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Teachers' Perceived Self-Efficacy and Sense of Inadequacy across Grade 1: Bidirectional Associations and Related Factors

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ABSTRACT

The present study investigated bidirectional associations between teachers' sense of inadequacy and self-efficacy and factors related to them across one academic year. Teachers ($N = 52$) rated their sense of inadequacy and self-efficacy in fall and spring, and reported the number of students in need of support in spring. The results of cross-lagged path models showed that teachers' sense of inadequacy in fall negatively predicted their subsequent self-efficacy, especially in the dimensions of student engagement and classroom management. In addition, teachers' work experience and number of students with need of support in terms of social and behavioral problems were related to teacher self-efficacy (TSE). Based on these findings, the number of students in need of support in the classroom is a critical factor that influences TSE; therefore, teachers may need support to manage students with needs in terms of social and behavioral problems to maintain their sense of high self-efficacy.

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KEYWORDS
Teacher self-efficacy; inadequacy; social and behavioral problems; students with need of support; work experience

Teachers face daily emotionally, socially, and pedagogically challenging situations that can diminish their experiences of efficacy and professional competence. Teacher self-efficacy has been studied for decades, and it has been found to be an important factor in teachers' occupational wellbeing (Zee & Koomen, 2016). Besides being of great importance to teachers and their wellbeing, teacher self-efficacy also plays an important role in students' learning outcomes (Thoonen et al., 2011; Zee & Koomen, 2016), and needs therefore further investigation. Another aspect of occupational well-being is sense of inadequacy (cf., lowered personal accomplishment) that has increased recently in teachers. For example, sense of inadequacy in teacher–student interaction was positively related to turnover intentions and negatively related to self-efficacy beliefs (Heikonen et al., 2017). Inadequacy is one of the three components of burnout, but it has been rarely investigated separately from the other components (see Aloe et al., 2014a, for an exception), and thus needs further examination. Despite the recognized importance of teacher perceived efficacy and low inadequacy, research on relations between teachers' perceived inadequacy and their sense of efficacy is insufficient. Although it has been argued that perceived inadequacy could be comprehended as low general self-efficacy (e.g., Schwarzer & Hallum, 2008), recent research has suggested that it is possible to capture teacher perceptions of inadequacy specifically at work (e.g., Feldt et al., 2014), which was the focus of the present study. However, we are far from understanding how these two constructs are related and

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whether higher teacher self-efficacy leads to lower inadequacy or vice versa. To better support teachers' occupational wellbeing, there is a clear need to gain deeper understanding of the dynamics between these two constructs, which have typically been investigated separately.

According to the Job Demands-Resources model of burnout ([JD-R]; Demerouti et al., 2001), teacher stress and burnout could be predicted by job demands and resources (Hakanen et al., 2006). In the school context, job demands include, for example, students' behavioral problems (Hakanen et al., 2006; Pyhältö et al., 2011; Skaalvik & Skaalvik, 2011), and job resources include, for example, teacher self-efficacy (Rudow, 1999). In addition, lack of personal resources, including self-efficacy, can be predictors of burnout symptoms, such as job resources, in the JD-R model (Bakker & Demerouti, 2017). Therefore, it is understandable that one factor that could support teachers' occupational wellbeing and commitment to work and protect them from stress and exhaustion is teacher self-efficacy (TSE): high self-efficacy is related to high job satisfaction and work engagement (Guskey & Passaro, 1994; Wheatley, 2005; Woolfolk-Hoy & Spero, 2005), whereas low self-efficacy is typically linked with high stress and burnout (Aloe et al., 2014a; Collie et al., 2012; Klassen & Chiu, 2011). Although previous studies have found a relationship between TSE and sense of inadequacy (see meta-analysis; Aloe et al., 2014a; Brown, 2012), previous research has focused on TSE and burnout in general (Montgomery & Rupp, 2005), and less is known about how TSE and inadequacy are related longitudinally, and which factors are related to TSE and sense of inadequacy. Consequently, the present study aimed to contribute to the existing literature by investigating the bidirectional association between teachers' sense of inadequacy and different dimensions of TSE during a school year. This study provides important information about the direction of effect between teachers' sense of inadequacy and self-efficacy, and expands our understanding of individual and environmental factors that are related to teachers' sense of inadequacy and self-efficacy.

