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RESEARCH PAPER

Thriving on Strengths: Effects of a Strengths Intervention for Younger and Older Teachers

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Abstract

The teaching profession is characterized by high demands and teachers who thrive are better able to navigate their demanding context than teachers who survive. Based on theories on strengths use we propose that strengths interventions which help teachers to identify, use, and develop their strengths can enhance their thriving (vitality and learning) which enables them to perform better. In addition, based on the socioemotional selective theory we propose that strengths interventions are especially beneficial for older teachers because it fits their goals and skills. We conducted a quasi-experimental study, in which 152 teachers and their team leaders participated in a strengths intervention. Longitudinal survey data indicated that the strengths intervention contributed to older teachers' (≥46 years old) vitality, which in turn, contributed to their performance. No significant effects were found for younger teachers. We discuss the implications of our study for older teachers.

Keywords Strengths · Thriving · Teachers · Performance · Intervention

The teaching profession is known for its increasingly demanding nature caused by challenges like the complexity and diversity of the pupil population, excessive working hours, and increased administrative burden (e.g., Skaalvik & Skaalvik, 2011; Ingersol et al., 2016) Next to these high demands, teachers often experience a lack of job resources such as social support, autonomy, and participation in decision-making, which could potentially help them cope with the demanding nature of their profession (e.g., Bakker et al., 2007; Boldrini, et al., 2019; Salanova et al., 2006). Given this challenging context it is important that schools do not only help their teachers to survive (i.e., preserving resources or being

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stuck) but also to thrive (i.e., obtaining resources and making progress), in terms of feeling energized and alive (vitality), and achieving greater knowledge and understanding (learning; Hall et al., 2009; Joseph & Linley, 2008; Porath, et al., 2012; Saakvitne, et al., 1998; Spreitzer et al., 2005;). Both components of thriving help individuals to determine whether their actions are successful and what needs to be changed to obtain growth and performance (Spreitzer et al., 2005). Therefore, teachers who thrive are better able to navigate through their demanding work context and make the needed changes in order to improve their own functioning at work (Spreitzer et al., 2005).

Strengths interventions seem to be a promising tool to promote thriving. Although there are many different conceptualizations of strengths (e.g., character strengths; Peterson & Seligman, 2004), we define strengths more broadly as specific individual characteristics, traits, and abilities that are naturally present within an individual and that, when used, generate energy and drive performance (Linley & Harrington, 2006; Miglianico et al., 2020; Wood et al., 2011). This definition captures the agreement between different definitions of strengths and allows participants to give their own interpretation to the meaning of their strengths instead of imposing a somewhat more restrictive definition (Wood et al., 2011). An example of a strength is perseverance which captures the ability to overcome obstacles and to finish what one started. By participating in a strengths intervention, employees develop insight into their strengths, and how to apply and develop them at work (Ghielen et al., 2018; Wood et al., 2011). People who identify their strengths evoke vivid memories about their 'best self', resulting in higher levels of energy (Cable et al., 2015; Linley & Harrington, 2006; Peterson & Seligman, 2004), and vitality (e.g., Ghielen et al.,, 2018). Moreover, participation in a strengths intervention has been linked to self-improvement skills of educational professionals (Meyers et al., 2015; Van Woerkom & Meyers, 2019). Therefore, strengths interventions are a promising tool to fuel both components of thriving. In turn, it can be expected that thriving enhances performance, because workers who feel vital tend to put extra effort into task accomplishment (Kark & Carmeli, 2009; Tummers et al., 2016) and workers who are engaged in learning are more likely to develop skills and knowledge that can help them in performing effectively (Abid, 2016; Spreitzer & Sutcliffe, 2007).

In addition, since the aging of the teacher population and age-related declines in personal resources (Bakker & Hakanen, 2019) may have important implications for the ability of older teachers to continue to thrive (e.g., Kanfer & Ackerman, 2004; Truxillo et al., 2015), we aim to investigate whether a strengths intervention is especially beneficial for older (vs. younger) teachers. Because the term 'older worker' is contested and may be used for workers aged from 40 to 75 years old (Collins et al., 2009; Veth et al., 2015), we use this term in a relative sense, compared to the age of team members (Beier et al, 2022). Offered Human Resource (HR) practices, like strength interventions, only fuel employees' thriving when these align with their goals (Taneva & Arnold, 2018). Older people, compared to their younger counterparts, tend to be more able and motivated to use their strengths in comparison to younger people because older individuals usually have a greater understanding of their abilities and professional identity and are more inclined to set goals that fit their self-concept (Bosma & Kunnen, 2001; Fasbender et al., 2019; Kanfer & Ackerman, 2004; Roberts & Caspi, 2003). Therefore, we expect that a strengths intervention will fit the goals of older teachers in particular and will therefore be most beneficial for them.

With this study, we contribute to the literature in three ways. *First*, we investigate the effect of a strengths intervention on two components of thriving – vitality and learning. Although several studies have suggested that participating in a strengths intervention enhances energy and work engagement (e.g., Ghielen et al., 2018) as well as the skills needed for self-improvement (Meyers et al., 2015; Van Woerkom & Meyers, 2019), it is still unknown whether a strengths intervention also leads to higher levels of learning and thriving during work.

