egyed & Short, 2006; Friedman, 2003). Furthermore, the beneficial effects of these capability beliefs continue to be present in secondary school, as indicated by rigorous, mainly Dutch research (Briones, Taberno, & Arenas, 2010; Brouwers et al., 2001; Brudnik, 2009; Evers, Brouwers, & Tomic, 2002; Evers, Tomic, & Brouwers, 2005). In line with Bandura's (1997) notion of reciprocal determinism, support has even been found for a feedback loop in which low levels of TSE reinforce teachers' burnout and vice versa (Brouwers et al., 2001). Focusing on specific burnout dimensions, TSE has a longitudinal negative effect on depersonalization, and a synchronous positive effect on personal accomplishment (Brouwers & Tomic, 2000). It should be noted, however, that Brouwers and Tomic's results also pointed to a reversed direction of relationships between TSE and emotional exhaustion. This underscores the importance of longitudinal research that advances knowledge of the definitive causation of TSE on burnout dimensions.

Culturally diverse studies concerned with all grade levels did not deviate much from the abovementioned pattern of results (e.g., Avanzi et al., 2013). In Norway, negative relationships were found between TSE and overall burnout scores (Skaalvik & Skaalvik, 2007) and emotional exhaustion and depersonalization (Skaalvik & Skaalvik, 2010). Similarly, Avanzi et al. (2013) found that Italian teachers' efficacy was negatively correlated with student- and work-related burnout. Researchers from the United States suggest that teachers have a higher sense of personal accomplishment and feel less emotionally exhausted when they have confidence in their abilities to actively engage their students and to handle student misbehavior (Martin et al., 2012; Shyman, 2010; Tsouloupas et al., 2010). These findings substantiate those of Schwarzer and colleagues (Schwarzer & Hallum, 2008; Schwarzer, Schmitz, & Tang, 2000; So-kum Tang, Au, Schwarzer, & Schmitz, 2001), who generally found the same pattern of relationships as studies discussed above for Syrian, Chinese, and German teachers. So-kum Tang et al. (2001)

furthermore found TSE to be directly and indirectly related to the mental health of teachers, through their burnout. In one longitudinal study, it was demonstrated that changes in Canadian teachers' self-efficacy were negatively related to changes in their levels of emotional exhaustion and depersonalization, and positively related to changes in their sense of personal accomplishment (Fernet, Guay, Senecal, & Austin, 2012).

Indirect consequences of TSE on teacher burnout

In two studies (Doménech-Betoret, 2009; Martin et al., 2012) the focus has been on the potential indirect consequences of teachers' self-efficacy for their levels of burnout. Martin et al. (2012), for instance, showed that TSE for student engagement relates positively to instructional practices, which, in turn, predict the amount of student stressors in the classroom and increases teachers' personal accomplishment. Moreover, Doménech-Betoret (2009) found that difficulties related to the classroom (i.e., student diversity and misbehavior) mediate the relationship between TSE and burnout dimensions. Hence, with some exceptions, studies of the predictive associations between TSE and teacher burnout show a quite consistent pattern across contexts and grade levels. Practices related to instruction and behavior management may mediate this relationship.

TEACHERS' STRESS AND COPING

Six studies (see Appendix 3) investigated the degree to which TSE is related to teachers' levels of stress and coping. In these studies, correlations between TSE and stress ranged from .06 to .50, and between TSE and coping from –.11 to .05. Across grades, the results reported indicate that teachers with high self-efficacy experience less job-related stress (Barouch Gilbert, Adesopea, & Schroeder, 2013; Doménech-Betoret, 2006; Robertson & Dunsmuir, 2013), and fewer student stressors (e.g., concerns regarding student demotivation, or teaching students of mixed ability). Such student stressors, in turn, may significantly reduce teachers' dissatisfaction for their job (Sass, Seal, & Martin, 2011). Next to direct associations, higher class and school TSE also indirectly reduce the amount of teachers' perceived tension (Helms-Lorenz, Slof, Vermue, & Canrinus, 2012). Teachers' active or passive coping, however, was not found to be predicted by TSE (Chan, 2008). Instead, school coping resources and TSE have been shown to buffer the negative effect of stressors on teachers' burnout (Doménech-Betoret, 2006). Thus, efficacious teachers do not necessarily seem to have more coping resources, but at least may experience less stress in their profession. The results from these studies should be interpreted with caution, as these studies typically included only a limited number of teachers, and, in six

cases, employed statistical techniques that may be unsuitable for use in smaller samples.

TEACHERS' JOB SATISFACTION

Next to stress and burnout, few researchers have considered more positive factors underlying teachers' psychological well-being as outcomes of TSE (e.g., Caprara et al., 2003, 2006; Collie et al., 2012; Helms-Lorenz et al., 2012). One of the most common outcomes studied in this domain is teachers' job satisfaction (n = 21). Only Avanzi et al. (2013) and Salanova et al. (2011) have conducted longitudinal studies and can infer the causality that has been posited. However, more than half of the reviewed investigations have gone beyond commonly used correlational approaches, fitting complex structural equation models and revealing more complex patterns of relationships. With some exceptions (Briones et al., 2010; Høigaard et al., 2012; Lent et al., 2011), investigators considering this consequence of TSE have demonstrated a stable pattern of results, with coefficients ranging from .10 to .86 (*Mdn* = .33). In elementary school (Collie et al., 2012; Helms-Lorenz et al., 2012; Skaalvik & Skaalvik, 2010; Stephanou, Gkavras, & Doulkeridou, 2013), as well as in middle and high school (Canrinus, Helms-Lorenz, Beijaard, Buitink, & Hofman, 2010; Caprara et al., 2003, 2006; Tsigilis, Koustelios, & Grammatikopoulos, 2010), self-efficacious teachers have been found to be more satisfied with their job and relationships than their less efficacious counterparts. Interestingly, higher efficacy teachers seem less satisfied with their salary, but are better able to manage this when they are at the same time satisfied with their relationships at work (Canrinus et al., 2012).

Assessing all grade levels simultaneously, results also point to positive associations between TSE and job satisfaction (Avanzi et al., 2013; Barouch Gilbert et al., 2013; Collie et al., 2012; Duffy & Lent, 2009; Klassen et al., 2009; Klassen & Chiu, 2010; Moè, Pazzaglia, & Ronconi, 2010; Viel-Ruma, Houchins, Jolivette, & Benson, 2010) and (indirect) negative associations between TSE and job discontent (Sass et al., 2011). These effects seem to hold across time, domains of TSE, and levels of teaching experience (e.g., Blackburn & Robinson, 2008; Canrinus et al., 2012; Salanova, Llorens, & Schaufeli, 2011; Tsigilis et al., 2010).

Indirect consequences of TSE on teachers' job satisfaction

Probably, TSE and job satisfaction are part of a more complex dynamic. For instance, factors such as work conditions, student stressors, personal achievement, and social support have been shown to mediate the relationship between TSE and job satisfaction (Briones et al., 2010; Duffy & Lent, 2009; Lent et al., 2011; Sass et al., 2011). These complex direct and indirect

influences, which all encompass socioemotional aspects of teaching, evidently speak to Bandura's model of triadic reciprocal causation. Yet, longitudinal studies are needed to determine the causal ordering of effects.

TEACHERS' COMMITMENT

In total, 12 articles (see Appendix 3) have investigated the predictive associations between TSE and teacher commitment, which range from .10 to. 36 (*Mdn* = .26). Large-scale correlational studies of preservice teachers' self-efficacy have indicated that TSE, especially in the domain of classroom management, is a positive predictor of occupational commitment, irrespective of the country in which teachers perform their job (Evans & Tribble, 1986; Klassen & Chui, 2011; Klassen et al., 2013). Also in elementary, middle and high school, higher self-efficacy inservice teachers have generally been found to feel more professionally, affectively, organizationally, and occupationally committed than poorly efficacious educators (Barouch Gilbert et al., 2013; Bogler & Somech, 2004; Canrinus et al., 2010; Caprara et al., 2003; Chan, Lau, Nie, Lim, & Hogan, 2008, Coladarci, 1992; Ebmeier, 2003; Rots, Aelterman, Vlerick, & Vermeulen, 2007).

Regarding domain-specific TSE, two studies of Ware and Kitsantas (2007, 2011), using the same vast sample of 26,257 teachers, showed that teachers with high efficacy to enlist administrative control, make decisions, and control aspects of their classroom operations may be more committed to teaching. In Klassen and Chui's (2011) study, only TSE for instructional strategies was a positive predictor of practicing teachers' occupational commitment. Thus, teachers feel more committed to teaching when their self-efficacy is high. These results hold across countries and various types of commitment, including affective, organizational, and occupational commitment (e.g., Barouch Gilbert et al., 2013; Klassen & Chui, 2011; Klassen et al., 2013).

TEACHER ATTRITION AND RETENTION

Seven studies (see Appendix 3) sought to assess TSE in direct relation to teacher attrition and retention. From these generally small correlational studies, it follows that only preservice teachers with high self-efficacy intend to remain longer in the profession (Bruinsma & Jansen, 2010). Inservice TSE, irrespective of grade level, has not been found to be directly associated with teachers' levels of absenteeism (Imants & Van Zoelen, 1995), intention to leave (Barouch Gilbert et al., 2013; Høigaard et al., 2012) or stay (Canrinus et al., 2010; Hughes, 2012; Malow-Iroff, O'Connor, & Bisland, 2007).

Indirect consequences of TSE on teacher attrition and retention

Despite this lack of direct effects, some indirect effects of TSE on teacher attrition and retention have been noted. Several studies (Klassen & Chui, 2011; Tsouloupas et al., 2010) suggest that teachers with poor efficacy for classroom management and instructional strategies may be more prone to feel emotionally exhausted and uncommitted to their occupation than educators with high efficacy. This may cause them to leave the profession entirely. In contrast, teachers' responsibility to remain in their profession seems to be indirectly predicted by TSE via their affective commitment and relationship satisfaction (Canrinus et al., 2010). Notably, for both preservice and inservice teachers, low TSE for classroom management seems to be the most important trigger to abandon their job. Hence, although the correlational nature of the aforementioned literature prevents us from making causal inferences, the effect of TSE on attrition and retention is most likely to be mediated by teachers' job commitment and satisfaction.