Teacher self-efficacy and inadequacy

Most of the previous research on TSE beliefs is based on Bandura's (1977) conceptualization of self-efficacy (see meta-analysis; Klassen & Tze, 2014). Based on the theoretical framework of social cognitive theory, Bandura (1986, p. 391) defined perceived self-efficacy as "people's judgments of their capabilities to organize and execute courses of action required to attain designated types of performance". According to Bandura (1986, 1997), the four major sources of self-efficacy beliefs are vicarious experiences, verbal persuasion, physiological reactions, and enactive mastery experiences, the latter being the most effective source of self-efficacy (see also Bong & Skaalvik, 2003; Pajares, 1997). Based on Bandura's theory (1977, 1986, 1997), Tschannen-Moran and Woolfolk Hoy (2001) defined TSE as consisting of three dimensions, namely, student engagement (ETSE), classroom management (MTSE), and instructional strategies (ITSE) (Ainley & Carstens, 2018; Tschannen-Moran & Woolfolk Hoy, 2001). The student engagement dimension of TSE refers to teachers' ability to provide emotional and cognitive support to their students and how to motivate students in learning (Ainley & Carstens, 2018). The classroom management dimension refers to beliefs in the ability to organize the learning environment, especially managing disruptive student behavior (Brouwers & Tomic, 2000). The instructional strategies dimension involves teachers' beliefs about using alternative assessment strategies, teaching practices, and explanations (Ainley & Carstens, 2018). A recent study by Fackler and colleagues (2021) showed empirical evidence that TSE is a multi-dimensional construct consisting of ETSE, MTSE, and ITSE.

Previous studies have found TSE to be broadly related to teachers' wellbeing and other characteristics (see the literature review in Zee & Koomen, 2016). High TSE beliefs have been found to be related to improved psychological wellbeing of teachers, students' better learning outcomes, and high-quality classroom management (Thoonen et al., 2011; Zee & Koomen, 2016), whereas high levels of MTSE have been found to be related to lower levels of the symptoms of burnout (Aloe et al., 2014a). Although Herman et al. (2020) found that most teachers experience high levels of stress, only teachers with lower levels of self-efficacy had a high risk of burnout. According to

previous studies, level of TSE is an important predictor of burnout symptoms (Aloe et al., 2014a; Herman et al., 2020). However, existing studies have investigated burnout in general or other dimensions of burnout but not specifically inadequacy in relation to teacher self-efficacy, which is the focus of the present study.

Inadequacy is the behavioral component of burnout (Näätänen et al., 2003; Salmela-Aro et al., 2011). It refers to inadequacy at work, decreased accomplishments (Schaufeli et al., 2002), and lower feelings of competence and efficacy at work (Maslach & Leiter, 2016). A person with a high sense of inadequacy perceives no longer being able to fulfill their own job responsibilities efficiently (Maslach & Leiter, 2008). It has been argued that emotional exhaustion and cynicism are the central components of burnout (Schaufeli et al., 2002). Therefore, some researchers have used only one or two of the three possible dimensions of burnout and ignored inadequacy (e.g. Skaalvik & Skaalvik, 2010), which seems to be a separate construct from the other two dimensions. Teachers' sense of inadequacy is related to several factors that affect their wellbeing at work and their professional agency (Pyhältö et al., 2012). For example, Heikonen et al. (2017) found early career teachers' perceived inadequacy in teacher–student interaction was negatively correlated to their sense of professional agency in the classroom. Also, student teachers' sense of professional inadequacy has been defined as not being able to live up to the expectations of one's own professional standards (Lindqvist et al., 2017). Teachers' sense of inadequacy has also been found to be correlated with their turnover intentions (Hong, 2012; Pietarinen et al., 2013; Wang et al., 2015). Even teachers who are typically very committed to work and engaged have been found to be suffering from signs of inadequacy as a teacher (Salmela-Aro et al., 2019). Moreover, teachers with higher levels of inadequacy have been found to display increased risk of burnout, even though inadequacy seems to develop somewhat independently and is less systematically aligned with other burnout dimensions (Pyhältö et al., 2021).

In previous studies, teacher self-efficacy has been found to be negatively related to a sense of inadequacy (Betoret, 2009; Brudnik, 2009; Friedman, 2003; Schwarzer & Hallum, 2008). For example, from the three dimensions of burnout, inadequacy has been found to have the strongest relationship with the classroom management dimension of TSE (Aloe et al., 2014a). Brouwers and Tomic (2000) found that teachers who reported lower levels of efficacy were more likely to have a higher sense of inadequacy. Schwarzer and Hallum (2008) have further suggested that strengthening teacher self-efficacy could protect teachers from a higher sense of inadequacy.

Previous studies have also criticized sense of inadequacy as being too close to reversed professional efficacy (e.g., Schwarzer & Hallum, 2008). This criticism is based on the Maslach Burnout Inventory (MBI; Maslach et al., 1997), which is the commonly used burnout inventory. Items tapping inadequacy in MBI measure frequency of an individual's positive experience of professional efficacy, which is then reversed in the total burnout score. MBI items are close to those of the TSES measure, which makes the existing critique relevant. However, in the Bergen Burnout Inventory (BBI; Feldt et al., 2014), which is used in this study to measure teacher perceived inadequacy, the items tap the sense of inadequacy at work. It should also be noted that the BBI measures the intensity of burnout whereas MBI measures its frequency (Feldt et al., 2014).

