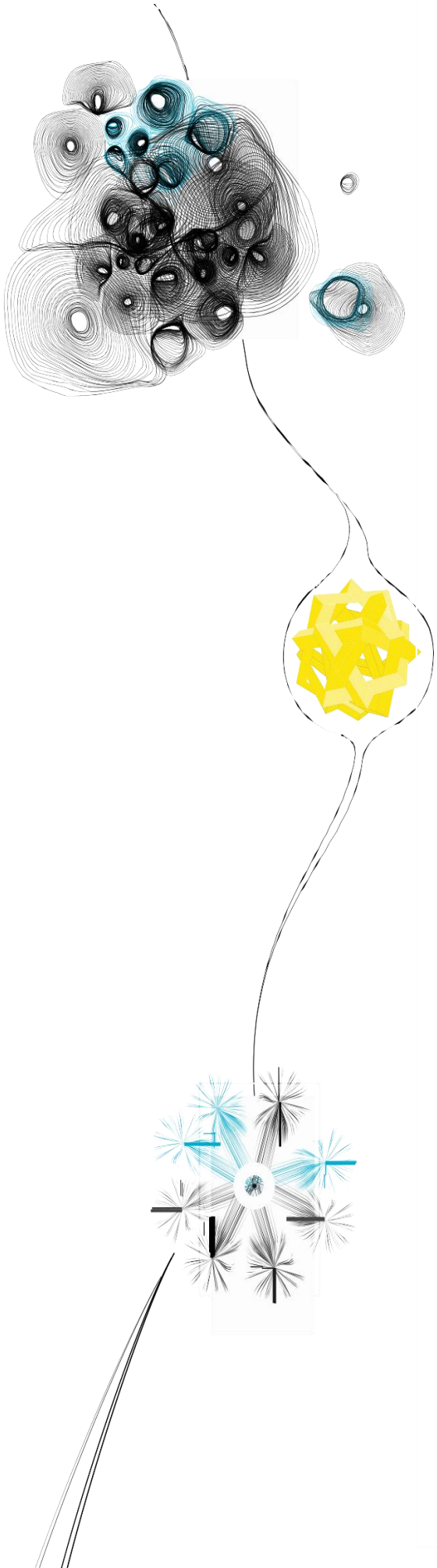

Master thesis

ARE TEACHERS REALLY AS STRESSED AS THE MEDIA DEPICT?

A quantitative study about the effects of organizational communication on teacher stress and teacher engagement applying the JD-R model.

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Abstract

The shortage of primary school teachers in The Netherlands leads to more work tasks and an increase of work pressure for teachers who are currently employed. Previous research towards the Job Demands-Resources (JD-R) model has indicated that different job demands can cause work stress. Yet, it remains unclear how organizational communication effects teachers' well-being. The aim of this research is to contribute to research on the effect of organizational communication on teachers' levels of stress and engagement by applying the JD-R model. A quantitative research has been conducted among 207 Dutch primary school teachers. The effects of collegial communication, communication structure and communication climate on teacher stress and teacher engagement have been measured. In addition, the mediation effects of quantitative demands (workload) and decision latitude have been included in the research. The results of the research showed that collegial communication, communication structure and communication climate, when acting as a resource, reduced teachers' levels of stress and increased teachers' levels of engagement. Moreover, quantitative demands mediated the relation between each organizational communication variable and teacher stress and decision latitude mediated the relation between each organizational communication variable and teacher engagement. Thus, the effect of the organizational communication variables proceeded partially via quantitative demands and decision latitude. The outcomes of this research offer a principal for a renewed JD-R model that includes the meaningful role of organizational communication. Furthermore, this research emphasizes the importance of well implemented organizational communication in schools.

Keywords: teacher stress, teacher engagement, collegial communication, communication structure, communication climate, quantitative demands, decision latitude, Job Demands-Resources model

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1. Introduction

The high and increasing workload among teachers of primary schools in the Netherlands has been on the public agenda for years now. Primary school teachers have indicated that they have to work a lot and extra hard. It is among others the result of a shortage of teachers, especially in the west of the country (Traag, 2018). According to Johnson et al. (2005), the teaching occupation is regarded as highly stressful. 1 in 5 teachers identified burnout symptoms in the Netherlands in 2014. Besides, they described higher levels of workload in comparison to other professionals (Hooftman, Mars, Janssen, De Vroome, & Van den Bossche, 2015). Attention for teacher stress is needed, since it is associated with serious consequences. Teacher stress could lead to decreased self-efficacy (Klassen, Wilson et al., 2013), reduced job satisfaction (Collie, Shapka, & Perry, 2012), reduced level of commitment (Klassen, Wilson et al., 2013), increased levels of burnout (Betoret, 2009), more teacher attrition (Skaalvik & Skaalvik, 2011), and motivation to leave the occupation (Skaalvik & Skaalvik, 2018). Moreover, it can negatively affect teachers' performance in class while reinforcing an inadequate teacher-student relation (Kokkinos, 2007).

Many scholars have identified job demands that cause teacher stress (Betoret, 2009; Boyle, Borg, Falzon, & Baglioni, 1995; Kokkinos, 2007). The same applies for identifying job resources that can help individuals to deal with teacher stress (Bakker, Demerouti, & Euwema, 2005; Betoret, 2009). Most studies regarding stress are approached from a psychological point of view by focusing on how people think, react and behave in certain situations. A model that has been frequently used to study the psychological processes related to stress is the Job Demands-Resources (JD-R) model (Demerouti, Bakker, Nachreiner, & Schaufeli, 2001). The JD-R model has encountered various developments and expansions is the last two decades within the research field of organizational psychology (Bakker & Demerouti, 2017). Scholars often recommended communication related practices as a solution for the reduction of work stress (Bakker, Demerouti, & Sanz-Vergel, 2014). However, they never included organizational communication in the JD-R model to measure its effect on teachers' well-being. The aim of this research is to contribute to research on the effect of organizational communication on teachers' levels of stress and engagement by applying the JD-R model. In order to achieve this research aim, the current research focuses on the relationship between organizational communication variables and teacher stress and the relationship between organizational communication variables and teacher engagement among Dutch primary school teachers. In consonance with the positive psychology approach (Luthans, 2002; Sheldon & King, 2001), teacher engagement

has been included in the research to focus not only on threats to teachers' well-being, but positive elements of teachers' work as well. Additionally, the mediation effect of quantitative demands and decision latitude has been included in the research. For this research, the following research questions have been formulated:

1. Does organizational communication reduce or increase teacher stress?
2. Does organizational communication reduce or increase teacher engagement?

Measuring the influence of organizational communication variables on teacher stress and teacher engagement contains theoretical relevance for several reasons. First, there is a need to explore relationships between organizational communication, teacher stress and teacher engagement. Organizational developments, like deterioration of authority and more participation of employees in decision making, have led to differences in how communication appears in organizations, among which schools (De Nobile, McCormick, & Hoekman, 2013). Furthermore, applying the JD-R model to measure the effects of organizational communication variables is an addition to previous research concerning the JD-R model and employee well-being. This research provides information about whether the JD-R model is applicable when measuring the effects of organizational communication and offers a principal for renewed JD-R model that includes organizational communication. Moreover, it demonstrates whether the two different processes of the JD-R model reappear when including a job demand and job resource as mediators into the research. Besides, this research has developed a bipolar scale based on the organizational communication scale of Schad (2019) to measure how organizational communication occurs in schools, which could also be used by other researchers. On the other hand, this research entails practical relevance for teachers and principals. The outcomes of this research provide knowledge about the levels of stress and engagement of primary school teachers. Furthermore, the research provides recommendations about which communication practices are most effective in reducing teacher stress and increasing teacher engagement and how these practices should be implemented.

2. Theoretical framework

2.1. Teacher stress

Teacher stress has received increased attention the last decade in scientific research. Previous research has showed the complexity of stress. Understanding stress has led to the development of different models of stress. The different perceptions can be expressed via three leading models (Steyn & Kamper, 2006). Researchers supporting the stimulus-based model of stress, view stress as a condition part of the surroundings which is external to the individual and affects an individual in a disturbing way (Cooper, Dewe, & O'Driscoll, 2001; Rout & Rout, 2002). The individual's understanding and thoughts are not included in the model. Teachers are perceived as passive receivers instead of actors (Rout & Rout, 2002; Wilson & Hall, 2002). According to this model, a job demand or stressor surpasses an individual's ability to cope with it. Despite the model has weaknesses, it could be useful for schools to recognize stressors that might influence their employees (Rout & Rout, 2002; Steyn & Kamper, 2006). Another approach is demonstrated by means of the response-based model of stress. This model explains stress as an individual's reaction to a threating stimulus (Rout & Rout, 2002). The model demonstrates physiological, psychological and behavioral reactions that emerge as outcomes of stress (Wilson & Hall, 2002). Teachers are perceived as passive receivers who are pressurized by resultant stress (Steyn & Kamper, 2006; Wilson & Hall, 2002).

Furthermore, the transactional model of stress views stress not grounded in the environment or in the individual, but in the relation between the stressor, the individual's perception of the situation and the individual's subjective reaction (Cooper et al., 2001). The transactional model views teachers as actors and not passive receivers of external strain (Steyn & Kamper, 2006; Wilson & Hall, 2002). According to this model, stress appears when an individual finds a situation threatening to his or her objectives and feels him- or herself incapable to deal with the demands. If an individual considers the situation to be stressful, he or she will ascertain coping strategies, which results into well-being or ill-health (Rout & Rout, 2002; Steyn & Kamper, 2006). Therefore, stress emerges from teachers' perceptions of demands, incapability to deal with the demands arising from an absence of effective coping resources, and the threat to the teachers' psychological and physical well-being (Abel & Sewell, 1999). The model demonstrates the complexity that is related to stress. The process consist of multiple relating and transactional aspects including stressors, individual understanding, accessible coping resources and strategies, and the appearance of the demands (Steyn & Kamper, 2006). The perspective on stress demonstrated by this model has been followed in the

current research. The transactional model closely fits the JD-R model (which will be elaborated on later).

The complexity of stress, which has already been demonstrated by the different models, has caused disagreement among researchers concerning the conceptualization of the phenomenon. In this research, teacher stress is defined as one's undesirable physical and emotional reactions to a lack of balance between job demands, competence, resources and needs perceived while working as a teacher (Kyriacou, 2001; Montgomery & Rupp, 2005). Previous research has explored which aspects of the teaching job are causing perceived stress. Specific stressors that are commonly identified are workload, pupils' behavior, relationships with colleagues, role ambiguity, and low autonomy (Betoret, 2009; Boyle et al., 1995; Kokkinos, 2007).

2.2. Stress outcomes

Giving attention to teacher stress is important, since it has been linked to important individual and organizational outcomes. Previous research has found that high levels of stress are negatively related to an individual's work attitude, well-being, and performance (Jepson & Forrest, 2006; Klassen & Chiu, 2010; Kyriacou, 2001). Examples of work attitudes that have received quite some attention in the literature concerning teacher stress are commitment and job satisfaction (Collie et al., 2012; Jepson & Forrest, 2006; Klassen & Chiu, 2010; Klassen, Wilson et al., 2013). Occupational commitment refers to an employee's attachment to a profession or a career (Meyer, Allen, & Smith, 1993). Occupational commitment has been associated with various positive effects, like work engagement, less absence, higher levels of job satisfaction (Freund, 2005). According to Ware and Kitsantas (2011), occupational commitment can be perceived as the intention to remain teaching. Moreover, Rots, Aelterman, Vlerick and Vermeulen (2007) showed that occupational commitment is highly connected to preservice teachers' choice about entering the profession. Commitment is important for teachers, since it can be regarded as a form of motivation (Rosenholtz, 1989). Jepson and Forrest (2006) analyzed the influence of occupational commitment on perceived stress among teachers from schools in the UK. They found that teachers with high levels of stress were dealing with a reduction of occupational commitment.

Furthermore, many teachers experience personal satisfaction during their work (Klassen & Chiu, 2010). Job satisfaction, which refers to an enjoyable or positive emotional state derived from one's job tasks (Locke, 1969), is linked to higher levels of job performance

(Judge, Thoresen, Bono, & Patton, 2001). Occupational stressors are the strongest cause of low job satisfaction among teachers (Liu & Ramsey, 2008). Nathaniel, Sandilos, Pendergast and Mankin (2016) measured the relationship between teacher stress and job satisfaction, while including the effect of self-efficacy, of teachers in the United States. Their outcomes underscored the negative relationship between stress and job satisfaction. However, teachers' self-efficacy appeared to be an important component in reducing the unfavorable effect on job satisfaction.

According to Fantuzzo et al. (2012) and Ouellette et al. (2018), teacher stress has been linked to unfavorable outcomes like burnout, depression, ill health, and low quality of life, which in turn may lead to employee turnover. Individual's well-being has been researched often via burnout, which is described as a condition of emotional, physical and attitudinal exhaustion which can happen to teachers that have been failing to cope with stress adequately for a longer time (Guglielmi & Tatrow, 1998; Kyriacou, 2001). The research of Betoret (2009) focused on primary and secondary Spanish school teachers and measured the relationship between school resources, teacher self-efficacy, stressors and burnout. He showed that work-related stressors are positively related to teachers' burnout. Moreover, work-related stressors were strongly reinforcing depersonalization and reduced personal achievement by means of the mediator emotional exhaustion. Emotional exhaustion appeared to be a strong predictor of primary school teachers' burnout.