SYNTHESIS OF RESULTS

Findings pertaining to factors underlying teachers' psychological well-being seem robust. Irrespective of pre- or inservice context, grade level, and country, and potentially over time, self-efficacious teachers may suffer less from stress, emotional exhaustion, depersonalization, and overall burnout, and experience higher levels of personal accomplishment, commitment, and job satisfaction. Moreover, emotional and organizational processes in class, such as student misbehavior and motivation, positive affect, and instructional management, are likely to function as catalysts in the relationship between TSE and teachers' burnout and job satisfaction. Following Spilt, Koomen, and Thijs (2011), this process might be attributable to teachers' internalization of experiences with specific students in representational models of relationships, which not only guide teachers' emotional responses and well-being in class, but may also increase or compromise their self-efficacy.

TSE is not directly related to teacher attrition and retention. Rather, teachers with low self-efficacy seem to experience higher levels of emotional exhaustion and lower levels of satisfaction and commitment, ultimately leading them to quit their job. These indirect effects imply that positive feelings of well-being, such as commitment and satisfaction, are the mechanism through which TSE exerts its influence over teachers' intention to stay or leave.

Overall, positive aspects of teachers' psychological well-being can thus be suggested to be more mutable due to their self-efficacy than negative aspects.

DISCUSSION

The present review is probably the first to provide an up-to-date synthesis of forty years of research on TSE and its various consequences, using a heuristic model inspired by the process-oriented view of Woolfolk Hoy et al. (2009) and CLASS-framework of Pianta et al. (2008). In this section, critical areas of research needed to advance TSE research across lines of inquiry related to classroom processes, student adjustment, and teacher well-being are discussed. Additionally, some more general methodological and theoretical challenges to the study of TSE are considered.

CLASSROOM PROCESSES

Of all domains, aspects of classroom organization were found to be the best represented in the literature, probably owing to the growing popularity of classroom management TSE and the numerous attempts made to measure this construct (O'Neill & Stephenson, 2011). Unfortunately, though, most studies in this field did not seem to inform or effectively build on one another. Specifically, the range of efficacy-influenced teaching processes associated with this domain was quite extensive, covering a host of different strategies, behaviors, attitudes, and decisions in class. Moreover, each of these teacher processes appeared to be investigated only once or twice in isolated, cross-sectional studies focusing on various student groups or different grades, and using different measures. Such fragmentation of the field may prevent researchers from drawing definite conclusions on the links among TSE and aspects of classroom organization across grade level, specific types of students, and contexts. Hence, the need for integration among those diverse literatures will continue to be an important area of research for the years to come.

The heuristic model highlighted the current lack of research on the consequences of TSE for emotionally supportive classroom processes. This is important, as TSE may be particularly relevant for the interpersonal aspects of teaching (see Labone, 2004). For instance, past research suggests that TSE may function as a protective factor against poor student–teacher relationship quality, such that students with generally self-efficacious teachers are less vulnerable to developing poor-quality relationships with their teacher, even if their behavior is

problematic (Hamre et al., 2008; Mashburn et al., 2006; Midgley et al., 1989). From a dyadic angle, Spilt and Koomen's (2009) results showed that teachers perceive themselves as less self-efficacious in relation to individual, disruptive students.

Notably, the absence of the emotional support component of teaching is also evident in the various instruments that have been developed to measure TSE and its underlying dimensions. Possibly, the role of teachers in maintaining warm relationships with students and supporting their basic needs is an aspect of TSE that is difficult to capture by current instruments, especially when taking a dyadic perspective on such associations. However, as classrooms are inherently social contexts, and teachers' socioemotional support is one of the strongest correlates of student adjustment (e.g., Davis, 2003), researchers should work to increase awareness of the impact of TSE on emotional support in the classroom. Adapting TSE instruments to include the emotional domain and broadening the construct of TSE to include dyadic relationships may be important steps forward to further elucidate this link.

STUDENTS' ACADEMIC ADJUSTMENT

Next to classroom processes, results bring attention to the need to better understand the role of TSE in students' academic adjustment. To date, many scholars have come to claim that TSE is a particularly powerful predictor of students' academic adjustment. However, the body of research looking into this specific relationship is not nearly as large as can be expected from this general assertion. Of all studies reviewed, only 27 provided insight into the links among TSE and students' achievement and motivation. Interestingly, these do not appear to be the studies that are usually referred to. Specifically, most-cited articles (e.g., Tschannen-Moran et al., 1998) seem to be theoretical in nature, only assuming possible links between TSE and students' academic adjustment. Additionally, the majority of scholars focusing on the link between TSE and achievement tend to mainly discuss links between TSE and a range of classroom processes. Although these efficacy-influenced processes are generally *presumed* to be supportive of students' achievement, empirical evidence regarding such complex, indirect links is still lacking. This potentially suggests a bias in the interpretation of TSE research.

Another challenge in the examination of TSE in relation to students' adjustment pertains to the methods of data collection and analysis. Generally, the majority of reviewed studies solely relied on teacher reports of both TSE and student adjustment, and largely overlooked the fact that students were not sampled independently from each other. This lack of consideration for

both shared method variance and the dependent nature of the data might have possibly lead to an overstatement of statistical significance, given that students' adjustment tends to be more alike when they share the same teacher. As such, the validity of the results of this work may be questionable in the absence of methodological rigor. Overall, future researchers should take account of both teacher and student data, and use multilevel (SEM) designs to elucidate the relationship between TSE and students' achievement, both directly and indirectly, through daily classroom processes.

TEACHERS' WELL-BEING

There is an abundance of studies on the link between TSE and teachers' psychological well-being, but the majority of this research has concentrated on factors hampering teachers' welfare. Perhaps, the popularity of this research focus is unsurprising, as teaching is considered one of the most stressful occupations (Johnson et al., 2005). Still, the empirical evidence included in this review suggests that TSE may be of higher predictive value for positive factors, such as personal accomplishment, than for dimensions of stress and burnout (see Aloe et al., 2014). Specifically, high TSE beliefs, and in particular those that go beyond the instructional domain, seem to help teachers stay motivated, satisfied, and consequently on the job. Further investigation of the complex interrelationships between TSE, positive feelings of well-being, and teacher retention may be an important avenue of research that could be pursued.

CONCEPTUAL AND METHODOLOGICAL CHALLENGES

Both theoretically and empirically, one of the major challenges to TSE research is to realize the full richness of the TSE construct. Theories of self-efficacy suggest that TSE should be measured in terms of specific beliefs that fluctuate across tasks, domains, and different contexts. Consistent with the review findings of Klassen et al. (2011), a large proportion of empirical studies unfortunately failed to use such more complex, multidimensional measures. Bandura (1997) has cautioned researchers attempting to measure TSE that undifferentiated self-efficacy scales usually suffer from low predictiveness, as these scales are not distinctly linked to what they seek to predict. This may explain, in part, why most reported coefficients, and especially those in the domain of teaching and learning, are only small to moderate.

Studies using multidimensional measures of TSE may allow for the detection of unique self-efficacy dimensions that may have different patterns of effects on similar outcomes. A good

starting point is the domain-specific Bandura-based scale of Tschannen-Moran and Woolfolk Hoy (2001), which, coincidentally, bears a strong resemblance to the CLASS-domains of Pianta and colleagues (2008). The identification of such dimensions of TSE has potential for comparing, contrasting, and integrating various lines of TSE research and theory that, to date, have occupied isolated territories.

Ideally, advancements in the sophistication of measures should be accompanied by greater methodological and data-analytic rigor. Generally, the quality of reviewed studies varied considerably in terms of sample size, employed measures of TSE, and complexity of statistical analyses. Especially where students' academic adjustment and aspects of classroom processes were concerned, the host of research primarily relied on simple correlation techniques and total self-efficacy scores in cross-sectional designs, thereby largely failing to take account of the highly particularized and potentially fluctuating nature of TSE. In future studies, therefore, greater emphasis should be placed on longitudinal analyses and (multilevel) structural equation models, in which differing pathways of influences can be compared, and the temporal precedence of predictors can be established.

LIMITATIONS

The current review faces some limitations. First, despite careful efforts to systematically search the literature, it is possible that some studies have been overlooked, or their relevance unacknowledged. This might especially be the case for unpublished work, or articles that did not meet our inclusion and exclusion criteria. By paying attention to qualitative papers, non-English language articles, dissertations, or book chapters, future researchers might be able to uncover new, and more nuanced patterns of results than this review has provided, and overcome the traditional limitation of publication bias.

A second limitation pertains to the fact that both TSE and its consequences have been measured by a variety of different instruments, each of which focuses on slightly different aspects. This lack of common measures not only makes it difficult to make proper distinctions between different dimensions of TSE, but also to compare and synthesize its consequences along the heuristic model. In some cases, this might have resulted in a lack of nuance, or even a misclassification of effects. Related, the divergences in measurement and conceptualization of the variables of interest in this review, as well as the sometimes largely varying sample sizes across the included articles, have impeded comparison of the results of all studies, and

especially those regarding students' academic adjustment. For this reason, we also did not provide a detailed overview of the strength of relationships between TSE and student and teacher outcomes in the classroom. Although full-scale meta-analyses of TSE and its consequences are warranted to further advance the field, this is probably only (partly) possible for research on teachers' well-being, which generally relies on similar measures.

Third, as the bulk of selected studies was cross-sectional in nature, this review does not allow for conclusions about definitive causation of TSE along multiple dimensions. Moreover, following Bandura's (1997) notions, TSE is likely to be part of a complex system of triadic reciprocal causality, in which environmental forces, personal factors, and behaviors influence one another bi-directionally. Consideration of alternative, potentially reciprocal pathways in process-oriented models would probably add important insights to the discussion of these associations. To this end, markers of change in TSE over time are needed in future research. Fine examples in this respect come from studies on the link between TSE and burnout (Brouwers et al., 2001; Brouwers & Tomic, 2000), suggesting feedback loops in which low levels of TSE reinforce teachers' burnout and vice versa. Both social-cognitive theory and classroom-based research (e.g., Pianta et al., 2008), may provide guidelines for exploring causal pathways among TSE, classroom processes, and student adjustment across time, and detecting potential feedback loops. Both longitudinal and experimental studies, especially in the area of student performance and classroom processes, may therefore be promising next steps to considering the causal mechanisms underlying TSE and its consequences for students, teachers, and classroom processes. Research exploring the development of different patterns of TSE may eventually reveal warning signs early enough to allow preventative actions.