Second, we investigate the moderating impact of age. Although older workers experience. declines in personal resources, they can still thrive with the right HR practices (Taneva & Arnold, 2018). However, there is still limited knowledge about what specific HR practices might fuel older aged teachers' thriving and, in turn, will optimize their performance. Our study therefore contributes to the literature on aging workers (e.g., Fasbender et al., 2019; Kooij et al., 2017) and the positive activity model (Lyubomirsky & Layous, 2013), which suggest that the effectiveness of positive activities depend on personal features like age.

Third, our study makes a methodological contribution to research on strengths interventions and on teacher well-being. Only (quasi-) experimental studies can establish causality, and such studies are urgently needed in an organizational context and particularly in an educational setting (Quinlan et al., 2012; Eden, 2017; Van Woerkom et al., 2021).

1 Strengths Interventions, Teacher Performance, and Thriving

Strengths interventions are a specific form of a Positive Psychological Intervention (PPI), which have generated much interest over the past years. PPIs are "[…] treatment methods or intentional activities that aim to cultivate positive feelings, behaviors, or cognitions" (Sin & Lyubomirsky, 2009, p. 468) and that enable individuals to transition from a 'languishing' state to a 'flourishing' state (Keyes, 2005). Several systematic reviews and meta-analyses have shown that PPIs can improve desirable work-related outcomes (Donaldson et al., 2019; Van Woerkom, 2021; White et al., 2019). Strengths interventions aim to enhance the identification, use, and development of one's strengths (Ghielen et al., 2018; Wood et al., 2011). According to character strengths theory, an individual typically possesses three to seven signature strengths (Seligman, 2004) that, even though they are relatively stable, can be developed by practice and accumulation of skills and knowledge (Miglianico et al., 2020; Biswas-Diener et al., 2011). An example of a strength that could be relevant for teachers is patience, referring to the ability and willingness to suppress annoyance when confronted with a delay (e.g., a student who has trouble learning). By participating in a strengths intervention, individuals develop insights into the traits, abilities and characteristics that allow them to perform at their personal best (Wood et al., 2011). Several studies have provided empirical evidence for the positive relationship between strengths interventions and performance at work (e.g., Dubreuil et al., 2014; Lee et al., 2016) or between strengths use and job performance (van Woerkom et al., 2016). However, limited evidence exists regarding the psychological processes that may explain this relationship (Ghielen et al., 2018; Quinlan et al., 2012).

We propose that thriving may act as a mediating variable, that transmits the effect of a strengths intervention on performance. The construct of thriving represents an experience of personal growth of which the two dimensions of vitality and learning capture both a cognitive and affective aspect (Porath et al., 2012). Although vitality and learning separately can indicate some progress toward personal development at work, it is only in concert that they enhance one another to form the experience of thriving (Porath et al., 2012, p. 251). Spreitzer et al. (2005) notes that this assumption is based on two reasons. First, both the cognitive and affective dimensions of psychological experiences are intertwined (Eagly & Chaiken, 1993), leaving no exception for thriving. Second, vitality represents the hedonic (pleasure attaining and pain avoidance) and learning the eudaimonic (self-realization) component of well-being, which is considered as a multidimensional construct with facets that complement each other (Kahneman et al., 1999; Ryan & Deci, 2001; Spreitzer et al., 2005). This combination of experiencing both aspects of well-being is what differentiates thriving from related constructs like resilience, subjective well-being, and work engagement (Carmeli & Spreitzer, 2009; Spreitzer et al., 2005, 2010). For example, while work engagement mostly captures the hedonic component of well-being, thriving also captures the eudaimonic part which is attained through the pursuit of excellence and realization of potential (Waterman, 2013).

We expect that both components of thriving can be enhanced as a result of participation in a strengths intervention, and that thriving, in turn, is related to increased performance. As for *vitality*, many researchers argue that people who use their strengths, experience feelings of aliveness and energy because they can act in accordance with their authentic selves (e.g., Hodges & Clifton, 2004; Linley, 2008; Peterson & Seligman, 2004). This is supported by both correlational and intervention research revealing relationships between strengths use on the one hand and subjective vitality (i.e., energy and aliveness; e.g., Forest et al., 2012; Wood et al., 2011) and work engagement, including vigor, on the other hand (Van Woerkom et al., 2016). In turn, workers who feel vital, work with positive energy and enthusiasm and are prompted to put extra effort into task accomplishment (Kark & Carmeli, 2009; Tummers et al., 2016). In accordance with this idea, research has shown that vigor is indeed positively associated with work performance (Bakker & Bal, 2010). Moreover, findings of a cross-sectional study by Dubreuil et al. (2014) suggest that strengths use is related to performance mediated by vitality.