2.3. Teacher engagement

Although it is not a direct counterpart to teacher stress, teacher engagement has been included in the research to measure a positive outcome. In contrast to employees who experience burnout, engaged employees perceive an energetic and dynamic relation with their work activities. Besides, they find themselves able to cope with the demands of their job (Schaufeli, Bakker, & Salanova, 2006). Schaufeli, Salanova, González-Romá and Bakker (2002) have defined work engagement as "a positive, fulfilling, work-related state of mind that is characterized by vigor, dedication, and absorption" (p. 74). Engagement concerns an affective-cognitive state that is pervasive and enduring, and is not aiming attention at a specific item, situation, individual, or action. Vigor indicates strong energy levels and mental resilience during work, the eagerness to put effort in one's work activities, and perseverance even when facing discomforts. The second characteristic of engagement dedication indicates serious involvement in one's work and perceiving a sense of importance, excitement, motivation,

dignity, and challenge. Furthermore, absorption refers to being completely focused and gladly absorbed in work activities, whereby time passes fast and one has problems with disconnecting oneself from work (Schaufeli et al., 2006). According to Maslach, Schaufeli and Leiter (2001), vigor and dedication are regarded as direct opponents of the basis burnout elements of exhaustion and cynicism, respectively.

Teacher engagement distinguishes itself through the energy dedicated to building relationships. Although employees of different sectors have to engage socially with others, teachers are standing out in building longstanding important relationships with individuals, in particular their pupils (Klassen, Yerdelen, & Durksen, 2013). In accordance with Jennings and Greenberg (2009), teachers who dedicate their energy in building pleasant relationships with their pupils tend to experience strong levels of well-being, and less stress and burnout symptoms. Like employees in other occupations, teachers connect with their colleagues while working. However, the opportunity to work nearby pupils and form social relationships is a powerful reason for a lot of teachers to enter the occupation (Klassen, Yerdelen et al., 2013).

2.4. Job Demands-Resources model

This research uses the JD-R model to gain insights in both the process related to stress, as the process related to engagement. A visualization of the JD-R model is presented in Figure 1. The JD-R model demonstrates that employee well-being can be predicted based on specific risk factors which can be divided in job demands and job resources. The two categories generate two different processes, a health impairment process and a motivational process (Demerouti et al., 2001). Different studies have provided evidence for the two processes that can predict employee well-being and have shown that the model can foresee meaningful organizational outcomes (Bakker et al., 2014). Job demands are defined as "those physical, psychological, social, or organizational aspects of the job that require sustained physical or psychological (cognitive and emotional) effort or skills and are therefore associated with certain physiological or psychological costs" (Bakker, Demerouti, Taris, Schaufeli, & Schreurs, 2003, p. 20). Strong job demands (e.g., workload) can lead to energy reduction, health issues, and exhaustion of employees (Bakker et al., 2003). Job resources, on the other hand, are "those physical, psychological, social, or organizational aspects of the job that (a) are functional in achieving work goals; (b) reduce job demands and the associated physiological and psychological costs; or (c) stimulate personal growth, learning, and development" (Bakker et al., 2003, p. 20). According to Bakker et al. (2003), there are different categories of job resources. Some job

resources are linked to the organization as a whole (e.g., compensation, work security, or career opportunities), other job resources are linked to social and interpersonal relations (e.g., supervisory support, group encouragement). Furthermore, some job resources are related to the organization of the job (e.g., role clearness, taking part in decision making), or related to the tasks within the job (e.g. task character, performance feedback, skill diversity, autonomy). Job resources contribute to intrinsic motivation by providing knowledge or personal development and extrinsic motivation by facilitating instrumental assistance or explicit information for goal accomplishment (Schaufeli & Bakker, 2004; Xanthopoulou, Bakker, Demerouti, & Schaufeli, 2009). In essence, job resources encourage employees to fulfil their goals. As a result, employees may become more committed and engaged in their work activities, when succeeding in achieving their goals (Hackman & Oldhan, 1980).

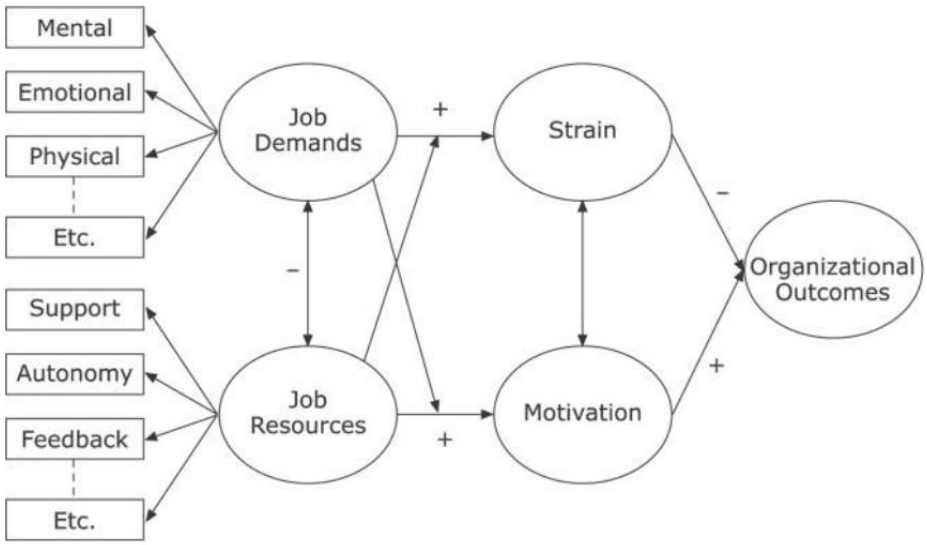

Figure 1. The Job Demands-Resources model. Reprinted from "The Job Demands-Resources model: state of the art.", by A.B. Bakker and E. Demerouti, 2007, *Journal of managerial psychology, 22*(3), 309-328. Copyright 2007 by the Emerald Group Publishing Limited.

Although job demands are (partial) responsible for teachers' levels of stress, the JD-R model suggests that job resources can buffer the relation between job demands and exhaustion. Teachers who are in possession of valuable resources, while facing demanding work circumstances, are better able to cope with these job demands. As a consequence, they perceive lower levels of exhaustion (Bakker et al., 2005). Betoret (2009) found that resources provided

by the school and self-efficacy (instructional and classroom management) had a negative and significant effect on occupational stressors. The resources included in his research weakened the influence which potential stressors have on primary school teachers in Spain. Furthermore, Skaalvik and Skaalvik (2018) analyzed the relationship between job resources, job resources, teacher well-being, and engagement. They found that value consonance, and positive and supporting relationships with colleagues were significantly related to teacher well-being, whereas value consonance was both directly and indirectly significantly related to engagement. One can conclude that resources can help to cope with teaching related stressors and can enhance engagement.

2.5. The effect of organizational communication on teacher stress and teacher engagement

The inclusion of organizational communication in the research focusing on teacher stress and teacher engagement is an interesting step. Organizational communication is often defined as a process of sending and retrieving information about the workplace or tasks by members of an organization to obtain common goals (Greenbaum, 1974; Miller, 2012; Price, 1997). However, this research views organizational communication as a more complex construct. Organizational communication is a dynamic process due to the social context of speaking and the social interactions with others influencing the construction of meaning leading to sense making (Christensen & Cornelissen, 2011). Moreover, communication forms organizing and organizations. It is the straightforward along with unobserved meanings and values of languages and the related signs, information, interplay, contacts, networks, and larger discourses that form organizational communication (Lutgen-Sandvik & Sypher, 2010). A numerous amount of scholars have acknowledged the importance of organizational communication for organizations and for organizing work in general (Keyton, 2017). According to McPhee and Zaug (2001), adequate organizational communication is a vital element for work practices and the cognitive and social environment. It is particularly essential for schools, because regardless of attempts to encourage professional interactions and cooperative training by authorities, the usual routines dominate and teachers frequently consider themselves, and one another, as very autonomous individuals (Little, 1990).

To explain the influence of organizational communication on teachers' levels of stress and engagement, the JD-R model, as proposed by Hakanen, Bakker and Schaufeli (2006), is applied. Previous research on the JD-R model of burnout and engagement often recommended communication related activities as solutions for stress reduction (Bakker et al., 2014; Hakanen

et al., 2006; Skaalvik & Skaalvik, 2016). According to Bakker et al. (2014), organizations should focus on reducing job demands and increasing job resources. They refer to the application of fair proceedings during organizational change and coaching of employees to integrate challenge demands (barriers to overcome) and adequate job resources. In addition, Skaalvik and Skaalvik (2016) argue that people should work to set up mutual goals and values at school. Beside lower levels of stress, it may also lead to better relationships between teachers.

The current research provides a new perspective on the JD-R model by using organizational communication as input instead of an outcome. It is demonstrated that organizational communication can act both as a resource and a demand. According to Schad (2019), solid an powerful communication can act as a resource for the teaching occupation. Moreover, organizational communication in schools can counteract restraints and mitigate workload or other demands perceived by teachers. However, destructive organizational communication may function as a demand. Destructive organizational communication includes, amongst others, disrespect, badgering, and abuse of power in the workplace. Within organizations that practice destructive communication, personal and organizational drives for control, authority and capital dominate human interests (Lutgen-Sandvik & Sypher, 2010). According to Schad (2019), collegial communication, communication structure and communication climate are relevant components of organizational communication within schools. Therefore, the communication variables that are derived from organizational communication and are included in the research are collegial communication, communication structure, and communication climate in school. Here, collegial communication may be regarded an interpersonal factor, whereas communication structure and communication climate may be regarded factors related to the organization. Although it is not yet known what the effects are of collegial communication, communication structure, and communication climate on teacher stress and teacher engagement, arguments have been found that support a relationship between organizational communication and teacher stress and organizational communication and teacher engagement.

There is strong support in literature for the role of collegial communication as relevant variable. Collegial communication refers to interactions between colleagues of an organization (Schad, 2019). Relationships between teachers and his or her colleagues could be positive and supportive, but it could also be adversarial and forced (Skaalvik & Skaalvik, 2017). The qualitative research of Margolis and Nagel (2006) showed that support by means of recognition and attentiveness from leaders was related to lower levels of stress. Another research focusing

on leadership described a negative relation between support from principals and burnout of teachers (Rajesh & Suganthi, 2013). Furthermore, Kinman, Wray and Strange (2011) found that social support diminished the influence of emotional demands on emotional exhaustion of UK teachers. In addition, a more recent research of De Nobile (2016), showed a negative relationship between collegial communication and teacher stress. Hence, the following hypothesis is formulated:

H1a: *Collegial communication as a resource is negatively related to teacher stress.*

Subsequently, collegial communication appears to be important for the development of teacher engagement. According to Pogodzinski, Youngs and Frank (2013), stimulating collaboration between teachers probably affects teachers' levels of engagement with their school. Various studies support these statements. Hakenen et al. (2006) hypothesized that job resources were related to organizational commitment through work engagement. Their research, including Finish teachers, showed that supervisory support and social climate are positively related to engagement. Furthermore, Simbula, Guglielmi and Schaufeli (2011) studied how collegial and supervisor support were related to Italian teachers' work engagement over time. The results revealed that when teachers experience support from their colleagues and principal, they are likely to be more engaged at the end of the first term and at the end of the school year. Meister (2010) interviewed experienced secondary teachers in the United States. She found that the support network of colleagues was one the most common factors which led to teacher engagement. These finding have led to the following hypothesis:

H1b: *Collegial communication as a resource is positively related to teacher engagement.*

On the other hand, other research has demonstrated negative sides of collegial communication. Collegial communication as a demand refers to unfavorable workplace behaviors. It implies a lack of respect and attention for others (Lutgen-Sandvik & Sypher, 2010). An example of deficient collegial communication is workplace bullying (Lutgen-Sandvik, Namie, & Namie, 2010). Nielsen, Hetland, Matthiesen and Einarsen (2012) measured the relationship between bullying and psychological distress among Norwegian employees in an longitudinal research. They found that bullying behavior was significantly related to an increase in psychological distress. Furthermore, research of De Vogli, Ferrie, Chandola,

Kivimäki and Marmot (2007) showed that perceptions of workplace injustice are linked to chronic stress. Moreover, negative communicative interactions between members of an organization can reduce emotional and psychological resources which may influence teachers' work-related performances and engagement (Schad, 2019). Bearing negative emotions could disturb work tasks (Zajonc, 1998). Given these findings, the following hypotheses are proposed:

H1c: *Collegial communication as a demand is positively related to teacher stress.*
H1d: *Collegial communication as a demand is negatively related to teacher engagement.*

The second communication variable, communication structure, is less widely researched. Communication structure refers to the internal communication of organizations (Schad, 2019). It is the organization's controlled communication system, where employees are viewed as an internal stakeholder group (Verčič, Verčič, & Sriramesh, 2012). The organization's controlled communication system involves different channels and activities, like newsletters, staff meetings, notice-board, and intranet (Yeomans & FitzPatrick, 2017). A well implemented communication structure is important for organizational outcomes. Multiple scholars have found a negative relationship between communication structure and stress. Lambert, Hogan and Allen (2006) focused on the influence of communication structure on the stress levels of correctional officers. They found that instrumental communication was negatively related to job stress. Furthermore, the research of De Nobile (2016) demonstrated that access to communication channels was a main predictor of teacher stress. He described that the strong negative relationship can be explained by the fact that having opportunities to share work-related issues with colleagues or the principal can mitigate work burden. Opportunities to share and discuss work-related issues also helps to avoid stress development emerging from uncertainty and duality. In addition, Prilleltensky, Neff and Bessell (2016) argue that schools should implement professional learning communities which create a secure area for teachers to take on problems and encourages a sense of belonging. They state that these communities can help teachers to cope with stress which leads to increased well-being. Hence, the following hypothesis:

H2a: *Communication structure as a resource is negatively related to teacher stress.*

Other research has demonstrated that communication structure could be important for teacher engagement as well (Verčič & Vokić, 2017; Welch, 2011). Welch (2011) has provided an accurate review about the relation between engagement and internal communication and has determined that engagement of employees depends on internal communication. She concludes that internal communication is an powerful tool to transfer organization's values to employees and include them in organizational goals. The research of Karanges, Johnston, Beatson and Lings (2015) found a positive relationship between internal organizational communication and engagement of employees in Australia. Moreover, internal communication in the form of communication during meetings has been indicated to be a relevant predictor of work engagement (Verčič & Vokić, 2017). However, a negative relationship was found between communication during meetings and absorption. According to Verčič and Vokić (2017), this could mean that people who are more focused, joyfully absorbed in their work tasks and experience intrinsic pleasure are more demanding about the duration, organization and the effectiveness of meetings. The following hypothesis is proposed:

H2b: *Communication structure as a resource is positively related to teacher engagement.*

According to Tracy (2010), an inadequate communication structure, which is characterized by discontent and uncertainty around organizational roles, workload, surveillance, and power and control etc., could lead to higher levels of stress and lower levels of engagement. However, little empirical research has focused on the consequences of inadequate communication structure. Since a well implemented communication structure has demonstrated to correlate with lower levels of stress and higher levels of engagement (e.g., De Nobile, 2016; Welch, 2011), one could argue that an inadequate communication structure will correlate with higher levels of teacher stress and lower levels of teacher engagement. This leads to the following hypotheses:

H2c*: Communication structure as a demand is positively related to teacher stress.*
H2d: *Communication structure as a demand is negatively related to teacher engagement.*

Furthermore, communication climate is linked with low levels of teacher stress. Communication climate concerns the cognitive climate shared among employees based on the communicative aspects of a work environment (Smidts, Pruyn, & Van Riel, 2001). In this

research, it is perceived as the workplace environment that enables teachers to act in a certain way. Friedman (1991) described that in schools with high numbers of burnout, educational objectives were explicit defined. However, teachers did not have the opportunity to share their feelings and thoughts towards accomplishing them. In addition, Collie et al. (2012) found that teachers who had more input in decision making and adequate school resources showed reduced levels of stress derived from workload. One aspect of communication climate, when acting as a resource, is openness (Spillan & Mino, 2001). De Nobile et al. (2013) showed that openness in school was negatively related to teacher stress. They highlight the importance of communication openness between the principal and teachers and argue that greater vertical openness is linked to reduced levels of stress from school climate. Therefore, the following hypothesis is proposed:

H3a: *Communication climate as a resource is negatively related to teacher stress.*

Communication climate is also associated with increased levels of teacher engagement. The research of Hoy, Tarter and Bliss (1990) focused on the effectiveness of organizational climate. They described that cooperative and encouraging relations in vigorous school climates induce a positive mental state and engagement with one's responsibilities. In addition, John and Taylor (1999) argue that climate openness is related to teacher engagement. They state that a climate characterized by mutual respect, exchange of beliefs, participation in decision making and program development makes teachers experience fulfillment regarding their job. In accordance with MacTavish and Kolb (2006), empowerment is an important factor for the realization of engagement. They argue that principals should enhance access to school information, encourage teachers' participation in decision making, and create a degree of independence. Hence, the following hypothesis is formulated:

H3b: *Communication climate as a resource is positively related to teacher engagement.*

On the other hand, a destructive communication climate could lead to higher levels of teacher stress and lower levels of teacher engagement. If employees experience that they cannot express their opinion regarding the development of policies that influence their work, they feel weak and less succeeded (Tracy, 2005). According to Cheng (1991), teachers are more fulfilled, happy and confident when working in open organizational climates in comparison to closed

organizational climates. His research pointed out that teachers working in a closed climate had significant more stress than teachers working in an open climate. Ahghar (2008) studied the effect of the organizational climate on the stress levels of secondary school teachers. He found that the stress levels of teachers working in closed and disengaged climates were considerably higher than of teachers working in open and engaged climates. Furthermore, Galand, Lecocq and Philippot (2007) explored the impact of a destructive communication climate on teacher disengagement. Their findings imply that the negative emotional effect of school violence is an important predictor of teacher disengagement. Given the findings described above, the following hypotheses are proposed:

H3c: *Communication climate as a demand is positively related to teacher stress.*
H3d: *Communication climate as a demand is negatively related to teacher engagement.*

2.6. Quantitative demands as a mediator

It has been demonstrated that specific job demands are predictors of teacher stress (Betoret, 2009; Boyle et al., 1995; Kokkinos, 2007). However, it is unclear how job demands influence the relationship between organizational communication and teacher stress and organizational communication and teacher engagement. The current research includes the mediating effect of quantitative demands in the relationship between organizational communication variables and teacher stress and in the relationship between organizational communication variables and teacher engagement. Quantitative demands refers to high workload and few moments to pause (Schad, 2019). Previous research that focused on quantitative demands demonstrated positive relationships with stress and negative relationships with engagement. Time pressure was found to be a significant predictor of emotional exhaustion of Norwegian teachers (Skaalvik & Skaalvik, 2011). In addition, Hakanen et al. (2006) used the JD-R model to study how teachers' work circumstances were related to their work-related well-being. They found that workload was positively related to ill health through its impact on burnout. Moreover, high levels of burnout, as a result of high demands (including workload), were related to low levels of teacher engagement. Klassen and Chiu (2010) found in their research concerning Canadian practicing teachers that teachers who reported higher levels of stress retrieved from workload had higher levels of overall stress. Prieto, Soria, Martínez and Schaufeli (2008) measured teacher stress and teacher engagement by applying an extended version of the JDR-model. They showed that quantitative overload was a relevant predictor of exhaustion and dedication at the end of the

year. The more quantitative overload at the beginning of the school year, the more exhaustion and the less dedication they experienced at the end of the school year.

It is expected that well implemented organizational communication in schools reduces quantitative demands. Recent research of Schad (2019) did include quantitative demands in the relationship between organizational communication and job satisfaction. She found a negative relation between the three organizational communication variables, that are included in this research as well, and quantitative demands. The expected negative relation can be explained for each communication variable individually. To begin with, respecting and supporting each other helps to spread the work pressure (Schad, 2019). Social interactions may create an optimistic and positive atmosphere which helps teachers to get more tasks done and to push boundaries. Furthermore, communication structure facilitates clear arrangements between colleagues about work-related tasks, which ensures that teachers can work efficiently. Knowing what to do or who to turn to when dealing with work-related problems helps to resolve these problems quickly, whereupon the work can still be carried out (De Nobile, 2016). Finally, a communication climate whereby teachers receive clarity from each other and their principal and where they dare and are permitted to share their opinion creates a productive work atmosphere (De Nobile et al., 2013). Given the literature, it is expected that quantitative demands mediates the relationship between organizational communication variables and teacher stress and the relationship between organizational communication variables and teacher engagement. Hence the following hypotheses:

***H4a**: Quantitative demands mediates the relationship between collegial communication and teacher stress.*

***H4b:** Quantitative demands mediates the relationship between communication structure and teacher stress.*

***H4c:** Quantitative demands mediates the relationship between communication climate and teacher stress.*

***H5a:** Quantitative demands mediates the relationship between collegial communication and teacher engagement.*

***H5b:** Quantitative demands mediates the relationship between communication structure and teacher engagement.*

***H5c:** Quantitative demands mediates the relationship between communication climate and teacher engagement.*

2.7. Decision latitude as a mediator

Beside quantitative demands, the mediation effect of the decision latitude has been included in the research. The JD-R model (Hakanen et al., 2006) has already demonstrated the importance of resources in maintaining employee wellbeing. Decision latitude is one of the major resources that has positive influence on various outcome variables (Taris, Schreurs, & Van Iersel-Van Silfhout, 2001). Decision latitude is characterized by skill discretion and decision authority. Skill discretion includes the skills and creativity needed for a job and the ability to use these skills. Decision authority on the other hand, concerns the authority of employees permitted by the organization to make decisions concerning their job (Karasek et al., 1998). Taris et al. (2001) found that employees who had much control were perceiving lower levels of strain. Other research, measuring emotional exhaustion among Dutch teachers, showed that less job control was related to more emotional exhaustion (Näring, Briët, & Brouwers, 2006). However, the effects of job control show a curvilinear pattern. Hakanen et al. (2006) included job control as well. Job control was accountable for high levels of engagement and low levels of emotional exhaustion. Furthermore, Skaalvik and Skaalvik (2014) explored if self-efficacy and decision latitude were individually related to teachers' engagement and emotional exhaustion. They demonstrated that decision latitude was positively related to engagement and negatively related to emotional exhaustion. Although decision latitude functions positively for teachers (Skaalvik & Skaalvik, 2014), one should note that possessing too much job control may also cause stress, since it concerns complicated decision making and much responsibility (De Jonge & Kompier, 1997).

It is expected that well implemented organizational communication increases decision latitude of teachers. Actions for reducing stress seem to be more useful for employees with high job control than employees with low job control (Van der Klink, Blonk, Schene, & Van Dijk, 2001). Therefore, increasing teachers' decision latitude is important. Beside individual understanding and coping skills, organization-focused programs are needed to improve and enhance decision latitude (Van der Klink et al., 2001). Collegial communication could increase teachers' decision latitude. According to Fairman and Mackenzie (2015), relations, informal teamwork, and trust encourage teachers' leadership development. Furthermore, a close work-related social network generates teachers' involvement in the decision making process (Moolenaar, 2010; Yisrael, 2008). Nevertheless, collegial communication could also constrain teachers' autonomy and independence. Collaboration could act as a social control system whereby teachers are stronger bound to standardized performance expectations (Vangrieken,

Dochy, Raes, & Kyndt, 2015). Communication structure, on the other hand, could enhance teachers' decision latitude in a different manner. By determining clear agreements, meetings, and communication channels, teachers can carry out tasks and fill in their work activities independently (De Nobile, 2016). In addition, an open, trustful and transparent communication climate characterizes a flat organization in which people are allowed to think along about the fulfilment and execution of tasks (Dee, Henkin, & Singleton, 2006). Given the findings, it is expected that decision latitude mediates the relationship between organizational communication variables and teacher stress and the relationship between organizational communication variables and teacher engagement. The following hypotheses are proposed:

H6a: *Decision latitude mediates the relationship between collegial communication and teacher stress.*
H6b: *Decision latitude mediates the relationship between communication structure and teacher stress.*
H6c: *Decision latitude mediates the relationship between communication climate and teacher stress.*
H7a: *Decision latitude mediates the relationship between collegial communication and teacher engagement.*
H7b: *Decision latitude mediates the relationship between communication structure and teacher engagement.*
H7c: *Decision latitude mediates the relationship between communication climate and teacher engagement.*

2.8. Conceptual model

The hypotheses that are derived from literature are conceptualized in the conceptual model below. Figure 2 shows the negative effect of the three organizational communication variables (functioning as a resource) on teacher stress. The mediation effects of quantitative demands and decision latitude are also included in the model. When organizational communication functions as a demand, the direct effect becomes positive. In addition, the effect of organizational communication on quantitative demands becomes positive and the effect of organizational communication on decision latitude becomes negative. On the other hand, Figure 3 shows the positive effect of the three organizational communication variables (functioning as a resource) on teacher engagement. When organizational communication functions as a demand, the direct

effect becomes negative. In addition, the effect of organizational communication on quantitative demands becomes positive and the effect of organizational communication on decision latitude becomes negative.

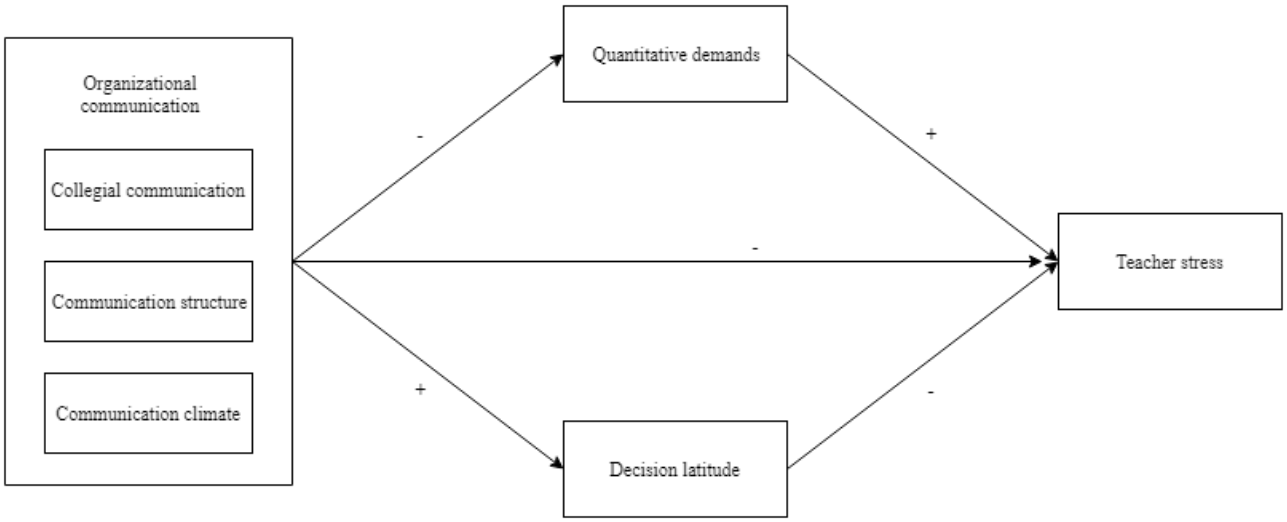

Figure 2. Conceptual model of teacher stress and organizational communication as a resource.