CONCLUSION

This review aimed to provide an up-to-date, critical review of forty years of research on TSE and its direct and indirect consequences at different levels of classroom ecology. Although the evidence tends to corroborate that TSE is relevant for the quality of classroom processes, students' adjustment, and teachers' well-being, further theoretical elaboration and empirical substantiation of the outcomes of the reviewed studies is needed to move the field forward. Multidimensional measures, research designs that reveal more complex indirect effects and potential feedback loops, and further integration between lines of inquiry as suggested by the heuristic model may be helpful in achieving this goal.

APPENDIX 1

Classroom Processes

Author(s)	Country	Category	Subtheme	Grade	N	TSE measure	Analysis	Results
Abuh-Tineh et al. (2011)	Jordan	CO	SAB	Elementary, middle, and high school	566 teachers	TSES	Correlations	TSE→ Instructional Management: $r = .42$ TSE→ Behavior Management: $r = .36$ TSE→ People Management: $r = .35$ TSE→ Classroom Management Overall: $r = .47$
Ahmad et al. (2010)	Malaysia	CO	Computer Use	University	731 teachers	Newly developed scale	SEM	Computer TSE→ Technology Use: $\beta = .45$
Ahsan et al. (2012)	Bangla-desh	CO	Inclusive Practices	Preservice context	1,623 teachers	TEIP	Correlations	TSE (Inclusive Practices)→ Concerns: $r = .24$ TSE (Inclusive Practices)→ Attitudes: $r = .20$
Allinder (1995)	USA	IS	IP	Elementary school (Special Education; G3–G6)	19 teachers 38 students	TES	ANCOVA	High *vs.* low TSE→ Goal Ambitiousness: $M = 20.50$ ($SD = 4.83$); $M = 16.88$ ($SD = 4.78$) (*ns*) High *vs.* low TSE→ N Instructional Changes: $M = .67$ ($SD = .26$); $M = 1.08$ ($SD = .49$) (*ns*) High *vs.* low TSE→ N Goal Changes: $M = 1.17$ ($SD = .67$); $M = .54$ ($SD = .48$) High *vs.* low TSE→ Timing of Change: $M = 2.00$ ($SD = 1.67$); $M = 2.23$ ($SD = 1.59$) (*ns*)
Almog & Shechtman (2007)	Israel	CO	Problem Behaviors	Elementary school (G1 – G3)	33 teachers	TES	Correlations	TSE→ Low Achievement: $r = .33$ TSE→ Shyness: $r = .44$ TSE→ Disobedience: $r = .22$ TSE→ Social Rejection: $r = .37$ TSE→ Passive Aggression : $r = .45$ TSE→ Impulsiveness : $r = .30$ TSE→ Hostility and Aggression : $r = .20$ TSE→ Hyperactivity: $r = .30$
Bogler & Somech (2004)	Israel	CO	SAB	Middle school (G7–G9)	983 teachers	SPES	Regression	TSE→ Organizational Citizenship Behavior: $\beta = .35$
Brady & Woolfson (2008)	UK	CO	Inclusive Practices	Primary school	118 teachers	TSES (short)	Regression	TSE→ Locus of Causality: $\beta = .19$ TSE→ Controllability: $\beta = -.09$ *(ns)* TSE→ Stability: $\beta = .11$ *(ns)*

Brown (2005)	USA	IS	IS Math/ Literacy	Preschool	94 teachers	TSES	Correlations	TSE (IS, CM, SE, Overall)→ Math Beliefs: r = .23; r = .20; r = .27; r = .25 TSE (Overall)→ Teacher Beliefs about the Importance of Maths: r = .19 *(ns)* TSE (Overall)→ Math Instructional Practices: r = .24*(ns)*
Brownell & Pajares (1999)	USA	CO	Inclusive Practices	Elementary school (G2)	200 teachers	Newly developed scale	SEM	TSE→ Success in Teaching Students with Disabilities: β = .39
Capa-Aydin et al. (2009)	Turkey	CO	Goal Structures	Preservice context	1,218 teachers	(T)TSES	Canonical correlations	TSE→ Self-Regulation Variables: r = .52
Chacon (2005)	Venezuela	IS	IS Math/ Literacy	High school	104 teachers	TSES (short)	Correlations	TSE (IS, CM, SE)→ Communication Strategy: r = .32; r = .26; r = .39 TSE (IS, CM, SE)→ Grammar Strategy: r = .24; r = .24; r = .24
Cantrell & Hughes (2008)	USA	IS	Imple-mentation	Elementary and middle school (G6 –G9)	22 teachers	Newly developed scale	Correlations	TSE (fall, spring)→ Implementation Content Literacy Approach: r = .48; r = .31 *(ns)*
Chen (2010)	USA	CO	Computer Use	Preservice context	206 teachers	Newly developed scale	SEM	TSE→ Technology Use: β = .45
Cho & Shim (2013)	USA	CO	Goal Structures	Elementary, middle, and high school	211 teachers	TSES (short)	HLM	TSE→ Mastery Goals for Teaching: β = .31 TSE→ Performance Goals for Teaching: β = .17
Chung et al. (2005)	USA	ES	STR	Preschool	152 teacher 608 children	TBS	Regression	TSE→ Student-Teacher Relationship: β = .14 (*ns*)
Ciani et al. (2008)	USA	CO	Goal Structures	Senior high school	156 teachers	TSES (short)	SEM	TSE-IS→ Mastery Classroom Goal Structure: β = .33
Deemer (2004)	USA	CO	Goal Structures	High school (G9–G12)	99 teachers	TES (adapted)	SEM	TSE→ Mastery Instr. Practices: β = .26 TSE→ Performance Instr. Practices: β = .00 (*ns*)
DeForest & Hughes (1992)	USA	CO	Referral Decisions	Elementary school (G2–G4)	102 teachers	TES	ANOVA	Low *vs.* high TSE→ Intervention Acceptance: $F(1, 56)$ = 6.72
De Jong et al. (2013)	Nether-lands	ES	STR	Preservice context	120 teachers	TSES (short)	HLM	TSE-IS→ Control; Affiliation: B = -.04; B = -.03 (*ns*) TSE-CM→ Control; Affiliation: B =.04; B = -.04 (*ns*) TSE-SE→ Control; Affiliation: B = -.05; B = .06 (*ns*)

Dunn & Rakes (2011)	USA	CO	ILF	Preservice context	185 teachers	TSES (short)	Correlations	TSE→ Learner-Centered Beliefs: $r = .32$
Dunn et al. (2013)	USA	IS	Imple-mentation	Kindergarten – high school (K–12)	537 teachers	Newly developed scale, TSES	SEM	Data-Driven Decision Making TSE→ Impact Collaboration Concerns: $\beta = .25$
Dussault (2006)	Canada	CO	SAB	High school	487 teachers	EAEE	Correlations	TSE→ Altruism: $r = .34$ TSE→ Courtesy: $r = .19$ TSE→ Conscientiousness: $r = .19$ TSE→ Civic Virtue: $r = .24$
Egyed & Short (2006)	USA	CO	Referral Decisions	Elementary school	106 teachers	TES	Discr. analysis	*No results are given (insignificant)*
Emmer & Hickman (1991)	USA	CO	SAB	Preservice context	161 teachers	SCMD	Correlations	TSE-CM→ Positive Strategies: $r = .30$ TSE-CM→ Reductive Strategies: $r = .00$ (*ns*) TSE-CM→ External Strategies: $r = .09$(*ns*) TSE (Personal)→ Positive Strategies: $r = .32$ TSE (Personal)→ Reductive Strategies: $r = .11$ (*ns*) TSE (Personal)→ External Strategies: $r = .20$
Eren (2009)	Turkey	CO	Goal Structures ILF	Preservice context	374 teachers	TESPT	Correlations HLM	*Correlational results:* TSE→ Performance- Approach Goals;: $r = .19$ TSE→ Performance- Avoidance Goals;: $r = -.21$ TSE→ Mastery- Approach Goals;: $r = .27$ TSE→ Mastery- Avoidance Goals;: $r = -.07$(*ns*) *Regression results:* TSE→ Constructivist Conceptions: $\beta = .12$ TSE→ Traditional Conceptions: $\beta = -.03$(*ns*)
Eren (2012)	Turkey	CO	Goal Structures	Preservice context	396 teachers	TSAO/TSES	SEM	AO→ Planned Effort: $\beta = .83$ AO→ Planned Persistence: $\beta = .48$ AO→ Professional Development Aspirations: $\beta = .78$ AO→ Leadership Aspirations: $\beta = .14$
Eslami & Fatahi (2009)	Iran	IS	IS Math/ Literacy	High school	40 teachers	Newly developed scale	Correlations	TSE (IS, CM, SE)→ Grammar-Oriented Strategies: $r = .19$ (*ns*); $r = -.08$ (*ns*); $r = -.04$(*ns*) TSE (IS, CM, SE)→ Communication-Oriented Strategies: $r = .30$; $r = .25$ (*ns*); $r = .37$