To the best of our knowledge, previous research on the bidirectional associations of the dimensions of teacher self-efficacy and teacher's sense of inadequacy is limited. Thus, there is no consensus on whether TSE predicts future levels of inadequacy or the other way round. To investigate this, the current study uses cross-lagged path models, which have previously been used to study the bidirectional association of teacher self-efficacy and the burnout dimensions of exhaustion and disengagement (Kim & Burić, 2020). Previous studies have found longitudinal associations between TSE and other dimensions of burnout. TSE has shown a longitudinally negative effect on emotional exhaustion (Malinen & Savolainen, 2016), and exhaustion and disengagement have been found to negatively predict subsequent levels of TSE (Kim & Burić, 2020). Although there is some evidence on associations between teachers' sense of inadequacy and self-efficacy (see meta-analysis; Aloe et al., 2014a; Brown, 2012), our knowledge on the bidirectional associations is missing. Consequently, the aim of this study is to deepen our understanding of the bidirectional association

between teachers' sense of inadequacy and self-efficacy across a school year. Based on previous studies, these factors are related, and TSE seems to protect teachers from a sense of inadequacy (Aloe et al., 2014b; Brown, 2012; Schwarzer & Hallum, 2008). Based on the JD-R model (Demerouti et al., 2001), a sense of inadequacy as a dimension of burnout could be predicted by low levels of TSE as a personal resource (Bakker & Demerouti, 2017). However, Kim and Burić (2020) suggested that TSE is, instead, an outcome of the burnout dimensions of exhaustion and disengagement. To the best of our knowledge, cross-lagged design has not been used to examine the directional association between teachers' sense of inadequacy and self-efficacy. Following Hobfoll's (1989) Conservation of Resources theory, we assume that the link between teacher self-efficacy and inadequacy may not necessarily be unidirectional. In line with this theory (Hobfoll, 1989), long-term exposure to stressors leads to depletion of resources, and can result in symptoms of burnout. This state could have a negative effect on people's ability to maintain their resources and self-efficacy. Betoret (2006) found that teachers with fewer symptoms of stress and burnout had higher teacher self-efficacy. In a similar vein, Klassen and Chiu (2010) found that teachers with higher levels of classroom stress had lower teacher self-efficacy and job satisfaction. Although not empirically tested, this theoretical reasoning could explain why inadequacy could lead to lowered self-efficacy.

Teacher and student characteristics

Previous studies have reported that teacher work experience (Klassen & Chiu, 2011) as well as students' misbehavior and learning difficulties (Zee et al., 2016) influence TSE. However, the findings concerning the role of teachers' work experience in TSE have been mixed. For example, it has been found that teacher self-efficacy typically increases during the first 23 years of their careers and then decreases. The three dimensions of TSE (Tschannen-Moran & Woolfolk Hoy, 2001) have shown a curvilinear trend across years (Klassen & Chiu, 2011). On the other hand, Lauermann and König (2016) found teacher self-efficacy to be lower among older teachers than among younger and less-experienced teachers. Further, they found that a linear trend captured this development better than a curvilinear one. In addition, Ghaith and Yaghi (1997) found TSE levels to be lower among more experienced teachers. Thus, the current study investigated the role of work experience in teachers' perceived sense of self-efficacy and inadequacy.

Other factors affecting TSE are student characteristics and behavior in the classroom. Misbehaving students and students with learning difficulties have been found to have a negative relationship with teachers' perceived self-efficacy (Lambert et al., 2009; Zee et al., 2016). In addition, an association between teachers' sense of inadequacy and disruptive student behavior has been found. Teachers' sense of inadequacy has been found to be associated with higher levels of disruptive student behavior (Aloe et al., 2014b). Also, a study by Skaalvik and Skaalvik (2017) found disruptive student behavior to be the strongest predictor of teachers' sense of inadequacy. According to the JD-R model (Demerouti et al., 2001), student misbehavior, as one aspect of job demands, predicts symptoms of burnout (Bakker & Demerouti, 2017). The current study used the number of students requiring support for their socio-emotional and behavioral problems and learning to study in relation to TSE and teachers' sense of inadequacy.

Finnish educational system

This study was conducted in the Finnish school context, where children start their nine years' of comprehensive school in the year in which they turn seven. Before Grade 1, children participate in pre-primary education for one year. The Finnish educational system follows inclusion ideas in which children with special needs are integrated into normal classrooms. To support this inclusive approach, a three-tiered support system was launched in 2010–2011 (Pesonen et al., 2015). However, teachers have found that this approach causes challenges due to extended documentation and lack of time to support all pupils in class (Eklund et al., 2020).

The present study

The aim of this study was to examine the bidirectional association between teachers' sense of inadequacy and self-efficacy and factors related to them across one academic school year. The more specific research questions were:

(1) Does teacher self-efficacy predict inadequacy, or does inadequacy predict subsequent teacher self-efficacy? Based on the JD-R model (Demerouti et al., 2001) and previous findings, it was expected (Hypothesis 1A) that teachers' sense of inadequacy would be negatively related to subsequent teacher self-efficacy (Brown, 2012; Schwarzer & Hallum, 2008), especially in relation to the dimension of classroom management (Aloe et al., 2014a). According to Hobfoll's (1989) Conservation of Resources theory, exposure to stressors leads to symptoms of burnout, and symptoms of burnout lead to decline in self-efficacy. In line with this theory, sense of inadequacy is expected to predict future levels of teacher self-efficacy (Hypothesis 1B).
(2) To what extent are the number of students with a need for support, in terms of socio-emotional and behavioral problems and learning, and teachers' work experience related to teachers' sense of self-efficacy and inadequacy? It was expected (Hypothesis 2) that the number of students with a need for support in socio-emotional and behavior (Lambert et al., 2009; Zee et al., 2017) and learning problems (Ross, 1992) would be negatively related to TSE. Moreover, it was expected (Hypothesis 3) that the number of students with a need for support in dealing with socio-emotional and behavior problems would be positively related to teachers' sense of inadequacy (Skaalvik & Skaalvik, 2017). In addition, the association between teachers' work experience and self-efficacy was examined. However, since the results of previous studies have been mixed (Ghaith & Yaghi, 1997; Klassen & Chiu, 2011; Lauermann & König, 2016), a specific hypothesis was not set for this.

Method

Participants and procedures

The present study was part of a larger longitudinal study (Lerkkanen & Pakarinen, 2016-2022) concerning teacher and student wellbeing and interaction in the classroom. The study was approved by the Committee of Ethics in the University of Jyväskylä on 8 August 2017. The participants were 52 Grade 1 teachers (49 female, 3 male; $M_{age} = 44.85$, $SD = 8.83$; $M_{Work\ Exp} = 16.28$, $SD = 9.41$) from five municipalities of Central Finland, including both urban and rural areas. The data were collected in the academic year 2017–2018 when teachers were working as class teachers in first-grade classrooms. All teachers had an MA degree in education. Participation was voluntary, and the teachers provided written consent prior to data collection. The participants filled in a questionnaire about their occupational wellbeing and background factors in the fall of 2017 (T1; September–December) and again in the spring of 2018 (T2; February–May), the individual teachers having a five-month lag between the two data collection points.

Measures

Teachers' sense of efficacy

To investigate teacher self-efficacy, the 24-item Teachers' Sense of Efficacy Scale (TSES; Tschannen-Moran & Woolfolk Hoy, 2001) was used. To define TSE, this study devised its multidimensional structure to include the following: ETSE, MTSE, and ITSE (Ainley & Carstens, 2018; Fackler et al., 2021; Tschannen-Moran & Woolfolk Hoy, 2001). Teachers were asked to rate 24 questions (How much/well can you …) on a scale of 1 (nothing) to 9 (a great deal). These included eight questions for each teacher self-efficacy dimension. The ETSE questionnaire

included items, for example, about how teachers could motivate students demonstrating low school motivation. The MTSE included items concerning how the teachers were able to calm down students who are making a disturbance and get students to follow rules. The ITSE dimension included items such as how the teacher was able to teach students individually and use different means of assessment. The Cronbach's alphas for the three teacher self-efficacy dimensions were for ETSE, fall 0.849 and spring 0.812; for MTSE, fall 0.922 and spring 0.792; and for ITSE, fall 0.883 and spring 0.825.

Sense of inadequacy

To measure teachers' sense of inadequacy, three statements of the 9-item Bergen Burnout Inventory were used ([BBI-9]; Salmela-Aro et al., 2011). The three-factor structure of BBI-9 (sense of inadequacy, cynicism, and emotional exhaustion) has been confirmed (Feldt et al., 2014). The measure uses a six-point scale (1 = totally disagree to 6 = totally agree). Three items measuring the sense of inadequacy were perception about the value of a person's work, expectations to work, and a person's appreciation at work (see Feldt et al., 2014). Cronbach's alphas for the mean of three items were 0.706 and 0.727 in fall and spring, respectively.

Teacher and student characteristics

The teachers reported the number of students who need support in socio-emotional or behavioral problems and in learning, the total number of students in class, and their work experience in school as a teacher. They rated the number of these students in spring. Teachers' work experience in school, in years, was reported in the fall.

Analysis strategy

First, the data were analyzed using IBM SPSS Statistics version 26.0 (IBM, Armonk, NY, USA) to test whether there were any outliers according to sense of inadequacy and the three dimensions of teacher self-efficacy. According to the basic scatter plot option (1.5 IGR) there were no outliers in the data. Second, we investigated bivariate correlations between sense of inadequacy, different dimensions of TSE (instructional strategies, classroom management, and student engagement), and background factors (the number of students with a need for support in socio-emotional and behavioral problems, students with a need for support in learning, and teachers' work experience in school). To analyze cross-lagged associations among the study variables, the Mplus statistical program (version 7.4; Muthén & Muthén, 2015) was used. Based on correlations and previous studies (Skaalvik & Skaalvik, 2017; Zee et al., 2017), cross-lagged path models (see Figure 1) were used to research the bidirectional association between sense of inadequacy and each of the three dimensions of TSE from fall to spring. In addition, the models included the number of students who need support in learning, the number of students who need support in socio-emotional or behavioral problems, and the teacher's work experience in school as control variables. The quality of model fit was measured using the comparative fit index (CFI), Tucker–Lewis index (TLI), root-mean-square error of approximation (RMSEA), and standardized root-mean residual (SRMR). Values of .95 or above for CFI (Bentler, 1990) and TLI (Tucker & Lewis, 1973) are required for an acceptable fit, while RMSEA values lower than .06 and SRMR values lower than .08 indicate a good model fit (Browne & Cudeck, 1992). Due to the small sample size (N = 52), the analysis was conducted with a bootstrapping option (Lockwood & MacKinnon, 1998). Although we had a small sample size, it has been argued that cross-lagged models even with small sample sizes can provide reliable results when variables are reliable and models are not complex (Bearden et al., 1982; Bollen, 1990), which was the case in the current study.