As for *learning*, strengths use theory (Peterson & Seligman, 2004) proposes that using one's signature strengths is related to feelings of mastery and rapid learning curves when the learning themes are aligned with one's strengths. By participating in a strengths intervention, individuals increase their knowledge about how they can use their strengths to perform at their personal best, making it possible to attribute performance to factors within their personal control (Ghielen et al., 2018; Martocchio & Dulebohn, 1994; Wood et al., 2011). In turn, participants will hold more positive attributions towards the future and personal growth (Karademas, 2006; Van Woerkom & Meyers, 2019). Former research has linked participation in a strengths intervention to self-improvement skills of graduate students (Meyers et al., 2015) and educational professionals (Van Woerkom & Meyers, 2019), which is seen as a perquisite for growth (Robitschek & Cook, 1999). It can therefore be expected that strength interventions will also enhance teachers' learning. When workers are more engaged in learning, they are more equipped to utilize the newly learned skills and knowledge, which in turn enhances their performance at work (Abid, 2016; Spreitzer & Sutcliffe, 2007). In accordance with this idea, research by Lejeune et al. (2021) has shown that when learners are actively engaged in their own learning process, they will show higher performance at work.

In sum, we propose the following hypotheses:

Hypothesis 1 Participating in a strengths intervention has a positive effect on performance.

Hypothesis 2 Participating in a strengths intervention has a positive effect on vitality (H2a) and learning (H2b).

Hypothesis 3 Both vitality (H3a) and learning (H3b) have a positive effect on performance.

Hypothesis 4 The two components of thriving: vitality (H4a) and learning (H4b) mediate the positive relationship between participation in a strength intervention and performance.

2 The Moderating Role of Age

We propose that a strengths intervention better suits the needs and goals of teachers who are relatively older compared to their peers and will therefore lead to a greater increase in their thriving. In order for people to benefit from a positive activity such as participating in a strengths intervention, they must fully engage in it, feel motivated, and believe that their hard work will pay off (Layous et al., 2013a, 2013b; Layous et al., 2013a, 2013b; Lyubomirsky et al., 2011). For that reason, Lyumbomirsky and Layous (2013) conclude that certain positive activities are better suited for certain people. Carstensen's (2006) socioemotional selective theory (SST) explains that people set their goals as a function of their age. Specifically, SST assumes that the higher an individuals' age, the more they will perceive future time as increasingly limited, shifting their attention from future oriented goals like knowledge acquirement to more present-oriented and emotionally meaningful goals like feeling authentic and motivated. In addition, since people gain more self-knowledge over their life span, they learn more about their own strengths and deficits, and use this knowledge to develop a strong and clear (professional) identity (Bosma & Kunnen, 2001; Fasbender et al., 2019). While aging, people become more inclined to select experiences that deepen and refine this identity (Roberts & Caspi, 2003). Indeed, Kanfer and Ackerman (2004) have shown that older people are more inclined than younger people to turn towards tasks that support their self-concept (i.e., tasks in which they have a lot of expertise) and that provide them with the opportunity for positive experiences. For these reasons, older teachers might be more motivated than their younger counterparts to fully engage in a strengths intervention that stimulates them to identify, use and develop their strengths because the intervention aligns more closely with their goals. Consequently, they will experience greater increases in thriving after participating in a strengths intervention. This is in line with a study by Kooij et al. (2017) showing that an intervention aimed at adjusting the job to personal strengths, was more beneficial for older workers.

Based on the reasoning above, we hypothesize the following:

Hypothesis 5 The indirect effect of participating in a strength intervention on performance through vitality (H5a) and learning (H5b) is stronger for older (vs. younger) teachers.

3 Method

To increase transparency, we report in our methods section how we determined our sample size, all data exclusions (if any), all manipulations, and all measures in the study as recommended by Simmons et al. (2012).

3.1 Participants and Procedure

Participants were teachers and team leaders working in nine different Dutch schools for Vocational Education and Training (VET). After the school management approved participation, teaching teams (16 teams in total) were invited to participate in three consecutive strengths trainings and to fill in one pre- and two post-intervention online surveys. Training participation was not mandatory but highly encouraged by management. To prevent contamination within teaching teams, we applied cluster randomization (Nielsen & Miraglia, 2017) assigning complete teaching teams to either the experimental condition or the wait-list control condition. We declare that we only used these two conditions and that no conditions were dropped. Based on the moment of registration, uneven team numbers (e.g., first, third, fifth team etc.) were assigned to the experimental condition and even numbers (e.g., second, fourth, sixth team etc.) to the wait-list control condition. Also, teams of the same school, located at the same address, were assigned to the same condition to avoid cross-contamination. Two teams had to be manually switched from one condition to another (one team from the experimental condition to the control condition and one team form the control condition to the experimental condition) because of their busy schedules. Three teams that were included in the experimental condition dropped out after the first training because of a lack of fit between their expectations and the content of the trainings. The study gained approval by the research ethics committee of the relevant university, and we adhered to the Dutch code of conduct for social scientists.