Eun & Heining-Boynton (2007)	USA	IS	Imple-mentation	Kindergarten–high school (K–12)	90 teachers	TES (adapted)	Regression	TSE→ Use of Knowledge and Skills: $t(1) = 2.435$
Gao & Mager (2011)	USA	CO	Inclusive Practices	Preservice context	216 teachers	TES	Correlations	TSE→ Attitudes toward Children with Academic Disabilities: $r = .29$ TSE→ Attitudes toward Children with Physical Disabilities: $r = .18$ TSE→ Attitudes toward Children with Behavioral Disabilities: $r = .20$ TSE→ Attitudes toward Children with Social Disabilities: $r = .29$ TSE→ Personal Beliefs of Diversity: $r = .35$ TSE→ Professional Beliefs of Diversity: $r = .43$
Geijsel et al. (2009)	The Nether-lands	IS	IP	Elementary school	328 teachers	Newly developed scale	SEM	TSE→ Keeping up-to-date: $\beta = .31$ TSE→ Reflective Practice: $\beta = .30$ TSE→ Changed Practice: $\beta = .25$
Ghaith & Yaghi (1997)	USA	IS	Imple-mentation	Middle and high school	25 teachers	TES	ANOVA	Low *vs.* High TSE→ Congruence: $M = 3.00$ ($SD = 1.20$); $M = 4.60$ ($SD = .67$) Low *vs.* High TSE→ Cost: $M = 3.53$ ($SD = 1.13$); $M = 3.30$ ($SD = 1.42$) (*ns*) Low *vs.* High TSE→ Difficulty: $M = 3.33$ ($SD = 1.11$); $M = 2.70$ ($SD = 1.06$) (*ns*) Low *vs.* High TSE→ Importance: $M = 4.53$ ($SD = .74$); $M = 5.20$ ($SD = .42$)
Ghaith & Shaaban (1999)	Lebanon	IS	Imple-mentation	Unknown	292 teachers	TES	Correlations	TSE→ Self-Survival Concerns: $r = -.14$ TSE→ Impact Concerns: $r = -.17$ TSE→ Total Teacher Concerns: $r = -.19$
Gibbs & Powell (2012)	UK	CO	Referral Decisions	Primary and nursery schools	197 teachers	TSES (adapted)	Correlations	TSE-CM→ Fixed Term Exclusions: $r = -.14$ (*ns*) TSE-IS→ Fixed Term Exclusions: $r = -.10$ (*ns*) TSE-SE→ Fixed Term Exclusions: $r = -.10$ (*ns*)
Gibson & Dembo (1984)	USA	CO	Goal Structures ILF	Preservice context	55 teachers (results are based on 8 teachers)	TES	Descriptives	High *vs.* Low TSE→ Amount of Time Spent in Instruction: $M = 234.0$ ($SD = .61.9$); $M = 271.5$ ($SD = 24.9$) High *vs.* Low TSE→ Amount of Time Spent in Nonacademic Tasks: $M = 210.3$ ($SD = 64.4$); $M =$

								172.0 (*SD* = 12.5) High *vs.* Low TSE→ Praise per Correct Answer: *M* = .03 (*SD* = .03); *M* = .01 (*SD* = .02) High *vs.* Low TSE→ Criticism per Incorrect Answer: *M* = .00 (*SD* = .00); *M* = .04 (*SD* = .02) High *vs.* Low TSE→ Persistence per Incorrect Answer: *M* = .75 (*SD* = .37); *M* = .66 (*SD* = .34) High *vs.* Low TSE→ Lack of Persistence per Incorrect Answer: *M* = .38 (*SD* = .11); *M* = .67 (*SD* = .12)
Gorozidis & Papaioannou (2011)	Greece	IS	Imple-mentation	Junior high school	130 teachers	Newly developed scale	SEM	TSE in Student-Centered Teaching Styles→ Attitudes toward Implementation: β = .31 TSE in Teaching Daily Lesson Plans→ Intention toward Implementation: β = .31
Guo et al. (2010)	USA	ES, IS	EC IS	Preschool	67 teachers 328 students	TSEQ	Correlations	TSE→ Emotional Support: *r* = .16 (*ns*) TSE→ Instructional Support: *r* = .17 (*ns*)
Guo et al. (2012)	USA	ES	EC	Elementary School (G5)	1,043 teachers and their students	TSEQ	SEM	TSE→ Support for Learning: β = .19 TSE→ Support for Learning→ Grade 5 Reading: β = .01
Guo et al. (2013)	USA	IS	IS Math/ Literacy	Preschool	54 teachers	TSEQ	Regression	TSE→ Instructional Support: β = .40
Hamre et al. (2008)	USA	ES	STR	Preschool	597 teachers 2,282 children	TSEQ (adapted)	HLM	TSE→ Conflict: *B* = -.01
Hardré & Sullivan (2008)	USA	ES	STR Persp.	High school	75 teachers	MSQ	Regression	TSE (Motivating; Diagnosing)→ Relatedness and Emotional Support: β = .21 (*ns*); β = .17(*ns*) TSE (Motivating; Diagnosing)→ Relevance and Value: β = .11 (*ns*); β = .37
Hardré & Sullivan (2009)	USA	ES	EC	High school	96 teachers	MSQ	Regression	TSE (Motivating; Diagnosing)→ Autonomy Supportive Interpersonal Styles: *r* = -.02 (*ns*); *r* = .21 (*ns*) TSE (Motivating; Diagnosing)→ Internal Strategies: β = .08 (*ns*); β = .59 TSE (Motivating; Diagnosing)→ Can't Influence: β = -.36; β = .02 (*ns*)

Haverback (2009)	USA	IS	IS Math/ Literacy	Preservice context	40 teachers	TSES (reading)	Correlations	TSE (pretest)→ Reading Strategy Use: r = .10 (*ns*) TSE (posttest)→ Reading Strategy Use: r = -.12 (*ns*)
Holzberger et al. (2013)	Germany	CO, IS	SAB IS Math/ Literacy	Middle school (G9)	155 teachers 3,483 students	GTSES	(Longitudinal) SEM, correlations	*Correlational results (teacher and child perceptions):* TSE→ Cognitive Activation: r = .21 (*ns*); r = .45 TSE→ Classroom Management: r = .47; r = .31 TSE→ Individual Learning Support: r = .16 (*ns*); r = .24 *Longitudinal results (teacher and child perceptions):* T1 TSE→ T2 Cognitive Activation: *ns* T1 TSE→ T2 Classroom Management: *ns* T1 TSE→ T2 Individual Learning Support: β = .24; *ns* T1 Cognitive Activation→ T2 TSE: *ns*; β = .33 T1 Classroom Management→ T2 TSE: β = .19; β = .33
Hoy & Woolfolk (1990)	USA	CO	SAB	Preservice context	191 teachers	TES	Repeated measures ANOVA	Pre- and post Pupil Control Orientation: $M_{pretest}$ = 50.83; $M_{posttest}$ = 48.50
Hughes et al. (1993)	USA	CO	Referral Decisions	Elementary school	55 teachers	Newly developed scale	ANOVA	*Univariate F for problem behavior vignettes are not given.*
Jimmieson et al. (2010)	Australia	ES	STR	Elementary and middle school (G5–G7)	170 teachers 3,057 students	JES	HLM	TSE→ Student-Teacher Relationship : β = .20
Justice et al. (2008)	USA	IS	IS Math/ Literacy	Preschool	135 teachers	TSEQ (adapted)	Regression	TSE→ Quality of Language Modeling : B = .13 *(ns)* TSE→ Quality of Literacy Focus : B = .68
Kao et al. (2011)	Taiwan	CO	Computer Use	Elementary school	484 teachers	Newly developed scale	Regression	*Results for various professional development outcomes:* Basic (Internet) TSE→ Personal Interest: β = .16 Advanced (Internet) TSE→ Occupational Promotion: β = .32 Advanced (Internet) TSE→ Practical Enhancement: β = .13 Advanced (Internet) TSE→ Social Contact: β = .22 Advanced (Internet) TSE→ Social Stimulation: β = .19
Lakshmanan et al. (2011)	USA	IS	Imple-mentation	Elementary school (G5–G8)	79 teachers	STEBI	Growth Modeling	TSE→ Teacher Reform: *r(change of growth)* = .35
Lambert et al.	USA	CO	Problem	Elementary school	521 teachers	PSE - BM	Correlations	TSE-BM→ Behavior Problems : r = -.16

(2009)			Behaviors					
Lee et al. (2013)	USA	IS	Imple-mentation	Elementary and secondary school	40 teachers	TSES (short)	Regression	TSE (Overall)→ Conceptual Change: $F(1,25) = .359$ (*ns*) TSE (Primary School)→ Conceptual Change: $F(1,9) = .99$ (*ns*) TSE (Secondary School)→ Conceptual Change: $F(1,14) = 4.71$
Lee & Tsai (2010)	Taiwan	CO	Computer Use	Elementary, middle, and high school	558 teachers	Newly developed instrument	Correlations	TSE (Web-general)→ Attitude toward Web-Based Instruction: $r = .46$ TSE (Web-communicative)→ Attitude toward Web-Based Instruction: $r = .27$ TSE (Web-Content Knowledge)→ Attitude toward Web-Based Instruction: $r = .60$ TSE (Web-Pedagogical Content Knowledge)→ Attitude toward Web-Based Instruction: $r = .61$
Leroy et al. (2007)	France	ES	Persp.	Elementary school (G5)	336 teachers	TES (French)	SEM	TSE→ Autonomy Supportive Climate: $\beta = .21$
Liljequist & Renk (2007)	USA	CO	Problem Behaviors	Preservice context	99 teachers	TES	SEM	TSE→ Control over Externalizing Problems: $B = .22$ TSE→ Bothersome of Internalizing Problems: $B = .11$
Malinen et al. (2012)	Finland	CO	Inclusive Practices	Preschool to high school	451 teachers	TEIP	SEM	TSE for Collaboration→ Attitude toward inclusive practices : $\beta = -.03$ *(ns)* TSE for Inclusive Practices→ Attitude toward Inclusive Practices : $\beta = .36$ TSE for Behavior Management→ Attitude toward Inclusive Practices : $\beta = .12$ *(ns)*
Martin et al. (2012)	USA	IS	IP	Elementary, middle and high school	631 teachers	TSES	SEM	TSE-EN→ Instructional Management: $\beta = -.83$ TSE-EN→ Instr. Man.→ Student Behavior Stressors: $\beta = -.43$ TSE-EN→ Instr. Man.→ Personal Accomplishment: $\beta = -.63$
Martin & Sass (2010)	USA	CO	SAB	Elementary, middle, and high school	550 teachers	TSES	Correlations	TSE-CM→ Behavior Management; Instruction Management: $r = -.19$; $r = -.51$ TSE-IS→ Behavior Management; Instruction Management: $r = -.02$ *(ns)*; $r = -.52$ TSE-SE→ Behavior Management; Instruction