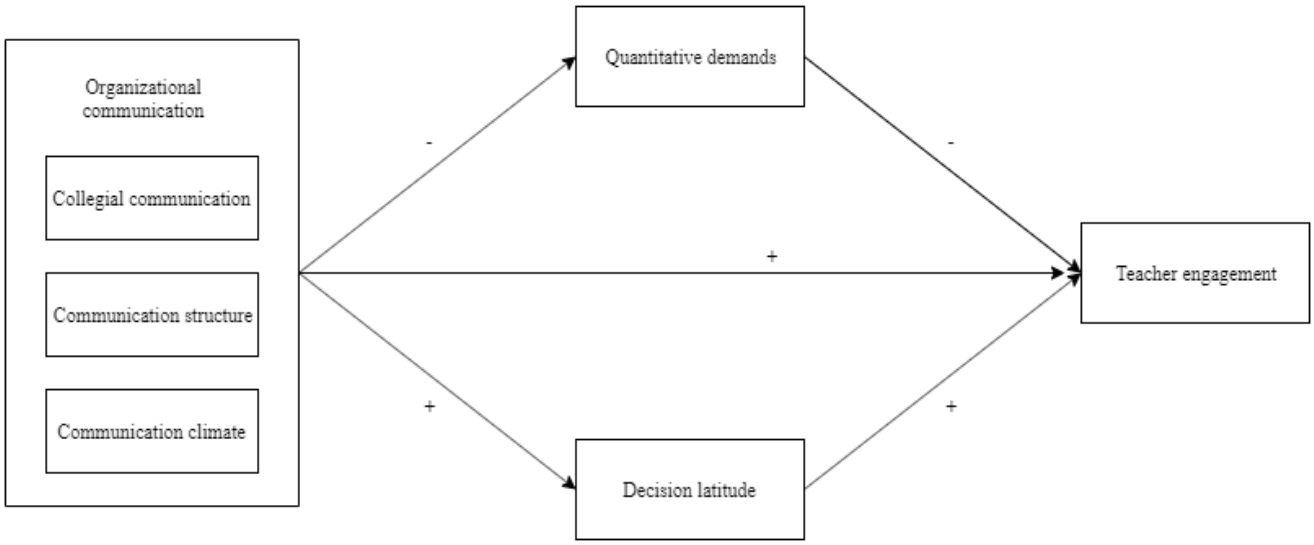

Figure 3. Conceptual model of teacher engagement and organizational communication as a resource.

3. Method

3.1. Procedure

Relationships between organizational communication variables, quantitative demands, decision latitude, teacher stress, and teacher engagement were analyzed by means of a quantitative research conducted among Dutch primary school teachers. The quantitative research consisted of an online survey in order to collect data on a large scale. In October 2019, the survey was distributed via e-mail and Social Media. 540 primary schools located throughout the Netherlands were e-mailed to participate in the research. The e-mail is presented in Appendix A. The principal was asked to forward the e-mail to teachers working at the school in question. After two weeks, a reminder was sent to the schools. Beside the database with e-mail addresses, teachers in the network of the researcher were recruited to participate in the research. Participating in the research was voluntary and confidentiality agreements were observed with respect to the participants and their schools. The obtained data has been analyzed with statistics program SPSS.

3.2. Sample

The population of this research consisted of people who were employed as a primary school teacher in the Netherlands for at least six months. People could not participate if they were working in special needs education. In 2017, there were 154,000 teachers employed in primary education in the Netherlands (Traag, 2018). To obtain data that could be generalized over the whole population, a representative sample of minimum 200 participants was needed. In total, 229 surveys were completed. However, 22 surveys had to be removed, since they were completed by principals, fulltime remedial teachers and fulltime internal counselors. Accordingly, the sample of the study consisted of 207 primary school teachers (86% female, 14% male) from all 12 provinces of the Netherlands. Teachers' age varied from 21 to 67 years (M = 41.62 and SD = 13.06) and their teaching experience between .5 and 45 years (M = 17.42 and SD = 12.34). Of the teachers, 178 (86%) had a permanent contact, 16 (7.7%) had a temporary contract with the prospect of permanent employment, 7 (3.3%) had a temporary contract with no prospect of permanent employment, whereas 6 teachers (2.9%) had another employment contract. Furthermore, 38.2% of the teachers worked less than 28 hours a week, whereas 30% worked between 28 and 36 hours a week and 31.4% worked more than 36 hours a week. The number of pupils per school varied from 41 to 900 (M = 237 and SD = 156) and the number of pupils per class varied from 10 to 46 (M = 23 and SD = 5). Finally, 5 teachers

(2.4%) indicated that they had another position in school besides being a teacher (e.g., remedial teacher, internal counselor or gymnastics teacher).

3.3. Measures

To measure all variables included in the research, Dutch translations of existing validated scales were used. Back-translation was conducted to validate the quality of the translated instrument. The survey is presented in Appendix B. Before analyzing the data, all 47 items were factor analyzed by means of principal components analysis with varimax rotation. Seven factors were engendered, explaining for a total of 58.8% of variance. Items with factor loadings ≥0.4 were used to interpret the factors. In total, 42 items were used for further analyses. An overview of the factor analysis is presented in Appendix C.

Organizational communication variables were measured by means of a scale developed by Schad (2019). For this research, the original scale was adjusted to a bipolar scale. Answers were given on a 7-point scale. Values equal to or higher than four were considered a resource, while values lower than four were considered a demand. Collegial communication was measured with five items (e.g., *"Colleagues pay little attention to each other and treat each other with little respect at work – Colleagues pay a lot of attention to each other and treat each other with much respect at work"*). Communication structure was assessed with four items (e.g., *"The communication tools used at work are very inefficient – The communication tools used at work are very efficient"*). Lastly, communication climate was assessed with five items (e.g., *"We keep our opinion and ideas to ourselves at work – We share ideas and take part in decision making at work"*). In the factor analysis, the communication variables loaded on the same factor. This is accountable by the fact that the three variables are related with one another. It was decided to include the variables separately in further analyses, since the individual validity has been proven by Schad (2019). One communication structure item about learning platforms was removed based on the factor analysis. The internal reliabilities using the Cronbach's alpha coefficient were: .90 (collegial communication), .81 (communication structure) and .91 (communication climate).

Subsequently, the job resource decision latitude was measured with six items focusing on skill discretion (e.g., *"My job requires that I learn new things"*) and three items focusing on decision authority (e.g., *"My job allows me to make a lot of decisions on my own"*). Answers were given on a 5-point scale (strongly disagree – strongly agree) (Karasek et al., 1998). The factor analysis indicated skill discretion and decision authority separately, which was

predictable. One reversed item about skill discretion was removed afterwards. The Cronbach's alpha of decision latitude was .71. Additionally, quantitative demands was assessed using a four-item subscale from COPSOQ II (Pejtersen, Kristensen, Borg, & Bjorner, 2010) (e.g., *"I have no time to complete all my work tasks"*). Answers were given on a 5-point scale (never – very often). The factor quantitative demands had a Cronbach's alpha of .85.

Teacher engagement was measured with nine items from the Utrecht Work Engagement Scale (UWES-9) (Schaufeli et al., 2006) (e.g., "*At my work, I feel bursting with energy*"). Answers were given on a 5-point scale (never – very often). The Cronbach's alpha was .88. Furthermore, teacher stress was measured using ten items from the Perceived Stress Scale (PSS) (Cohen, Kamarck, & Mermelstein, 1983) (e.g., "*How often have you been upset because of something that happened unexpectedly in the last month?*"). Besides, teachers' overall stress was measured using a single item *"I find teaching to be very stressful"* on a 5-point scale (strongly disagree – strongly agree) (Boyle et al.; Klassen & Chiu, 2011). However, two reversed items of teacher stress and the single item measuring teachers' overall stress were removed for further analyses following the factor analysis. The Cronbach's alpha of teacher stress was .89. Finally, the survey included questions concerning personal demographics and the participants' occupational situation (e.g., age, gender, employment status, and years of experience).

4. Results

4.1. Descriptive results

The mean scores and the corresponding standard deviation of the different variables are presented in Table 1. There are a number of things that stand out when examining the scores. First, the mean score of teacher stress was 2.64 (*SD* = .72), which demonstrates that teachers rarely or sometimes experienced stress. Table D1 in Appendix D shows that there were no serious differences in mean scores per province. Teacher engagement, on the other hand, was experienced quite often by teachers (*M* = 3.99, *SD* = .52). Decision latitude also had a high mean score of 4.02. Among the organization communication variables, collegial communication had a striking high average score of 5.75 (*SD* = 1.10), which indicates that communication between fellow teachers is experienced positively by the respondents. When looking at the scores on the three organizational communication variables, that are presented in the scatter plots (Appendix E, Figure E1 till E6), it stands out that there are almost no low scores. Due to this, there was no data available for communication as a demand and the hypotheses 1c, 1d, 2c, 2d, 3c and 3d could not be supported.

4.2. Correlations

In order to test the hypothesized effects, first a correlation analysis was conducted to measure the strength of underlying coherence between the variables. The bivariate correlations, which are presented in Table 1, showed that almost all variables were significantly correlated with one another. Only quantitative demands did not correlate significantly with decision latitude and teacher engagement. Of the communication variables, collegial communication was negatively correlated with quantitative demands (r = -.21, p < .01), positively correlated with decision latitude (r = .35, p < .001), negatively correlated with teacher stress (r = -.29, p < .001) and positively correlated with teacher engagement (r = .33, p < .001). Communication structure was negatively correlated with quantitative demands (r = -.36, p < .001), positively correlated with decision latitude (r = .36, p < .001), negatively correlated with teacher stress (r = -.34, p < .001) and positively correlated with teacher engagement (r = .31, p < .001). Communication climate was negatively correlated with quantitative demands (r = -.26, p < .001), positively correlated with decision latitude (r = .41, p < .001), negatively correlated with teacher stress (r = -.33, p < .001) and positively correlated with teacher engagement (r = .38, p < .001). Furthermore, quantitative demands had a significant positive correlation with teacher stress (r = .52, p < .001).

Lastly, decision latitude was negatively related to teacher stress (r = -.22, p < .01) and positively related to teacher engagement (r = .47, p < .001).

Table 1

Pearson correlations between variables

	Descriptives		Correlations					
	M	*SD*	1	2	3	4	5	6
1. Collegial communication	5.75	1.10						
2. Communication structure	4.80	1.18	.63**					
3. Communication climate	5.27	1.16	.77**	.74**				
4. Quantitative demands	3.42	.77	-.21**	-.36**	-.26**			
5. Decision latitude	4.02	.46	.35**	.36**	.41**	-.03		
6. Teacher stress	2.64	.72	-.29**	-.34**	-.33**	.52**	-.22**	
7. Teacher engagement	3.99	.52	.33**	.31**	.38**	-.13	.47**	-.25**

Note: **p < .01 (2-tailed), variables 1 to 3 were measured on a 7-point scale and variables 4 to 7 were measured on a 5-point scale.

4.3. Effect of organizational communication variables on teacher stress and teacher engagement

A series of regression analyses were performed to discover the relative contribution of various variables in predicting stress and engagement among primary school teachers. The results are shown in Table 2. Three separate linear regression analyses were conducted to measure the effect of the three organizational communication variables on teacher stress. The first regression analysis showed that collegial communication significantly predicted teacher stress (β = -.29, t(205) = -4.36, p < .001). The negative regression coefficient indicates that collegial communication is negatively related to teacher stress. Collegial communication also explains a significant part of the variance in teacher stress (R^2 = .09, F(1, 205) = 19.00, p < .001). Hypothesis 1a is supported. Furthermore, communication structure significantly predicted teacher stress (β = -.34, t(205) = -5.17, p < .001). The negative regression coefficient shows that communication structure has a negative effect on teacher stress. Moreover, communication structure explains a significant part of the variance in teacher stress (R^2 = .12, F(1, 205) = 26.68, p < .001). Hypothesis 2a is supported. A third regression analysis showed that communication climate significantly predicted teacher stress (β = -.33, t(205) = -4.97, p < .001). Again, the

regression coefficient indicates that communication climate is negatively related to teacher stress. Furthermore, a significant part of the variance in teacher stress is explained by communication climate (R^2 = .11, F(1, 205) = 24.72, p < .001). Therefore, hypothesis 3a is supported.

Subsequently, three separate linear regression analyses were conducted to measure the effect of organizational communication variables on teacher engagement. The regression analysis demonstrated that collegial communication significantly predicted teacher engagement (β = .33, t(205) = 4.98, p < .001). The positive regression coefficient shows that collegial communication is positively related to teacher engagement. Collegial communication explains a significant part of the variance in teacher engagement (R^2 = .11, F(1, 205) = 24.84, p < .001). Hence, hypothesis 1b is supported. The second regression analysis indicated that communication structure significantly predicted teacher engagement with a positive regression coefficient (β = .31, t(205) = 4.72, p < .001). A significant part of the variance in teacher stress is explained by communication climate (R^2 = .10, F(1, 205) = 22.28, p < .001). Therefore, hypothesis 2b is supported. Lastly, communication climate turned out to significantly predict teacher engagement (β = .38, t(205) = 5.89, p < .001). The positive regression coefficient demonstrated that communicated climate is positive related to teacher engagement as well. Moreover, communication climate explains a significant part of the variance in teacher engagement (R^2 = .15, F(1, 205) = 34.73, p < .001). Hypothesis 3b is supported.