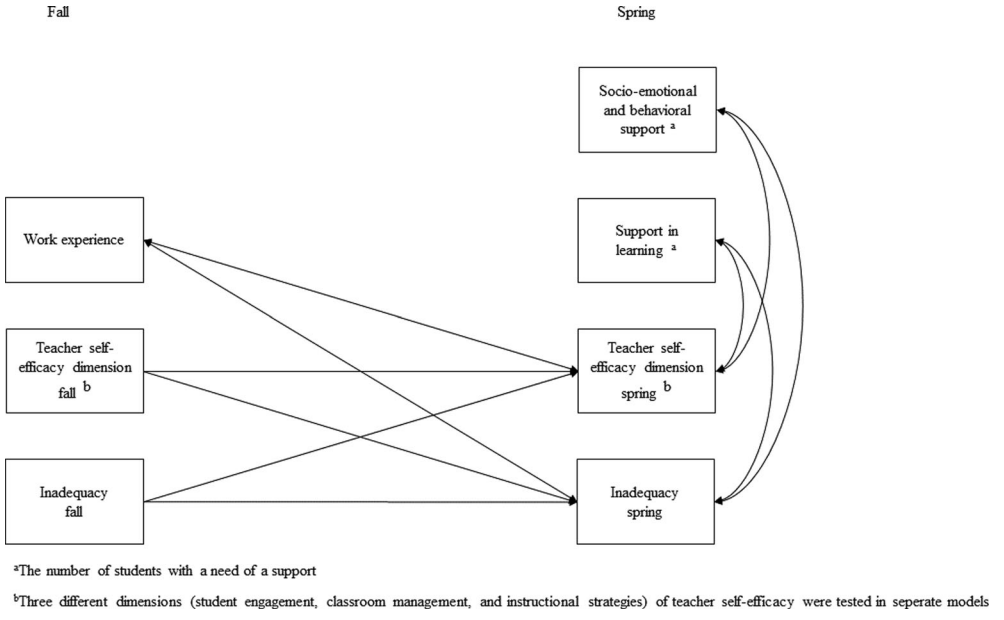

Figure 1. Cross-Lagged Path Models with Covariates.

Results

The descriptive statistics of the study variables are shown in Table 1, and correlations are reported in Table 2. Teacher sense of inadequacy in fall had a significant negative correlation with all three dimensions of TSE in fall and spring except ITSE in spring. Sense of inadequacy in spring had a significant negative correlation with the TSE dimensions of student engagement and classroom management in fall and spring. All three dimensions of TSE in fall and spring correlated negatively with the number of students in need of support in socio-emotional and behavioral problems in spring. Sense of inadequacy in fall correlated with the number of students needing support in spring. Sense of inadequacy in spring correlated with the number of students needing support in learning in spring.

The aim of this study was first to examine whether dimensions of teacher self-efficacy predict inadequacy or if inadequacy predicts future levels of teacher self-efficacy dimensions, in one

Table 1. Descriptive Statistics.

Variable	Min	Max	M	SD
Teacher self-efficacy beliefs				
Student engagement (fall)	4.5	9	6.702	1.100
Student engagement (spring)	4.75	8.38	6.681	.914
Instructional strategies (fall)	4.63	8.5	6.623	.966
Instructional strategies (spring)	4.63	8.5	6.5962	.861
Classroom management (fall)	4	9	6.882	1.063
Classroom management (spring)	5.5	8.75	6.991	.8199
Teacher sense of inadequacy (fall)	1	4.33	2.103	1.047
Teacher sense of inadequacy (spring)	1	5	2.385	1.136
Background factors				
Teacher work experience in school (fall)[1]	0.5	39	16.280	9.406
Students in class (spring)	7	25	19.346	4.405
Socio-emotional and behavioral support (spring)[a]	0	7	2.664	2.026
Support in learning (spring)[a]	1	10	4.636	2.151

Note. [1] = in years; [a] = Number of students with a need of support.

Table 2. Correlations among Teacher Self-Efficacy Dimensions, Sense of Inadequacy, and Control Factors.