								Management: r = -.12 *(ns)*; r = -.65
Mashburn et al. (2006)	USA	ES	STR	Preschool	210 teachers 711 children	TSEQ (adapted)	HLM	TSE→ Conflict: B = -.01 (*ns*) TSE→ Closeness: B = .02
Meijer & Foster (1988)	Nether-lands	CO	Referral Decisions	Elementary school (G2)	230 teachers	TES (Dutch adapted version)	Correlations	TSE→ Problem Chance: r = -.23 TSE→ Referral Chance: r = -.14
Midgley et al. (1995)	USA	CO	Goal Structures	Elementary and middle school (G4–G7)	158 teachers 969 students	Newly developed sclae	Correlations	*Results for elementary and middle school teachers:* TSE→ Task Goals for Students: r = .37; r = .23(*ns*) TSE→ Performance Goals for Students: r = .07(*ns*); r = -.07(*ns*) TSE→ Instructional Practices-Task: r = .32; r = .21(*ns*) TSE→ Instructional Practices-Performance: r = .07 (*ns*); r = -.20(*ns*)
Morris-Rothschild & Brassard (2006	USA	CO	SAB	Elementary and secondary school	283 teachers	SCMD	Regression	TSE→ Integrating Style: β = .33 TSE→ Obliging Style: β = .24 TSE→ Compromising Style: β = .22 TSE→ Dominating Style: β = .17 (*ns*) TSE→ Avoiding Style: β = -.05 (*ns*)
Mueller et al. (2008)	Canada	CO	Computer Use	Elementary and secondary school	389 teachers	TES (short)	Correlations	TSE→ Computer Use: r = .01(*ns*) TSE→ Integration: r = -.01(*ns*) TSE→ Comfort with Computers: r = .02(*ns*)
Ngidi (2012)	South Africa	CO	ILF	Elementary, middle, and high school	280 teachers	TSES (short)	Correlations	AO→ Student-Centered Teaching: r = .32 AO→ Citizenship Behavior: r = .29 AO→ Humanistic Management: r = .07(*ns*) AO→ Dispositional Optimism: r = .30
Nie et al. (2013)	Singapore	CO	ILF	Elementary school	2,139 teachers	TSES (short)	SEM	TSE→ Constructivist Instruction : β = .62 TSE→ Didactic Instruction : β = .21
Pakarinen et al. (2010)	Finland	IS	EC IS	Kindergarten	49 teachers	TES (short)	Correlations	TSE→ Emotional Support: r = .23 TSE→ Classroom Organization: r = .11 (*ns*) TSE→ Instructional Support: r = .13(*ns*)
Pas et al. (2010)	USA	CO	Referral Decisions	Elementary school (K–5)	491 teachers 9,795 students	PTE	Logistic regression	TSE (fall)→ Referral to student support team (spring): Odds ratio = .77 TSE (fall)→ Referral to special education (spring):

								Odds ratio = .88 (*ns*) TSE (fall)→ Referral to principal's office (spring): Odds ratio = .94 (*ns*) TSE (fall)→ In-school suspension (spring): Odds ratio = .81 (*ns*) TSE (fall)→ Out-of-school suspension (spring): Odds ratio = .94 (*ns*)
Ransford et al. (2009)	USA	IS	ILS	Elementary school (K–5)	156 teachers	TES (adapted)	Regression	TSE-SE→ Implem.. Dosage (average): β = .17 (*ns*) TSE-SE→ Implem. Dosage (supplemental): β = .19
Rohaan et al. (2012)	The Nether-lands	CO	Computer Use	Elementary school (G3–G6)	354 teachers 1,584 students	STEBI	SEM	TSE-IS→ Attitudes toward Techology: β = .53
Rubie-Davies et al. (2012)	New Zealand	CO	Goal Structures	Elementary and middle school	68 teachers	TSES (reading)	Regression	TSE-IS→ Mastery Goals; Performance Goals; Class-Level Expectation: β = .13 (*ns*); β = -.34 (*ns*); β = .11(*ns*) TSE-CM→ Mastery Goals; Performance Goals; Class-Level Expectation: β = -.41; β = .01 (*ns*); β = .19 (*ns*) TSE-SE→ Mastery Goals; Performance Goals; Class-Level Expectation: β = .71; β = .14 (*ns*); β =- .02 (*ns*)
Saklofske et al. (1988)	USA	CO	SAB	Preservice context	87 teachers	TES	Correlations	TSE→ Lesson Presenting Behaviors : r = .26 TSE→ Classroom Management Behaviors: r = .23 TSE→ Questioning Behaviors: r = .22
Sang et al. (2010)	China		Computer Use	Preservice context	727 teachers	TSES, CSE	SEM	TSE→ Prospective ICT Use: β = .06 Computer TSE→ Prospective ICT Use: β = .23
Soodak & Podell (1993)	USA	CO	Referral Decisions	Special education	167 teachers	TES (short)	Regression	TSE→ Placement Judgments: F = 4.45 (*ns*) TSE→ Referral Judgments: F = 1.74 (*ns*)
Soodak et al. (1998)	USA	CO	Inclusive Practices	General education	188 teachers	TES (adapted)	Regression	TSE→ Anxiety/Calmness : F = 9.19
Tejeda-Delgado (2009)	USA	CO	Referral Desicions	Elementary school (G1–G5)	167 teachers	TES	ANOVA	Zero *vs.*1,2, >3 referrals→ TSE: $F(2, 161)$ = 1.98 (*ns*)
Temiz & Topcu (2013)	Turkey	CO	ILF	Preservice context	101 teachers	TSES	Correlations	TSE-IS→ Constructivist Conceptions: r = .87 TSE-CM→ Constructivist Conceptions: r = .78 TSE-SE→ Constructivist Conceptions: r = .76

								TSE (Overall)→ Constructivist Conceptions: r = .78
Teo (2009)	Singapore	CO	Computer Use	Preservice Context	1,094 teachers	Newly developed scale	SEM	Basic Teaching Skills TSE→ Traditional Use of Technology; Constructivist Use of Technology: β = .17; β = .35 Advanced Teaching Skills TSE→ Traditional Use of Technology; Constructivist Use of Technology: β = -.04 *(ns)*; β = -.07 *(ns)* Technology for Pedagogy TSE→ Traditional Use of Technology; Constructivist Use of Technology: β = .25; β = .19
Thoonen et al. (2011)	Holland	IS	IP	Elementary school (G4–G6)	621 teachers 3,462 students	SSE	SEM	TSE→ Process-Oriented Instruction: B = .21 TSE→ Fit between School and Students' Lives: B = .35 TSE→ Cooperative Learning: B = .30 TSE→ Differentiation in Instruction: B = .44
Vannatta & Fordham (2004)	USA	CO	Computer Use	Kindergarten – high school (K–12)	177 teachers	TAS	Regression	TSE-SE→ Classroom Technology Use: *ns*
Wertheim & Leyser (2002)	USA	CO	SAB IP	Preservice context	191 teachers	TES	Correlations	TSE→ Behavior Management (Use; Effectiveness): r = .31; r = .24 TSE→ Individualized Instruction (Use; Effectiveness): r = .39; r = .25 TSE→ Diagnostic Teaching (Use; Effectiveness): r = .28; r =.21
Weshah (2012)	Jordan	IS	IP	Preservice context	106 teachers	TES (adopted)	Correlations	TSE→ Effective Teaching Practices: r = .86
Wolters & Daugherty (2007)	USA	CO	Goal Structures	Kindergarten – high school (K–12)	1,024 teachers	TSES	HLM	TSE-IS→ Mastery Structure; Performance Structure: β = .31; β = .09 (*ns*) TSE-CM→ Mastery Structure; Performance Structure: β = -.12; β = -.07 (*ns*) TSE-SE→ Mastery Structure; Performance Structure: β = .21; β = .07 (*ns*)
Wong et al. (2012)	Malaysia	CO	Computer Use	Preservice context	302 teachers	Newly developed scale	SEM	Computer TSE→ Perceived Ease of Use: β = .48 Computer TSE→ Usefulness: β = .22 Computer TSE→ Att. toward Computer Use: β = .38 Computer TSE → Perceived Use → Behavioral Intention: β = .11

Woolfolk & Hoy (1990)	USA	CO	SAB	Preservice context	182 teachers	TES	(Canonical) Correlations Regression	TSE→ Pupil Control Ideology: r = -.04 (*ns*); F = .00 (*ns*) TSE→ Motivational Orientation: r = .05 (*ns*); F = 10.43 TSE→ Bureaucratic Orientation: r = .18; F = .28 (*ns*)
Woolfolk et al. (1990)	USA	CO	SAB	Elementary and middle school (G6–G7)	55 Hebrew religious teachers	TES	Correlations Regression	TSE→ Pupil Control Ideology: r = -.36; β = -.13 (*ns*) TSE→ Control/Autonomy Orientation: β = .058 (*ns*)
Yildirim & Ates (2012)	Turkey	IS	IS Math/ Literacy	Preservice context	346 teachers	Newly developed scale	Correlations	TSE→ Knowledge of Using Expository Text: r = .14
Yilmaz (2011)	Turkey	IS	IS Math/ Literacy	Elementary and high school	54 teachers	TSES (short)	Correlations	TSE (IS, CM, SE)→ Grammar Oriented Strategies: r = .08 (*ns*); r = .07 (*ns*); r = .05 (*ns*) TSE (IS, CM, SE)→ Communication Oriented Strategies: r = .22 (*ns*); r = .17 (*ns*); r = .15 (*ns*)
Yoon (2002)	USA	ES	STR	Elementary school (K–5)	113 teachers	PSE-BM	HLM	TSE-BM→ Good Relationship: R = .15 (*ns*) TSE-BM→ Negative Relationships: R = .32 (*ns*)
Yoon (2004)	USA	CO	SAB	Elementary school	98 teachers	PSE-BM	Regression	TSE-BM→ Intervention Bullying Behaviors : β = .21

Note. AO = Academic Optimism; CO = Classroom Organization; Computer Use = Computer and technology use in the classroom; EC = Emotional Climate; ES = Emotional Support; ILF = Instructional Learning Formats; Implementation = Implementation of instructional practices; IP = Instructional Practices; IS = Instructional Support; IS Math/Literacy = Instructional support for math and literacy; Goal Structures = Teachers' classroom goal structures; Persp. = Regard for student perspectives; Problem Behaviors = Ability to cope with problem behaviors; SAB = Classroom management strategies, attitudes, and behaviors; STR = Student–teacher relationship quality. TSE-IS = TSE for instructional strategies; TSE-CM = TSE for classroom management; TSE-SE = TSE for student engagement.