Participants were asked to fill out the baseline survey approximately one month before the first training started and the follow-up surveys directly after the last training and approximately two months after the last training for the experimental condition. The baseline survey (T1) and the two follow-up surveys (T2 and T3) were the exact same surveys apart from minor differences (e.g., exclusion of demographic variables after T1; addition of training evaluation questions at the T2 survey of the experimental condition). Participants were rewarded with a gift voucher of 50 euros when they completed all three the questionnaires. As an extra incentive, the teaching teams were rewarder a dinner voucher when all participants of the teaching team filled out all three the surveys.

The sample size in this study was partly based on practical considerations, since we received a grant from the Dutch government to deliver our training to teacher teams in Dutch schools for Vocational Education and Training (VET). Based on the amount of the grant, we were able to deliver the training to a maximum of 16 teacher teams, which resulted in a total of 263 participants that took part in this study ($n = 130$ in the experimental condition and $n = 133$ in the control condition) of which 153 (58.2%) responded to all three surveys. The data of one person was deleted because this person indicated not to have been present during the trainings, resulting in a final data set of 152 participants ($n = 56$ in the experimental condition and $n = 96$ in the control condition). No additional data was dropped.

Based on calculations in G*power (Faul, et al., 2009), this sample size of 152 was sufficient to detect small effect sizes ($f2 = 0.012$) in both the moderation part of our analysis including five predictors (power of 0.92), and the mediation part of our analysis including four predictors (power of 0.94). This resulted in an approximate power of 0.87 for the complete moderated mediation model when multiplying the powers of the moderation and the mediation part of our analysis (based on the joint significance method, see MacKinnon et al., 2002).

Participants were teachers and their team leaders, who reported an average of 17.24 teaching hours per week (*SD* = 8.01), and an average of 31.35 working hours a week (*SD* = 8.31). These figures are similar to the average working hours per week (34, in 2020) of VET teachers in the Netherlands (DUO, 2021). The average age of the participants was 44.53 years (*SD* = 10.77, missing = 2) and the majority of the participants were female (*n* = 87, 57.2%), which is similar to the average age (47, in 2018) and the proportion of women working in VET schools in the Netherlands (52%, in 2020) (MBO DUO, 2018; Raad, 2021). Most participants completed a bachelor's degree (*n* = 112, 73.7%), 14.5% completed basic and intermediate vocational education (*n* = 22) and 11.8% had a master's degree (*n* = 18). Furthermore, participants' average organizational tenure was 9.82 years (SD = 8.42).

3.2 The Strength Intervention

The strengths intervention consisted of three consecutive 4-h trainings with one month in between each session and led by a professional trainer. The design of the trainings was based on the definition of strengths interventions by Quinlan et al. (2012), referring to training processes aimed at identifying, using, and developing strengths. In addition, the integrative model to promote strengths development in organizational environments developed by Miglianico et al. (2020) was used as a framework to design the structure and process of the trainings. This model proposes that the protocol of strengths interventions should encompass the five steps of preparation, identification, integration, action, and evaluation, to promote strengths development in organizations. The content of the intervention, its connection to the steps of the integrative model and Quinlan's definition of strengths interventions are presented in Table 1.

3.3 Measures

3.3.1 Performance

Performance was measured with one-item ('In general, how would you rate your own performance?') adapted from the measure developed by Wright and Staw (1999). Participants were asked to evaluate their performance on a 10-point scale ranging from 1 (bad) to 10 (excellent).

3.3.2 Thriving

Thriving was measured with the 10-item scale developed by Porath et al., (2012). The scale includes 5 items assessing vitality (e.g., 'At work, I feel lively and vital'), and 5 items assessing learning (e.g., 'At work, I continue to learn as time goes on'). All items were rated on a 5-point Likert scale ranging from one (totally disagree) to five (totally agree).

A CFA, using the R Lavaan package (Rosseel, 2012), confirmed that all items loaded on the intended components (T1 $\chi^2 = 68.816$, df = 34; CFI = 0.96, SRMR = 0.08; T2 $\chi^2 = 88.144$, df = 34; CFI = 0.94, SRMR = 0.08; T3 $\chi^2 = 83.971.816$, df = 34; CFI = 0.94, SRMR = 0.07). Both subscales showed good reliabilities at all measurement moments (α vitality T1 = 0.81, T2 = 0.83, T3 = 0.86, and α learning T1 = 0.90, T2 = 0.90, T3 = 0.82).