Table 2

Organizational communication variables as predictors of teacher stress and teacher engagement

Variables	B	SE	β	*t*	*p*	R^2	*F*	df	*p*
Teacher stress									
Collegial communication	-.19	.04	-.29	-4.36	.00	.09	19.00	1, 205	.00
Communication structure	-.21	.04	-.34	-5.17	.00	.12	26.68	1, 205	.00
Communication climate	-.21	.04	-.33	-4.97	.00	.11	24.72	1, 205	.00
Teacher engagement									
Collegial communication	.15	.03	.33	4.98	.00	.11	24.84	1, 205	.00
Communication structure	.14	.03	.31	4.72	.00	.10	22.28	1, 205	.00
Communication climate	.17	.03	.38	5.89	.00	.15	34.73	1, 205	.00

To analyze the combined effect of the three organizational communication variables, stepwise linear regression analyses were performed. First, a stepwise linear regression analysis was performed with collegial communication, communication structure, communication climate and teacher stress. Only communication structure was included in the regression model (β = -.34, $t(205)$ = -5.17, p < .001) and explained a significant part of the variance in teacher stress (R^2 = .12, $F(1, 205)$ = 26.68, p < .001). Collegial communication (β = -.13, $t(205)$ = -1.52, p = .13) and communication climate (β = -.17, $t(205)$ = -1.76, p = .08) were excluded from the model. Furthermore, a stepwise regression analysis was performed with collegial communication, communication structure, communication climate and teacher engagement. This time, only communication climate was included in the regression model (β = .38, $t(205)$ = 5.89, p < .001) and explained a significant part of the variance in teacher stress (R^2 = .15, $F(1, 205)$ = 34.73, p < .001). Collegial communication (β = .09, $t(205)$ = .85, p = .40) and communication structure (β = .07, $t(205)$ = .74, p = .46) were excluded from the model. Based on the stepwise regression analyses, it can be concluded that together the communication variables did not explain more variance in teacher stress and teacher engagement.

4.4. Mediation effect of quantitative demands

4.4.1. Mediation effect of quantitative demands on teacher stress

To test whether quantitative demands mediates the relationship between organizational communication variables and teacher stress, and organizational communication variables and teacher engagement, linear regression analyses and the Sobel test (Baron & Kenny, 1986) have been used. First, the mediation effect of quantitative demands on the relationship between each organizational communication variable and teacher stress has been measured. In order to find a mediation effect, organizational communication variables should have a significant effect on quantitative demands and quantitative demands should have a significant effect on teacher stress. Visualizations of the mediation effects are presented in Appendix F.

The effect of collegial communication on quantitative demands was analyzed by means of a regression analysis. Collegial communication significantly predicted quantitative demands (β = -.21, $t(205)$ = -3.11, p < .01). By including both collegial communication and quantitative demands as independent variables in the regression analysis, the effect of quantitative demands on teacher stress was analyzed (β = .48, $t(204)$ = 8.04, p < .001). Collegial communication was still a significant predictor of teacher stress (β = -.19, $t(204)$ = -3.17, p < .01). The Sobel test demonstrated whether the direct effect deviated significantly from the total effect. The effect of

collegial communication on teacher stress was indeed partially mediated by quantitative demands (t = -2.88, p < .01). Partial mediation indicates that the effect of collegial communication on teacher stress was still significant, but became much smaller when the mediator was added. Thirty-five percent of the total effect was explained by quantitative demands. Therefore, hypothesis 4a is supported.

Furthermore, communication structure significantly predicted quantitative demands (β = -.36, t(205) = -5.59, p < .001). The inclusion of communication structure and quantitative demands as independent variables in the regression analysis showed the effect of quantitative demands on teacher stress (β = .46, t(204) = 7.26, p < .001). Communication structure still predicted teacher stress (β = -.17, t(204) = -2.74, p < .01). Applying the Sobel test showed that quantitative demands partially mediated the relationship between communication structure and teacher stress (t = -4.42, p < .001). Forty-nine percent of the total effect was explained by quantitative demands. Hence, hypothesis 4b is supported.

In addition, the effect of communication climate on quantitative demands was analyzed by means of a regression analysis. Communication climate had a significant effect on quantitative demands (β = -.26, t(205) = -3.90, p < .001). By including both communication climate and quantitative demands as independent variables in the regression analysis, the effect of quantitative demands on teacher stress was analyzed (β = .47, t(204) = 7.74, p < .001). Communication climate was still a significant predictor of teacher stress (β = -.21, t(204) = -3.41, p < .01). The Sobel test demonstrated that the relationship between communication climate and teacher stress was partially mediated by quantitative demands (t = -3.48, p < .001). Quantitative demands explained 37% of the total effect. Hypothesis 4c is supported.

4.4.2. Mediation effect of quantitative demands on teacher engagement

Previous analyses have already shown that organizational communication variables were significantly related to quantitative demands. However, the outcomes of the correlation analysis showed that there was no significant correlation between quantitative demands and teacher engagement. It is therefore likely that quantitative demands has no significant effect on teacher engagement. The inclusion of both collegial communication and quantitative demands as independent variables in the regression analysis indicated that quantitative demands had no significant effect on teacher engagement (β = -.06, t(204) = -.91, p = .37). Moreover, including both communication structure and quantitative demands as independent variables demonstrated that quantitative demands had no significant effect on teacher engagement (β = -.02, t(204) = -

.23, p = .82). Lastly, the effect of quantitative demands on teacher engagement was analyzed using communication climate and quantitative demands as independent variables. The outcomes showed that quantitative demands again had no effect on teacher engagement (β = -.03, t(204) = -.45, p = .66). No further steps were taken to test the mediation effect. Hypotheses 5a, 5b and 5c are not supported.

Table 3

Mediation effect of quantitative demands on teacher stress and teacher engagement

Variables	B	SE	β	*t*	*p*	R^2	*F*	df	*p*
Teacher stress						.30	44.79	2, 204	.00
Collegial communication	-.12	.04	-.19	-3.17	.00				
Quantitative demands	.45	.06	.48	8.04	.00				
Teacher stress						.29	43.06	2, 204	.00
Communication structure	-.11	.04	-.17	-2.74	.01				
Quantitative demands	.43	.06	.46	7.26	.00				
Teacher stress						.31	45.86	2, 204	.00
Communication climate	-.13	.04	-.21	-3.41	.00				
Quantitative demands	.44	.06	.47	7.74	.00				
Teacher engagement						.10	12.82	2, 204	.00
Collegial communication	.15	.03	.32	4.68	.00				
Quantitative demands	-.04	.05	-.06	-.91	.37				
Teacher engagement						.09	11.11	2, 204	.00
Communication structure	.14	.03	.31	4.30	.00				
Quantitative demands	-.01	.05	-.02	-.23	.82				
Teacher engagement						.14	17.40	2, 204	.00
Communication climate	.17	.03	.37	5.56	.00				
Quantitative demands	-.02	.05	-.03	-.45	.66				

4.5. Mediation effect of decision latitude

4.5.1. Mediation effect of decision latitude on teacher stress

To test whether decision latitude mediates the relationship between organizational communication variables and teacher stress, and organizational communication variables and teacher engagement, again linear regression analyses and the Sobel test were used. First the mediation effect of decision latitude on the relationship between each organizational communication variable and teacher stress has been measured. Collegial communication significantly predicted decision latitude ($\beta = .35$, $t(205) = 5.32$, $p < .001$). By including both collegial communication and decision latitude as independent variables in the regression analysis, the effect of decision latitude on teacher stress was analyzed ($\beta = -.13$, $t(204) = -1.86$, $p = .06$). The effect of decision latitude on teacher stress was not significant, whereupon no mediation effect could be found. Hypothesis 6a is not supported.

Furthermore, the effect of communication structure on decision latitude was analyzed by means of a regression analysis. Communication structure was a significant predictor of decision latitude ($\beta = .36$, $t(205) = 5.48$, $p < .001$). Using both communication structure and decision latitude as independent variables demonstrated that there was no significant effect of decision latitude on teacher stress ($\beta = -.11$, $t(204) = -1.57$, $p = .12$), which meant that no mediation effect could occur. Therefore, hypothesis 6b is not supported.

A third series of analyses was conducted to measure the mediation effect of decision latitude on the relationship between communication climate and teacher stress. Communication climate significantly predicted decision latitude ($\beta = .41$, $t(205) = 6.34$, $p < .001$). The inclusion of communication climate and decision latitude as independent variables in the regression analysis showed the effect of decision latitude on teacher stress ($\beta = -.10$, $t(204) = -1.40$, $p = .16$). The effect of decision latitude on teacher stress was not significant. Therefore, a mediation effect could not happen. Hypothesis 6c is not supported.

4.5.2. Mediation effect of decision latitude on teacher engagement

Various regression analyses have been conducted to find the mediation effect of decision latitude on the relationship between each organizational communication variable and teacher engagement. Previous analyses have already shown that organizational communication variables were significantly related to decision latitude. By including both collegial communication and decision latitude as independent variables in the regression analysis, the effect of decision latitude on teacher engagement was analyzed ($\beta = .41$, $t(204) = 6.28$, $p <$

.001). Collegial communication was still a significant predictor of teacher engagement (β = .19, $t(204) = 2.91$, $p < .01$). The Sobel test demonstrated whether the direct effect deviated significantly from the total effect. The effect of collegial communication on teacher engagement is indeed partially mediated by decision latitude ($t = 4.09$, $p < .001$). Decision latitude explains 43% of the total effect. Hence, hypothesis 7a is supported.

Subsequently, the mediation effect of decision latitude on the relation between communication structure and teacher engagement was analyzed by means of regression analyses. The effect of decision latitude on teacher engagement was analyzed with communication structure and decision latitude as independent variables. Decision latitude significantly predicted teacher engagement (β = .41, $t(204) = 6.31$, $p < .001$). Besides, communication structure still predicted teacher engagement (β = .17, $t(204) = 2.55$, $p < .05$). Applying the Sobel test showed that decision latitude partially mediated the relationship between communication structure and teacher engagement ($t = 4.10$, $p < .001$). Forty-six percent of the total effect is explained by decision latitude. Therefore, hypothesis 7b is supported.

Finally, the inclusion of both communication climate and decision latitude as independent variables in the regression analysis demonstrated that decision latitude had a significant effect on teacher engagement (β = .38, $t(204) = 5.77$, $p < .001$). Communication climate was still a significant predictor of teacher engagement (β = .23, $t(204) = 3.47$, $p < .01$). The Sobel test demonstrated that the relationship between communication climate and teacher engagement is partially mediated by decision latitude ($t = 4.23$, $p < .001$). Decision latitude explains 40% of the total effect. Hypothesis 7c is supported. An overview with the outcomes for all hypotheses is presented in Table 5.

Table 4

Mediation effect of decision latitude on teacher stress and teacher engagement

Variables	B	SE	β	*t*	*p*	R^2	*F*	df	*p*
Teacher stress						.09	11.34	2, 204	.00
Collegial communication	-.16	.05	-.25	-3.46	.00				
Decision latitude	-21	.11	-.13	-1.86	.06				
Teacher stress						.12	14.66	2, 204	.00
Communication structure	-.19	.04	-.30	-4.28	.00				
Decision latitude	-.17	.11	-.11	-1.57	.12				
Teacher stress						.11	13.40	2, 204	.00
Communication climate	-.18	.05	-.29	-3.99	.00				
Decision latitude	-.16	.11	-.10	-1.40	.16				
Teacher engagement						.25	34.43	2, 204	.00
Collegial communication	.09	.03	.19	2.91	.00				
Decision latitude	.45	.07	.41	6.28	.00				
Teacher engagement						.24	33.18	2, 204	.00
Communication structure	.07	.03	.17	2.55	.01				
Decision latitude	.46	.07	.41	6.31	.00				
Teacher engagement						.26	36.72	2, 204	.00
Communication climate	.10	.03	.23	3.47	.00				
Decision latitude	.42	.07	.38	5.77	.00				

Table 5

Outcomes of the measured hypotheses

Hypothesis		Outcome
H1a	Collegial communication as a resource is negatively related to teacher stress.	Supported
H1b	Collegial communication as a resource is positively related to teacher engagement.	Supported
H1c	Collegial communication as a demand is positively related to teacher stress.	Not supported
H1d	Collegial communication as a demand is negatively related to teacher engagement.	Not supported
H2a	Communication structure as a resource is negatively related to teacher stress.	Supported
H2b	Communication structure as a resource is positively related to teacher engagement.	Supported
H2c	Communication structure as a demand is positively related to teacher stress.	Not supported
H2d	Communication structure as a demand is negatively related to teacher engagement.	Not supported
H3a	Communication climate as a resource is negatively related to teacher stress.	Supported
H3b	Communication climate as a resource is positively related to teacher engagement.	Supported
H3c	Communication climate as a demand is positively related to teacher stress.	Not supported
H3d	Communication climate as a demand is negatively related to teacher engagement.	Not supported
H4a	Quantitative demands mediates the relationship between collegial communication and teacher stress.	Supported
H4b	Quantitative demands mediates the relationship between communication structure and teacher stress.	Supported
H4c	Quantitative demands mediates the relationship between communication climate and teacher stress.	Supported
H5a	Quantitative demands mediates the relationship between collegial communication and teacher engagement.	Not supported
H5b	Quantitative demands mediates the relationship between communication structure and teacher engagement.	Not supported

Table 5 (Continued)

Hypothesis		Outcome
H5c	Quantitative demands mediates the relationship between communication climate and teacher engagement.	Not supported
H6a	Decision latitude mediates the relationship between collegial communication and teacher stress.	Not supported
H6b	Decision latitude mediates the relationship between communication structure and teacher stress.	Not supported
H6c	Decision latitude mediates the relationship between communication climate and teacher stress.	Not supported
H7a	Decision latitude mediates the relationship between collegial communication and teacher engagement.	Supported
H7b	Decision latitude mediates the relationship between communication structure and teacher engagement.	Supported
H7c	Decision latitude mediates the relationship between communication climate and teacher engagement.	Supported

5. Discussion

The aim of the research was to contribute to research on the effect of organizational communication on teachers' levels of stress and engagement by applying the JD-R model. It was hypothesized that organizational communication variables acting as a resource would reduce teachers' levels of stress and increase teachers' levels of engagement. On the other hand, it was hypothesized that organizational communication variables acting as a demand would increase teachers' levels of stress and reduce teachers' levels of engagement. Furthermore, it was expected that quantitative demands would mediate the relationship between organizational communication variables and teacher stress and the relationship between organizational communication variables and teacher engagement. Also, it was expected that decision latitude would mediate the relationship between organizational communication variables and teacher stress and the relationship between organizational communication variables and teacher engagement.