Instruments: CSE; Computer Self-Efficacy Scale; EAEE = Échelle d'Auto-Efficacité des Enseignants; GTSES = General Teacher Self-Efficacy Scale; JES = Job Efficacy Scale; MSQ = Motivating Strategies Questionnaire; PSE-BM = Personal Teaching Efficacy in Behavior Management; PTE = Personal Teacher Efficacy Scale; SCMD = Self-efficacy scale for Classroom Management and Discipline; SPES = School Participant Empowerment Scale; SSE = Sense of Self-Efficacy; STEBI = Science Teaching Efficacy Belief Instrument; TAS = Teacher Attribute Survey; TBS = Teacher Beliefs Scale; TEIP = Teacher Efficacy for Inclusive Practice scale; TES = Teacher Efficacy Scale (results are only given for PTE); TESPT = Teacher Efficacy Scale for Prospective Teachers; TSAO = Teacher Sense of Academic Optimism Scale; TSEQ = Teacher Self-Efficacy Questionnaire; TSES = Teacher Sense of Self-Efficacy Scale; TTSES = Turkish Teachers' Sense of Efficacy Scale.

APPENDIX 2

Students' Academic Adjustment

Author(s)	Country	Category	Theme	Grade	N	TSE measure	Analysis	Results
Allinder (1995)	USA	AA	Math	Elementary school (Special Education; G3–G6)	19 teachers 38 students	TES	ANCOVA	High *vs.* low TSE→ Math Achievement (digits): M = 57.40 (SD = 13.06); M = 48.06 (SD = 18.08) High *vs.* low TSE→ Math Achievement (problems): M = 21.26 (SD = 5.19); M = 18.02 (SD = 6.14)
Angle and Moseley (2010)	USA	AA	Biology	High School	214 biology teachers	STEBI	ANOVA	High *vs.* low TSE→ Biology Test: M = 55.59; (SD = 4.53); M = 55.68 (SD = 55.51) (*ns*)
Caprara et al. (2006)	Italy	AA	Overall	Junior high school	2,184 teachers	Newly developed scale	Longitudinal SEM	Time 2 TSE→ Time 3 Academic Achievement: β = .02
Cantrell et al. (2013)	USA	AA	Literacy	Middle school (G6) (High school, G9)	20 teachers 249 students	Newly developed scale	Regression	TSE→ Reading Achievement (Grade 6): β = .76
Chang (2011)	Taiwan	AA	Overall	Elementary school	1,003 teachers	Elementary School Teacher Academic Optimism Scale	SEM	Academic Optimism→ Ac. Achievement: β = .78 Academic Optimism→ Ac. Achievement→ Evaluation Score: β = .20
Chong et al. (2010)	Singapore	AA	Overall	Middle school	222 teachers	TSES (short)	Logistic regression Correlations	TSE→ Academic Achievement: e^{β} = .74 (*ns*) TSE-IS→ Academic Climate: r = .44 TSE-CM→ Academic Climate: r = .40 TSE-SE→ Academic Climate: r = .48
Guo et al. (2010)	USA	AA	Literacy	Preschool	67 teachers 328 students	TSEQ (adapted)	HLM (longi-tudinal)	TSE→ Literacy (voc. knowledge): $t(63)$ = .727 (*ns*); TSE→ Literacy (print awareness): $t(63)$ = 3.45
Guo et al. (2012)	USA	AA	Literacy	Elementary school (G5)	1,043 teachers and students	TSEQ	SEM (longi-tudinal)	TSE→ Literacy: β = .04 TSE→ Support for Learning→ Reading: β = .01
Hardré & Sullivan (2008)	USA	SM	Moti-vational Strategies	High school	75 teachers	MSQ	Regression	*Motivation:* TSE (Motivating; Diagnosing)→ Motivation: β = .21(*ns*); β = .14 (*ns*) TSE (Motivating; Diagnosing)→ Aspirations/Futures: β = -.22 (*ns*); β = .08 (*ns*) *Goals and Perceived Ability:* TSE (Motivating; Diagnosing)→ Learning Goals

								(students): β = -.22 (*ns*); β = .08 (*ns*) TSE (Motivating; Diagnosing)→ Future Goals (students): β = .21 (*ns*); β = .09 (*ns*) TSE (Motivating; Diagnosing)→ Perceived Ability: β = -.29 (*ns*); β = -.03 (*ns*) *Motivational Strategies:* TSE (Motivating; Diagnosing)→ Relevance and Value: β = .11 (*ns*); β = .37 TSE (Motivating; Diagnosing)→ Aspirations: β = .15 (*ns*); β = .40 TSE (Motivating; Diagnosing)→ Can't Influence: β = -.47; β = .16(*ns*) TSE (Motivating; Diagnosing)→ Relatedness and Emotional Support: β = .21 (*ns*); β = .17(*ns*) TSE (Motivating; Diagnosing)→ Acknowledge Peer Pressure: β = .19 (*ns*); β = .31
Hardré & Sullivan (2009)	USA	SM	Moti-vational Strategies	High school	96 teachers	MSQ	Regression	*Motivation:* TSE (Motivating; Diagnosing)→ Motivation: β = .52; β = -.03 (*ns*) *Motivational Strategies:* TSE (Motivating; Diagnosing)→ Internal strategies: β = .08 (*ns*); β = .59 TSE (Motivating; Diagnosing)→ Acknowledge Peer Pressure: β = .03 (*ns*); β = .30 TSE (Motivating; Diagnosing)→ Can't Influence: β = -.36; β = .02 (*ns*)
Hardré et al. (2006)	Taiwan	AA, SM	Overall (Task) Moti-vation and Engage-ment	High school	404 teachers	TES	Correlations	TSE→ Student Ability: r = .27 TSE→ Student Engagement and Effort: r = .29 TSE→ Student Motivation: r = .31 TSE→ Learning Goals: r = .23 TSE→ Performance Approach Goals: r = -.10 *(ns)* TSE→ Performance Avoidance Goals: r = .09 *(ns)*
Heneman et al. (2008)	USA	AA	Literacy	Elementary school	1,075 teachers	TSES (short)	SEM	TSE→ Reading Achievement: β = .02 (*ns*)
Hines (2008)	USA	AA	Math	Middle school (G7)	307 students and their	TSEQ (adapted)	ANOVA	High *vs.* low TSE→ Math Achievement (test 1): M = 81.23; (SD = 7.42); M = 71.47 (SD = 9.43)

					teacher			High *vs.* low TSE→ Math Achievement (test 2): *M* = 78.90; (*SD* = 9.29); *M* = 71.46 (*SD* = 8.59) High *vs.* low TSE→ Math Achievement (test 3): *M* = 82.09; (*SD* = 10.11); *M* = 69.01 (*SD* = 11.42)
Jimmieson et al. (2010)	Australia	AA, SM	Overall Well-being	Elementary and middle school (G5–G7)	170 teachers 3,057 students	JES	HLM	TSE→ General Satisfaction (students) : β = .17 TSE→ Psychological Distress (students) : β = -.12 TSE→ Achievement : β = .08 TSE→ Opportunity (students) : β = .13
Lumpe et al. (2012)	USA	AA	Science	Elementary school (G4, G6)	450 teachers	STEBI	Regression	TSE→ Science Achievement : β = .13
Midgley et al. (1989)	USA	AA, SM	Math Expec-tancies	Elementary and middle school (G5–G6)	1,329 students and their teacher	Newly developed scale	Regression	*Results across two time points:* TSE→ Expectancies: β = .04 (*ns*); β = .06; TSE→ Math Performance: β = .08; β = .07 TSE→ Task Difficulty: β = -.05 (*ns*); β = -.10
Mohamadi & Asadzadeh (2012)	Iran	AA	Overall	High school	284 teachers	TSES (short)	SEM	TSE→ Academic Achievement: β = .40
Mojavezi & Poodineh Tamiz (2012)	Iran	AA, SM	Overall Attitudes and Moti-vation	Senior high school	80 teachers 120 students	TSES (long)	Correlations ANOVA	*Correlational results (Motivational variables):* TSE→ Motivation (total): *r* = .45; TSE→ Intrinsic Motivation: *r* = .39 TSE→ Extrinsic Motivation: *r* = -.09 (*ns*) TSE→ Attitude: *r* = .79 TSE→ Opinion: *r* = .24 *ANOVA results (Academic achievement):* $F(2,77) = 8.40, p < .001$.
Reyes et al. (2012)	USA	AA, SM	Literacy Engage-ment	Elementary school (G5–G6)	63 teachers 1,399 students	AES	HLM	TSE→ English Language grades): γ = .48 (*ns*) TSE→ Reading Achievement (Engagement): γ = .22
Robertson & Dunsmuir (2013)	UK	SM	On-Task Behavior	Secondary school	58 teachers	TSES (short)	HLM	TSE→ On-Task Pupil Behavior: β = .44
Ross (1992)	Canada	AA	History	Middle school (G7–G8)	18 teachers	TES	Regression	TSE→ History Achievement : *multiple R* = .80
Ross et al. (2001)	Canada	AA, SM	Comp. Literacy Self-	Elementary school (K–3)	387 students and teachers	Newly developed scale	Regression	*Correlations for two time points*: TSE (Computer Use)→ Basic Skills: *r* = -.10 (*ns*); *r* = -.08 (*ns*)