Table 1 The design of the strengths intervention and it's connection to the 5 steps of the integrative model of strengths development and the definition of strengths interventions by Quinlan et al., (2012)

Intervention	Integrative model	Quilan's Definition
Before the start of the trainings		
First, the team leader was contacted to ensure that the aim of the intervention was in line with their expectations.	*Step 1* Preparation and commitment	/
Participants were asked to fill out the Values in Action Inventory of Strengths (VIA_IS; Peterson & Seligman, 2004) in order to identify and reflect upon their top 5 strengths.	*Step 2* Identification	Identifying strengths
Training 1		
In order for the participants to be actively involved in the intervention, to appreciate the approach and its value, to understand the steps involved and to minimize negativity bias, the content of the intervention and its goals were explained to the participants at the beginning of the first training (Clifton & Harter, 2003; Ito et al., 1998).	*Step 1* Preparation and commitment	/
The first session was primarily used for learning the participants how to identify their strengths. In accordance with the ideas of Dubreil & Forest (2017) and Quinlan et al., (2012) strengths were identified by means of multiple sources like reflecting on experiences and by collecting feedback from peers. Moreover, participants were asked, according to the proposed idea of Dubreuil et al. (2016), to identify past successes and the underlying strengths by drawing a story line of their ups and downs in their professional lives. In addition, participants were asked to conduct a reflected best self-exercise (Roberts et al., 2005) in which their colleagues and managers were asked for feedback on when they had seen the participant at their best.	Step 2: Identification	Identifying strengths
Assignment in between session 1 and 2		
Based on the idea of Dubreuil et al. (2016), participants were asked to identify moments in their professional life when they had success and to connect these moments to their strengths. More specifically, participants were asked to choose three of the identified strengths in step 2, to identify moments on a day to day basis in which they would use these strengths, and to reflect on the benefits. The goal of this exercise was to integrate their strengths in their identity.	*Step 3* Integration	/
Training 2		

Table 1 (continued)

Intervention	Integrative model	Quilan's Definition
The second session was divided in two parts. The first part focused on identifying which strengths the participants would like to use more and develop further. To do so, participants performed an appreciative inquiry exercise (Cooperrider & Srivastva, 1987), constructed an energy matrix in which they identified to what extent they use their strengths in their daily work and detected possible areas of improvement. The second part was focused on facilitating goalsetting regarding strengths use (Locke & Latham, 1990). Moreover, participants were asked to share their strengths with their team and to discuss which strength they would like to use more.	*Step 4* Action	Strengths use & Strengths development
Assignment in between session 2 and 3		
Participants were asked, at the end of session 2, to formulate two specific goals about how they would like to apply or develop their strengths between the second and third session. As proposed by Linley (2008), participants were asked for peer feedback from a colleague on their progress.	*Step 4* Action	Strengths use & Strengths development
Training 3		
In the last session, participants were asked to set long-term goals regarding strengths use and development. To facilitate this process, participants were taught about job-crafting (Wrzesniewski & Dutton, 2001) based on strengths (Kooij et al, 2017) and learned how to recognize states of flow (Nakamura & Csikszentmihalyi, 2002). The participants set their goals and identified possible hurdles and facilitators. In accordance with the argument of Linley (2008), the team was also asked to set connect the individual goals to the overarching team level goal.	*Step 4* Action	Strengths use & development
The final session was mostly focused on step 4. However, the progress that was already made in the sessions and between the sessions was also evaluated. Based on the idea of goal setting theory (Locke & Latham, 1990), the teams were asked to make a plan as to how and when they would reflect on their progress in the future.	*Step 5* Evaluation	/
Evaluation		
The results of the intervention were analyzed using both quantitative and qualitative methods. The results were provided to the participants.	Step 5: Evaluation	/

Because this research was part of a larger research project, we also included other measures of well-being (e.g., work engagement), learning (e.g., teacher professional development), performance (e.g., innovation), and contextual factors (e.g., supervisor support for strengths use) in the surveys that were not used in the analyses and results section of this manuscript.

3.4 Analyses

In the analysis, pre-intervention differences between the experimental and wait-list control conditions were investigated using one-way ANOVA's. No significant differences were found for vitality ($F(1151)=0.41$, $p=0.52$, $\eta^2=0.003$) and performance ($F(1151)=2.43$, $p=0.12$, $\eta^2=0.02$) at baseline. However, a significant small difference between the experimental ($M=4.18$, $SD=0.42$) and control ($M=3.96$, $SD=0.74$) condition ($F(1150)=5.53$, $p=0.02$, $\eta^2=0.03$) was found for learning at baseline. However, we controlled for the baseline values of the dependent variable and respective mediator in all analyses. A significant medium difference was also found for age (EX: $M=48.20$, $SD=9.51$; CON: $M=42.40$, $SD=10.93$; $F(1149)=10.77$, $p<0.01$, $\eta^2=0.07$), which was also controlled for in the analyses.

To assess the direct relationships (Hypothesis 1, Hypothesis 2, and Hypothesis 3), the mediating effect of thriving (Hypothesis 4), and the conditional indirect effect (Hypothesis 5), conditional process analysis was conducted using model 7 of the SPSS PROCESS macro version 3.5 (Hayes, 2013). Moreover, to pinpoint the region of significance for the moderation effect, the Johnson-Neyman technique was used. For all analyses, a 95% bootstrap CI with 5000 samples was constructed as proposed by Shrout and Bolger (2002). The data and codebook used to conduct the analyses are freely available at OSF (Tobias, 2023).