Variable	1	2	3	4	5	6	7	8	9	10	11	12
1 Student engagement fall												
2 Student engagement spring	.711**											
3 Instructional strategies fall	.871**	.745**										
4 Instructional strategies spring	.458**	.745**	.618**									
5 Classroom management fall	.731**	.642**	.699**	.519**								
6 Classroom management spring	.487**	.683**	.514**	.653**	.736**							
7 Inadequacy fall	−.329*	−.519**	−.395**	−.270	−.441**	−.430**						
8 Inadequacy spring	−.244	−.439**	−.232	−.147	−.405**	−.412**	.788**					
9 Students in class (spring)	−.220	−.111	−.258	−.208	−.164	−.145	−.097	−.055				
10 Work experience in school (fall)	.149	.121	.066	.225	.066	.165	.217	.088	−.028			
11 Socio-emotional and behavioral support (spring) [a]	−.427**	−.548**	−.411**	−.324*	−.409**	−.507**	.377**	.265	.108	.017		
12 Support in learning (spring) [a]	−.316*	−.260	−.306*	−.133	−.415**	−.257	.301*	.323*	.318*	.030	.500**	

Note. [a] = Number of students with a need of support
*** p <.001; ** p< .01; *p <.05

academic school year. Cross-lagged path models with bootstrapped confidence intervals were used to investigate this (Figure 1). Based on the correlations (Table 2), the number of children who need support in learning in spring, the number of children who need support in socio-emotional or behavioral problems in spring, and teachers' work experience in school were added to the models as control variables. Based on these criteria (Bentler, 1990; Browne & Cudeck, 1992; Tucker & Lewis, 1973), all models (Table 3) indicated a good fit.

Next, the relationship between the number of students with a need for support in terms of socio-emotional and behavioral problems and learning and teachers' work experience in self-efficacy and inadequacy was examined. First, the ETSE–Inadequacy model (Figure 2, Table 4) showed that sense of inadequacy strongly predicted the student engagement dimension in spring ($\beta = -.327$, $p < .001$). Also, the number of students with a need for support in socio-emotional and behavioral problems was negatively related to the TSE dimensions of student engagement ($\beta = -.203$, $p < .05$). Second, the MTSE–Inadequacy model (Table 4) showed that a sense of inadequacy in fall predicted the classroom management dimension of TSE in spring ($\beta = -.154$, $p < .05$). Also, the number of students with a need for support in socio-emotional and behavioral problems was negatively related to the classroom management dimension (–.256, $p < .01$). Finally, the ITSE–Inadequacy model (Figure 2, Table 4) indicated that a sense of inadequacy did not predict future level of TSE. However, teacher work experience was related (.208, $p < .05$) to the instructional strategies dimension.

Discussion

The aim of this study was to examine the directional association between teachers' sense of inadequacy and self-efficacy and factors related to them across one academic school year. The results indicated that teachers' sense of inadequacy was negatively related to their subsequent teacher self-efficacy, especially in relation to the dimensions of student engagement and classroom management. Moreover, the number of students who need support in social and behavioral problems was negatively related to TSE, especially in the dimensions of student engagement and classroom management, and teachers' work experience was negatively related to the dimension of instructional strategies of TSE.

First, we investigated to what extent the sense of inadequacy and teacher self-efficacy dimensions are related across a school year in a sample of Finnish Grade 1 teachers. Our results add to the previous, mostly cross-sectional, findings of the association between teachers' sense of inadequacy and teacher self-efficacy by showing that teachers' sense of inadequacy in fall was related negatively to their self-efficacy dimensions in spring. Teachers' inadequacy seems to have a significantly negative relationship with TSE and teachers' beliefs about organizing and executing the actions that their work demands. Our results support findings about teachers' increasing workload, declining work engagement, and inadequate completion of work tasks that have been reported in previous studies (Carver-Thomas & Darling-Hammond, 2017; Skaalvik & Skaalvik, 2009), which might indicate a further increase in teachers' sense of inadequacy. Previous studies have found teacher self-efficacy to be a protective factor against a sense of inadequacy and other dimensions of burnout (Aloe et al., 2014a; Schwarzer & Hallum, 2008), which deviates from the results of the current study. However, aligned with Hobfoll's (1989) Conservation of Resources theory, the results of the current study indicated that sense of inadequacy, as a behavioral dimension of burnout, negatively predicted teacher self-efficacy. This result might imply that prolonged exposure to stressors at work results in resource depletion (cf.,

Table 3. Model Fits of Cross-Lagged Path Models.

Model	χ^2	df	CFI	TLI	RMSEA	SRMR
ETSE–Inadequacy model	0.051	2	1.000	1.111	0.000	0.009
MTSE–Inadequacy model	0.045	2	1.000	1.102	0.000	0.007
ITSE–Inadequacy model	0.049	2	1.000	1.138	0.000	0.008