			efficacy					TSE (Adv. Computer Use)→ Basic Skills: r = -.03 (*ns*); r = .28 TSE (Computer Use)→ Advanced Skills: r = .05 (*ns*); r = .22 TSE (Adv. Computer Use)→ Advanced Skills: r = .10 (*ns*); r = .24 TSE (Computer Use)→ Self-efficacy: r = .15; r = .13 TSE (Adv. Computer Use)→ Self-efficacy: r = .20; .28
Thoonen et al. (2011)	Holland	SM	Task Motiation	Elementary school (G4–G6)	621 teachers 3,462 students	SSE	SEM	TSE→ Well-being (class, school): β = .02; β = .03 (*ns*) TSE→ Academic Efficacy: β = -.01(*ns*) TSE→ Intrinsic Motivation: β = .00 (*ns*) TSE→ Mastery Goals: β = -.01 (*ns*) TSE→ Performance Avoidance: β = -.01 (*ns*) TSE→ School Investment: β = -.01 (*ns*)
Throndsen & Turmo (2013)	Norway	AA	Math	Elementary school (G2–G3)	521 teachers 9,980 students	PALS (adapted)	Correlations	TSE→ Math Achievement (total): r = .11; TSE→ Math Achievement (Grade 2): r = .15; TSE→ Math Achievement (Grade 3): r = .07 (*ns*).
Tournaki & Podell (2005)	USA	AA	Literacy	Elementary and middle school	384 teachers	TES	ANOVA	*Non-significant results were not reported.*
Van Uden et al. (2013)	Holland	SM	Engage-ment	Secondary school ((pre)vocational education)	195 teachers	TSEQ (adapted)	Regression SEM	*Regression results*: TSE→ Behavioral Engagement: β = .13 (*ns*) TSE→ Emotional Engagement: β = -.15 *SEM results:* TSE→ Influence→ Beh. Engagement: β = .11 TSE→ Influence→ Em. Engagement: β = .11
Woolfolk Hoy et al. (2008)	USA	AA	Overall	Elementary school (G3–G4)	187 teachers	TSES (short)	Correlations	Academic Optimism→ Achievement: r = .24

Note. Biology = biology performance; Comp. literacy = computer literacy; History = history performance; Literacy = literacy performance; Math = math performance; Overall = students' overall performance; Science = science performance; SM = students' motivation (e.g., engagement, on-task behavior, goal orientations, self-efficacy); TSE-IS = TSE for instructional strategies; TSE-CM = TSE for classroom management; TSE-SE = TSE for student engagement. *Instruments:* AES = Adaptive Efficacy Scale; JES = Job Efficacy Scale; MSQ = Motivating Strategies Questionnaire; PALS = Patterns of Adaptive Learning Survey; SSE = Sense of Self-Efficacy; STEBI = Science Teaching Efficacy Belief Instrument; TES = Teacher Efficacy Scale; TSEQ = Teacher Self-Efficacy Questionnaire; TSES = Teacher Sense of Self-Efficacy Scale.

APPENDIX 3

Teachers' Psychological Well-Being

Author(s)	Country	Theme	Grade	N	TSE measure	Analysis	Outcomes
Avanzi et al.(2013)	Italy (Norway)	Burnout Satisf	Elementary, middle and high school (G1–G10)	348 Italian teachers; 558 Norwegian teachers	NTSES	SEM	TSE→ Job Satisfaction: r = .36 TSE→ Burnout (work-related): r = -.26 TSE→ Burnout (student-related): r = -.32
Barouch Gilbert et al. (2013)	Domi-nican Republic	Stress Satsif Commit Attrition	Preschool–high school	109 teachers	TSES (short)	Correlations	*English and Spanish-medium content teachers:* TSE→ Job Satisfaction: r = .29; r = .00 (*ns*) TSE→ Job Stress: r = -.40; r = -.06 TSE→ Commitment: r = .36; r = .32 TSE→ Intention to quit: r = -.18 (*ns*); r = -28 (*ns*)
Blackburn & Robinson (2008)	USA	Satisf	Agriculture education	80 agriculture teachers	TSES (long)	Correlations	*Low, moderate, and high teacher experience:* TSE-SE→ Job Satisfaction: r = .54; r = .56; r = .12 TSE-IS→ Job Satisfaction: r = -.12; r = .84; r = .10 TSE-CM→ Job Satisfaction: r = .57; r = .68; r = -.52
Bogler & Somech (2004)	Israel	Commit	Middle school (G7–G9)	983 teachers	SPES	Regression	TSE→ Organizational Commitment: β = .15 (*ns*) TSE→ Professional Commitment: β = .29
Briones et al. (2010)	Spain	Burnout Satisf	Secondary school	68 teachers	TISES	SEM	TSE→ Emotional Exhaustion: β = -.20 TSE→ Personal Achievement: β = .40 TSE→ Achievement→ Job Satisfaction: β = .16 TSE→ Support→ Job Satisfaction: β = .08
Brissie et al. (1988)	USA	Burnout	Elementary school	1,213 teachers	TOQ	Regression	TSE→ Burnout: β = -.17
Brouwers & Tomic (2000)	Nether-lands	Burnout	Secondary school	558 teachers	SCMD	Longitudinal SEM	Only fit indices are given.
Brouwers et al. (2001)	Nether-lands	Burnout	Secondary School	277 teachers	TISES	SEM	*Feedback loop:* TSE→ Emotional Exhaustion: β = -.45 → Depersonalization: β = .60 → Personal Accomplishment: β = -.41→ TSE: β = .18
Brudnik (2009)	Poland	Burnout	Secondary School	404 teachers	GTSES	Correlations	*Correlations across subjects taught:* TSE→ Emotional Exhaustion: r = -.23 – -.63.

							TSE→ Neg. Personal Accomplishment: r = -.28 – -.66 TSE→ Depersonalization: r = -.18 – -.53
Bruinsma & Jansen (2010)	Nether-lands	Retention	Preservice context	198 teachers	TSES (adapted)	SEM	TSE→ Intention to Stay: β = .17
Canrinus et al. (2012)	Nether-lands	Satisf Commit Retention	Secondary school	1,214 teachers	CSC	SEM	Classroom TSE→ Affective Commitment: β = .14 (*direct*); β = .12 (*indirect*) Classroom TSE→ Salary Satisfaction: β = -.20 (*direct*); β = .07 (*indirect*) Classroom TSE→ Relationship Satisfaction: β = .18 Classroom TSE→ Change in Motivation: β = .20 (*direct*); β = .13 (*indirect*) Classroom TSE→ Resp. to Remain: β = .02 (*indirect*) Classroom TSE→ Job Satisfaction: β = .74
Caprara et al. (2003)	Italy	Commit Satisf	Junior high school	726 teachers	Newly developed scale	SEM	TSE→ Job Satisfaction: β = .28 TSE→ Organizational Commitment: β = .21 (*direct*); β = .05 (*indirect through collective efficacy*)
Caprara et al. (2006)	Italy	Satisf	Junior High School	75 teachers	Newly developed scale	SEM	TSE→ Job Satisfaction: β = .74
Chan (2008)	China	Coping	Preservive and inserrvice context	273 teachers	GTSES	Regression	TSE→ Active Coping: β = .05 (*ns*) TSE→ Passive Coping: β = -.11 (*ns*)
Chan et al. (2008)	Singapore	Commit	Primary and secondary school	2,130 primary 1,587 secondary	TSES	SEM	TSE→ Commitment (primary school): β = .26 TSE→ Commitment (secondary school): β = .22
Coladarci (1992)	USA	Commit	Elementary and middle school (K–8)	170 teachers	TES	Regression	TSE→ Commitment: β = .19
Collie et al. (2012)	Canada	Satisf	Primary and secondary school	664 teachers	TSES (short)	SEM	TSE→ Job Satisfaction: β = .33
Doménech-Betoret (2006)	Spain	Stress	Secondary school	247 teachers	Newly developed scale	MANOVA HLM	High *vs.* Low TSE→ coping: M = 74.57 (SD = 12.77); M = 70.35 (SD = 14.28)
Doménech-Betoret (2009)	Spain	Burnout	Primary and secondary school	724 teachers	Teacher perceived teaching self-efficacy scale	SEM	*Primary school:* TSE→ Stressors→ Emotional Exhaustion: β = -.24 TSE→ Stressors→ Depersonalization: β = -.10 TSE→ Stressors→ Reduced Accomplishment: *ns*

							Secondary school: TSE→ Stressors→ Burnout: β = -.21
Duffy & Lent (2009)	USA	Satisf	Elementary, middle and high school	366 teachers	TSES (short); PEBS; newly developed scale	SEM	TSE→ Satisfaction: β = .17 TSE→ Goal Progress: β = .37 TSE→ Work Conditions → Satisfaction: β = .09
Ebmeier (2003)	USA	Commit	Elementary, middle, and high school	554 teachers	TES	SEM	TSE→ Commitment: β = .38
Egyed & Short (2006)	USA	Burnout	Elementary school	106 teachers	TES	Correlations	TSE→ Burnout (total): r = -.23 TSE→ Emotional Exhaustion: r = -.12 (*ns*) TSE→ Depersonalization: r = -.26 TSE→ Personal Accomplishment: r = .28
Evans & Tribble (1986)	USA	Commit	Preservice context	179 teachers	TES	Correlations	TSE→ Overall Problem Scores: r = .07 (*ns*) TSE→ Commitment: r = .23
Evers et al. (2002)	Nether-lands	Burnout	Secondary school	490 teachers	Newly developed measure	HLM	TSE Toward Guiding Groups→ EE, DP, PA: β = -.03 (*ns*); -.16; .32, respectively. TSE Toward Using Tasks→ EE, DP, PA: β = .08 (*ns*); -.02 (*ns*); .13, respectively. TSE Toward Using Innovations→ EE, DP, PA: β = -.60; -.34; .33, respectively.
Evers et al. (2005)	Nether-lands	Burnout	Secondary school	545 teachers	GSES (Dutch)	HLM	TSE→ Emotional Exhaustion: β = -.27 TSE→ Depersonalization: β = -.30 TSE→ Personal Accomplishment: β = .44
Fernet et al. (2012)	Canada	Burnout	Elementary, middle and high school (G1–G11)	806 teachers	CSC	(longitudinal) SEM	ΔTSE→ ΔEmotional Exhaustion: β = -.37 ΔTSE→ ΔDepersonalization: β = -.38 ΔTSE→ ΔPersonal Accomplishment: β = .63
Fives et al. (2007)	USA	Burnout	Preservice context	49 teachers	TSES	Correlations	*Results across two time points:* TSE-SE→ EE, DP, PA.: r = -.13 (*ns*); -.20 (*ns*); .38 (time 1) and r = -.59; -.59; .34 (time 2), respectively. TSE-IS→ EE, DP, PA.: r = -.21 (*ns*); -.30; .38 (time 1) and r = -.54; -.54; .34 (time 2), respectively. TSE-CM→ EE, DP, PA.: r = -.19 (*ns*); -.32; .36 (time 1) and r = -.36; -.33; .24 (*ns*) (time 2), respectively.
Friedman (2003)	Israel	Burnout	Elementary school	322 teachers	Newly developed scale	Regression	TSE (Influence, Consideration)→ Burnout (total): β = -