4 Results

4.1 Descriptive Statistics

Table 2 reports the means, standard deviations, and correlations of the study variables. There was no significant correlation between condition (experimental vs waitlist control condition) and vitality at T2, learning at T2, and performance at T3. Condition was positively correlated with age ($r=0.30$, $p<0.001$) meaning that participants in the experimental condition were slightly older. Learning at T2 and vitality at T2 were both positively correlated with performance at T3 (respectively $r=0.20$, $p<0.05$ and $r=0.38$, $p<0.001$). Age was not significantly correlated with vitality at T1 and T2 (respectively $r=-0.01$, $p=0.898$ and $r=0.05$, $p=0.586$) or learning at T1 and T2 ($r=-0.11$, $p=0.205$ and $r=-0.03$, $p=0.759$). See Table 3 for the means and standard deviations of the study variables per condition.

4.2 Hypotheses Testing

The direct effects of the condition on performance T3 (H1), the condition on vitality T2 and learning T2 (H2), and the direct effects of vitality T2 and learning T2 on performance T3 (H3) are presented in Tables 4 and 5. In contrast with hypothesis 1, the results of conditional process analysis indicate that the condition did not have a significant direct effect

Table 2 Correlations between the study variables and covariates

Variable	*M*	*SD*	1	2	3	4	5	6	7	8	9	10
1 Age	44.64	10.74	–									
2 Condition***	–	–	0.30**	–								
3 Vitality T1	3.84	0.57	−0.01	0.02	–							
4 Vitality T2	3.82	0.60	0.05	0.15	0.57**	–						
5 Vitality T3	3.78	0.60	0.05	0.11	0.64**	0.57**	–					
6 Learning T1	4.01	0.65	−0.11	0.10	0.40**	0.29**	0.28**	–				
7 Learning T2	3.97	0.65	−0.03	0.08	0.35**	0.51**	0.28**	0.65**	–			
8 Learning T3	3.96	0.52	−0.12	0.07	0.32**	0.35**	0.44**	0.54**	0.55**	–		
9 Performance T1	7.61	0.75	0.00	−0.12	0.24**	26**	0.20*	0.23*	0.23**	0.19*	–	
10 Performance T2	7.62	0.77	0.05	−0.045	0.17*	0.41**	0.19*	0.11	0.31**	0.17	0.61**	–
11 Performance T3	7.57	0.71	0.03	−0.04	0.32**	0.38**	0.38**	0.07	0.20*	0.19*	0.60**	0.62**

*$p < .05$. **$p < .001$. ***(control group = 0, experimental group = 1)

Table 3 Means and standard deviations of the study variables per condition

	Experimental condition		Control condition	
	M	*SD*	*M*	*SD*
Age	48.52	9.72	42.47	10.96
Vitality T1	3.89	0.52	3.83	0.58
Vitality T2	3.96	0.56	3.73	0.60
Vitality T3	3.90	0.59	3.71	0.60
Learning T1	4.18	0.42	3.96	0.74
Learning T2	4.02	0.60	3.95	0.67
Learning T3	4.02	0.48	3.94	0.54
Performance T1	7.47	0.73	7.68	0.75
Performance T2	7.58	0.73	7.64	0.76
Performance T3	7.53	0.76	7.60	0.66

Table 4 Results of moderated mediation analysis on vitality T2 and performance T3

	B	*SE*	*t*	*p*	R^2
DV: Vitality T2					0.43
F(5144) = 18.06***					
Constant	0.90*	0.44	2.04	0.04	
Condition	0.14	0.08	1.69	0.09	
Age	−.00	0.01	−0.76	0.45	
Intervention × age	0.02**	0.01	2.63	0.01	
Vitality T1	0.63***	0.08	7.72	0.00	
Performance T1	0.05	0.06	0.86	0.39	
DV: Performance T3					0.43
F(4145) = 25.50***					
Constant	2.38***	0.53	4.50	0.00	
Condition	−0.05	0.10	−0.47	0.64	
Vitality T2	0.35***	0.11	3.28	0.001	
Vitality T1	0.06	0.10	0.61	0.54	
Performance T1	0.48***	0.06	7.76	0.00	

Bootstrap results for condition indirect effect of intervention of performance T3 by age

	Effect	Boot SE	LL 95% CI	UL 95% CI
Low age (−1 *SD, 34 years*)	−0.03	0.05	−0.15	0.06
Average age (0.00, 45 years)	0.05	0.03	−0.01	0.12
High age (+1 *SD, 55 years*)	0.13	0.05	0.04	0.24
Index of moderated mediation	Index	Boot SE	LL 95% CI	UL 95% CI
	0.007	0.004	0.001	0.016

*$p \leq 0.01$, **$p \leq 0.01$, ***$p \leq 0.001$; N = 150; DV = dependent variable. Bootstrap sample size = 5000; condition (0 = waitlist control condition, 1 = experimental condition).