5.1. Discussion of results

First of all, it can be concluded that primary school teachers were not experiencing high stress levels in this study. The results of this research showed that teachers were rarely or sometimes experiencing stress. This was contrary expectations, since previous research demonstrated high stress levels among school teachers (Collie et al., 2012; Klassen & Chiu, 2011; Skaalvik & Skaalvik, 2016). However, some studies did find normal to low stress levels among teachers (Ouellette et al., 2018; Wolgast & Fischer, 2017). This could be due to subjective nature of similar research or the presence of considerable job resources. According to Bakker et al. (2005), job resources can buffer the relationship between job demands and stress. Job resources, including organizational communication variables, could have buffered the effect of job demands on teacher stress. The presence of well implemented organizational communication could have helped teachers to better cope with job demands, which possibly has led to lower levels of stress.

Furthermore, this research demonstrated that collegial communication, communication structure and communication climate, when acting as a resource, lead to lower levels of teacher stress. This is in line with previous research concerning communication and teacher stress (De Nobile et al., 2013; De Nobile, 2016). The analysis showed that communication structure was the strongest predictor of teacher stress. This is consistent with findings of De Nobile (2016).

In his research, the most important predictors of teacher stress were types of communication structure, namely underload and access to channels. However, he encountered notable differences in variance between multiple communication variables. The organizational communication variables used in this research were almost equivalent in predicting teacher stress. Moreover, the regression coefficient of collegial communication had the lowest value. This is remarkable, since the importance of collegial communication or social support for employee well-being has retrieved considerable attention in previous studies (De Nobile et al., 2013; De Nobile, 2016; Kinman et al., 2011). Besides, the low effect size demonstrated that there are other variables that might reduce stress. Other communication resources that could be important for reducing teacher stress are support and openness from the principal, performance feedback, and self-efficacy (classroom management and instructional) (Bakker et al., 2005; Betoret, 2009; De Nobile, 2016).

Additionally, the results have indicated that collegial, communication structure and communication climate, when acting as a resource, lead to higher levels of teacher engagement. This is consistent with earlier findings (Hakenen et al., 2006; Pogodzinski et al., 2013; Verčič & Vokić, 2017). The motivational process of the JD-R model was visible in the relationship between the three organizational communication variables and teacher engagement. The presence of well-implemented organizational communication could have contributed to intrinsic and extrinsic motivation for goal accomplishment, which possibly has led to higher levels of engagement (Schaufeli & Bakker, 2004). The outcomes of the analyses showed that, of the three organizational communication variables, communication climate was the strongest predictor of teacher engagement. Previous studies have already demonstrated that an communication climate is associated with increased levels of teacher engagement (Hoy et al., 1990; John & Taylor, 1999; MacTavish & Kolb, 2006). However, they did not include other communication variables in their studies. Again, there were no large differences between the communication variables in the magnitude of the determination coefficient. Based on the low effect size, it is expected that there are more variables that may increase teacher engagement. Social relationships with pupils, support from principals and an innovative climate may be other indicators of teacher engagement (Hakanen et al., 2006; Jennings & Greenberg, 2009).

The research did not show the effects of organizational communication variables as a demand on teacher stress and teacher engagement. Hypotheses 1c, 1d, 2c, 2d, 3c, 3d were rejected. Based on the results of this research, it cannot be stated that organizational communication variables as a demand increase teachers' levels of stress and reduce teachers'

levels of teacher engagement, since there was not enough information available about the functioning of the communication variables as a demand. A reason for this observation could be that organizational communication mostly only functions as resource and not as a demand within primary schools.

Subsequently, indirect effects were found by adding the variables quantitative demands and decision latitude. One can conclude that the effect of high levels of well implemented organizational communication on teacher stress proceeds partially via quantitative demands. Additionally, teacher stress is still directly influenced by collegial communication, communication structure and communication climate. Furthermore, one can conclude that the effect of high levels of well implemented organizational communication on teacher engagement proceeds partially via decision latitude. Besides, teacher engagement is still directly predicted by collegial communication, communication structure and communication climate. Mediation effects were not found for the relationships between organizational communication variables and teacher engagement when quantitative demands was included, and for the relationships between organizational communication variables and teacher stress when decision latitude was included.

The outcomes of the mediation analyses can explained as well by means of the JD-R model. As mentioned earlier, the functioning of job demands and job resources can be explained by two different processes in the JD-R model. Job demands lead to exhaustion in the energetic process and job resources cause engagement in the motivational process (Hakanen et al., 2006). Although other research has shown that job resources are associated with decreased burnout, not all job demands are associated with increased work engagement. Job demands which are evaluated as challenges could stimulate work engagement, but job demands evaluated as hindrances hurt work engagement (Crawford, LePine, & Rich, 2010). Quantitative demands is often perceived as a hindrance (Prieto et al., 2008). It is therefore reasonable that quantitative demands acts as a mediator in relation to teacher stress and decision latitude functions as a mediator in relation to teacher engagement.

5.2. Limitations and directions for further research

This research has some limitations that should be noted. First, limitations regarding the results of this research are discussed. Afterwards, limitations regarding the used method will be discussed. The first limitation of the results concerns the three organizational communication variables. The factor analysis demonstrated that the three organizational communication

variables should be perceived as one factor. Besides, the organizational communication variables correlated relatively strongly with each other, which indicated that they were interrelated. However, based on research purposes, it has been decided to measure the three communication variables separately. Further research may use a scale which measures organizational communication as one variable.

Subsequently, the research did not find results for organizational communication as a demand. There was almost no data available about teachers who experienced collegial communication, communication structure and communication climate as a demand. Future research could investigate other forms of communication demands within schools. Examples of demands that could be included are information overload or underload, disturbing behaviors of pupils, disturbing behaviors of parents or leadership (De Nobile, 2016; Kokkinos, 2007; Rajesh & Suganthi, 2013).

A limitation related to the used method is the subjective nature of the research. The research was based on teachers' subjective reports rather than objective measures like vital signs to measure teachers' stress levels (Wolgast & Fischer, 2017). Teachers may have reported what they thought was socially accepted or desired. Besides, teachers' answers on the questions may have depended on the time of completion. A longitudinal study, such as several measurements per year or a diary study, could reduce this effect.

Furthermore, principals or administrative staff may have deliberately decided not to forward the survey to teachers working at their school, if they felt that the workload or work pressure was already too high. Besides, teachers may have chosen not to complete the survey, if they had already too many work activities to complete. Due to this, data from teachers who are dealing with stress might have been missed in the sample. Also, principals could have chosen to complete the survey themselves. However, a question was asked about which group they taught. In a number of cases, respondents reported that they were fulfilling other tasks, like being a principal or a remedial teacher. These surveys were removed.

5.3. Theoretical implications

This research has contributed to theoretical knowledge in different ways. First, this research has explored the relationships between organizational communication, teacher stress and teacher engagement. Besides, this research has developed a bipolar scale based on the organizational communication scale of Schad (2019) to measure organizational communication in schools. Furthermore, by applying the JD-R model in communicational context, a principle is offered

for a renewed JD-R model, in which communication is included. Both in the original model and in the research model used for this study, a health impairment process and a motivational process are clearly coming forward. In the renewed model, communication could be part of both processes. Communication resources could be measured together with other job resources (e.g., decision latitude, performance feedback and career opportunities) and communication demands could be measured together with other job demands (e.g., quantitative demands, emotional demands and mental demands). Although this research only found that organizational communication is a resource in primary schools, it is expected that organizational communication may still be a demand in other context. Other research did find evidence that organizational communication could act as demand (Ahghar, 2008; Cheng, 1991; De Nobile, 2016; Nielsen et al., 2012). More research in the educational sector and other sectors in needed to find out if communication as a demand differs for occupations.

5.4. Practical implications

Besides the theoretical implications, there are some practical implications for principals and teachers of primary schools. According to this research, teachers are rarely to sometimes dealing with stress in primary education. On the other hand, teachers are experiencing reasonably often engagement in their work. Furthermore, the outcomes of this research have highlighted the importance of well implemented organizational communication for reduced levels of teacher stress and increased levels of teacher engagement. Therefore, principals should enhance collegial communication, communication structure and communication climate within their schools. The communication structure within school turned out to be most effective for reducing teacher stress and the communication climate within school turned out to be most effective for increasing teacher engagement. The communication structure can be improved by efficient use of communication means. It should be clear when which communication channel is used for which purpose. In addition, there should be a good mix of informal and formal meetings which is beneficial for learning and teaching. The communication climate can be enhanced by creating an open and transparent environment. Teachers should be given the opportunity to share their ideas and can be involved in decision making. Furthermore, collegial communication can be improved by stimulating positive interactions between teachers. Teachers should respect each other and pay attention to each other. Being open to each other's opinion and encouraging each other is also important for development of collegial communication. Subsequently, principals should take into account the substantial influence of

quantitative demands in stress formation and the considerable influence of decision latitude in engagement development.

5.5. Conclusion

To conclude, the present study contributes to research on the effects of organizational communication on teachers' levels of stress and engagement by applying the JD-R model. It has been demonstrated that collegial communication, communication structure and communication climate can reduce teachers' levels of stress and increase teachers' level of engagement when they function as a resource within school. Furthermore, quantitative demands mediates the relation between each organizational communication variable and teacher stress and decision latitude mediates the relation between each organizational communication variable and teacher engagement. This is in line with the two processes that are presented in the JD-R model. As has been stated, this study highlights the importance of well implemented organizational communication within primary schools. Further research could shed light on the development of stress caused by other communication related demands.

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Appendix A: E-mail (Dutch)

Beste heer/mevrouw,

Er is steeds meer aandacht voor het stressniveau van leraren in het basisonderwijs. De werklast is verhoogd en de hiermee gepaard gaande niveaus van stress hinderen de productiviteit. Om dit probleem aan te pakken, is het belangrijk om inzicht te krijgen in het stressniveau: hoe komt dit tot stand en hoe kan het verminderd worden? Om deze vragen te beantwoorden, heb ik uw hulp nodig.

Mijn naam is Marloes Korte, student Communicatiewetenschap aan de Universiteit Twente. Voor mijn masterscriptie onderzoek ik de relatie tussen communicatie en werkstress bij leraren in het basisonderwijs. Ik wil u vragen om onderstaande vragenlijst te delen met uw collega-leraren, om zoveel mogelijk inbreng van leraren in het basisonderwijs te verzamelen. Zo kan ik praktische aanbevelingen geven om werkstress te verminderen.

Meedoen aan het onderzoek is vrijwillig en de gegevens worden volstrekt anoniem en vertrouwelijk verwerkt. Het invullen van de vragenlijst duurt ongeveer 10 minuten.

Door onderstaande link te openen, start u de vragenlijst.
https://utwentebs.eu.qualtrics.com/jfe/form/SV_4MVQ2Rdh8i9wF1z

Wanneer u vragen heeft over het onderzoek, kunt u een e-mail sturen naar m.a.korte@student.utwente.nl. U kunt aan het eind van de vragenlijst aangeven of u de resultaten wilt ontvangen.

Ik kijk uit naar uw input!

Met vriendelijke groeten,

Marloes Korte
Masterstudent Communicatiewetenschap
Universiteit Twente

Appendix B: Survey (Dutch)

Beste deelnemer,

Bedankt dat u wilt deelnemen aan dit onderzoek. Voor mijn masterscriptie van de studie Communicatiewetenschap onderzoek ik de relatie tussen communicatie en werkstress bij leraren in het basisonderwijs.

Het onderzoek zal 5 tot 10 minuten duren. Er wordt om uw mening gevraagd en hierdoor zijn er geen goede of foute antwoorden. Tijdens het onderzoek kunt u op elk moment stoppen zonder hiervoor een reden op te hoeven geven. Het onderzoek is anoniem en de gegevens worden op een vertrouwelijke manier verwerkt.

Voor verdere vragen over het onderzoek kunt u contact opnemen met de onderzoeker: m.a.korte@student.utwente.nl

Nogmaals dank voor uw deelname en succes met het invullen van de vragenlijst!

Gaat u akkoord met deelname aan dit onderzoek?
Ja
Nee

De volgende stellingen gaan over de communicatie binnen de school waar u werkzaam bent. Geef aan welke optie voor u van toepassing is wat betreft hoe u zich voelt op het werk. (Het middelste rondje weergeeft een neutrale mening.)