							.20; β = -.25; TSE (Influence, Consideration)→ Emotional Exhaustion: β = -.20; β = -14; TSE (Influence, Consideration)→ Unaccomplishment: β = -.20; β = -.15; TSE (Consideration)→ Depersonalization: β = -.36
Helms-Lorenz et al. (2012)	Nether-lands	Stress Dissatisf	Secondary school	30 beginning teachers	CSC	Correlations	Classroom TSE→ Tension: β = -.28 (*ns*) Classroom TSE→ Job Discontent: β = -23 (*ns*) School TSE→ Tension: β = -.23 (*ns*) School TSE→ Job Discontent: β = -.56 *(indirect effects are not displayed)*
Høigaard et al. (2012)	Norway	Burnout Satisf Attrition	Unknown	192 beginning teachers	PTE	Regression	TSE→ Job Satisfaction: β = -.04 (*ns*) TSE→ Work Burnout: β = -.04 (*ns*) TSE→ Intention to Quit: β = -.02 (*ns*)
Hughes (2012)	USA	Retention	Elementary, middle, and high school (K–12)	782 teachers	Newly developed scale	Logistic Regression	TSE-CM→ Retention: β = -.16 (*ns*) TSE-IS→ Retention: β = .28 (*ns*) TSE-Student Motivation Retention: β = -.20 (*ns*) TSE-Technology→ Retention: β = -.32
Hultell et al. (2013)	Sweden	Burnout	Preservice context	816 teachers	TSES (short)	Cluster analysis	χ^2 = 20.15, p = .003
Imants & Van Zoelen (1995)	Nether-lands	Attrition	Elementary school	66 teachers	TPSES	MANOVA	*No results are given.*
Klassen & Chui (2010)	Canada	Satisf	Preservice context, elementary, middle, and high school	1,430 teachers	TSES (short)	SEM	TSE-IS→ Job Satisfaction: β = .29 TSE-CM→ Job Satisfaction: β = .26 TSE-SE→ Job Satisfaction: *ns*
Klassen & Chiu (2011)	Canada	Quit Commit	Preservice context, elementary, middle and high school	379 preservice teachers 434 inservice teachers	TSES (short)	SEM	*Practising teachers:* TSE-IS→ Commitment: β = .26 TSE-IS→ Commitment→ Intention to Quit: β = -.19 *Pres-service teachers:* TSE-CM→ Commitment: β = .32 TSE-CM→ Commitment→ Intention to Quit: β = -.58
Klassen et al. (2009)	Canada, Cyprus,	Satisf	Elementary, middle, and secondary	1,212 teachers	TSES (short)	Correlations	*Results across five countries:* TSE (overall) → Job Satisfaction: β = .33 – .48

	Korea, Singapore, and USA		school				TSE-IS→ Job Satisfaction: β = .17 – .45 TSE-CM → Job Satisfaction: β = .19 – .44 TSE-SE → Job Satisfaction: β = .34 – .44
Klassen et al. (2013)	Canada, Hong Kong, UK, and Thailand	Commit	Preservice context	1,187 teachers	TSES (short)	Bootstrapping analysis (regression)	TSE→ Commitment (across 4 countries): *B* = .10 – .32 Student Behavior Stress→ TSE→ Commitment (across 4 countries): *B* = -.03 – -.13 Work Stress→ TSE→ Commitment (across 4 countries): *B* = -.04 (*ns*)– .05
Lent et al. (2011)	Italy	Satisf	Middle and high school	235 teachers	TSES (short)	SEM	TSE→ Goal Progress: β = .38 TSE→ Job Satisfaction: β = .09 (*ns*) TSE→ Work conditions: β = .16 TSE→ Work conditions→ Job Satisfaction: β = .06 TSE→ Goal Progress→ Life Satisfaction: β = .05
Malow-Iroff et al. (2007)	USA	Retention	Elementary school (K–6)	68 teachers	TES	Regression	TSE→ Decision to Stay: β = .06 (*ns*)
Martin et al. (2012)	USA	Burnout	Elementary, middle and high school	631 teachers	TSES	SEM	TSE-SE→ Instr. Man.→ Student Stressors: β = -.43 TSE-EN→ Instr. Man.→ Pers. Accomp.: β = -.63
Moè et al. (2010)	Italy	Satisf	Elementary, middle and high school	399 teachers	TSES	SEM	TSE→ Job Satisfaction: β = .32
Robertson & Dunsmuir (2013)	UK	Stress	Secondary school	58 teachers	TSES (short)	HLM	TSE→ Teacher Stress: β = -.31
Rots et al. (2007)	Belgium	Commit	Secondary school	209 teachers	TSES (short)	SEM	TSE→ Teaching Commitment: β = .29
Salanova et al. (2011)	Spain	Satisf	Secondary school	483 teachers	GTSES	Longitudinal SEM	*Results for two time points:* TSE→ Enthousiasm: β = .50; β = .34 TSE→ Satisfaction: β = .38; β = .36 TSE→ Comfort: β = .41; β = .27 TSE→ Engagement: β = .22; β = .23
Sass et al. (2011)	USA	Stress Dissatisf	Elementary, middle, and high school	479 teachers	TSES	SEM	TSE-EN→ Student stressors: β = -.50 . TSE-EN→ Student stressors→ Job Dissatisf.: β = -.04
Schwarzer & Hallum (2008)	Syria and Germany	Burnout	Unknown	1,203 teachers 458 teachers	GTSES	Correlations	*Results for Syrian and German teachers:* TSE→ Emotional Exhaustion: *r* = -.17; *r* = -.48 TSE→ Depersonalization: *r* = -.24; *r* = -.56

							TSE→ Reduced Accomplishment: r = -.66; r = -.75
Schwarzer et al. (2000)	Hong Kong, Germany	Burnout	Unknown	542 teachers	GTSES	Correlations	*Results for Chinese and German subsamples:* TSE→ Emotional Exhaustion: r = -.36; r = -.50 TSE→ Depersonalization: r = -.26; r = -.38 TSE→ Personal Accomplishment r = .31; r = .58
Shyman (2010)	USA	Burnout	Unknown	100 para-educators	TSES (short)	HLM	TSE→ Emotional Exhaustion: β = .01
Skaalvik & Skaalvik (2007)	Norway	Burnout	Elementary–High school (G1–G10)	244 teachers	NTSES	SEM	TSE→ Teacher Burnout: β = -.76
Skaalvik & Skaalvik (2010)	Norway	Burnout Satisf	Elementary–High school (G1–G10)	2,249 teachers	NTSES	SEM	TSE→ Emotional Exhaustion: r = -.29 TSE→ Depersonalization: r = -.41 TSE→ Job Satisfaction: β = .17
So-kum Tang et al. (2001)	Hong Kong	Burnout	Elementary, middle, and high school	269 teachers	GTSES	SEM	TSE→ Burnout (total) β = -.53 TSE→ Negative Mental health: β = -.19 TSE→ Burnout→ Negative Mental health: β = -.24
Stephanou et al. (2013)	Greece	Satsif	Elementary school	268 teachers	Newly developed scale	HLM	TSE→ Job Satisfaction: r = .77
Tsigilis et al. (2010)	Greece	Satisf	Secondary school	405 teachers	TSES	Correlations	TSE-IS→ Job Satisfaction: r = .30 TSE-CM→ Job Satisfaction: r = .39 TSE-EN→ Job Satisfaction: r = .40
Tsoulopas et al. (2010)	USA	Burnout Quit	Elementary, middle and high school	610 teachers	PSECM	SEM	TSE→ Emotional Exhaustion: β = -.09 TSE→ Emotional Exhaustion→ Attrition: β = -.05 TSE→ Emotional Exhaustion→ Migration: β = -.05
Viel-Ruma et al. (2010)	USA	Satisf	Elementary, middle and high school	70 Special educators	TES	Correlations	TSE→ Job Satisfaction: r = .29
Ware & Kitsantas (2007, 2011)	USA	Commit	Public school	26,257 teachers	SASS	Regression HLM	TSE to Enlist Admin. Direction→ Commitment: β = .29 TSE-CM→ Commitment: β = -.14

Note. Burnout = teacher burnout; Commit = teacher commitment; Quit = teacher retention and attrition; Satisf = teacher job satisfaction; Stress = teacher stress and coping; TSE-IS = TSE for instructional strategies; TSE-CM = TSE for classroom management; TSE-SE = TSE for student engagement.

Instruments: CSC = Classroom and School Context Teacher Self-Efficacy Scale; GSES = General Self-Efficacy Scale; GTSES = General Teacher Self-Efficacy Scale; (N)TSES = Norwegian Teacher Self-Efficacy Scale; PEBS = Personal Efficacy Beliefs Scale; PSECM = Perceived Self-Efficacy in Classroom Management questionnaire; PTE = Personal Teacher Efficacy Scale; SASS = SASS Teacher; SCMD = Self-efficacy scale for Classroom Management and Discipline; SPES = School Participant Empowerment Scale; TES = Teacher Efficacy Scale; TSEQ = Teacher Self-Efficacy Questionnaire; TSES = Teacher Sense of Self-Efficacy Scale. TISES = Teacher Interpersonal Self-Efficacy Scale; TOQ = Teacher Opinion Questionnaire; TPSES = The Teachers' and Principals' Sense of Efficacy Scale.