Table 5 Results of moderated mediation analysis on learning T2 and Performance T3

	B	*SE*	*t*	*p*	R^2
DV: Learning T2					0.40
F(5144) = 6.74***					
Constant*	1.44*	0.61	2.38	0.02	
Condition	−0.05	0.09	−0.57	0.57	
Age	−0.01	0.01	−0.82	0.41	
Intervention × age	0.01	0.01	0.62	0.54	
Performance T1	0.00	0.08	0.05	0.96	
Learning T1	0.62***	0.12	5.32	0.00	
DV: performance T3					0.35
F(4145) = 20.58***					
Constant	3.38***	0.63	5.34	0.00	
Condition	0.06	0.10	0.61	0.55	
Learning T2	0.17	0.09	1.83	0.07	
Performance T1	0.54***	0.07	8.02	0.00	
Learning T1	−0.15	0.10	−1.58	0.12	
Bootstrap results for condition indirect effect of intervention of Performance T3 by age					
	Effect	Boot SE	LL 95% CI	UL 95% CI	
Low age (−1 *SD, 34 years*)	−0.018	0.02	−0.06	0.02	
Average age (0.00, 45 years)	−0.008	0.02	−0.04	0.03	
High age (+1 *SD, 55 years*)	0.002	0.03	−0.04	0.07	
Index of moderated mediation	Index	Boot SE	LL 95% CI	UL 95% CI	
	0.001	0.002	−0.002	0.005	

*$p \leq 0.01$, **$p \leq 0.01$, ***$p \leq 0.001$; N = 150; DV = dependent variable. Bootstrap sample size = 5000; intervention (0 = no intervention, 1 = intervention).

on performance T3 in the model with vitality (see Table 4: $B = -0.05$, $p = 0.64$) or learning (see Table 5: $B = 0.06$, $p = 0.55$) for all age groups combined. Moreover, the results also indicated that condition did not have a significant direct effect on either vitality T2 (see Table 4: $B = 0.14$, $p = 0.09$) or learning T2 (see Table 5: $B = -0.05$, $p = 0.57$) for all age groups combined. This is not in line with hypothesis 2a and 2b. In predicting performance at T3 for all age groups combined, learning T2 did not have a significant effect (see Table 5: $B = 0.17$, $p = 0.07$) but vitality T2 did (see Table 4: $B = 0.35$, $p = 0.001$). These results are in line with hypothesis 3a but not with hypothesis 3b.

The indirect effect of the condition on performance T3 through vitality T2 (H4a) is presented in Table 4, and the indirect effect through learning T2 (H4b) is presented in Table 5. The bootstrap results for the indirect effect of the condition on performance T3 mediated by vitality T2 do not support Hypothesis 4a by indicating that this effect was not significant for all age groups combined. However, the indirect effect was significant when age was high with a confidence interval excluding zero (Effect = 0.13, bootstrap CI [0.04, 0.24]). The indirect effect of the intervention on performance T3 mediated by learning was not significant for any level of age, with confidence intervals including zero, thereby not providing support for hypothesis 4b.

The conditional indirect effects of vitality T2 and learning T2 on performance T3 for different ages (H5a and H5b) are presented in Tables 4, 5. Results of the conditional process analysis indicate that the effect of the condition on vitality T2 was significantly moderated by age (see Table 4: $B=0.02$, $p=0.01$), but that this was not the case for the effect on learning T2 (see Table 5: $B=0.01$, $p=0.534$), which provides support for hypothesis 5a but not for hypothesis 5b. In line with the above findings, the index of moderated mediation (Hayes, 2015) was significant for the model including vitality (index = 0.007, $SE=0.004$, bootstrap CI [0.001, 0.016.]), but nonsignificant for the model including learning (index = 0.001, $SE=0.002$, bootstrap CI [-0.002, 0.005]). The results of the moderation part of the analyses showed that the effect of the condition on T2 vitality was only present for older teachers (effect = 0.13, boot $SE=0.05$, bootstrap CI [0.04, 0.24]). The results of the Johnson-Neyman analyses indicate that the region of significance starts from the age of 46 ($p=0.05$, 47% of sample), signifying that teachers from the age of 46 and up experienced an increase in their vitality due to their participation in the strengths intervention. The age × experimental condition interaction effect on T2 vitality is graphically displayed in Fig. 1.