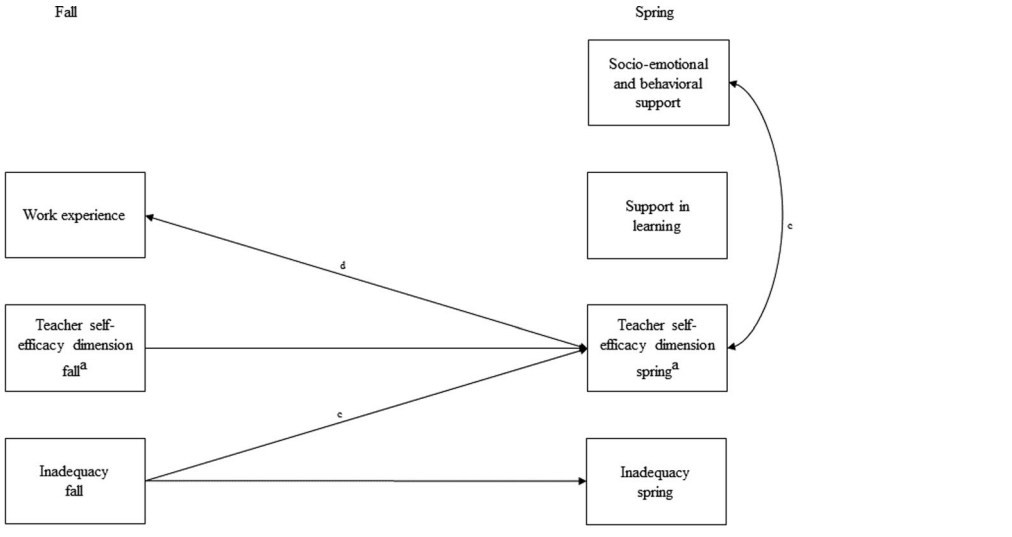

Figure 2. Results of Cross-Lagged Models (Statistically Significant Relations).

JD-R model), which can be reflected in experiences of inadequacy. Such a state can hinder teachers' ability to maintain their resources and thus negatively impact teachers' level of professional confidence and self-efficacy. In a similar vein, Byrne (1998) stated that experience of symptoms of burnout can have negative effects on teachers, including their motivation, beliefs, and ability to perform well in their job. Also, the study of Kim and Burić (2020) found that other dimensions of burnout negatively predicted subsequent levels of TSE, as a sense of inadequacy was found to do in this study. Simply put, when levels of symptoms of burnout are high, teachers feel less efficacy in completing their work tasks. Thus, actions focusing on decreasing teacher burnout, especially teacher perceptions of inadequacy, may be a more efficient way to enhance teachers' occupational wellbeing than increasing teacher perceptions of TSE.

Second, we examined whether the number of students needing support in socio-emotional and behavioral problems or in learning are related to teacher self-efficacy. The results partly supported our Hypothesis 2 by indicating that the number of students with a need for support in socio-emotional and behavioral problems in class has a negative effect on teacher perceived self-efficacy concerning classroom management and student engagement (Lambert et al., 2009; Zee et al., 2016), but this was not the case concerning the need for support in learning. It seems that the number of students with a need for support in socio-emotional and behavioral problems in class has a negative impact on teachers' efficacy beliefs regarding engaging students in schoolwork and managing the classroom. This negative relationship could be due to the lack of time and resources required to support student needs, and teachers may not have effective strategies for dealing with socio-emotional and behavioral and learning problems in the classroom. If a teacher cannot manage disruptive student behavior and organize a safe learning environment for students, it can have a negative impact on the classroom management dimension of TSE. If teachers cannot provide emotional support to students, it can have a negative impact on the student engagement dimension of TSE. According to the results, teachers have issues in both, and these are causing declining TSE. Giving teachers extra support with students with a need for support in terms of their socio-emotional and behavioral problems could have an impact on TSE and overall work wellbeing.

Table 4. Cross-Lagged Path Models with Covariates.

	ETSE–Inadequacy model		MTSE–Inadequacy model		ITSE–Inadequacy model	
Parameter estimate	ETSE [95% bootstrapped confidence intervals]	Inadequacy	MTSE	Inadequacy	ITSE	Inadequacy
Stability path						
T1→T2	.519*** [.266, .692]	.811*** [.659, .983]	.618*** [.351, .780]	.784*** [.573, .977]	.563*** [.271, .776]	.836*** [.678, .989]
Cross-lagged effects	ETSE→Inadequacy	Inadequacy→ETSE	MTSE→Inadequacy	Inadequacy→MTSE	ITSE→Inadequacy	Inadequacy→ITSE
T1→T2	.043 [–.166, .217]	–.327*** [—499, –.120]	–.050 [–.329, .157]	–.154* [–.290, –.030]	.126 [–.086, .312]	–.097 [–.380, .127]
Effects of background factors						
Socio-emotional and behavioral support [a] T2	–.203* [–.401, –.019]	–.076 [–.347, .136]	–.256** [-.439, –.061]	–.114 [.392, .071]	–.066 [–.297, .166]	–.042 [–.304, .178]
Support in learning[a] T2	.090 [–.116, .270]	.129 [–.100, .311]	.161 [–.048, .327]	.122 [–.092, .293]	.092 [–.167, .334]	.132 [–.105, .311]
Work experience T1	.116 [–.056, .286]	–.097 [–.298, .074]	.156 [–.021, .346]	–.081 [–.289, .081]	.208* [–.012, .410]	–.105 [–.302, .052]

Note. [a] = Number of students with a need of support; *$p < .05$, **$p < .01$, ***$p < .001$; All effects are based on StdYX standardization.