Op het werk …
1. hebben collega's weinig aandacht voor elkaar en behandelen collega's elkaar met weinig respect – hebben collega's veel aandacht voor elkaar en behandelen collega's elkaar met veel respect
2. heb ik het gevoel dat ik er alleen voor sta – heb ik het gevoel dat ik deel uit maak van het team
3. ben ik zeer ontevreden met hoe we elkaar behandelen – ben ik zeer tevreden met hoe we elkaar behandelen
4. zijn we zeer ongeïnteresseerd in elkaars mening – zijn we zeer geïnteresseerd in elkaars mening
5. worden we erg door elkaar ontmoedigd – worden we erg door elkaar aangemoedigd

Geef aan welke optie voor u van toepassing is wat betreft de interne communicatie op uw school.

Op het werk…
1. werken de communicatiemiddelen die gebruikt worden zeer inefficiënt – werken de communicatiemiddelen die gebruikt worden zeer efficiënt
2. is de structuur van vergaderingen voor leren en onderwijzen zeer belemmerend – is de structuur van vergaderingen voor leren en onderwijzen zeer bevorderlijk
3. is er een zeer slechte mix van informele en formele bijeenkomsten – is er een zeer goede mix van informele en formele bijeenkomsten
4. werken de digitale leerplatformen zeer slecht – werken de digitale leerplatformen zeer goed

Geef aan welke optie voor u van toepassing is wat betreft het communicatieklimaat op uw werk.
Op het werk…
1. houden we onze mening en ideeën voor ons – brengen we ideeën naar voren en nemen we deel aan besluitvorming
2. is de communicatie tussen collega's gesloten en wordt er weinig met elkaar gedeeld – is de communicatie tussen collega's open en eerlijk en wordt er veel met elkaar gedeeld
3. ben ik zeer ontevreden met het communicatieklimaat – ben ik zeer tevreden met het communicatieklimaat
4. geven we elkaar zeer destructieve kritiek – geven we elkaar zeer opbouwende kritiek
5. worden conflicten en meningsverschillen opgelost door erover te zwijgen en het te vergeten – worden conflicten en meningsverschillen opgelost door erover te praten

De volgende stellingen gaan over de keuzevrijheid die u ervaart op uw werk.

Geef aan in hoeverre u het eens bent met de volgende stellingen.
1 = helemaal mee oneens 2 = mee oneens 3 = niet mee eens en niet mee oneens 4 = mee eens 5 = helemaal mee eens

1. Op mijn werk kan ik veel beslissingen zelf nemen.
2. Ik heb veel te zeggen over wat er op mijn werk gebeurt.
3. Op mijn werk heb ik weinig vrijheid om te beslissen hoe ik mijn werk doe. *

Geef aan in hoeverre u het eens bent met de volgende stellingen.
4. Mijn werk vereist dat ik nieuwe dingen leer.
5. Mijn werk vereist creativiteit.
6. Mijn werk vereist een hoog niveau van vaardigheid.
7. Ik moet op mijn werk gevarieerde taken doen.
8. Ik heb de mogelijkheid mijn eigen vaardigheden te ontwikkelen.
9. Mijn werk omvat veel herhalende werkzaamheden. *

De volgende stellingen gaan over de hoeveelheid werk en het werktempo. Geef aan hoe vaak de volgende stellingen voor u voorkomen.
1 = nooit 2 = zelden 3 = soms 4 = redelijk vaak 5 = heel vaak
1. Mijn werklast is ongelijk verdeeld, waardoor het werk zich opstapelt.

2. Ik heb geen tijd om alle taken te voltooien.
3. Ik loop achter met mijn werkzaamheden.
4. Ik heb genoeg tijd voor mijn taken. *

De volgende stellen gaan over hoe u uw werk beleeft en hoe u zich daarbij voelt. Geef aan hoe vaak de volgende stellingen voor u voorkomen.
1 = nooit 2 = zelden 3 = soms 4 = redelijk vaak 5 = heel vaak
1. Op mijn werk bruis ik van energie.
2. Als ik werk voel ik me fit en sterk.
3. Ik ben enthousiast over mijn baan.
4. Mijn werk inspireert mij.
5. Als ik ‘s morgens opsta, heb ik zin om aan het werk te gaan.
6. Wanneer ik heel intensief aan het werk ben, voel ik mij gelukkig.
7. Ik ben trots op het werk dat ik doe.
8. Ik ga helemaal op in mijn werk.
9. Mijn werk brengt mij in vervoering.

De volgende vragen gaan over de hoeveelheid stress die u ervaart in uw werk. Geef aan hoe vaak de volgende situaties voor u voorkomen.
1 = nooit 2 = zelden 3 = soms 4 = redelijk vaak 5 = heel vaak
1. Hoe vaak was u de afgelopen maand van streek omdat er iets onverwachts gebeurde?
2. Hoe vaak had u de afgelopen maand het gevoel dat u geen controle had over de belangrijke dingen in uw leven?
3. Hoe vaak voelde u zich de afgelopen maand nerveus of gespannen?
4. Hoe vaak heeft u zich de afgelopen maand zeker gevoeld over uw vermogen om met persoonlijke problemen om te gaan? *
5. Hoe vaak had u de afgelopen maand het gevoel dat de dingen verliepen zoals u wilde? *
6. Hoe vaak had u de afgelopen maand het gevoel dat u niet om kon gaan met alle dingen die u moest doen?
7. Hoe vaak was u de afgelopen maand in staat om irritaties in uw leven onder controle te houden? *
8. Hoe vaak had u de afgelopen maand het gevoel dat u alles onder controle had? *
9. Hoe vaak heeft u zich de afgelopen maand opgewonden over dingen waarop u geen invloed had?
10. Hoe vaak had u de afgelopen maand het gevoel dat problemen zich zo hoog opstapelden dat u ze niet aan kon?

Geef aan in hoeverre u het eens bent met de volgende stelling.
1 = helemaal mee oneens 2 = mee oneens 3 = niet mee eens en niet mee oneens 4 = mee eens 5 = helemaal mee eens
1. Ik vind lesgeven stressvol.

Ten slotte volgen nog een aantal vragen over uw demografische kenmerken.

Wat is uw geslacht*?*

- Man
- Vrouw
- Anders, namelijk …

Wat is uw leeftijd?

Hoeveel jaar bent u werkzaam in het basisonderwijs?

Wat voor soort dienstverband heeft u?

- Vast dienstverband
- Tijdelijk contract met uitzicht op een vast dienstverband
- Tijdelijk contract zonder uitzicht op een vast dienstverband, dat binnen een jaar afloopt
- Tijdelijk contract zonder uitzicht op een vast dienstverband, dat nog een jaar of langer loopt
- Een ander soort dienstverband, namelijk ...

Hoeveel uren werkt u per week? (Het gaat hierbij om het aantal uren dat u volgens uw contract werkt.)

Hoeveel leerlingen zitten er op de school waar u werkzaam bent?

Hoeveel leerlingen zitten er in uw klas?

Aan welke groep(en) geeft u les?

In welke provincie bent u werkzaam?

U bent aan het eind gekomen van de vragenlijst. Door op onderstaande pijl te klikken, worden uw antwoorden geregistreerd en kunt u de vragenlijst verlaten.

Wanneer u interesse heeft in de resultaten van het onderzoek, kunt u uw e-mailadres achterlaten.

Appendix C: Factor analysis

Table C1

Rotated component matrix

	1	2	3	4	5	6	7
Collegial communication 5	.825						
Collegial communication 1	.814						
Comunication climate 2	.809						
Collegial communication 3	.800						
Communication climate 3	.754						
Communication climate 1	.752						
Communication climate 5	.752						
Collegial communication 2	.738						
Communication climate 4	.735						
Collegial communication 4	.731						
Communication structure 3	.676						
Communication structure 2	.607						
Communication structure 1	.565			-.306			.353
Teacher stress 6		.785					
Teacher stress 10		.741					
Teacher stress 1		.733					
Teacher stress 3		.697					
Teacher stress 8 Rev		.683					
Teacher stress 2		.676					
Teacher stress 9		.634					
Teacher stress 5 Rev		.619					-.324
Teacher stress 7 Rev		.414					-.390
Teacher engagement 3			.737				
Teacher engagement 9			.731				
Teacher engagement 7			.706				
Teacher engagement 4			.702				
Teacher engagement 1			.697				
Teacher engagement 6			.688				

Table C1 (Continued)

	1	2	3	4	5	6	7
Teacher engagement 5			.624				
Teacher engagement 2			.621				
Teacher engagement 8			.579		.375		
Overall teacher stress		.324	-.439				
Quantitative demands 3				.784			
Quantitative demands 2				.783			
Quantitative demands 4 Rev				.740			
Quantitative demands 1		.317		.656			
Skill discretion 2					.778		
Skill discretion 3					.757		
Skill discretion 4					.667		
Skill discretion 1					.628		
Skill discretion 6 Rev					-.472	.320	
Skill discretion 5					.375		
Decision authority 1						.668	
Decision authority 2	.439					.656	
Decision authority 3 Rev						.411	
Communication structure 4	.449						.537
Teacher stress 4 Rev							-.532
Eigenvalue	11.93	4.84	4.24	2.12	1.69	1.47	1.33
Explained Variance	25.37	10.31	9.02	4.51	3.59	3.13	2.82

Appendix D: Descriptive statistics for provinces

Table D1

Mean score and standard deviation of teacher stress

	M	*SD*	*N*
Drenthe	2.47	.73	15
Flevoland	2.70	.76	12
Friesland	2.57	.76	18
Gelderland	2.41	.85	8
Groningen	2.64	.81	45
Limburg	3.28	1.00	5
Noord-Brabant	2.58	.69	15
Noord-Holland	2.42	.69	31
Overijssel	2.90	.54	18
Utrecht	2.70	.71	8
Zeeland	2.95	.45	10
Zuid-Holland	2.68	.65	22

Table D2

Mean score and standard deviation of teacher engagement

	M	*SD*	*N*
Drenthe	4.12	.42	15
Flevoland	3.85	.74	12
Friesland	3.86	.54	18
Gelderland	4.03	.54	8
Groningen	4.10	.58	45
Limburg	3.98	.28	5
Noord-Brabant	4.04	.46	15
Noord-Holland	3.93	.40	31
Overijssel	3.76	.45	18
Utrecht	4.18	.34	8
Zeeland	4.07	.67	10
Zuid-Holland	3.98	.53	22

Appendix E: Scatter plot

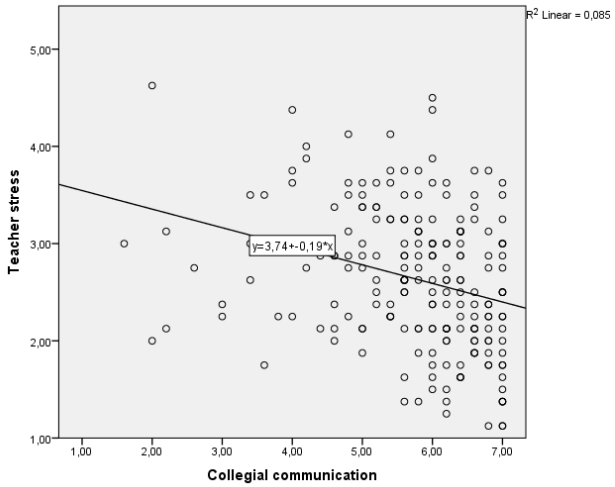

Figure E1. Scatter plot of collegial communication and teacher stress.

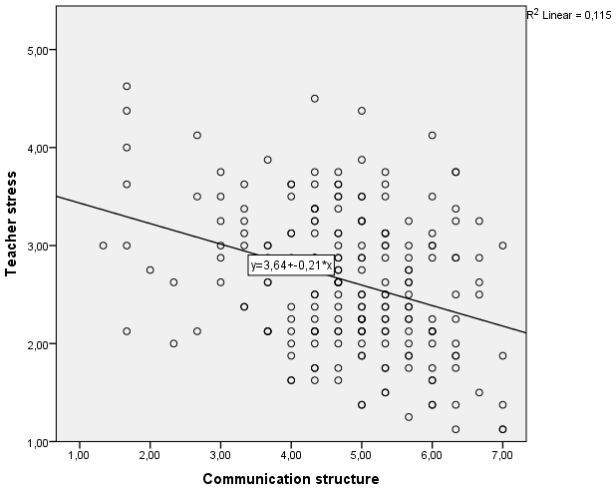

Figure E2. Scatter plot of communication structure and teacher stress.

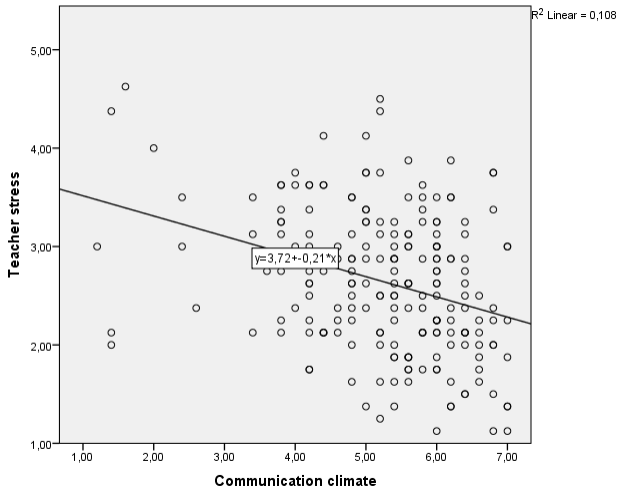

Figure E3. Scatter plot of communication climate and teacher stress.

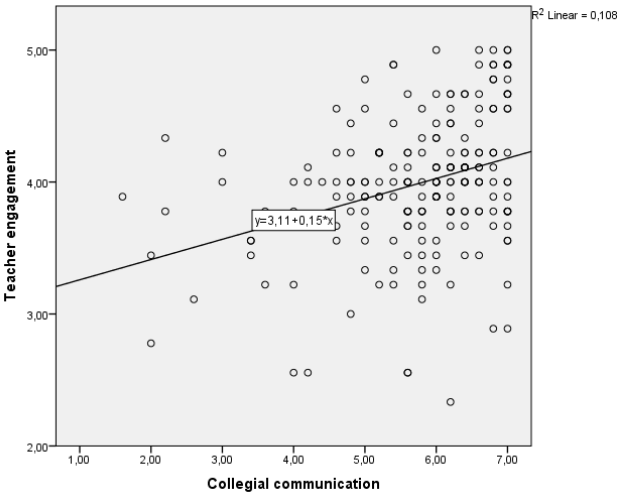

Figure E4. Scatter plot of collegial communication and teacher engagement.

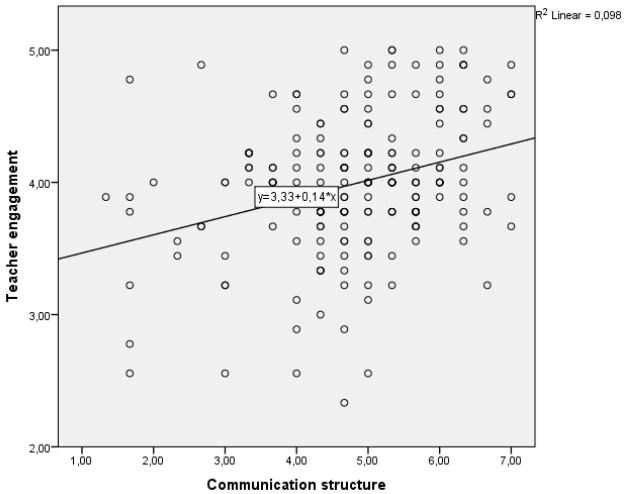

Figure E5. Scatter plot of communication structure and teacher engagement.

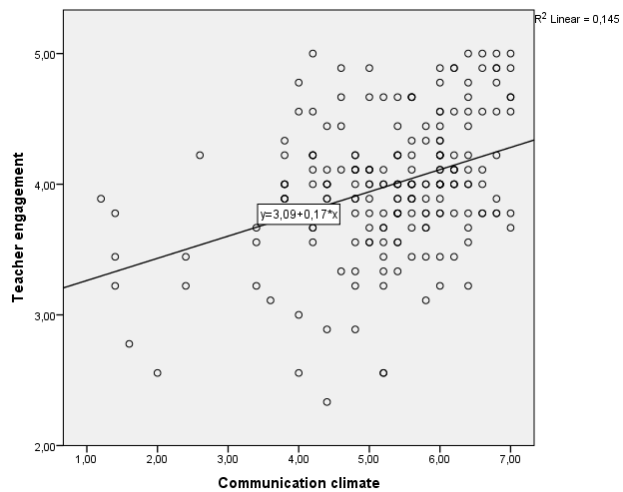

Figure E6. Scatter plot of communication climate and teacher engagement.

Appendix F: Mediation effects

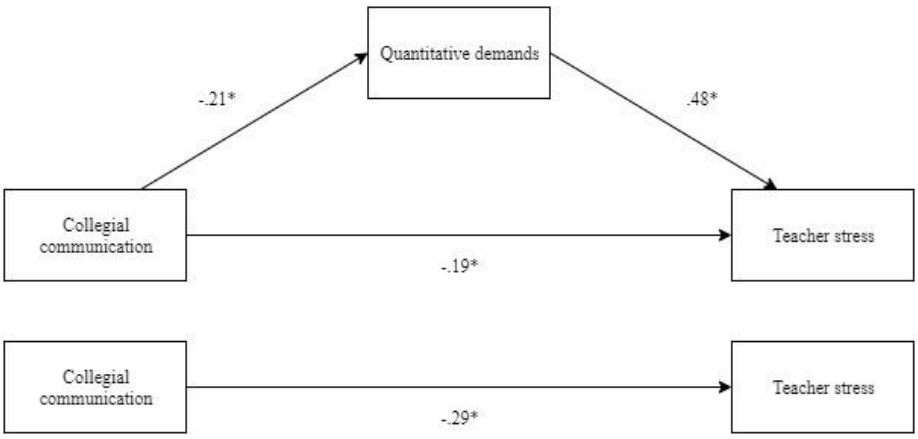

Figure F1. Mediation model of collegial communication, teacher stress and quantitative demands.
Note: *$p < .05$

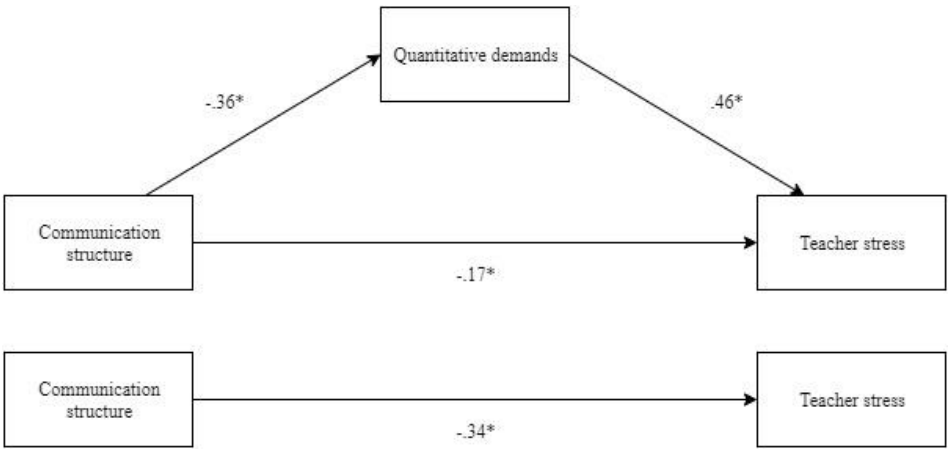

Figure F2. Mediation model of communication structure, teacher stress and quantitative demands.
Note: *$p < .05$

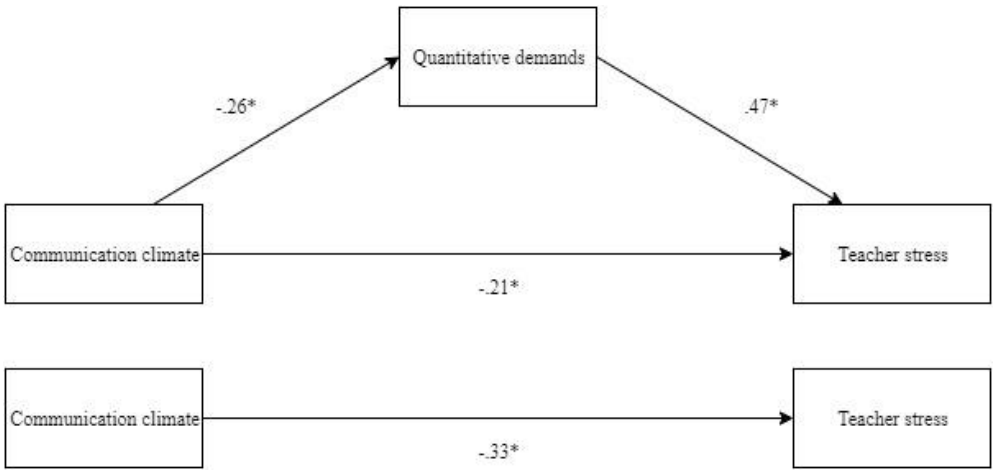

Figure F3. Mediation model of communication climate, teacher stress and quantitative demands.
Note: *$p < .05$

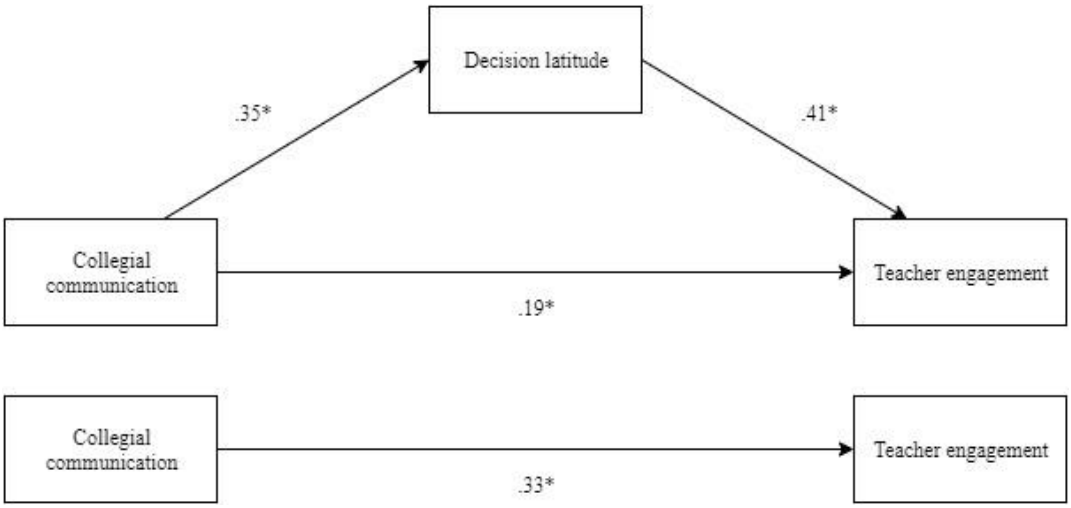

Figure F4. Mediation model of collegial communication, teacher engagement and decision latitude.
Note: *$p < .05$

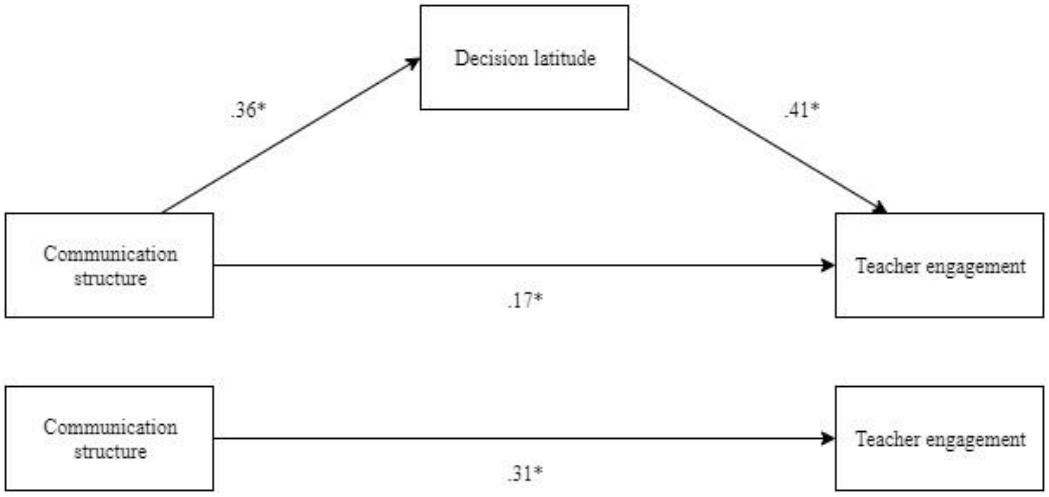

Figure F5. Mediation model of communication structure, teacher engagement and decision latitude.
Note: *$p < .05$

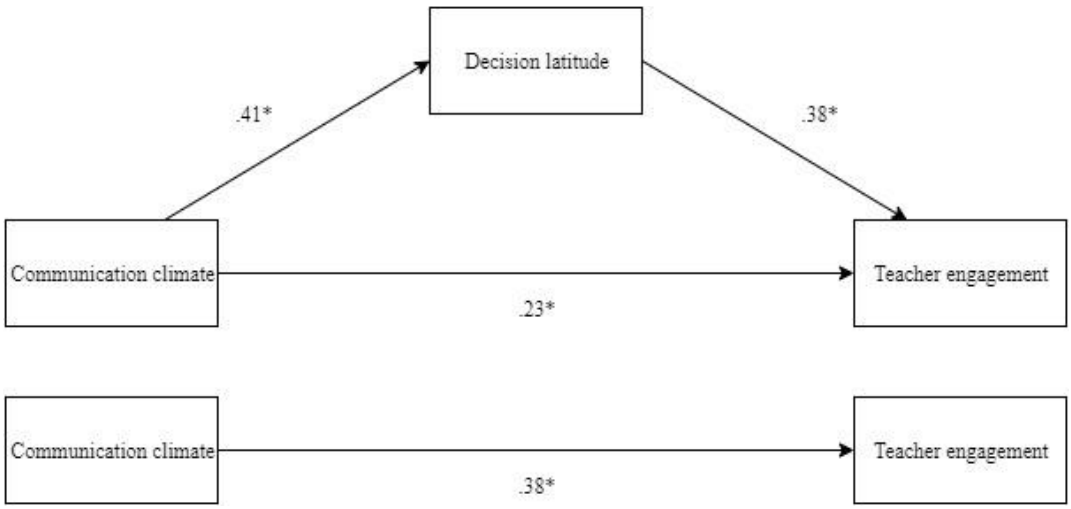

Figure F6. Mediation model of communication climate, teacher engagement and decision latitude.
Note: *$p < .05$