Even if Finnish teachers are highly educated, the results showed that the number of students with a need for support in socio-emotional and behavioral problems was negatively related to TSE beliefs. In the Finnish context, implementation of the three-tiered support system could have an indirect negative effect on TSE. Teachers have found that the three-tiered support system causes challenges due to the extended documentation and lack of time needed to support all students in class (Eklund et al., 2020). Lack of time to support students with their specific needs could be one reason why the current results indicated that the number of students with a need of support in class has a negative effect on TSE. However, there might have been cultural variations in pedagogical practices that played a role in the results. For example, Finnish teachers have been found to have lower self-efficacy for teaching students with emotional and behavioral problems compared with their Japanese colleagues (Moberg et al., 2020). Moreover, concerning teacher self-efficacy in relation to inclusive practices, Finnish teachers' perceived self-efficacy is lowest in the managing behavior dimension, while, in South Africa, teachers found managing behavior to be the strongest dimension of their self-efficacy (Savolainen et al., 2012).

This study did not find the number of students with a need for support in learning to be related to TSE, in opposition to our Hypothesis 2. It seems that teachers believe in their ability to support students in learning to a greater degree than their ability to support students with socio-emotional and behavioral problems. The result could also reflect the child-centered practices in Finnish Grade 1 classrooms, which emphasize focusing on individual support for the learning of each student (Lerkkanen et al., 2016). It is also possible that students struggling with socio-emotional and behavioral problems disturb classroom instructions and routines and, thereby, create more stress and feelings of professional incompetence for teachers.

Previous studies concerning the relationship between teachers' work experience and self-efficacy have found mixed results (Ghaith & Yaghi, 1997; Klassen & Chiu, 2011; Lauermann & König, 2016). This study completes the spectrum with a finding that teachers' work experience is positively related to the instructional strategies dimension of TSE. More experienced teachers perceived themselves as being more capable of, for example, using a variety of assessment strategies, responding to students' difficult questions, and adjusting teaching to the proper level for individuals. It is also notable that sense of inadequacy and number of students with a need for support were related to the student engagement and classroom management dimensions of TSE, but not to the instructional strategies dimension.

Finally, we examined whether the number of students in need of support was related to teachers' sense of inadequacy. The results did not support our Hypothesis 3 (Skaalvik & Skaalvik, 2017): the number of students with a need for support in socio-emotional and behavioral problems was not positively related to teachers' sense of inadequacy. The current results imply that the number of students with support needs did not drive teacher perceptions of inadequacy. A closer investigation, however, is needed to examine the role of students' support needs and other control factors in teacher experiences of inadequacy.

This study has some practical implications. The results indicate that number of students with a need for support in socio-emotional and behavioral problems has a negative impact on TSE. Thus, strengthening teacher self-efficacy, especially with the need to support students' behavior, in teacher education and in-service training would have a positive impact on teachers' work-related wellbeing. Also, actions which lead to decrease of sense of inadequacy would further have a positive impact on teachers' wellbeing. Teachers' ability to identify related factors would help them to protect themselves from a sense of inadequacy, to avoid symptoms of burnout and turnover intentions, and to support their self-efficacy. The identification of related factors should be taken into account in pre- and in-service training, and policies considering teachers' occupational wellbeing.

Limitations and future directions

The present study has some limitations. First, the sample size of the study was small, which might have affected the power of statistical analysis. In addition, it should be noted that the autoregressive

path of inadequacy in the models was high. Although it has been argued that cross-lagged models even with small sample sizes can provide reliable results when variables are reliable and models are not complex (Bearden et al., 1982; Bollen, 1990), caution is warranted in generalization of the findings and future studies should confirm the current results with a larger sample size. Second, all the participants were Grade 1 teachers, and all the data were drawn from teacher questionnaires where teachers answered questions based on their own perceptions. It is important to include objective measures on students' needs for support rather than using teacher-only ratings. In future, it would also be important to include teachers from upper grade levels to determine if the associations are the same. Third, no information on the severity of problems and received support was available. Future studies should include information on severity of students' problems, and the possible resources provided for school classrooms having several students with support needs. Fourth, according to the results of this study, a sense of inadequacy has a negative effect on dimensions of TSE. However, the study was able to show this only for one academic year. Future studies should include more measurement points to gain deeper understanding of the phenomena. In addition, future studies could include other factors, such as grade level of students or teacher temperament, which could also have an influence on the relationships.

Conclusion

The present study has the potential to improve our understanding of the association between TSE and sense of inadequacy. The results show that a sense of inadequacy negatively predicted future levels of TSE, and the number of students with a need for support in socio-emotional and behavioral problems is negatively related to TSE. Based on the results, teachers need more support with challenging students to improve their work-related self-efficacy. Smaller class sizes, team teaching practices, and in-service training on how to support challenging students could positively affect TSE and overall work-related wellbeing. However, actions decreasing teachers' sense of inadequacy may have a stronger influence on teachers' occupational wellbeing than actions increasing teachers' perceived TSE. Teachers' wellbeing is particularly important for children, especially at the beginning of school, because the beginning of school is a very specific phase in children's lives, shaping their experiences of learning, motivation, academic outcomes, and subsequent school path.

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