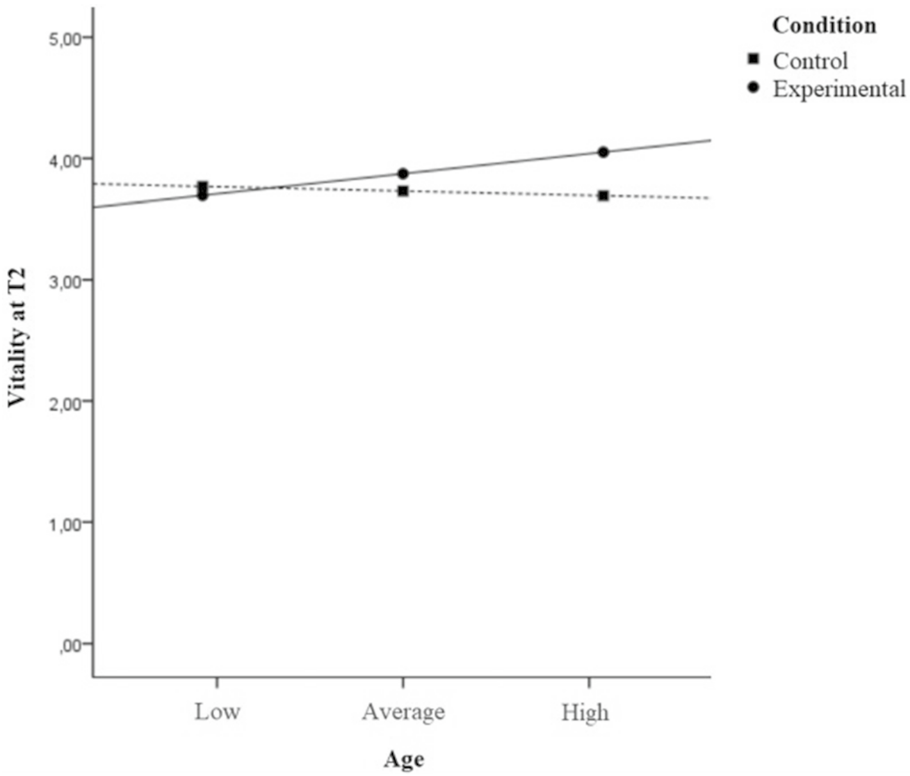

Fig. 1 Plot of the two-way interaction effect of age and experimental condition on vitality T2
Note: Low age = 34 years, Average age = 45 years, and High age = 55 years. The 95% confidence interval values can be found in Table 4

5 Discussion

The teaching profession is characterized by high work demands and low resources (e.g., Bakker et al., 2007; Ingersol et al., 2016) and teachers who thrive are better able to navigate this demanding context than teachers who merely survive (Spreitzer et al., 2005). For this reason, we investigated to what extent a strengths intervention can support teacher thriving and in turn their performance. Moreover, based on the idea that older individuals may benefit more from positive activities (Lyubomirsky & Layous, 2013), and may be more motivated and able to play to their strengths (Bosma & Kunnen, 2001; Fasbender et al., 2019; Kanfer & Ackerman, 2004; Roberts & Caspi, 2003), we tested whether the indirect effect of the strengths intervention on teacher performance through thriving was stronger for older than for younger teachers. Whereas we did not find evidence for a main effect of the strengths intervention on performance via thriving, we found evidence for a conditional indirect effect for older aged teachers, mediated by the vitality component of thriving.

Contrary to our hypothesis, we did not find evidence for an indirect effect of the strengths intervention on performance via vitality or learning for all age groups combined. The result show that the intervention did not affect thriving in the overall teacher population. This is not in line with previous research showing a direct and positive effect of strengths use and strengths interventions on constructs related to vitality, such as work engagement (Bakker & Van Woerkom, 2018; Miglianico et al., 2020). Although research on the effect of strengths use and strengths interventions on learning is sparse (Ghielen et al., 2018), earlier research has indicated that strengths interventions can increase self-improvement skills which are seen as a perquisite of learning and development (Van Woerkom & Meyers, 2019). An explanation for our non-significant results is that the scores on thriving were already quite high to begin with or that our current strengths intervention was not powerful enough to motivate teachers to apply their self-improvement skills and learn. Another explanation could be that the intervention did not meet the current needs of the overall teacher sample. The teacher profession is known for its demanding nature (e.g., Skaalvik & Skaalvik, 2011; Ingersol et al., 2016) and work pressure is a known contextual factor that hinders the transfer of trained knowledge and skills to practice (e.g., Botke et al., 2018). According to the positive activity model (Lyubomirsky & Layous, 2013), personal features like motivation and effort influence the effectiveness of a positive activity. Therefore, it might be that our participants were more inclined to prioritize other activities, like working on the quality of one's education or performing administrative tasks, over putting time and effort into the transfer of the training. In addition, recent work by van Woerkom (2021) has indicated that one-off PPI's may not be sufficient to structurally increase well-being and that interventions with policy-level commitment are necessary. Therefore, it might be the case that our strengths intervention on its own was simply not powerful enough to motivate the overall teacher population to change and that more structural interventions (e.g., HR practices regarding strengths-based performance reviews and career development) are needed to sustain the effect of one-off strengths interventions.

Although we did not find evidence for an effect of the strengths intervention on thriving in the overall teacher sample, our results provide partial support for the hypothesis that thriving fuels performance by showing that feeling vital positively influenced performance. The absence of the effect of learning contradicts earlier research showing that learning and development enable performance (e.g., Cerasoli et al., 2018). However, the effect of learning on performance may only manifest over time, as learning is not a one-time event but a cyclical process of preparing, executing, and reflecting on learning tasks (Molenaar &

Järvelä, 2014). The timeframe of the current study may have been too short to capture the effects of learning on performance that may unfold over a period of several weeks if not months whereas vitality might have a more short-term effect on performance. In addition, it has long been established that learning is only a necessary, but not a sufficient condition for behavioral change—and hence performance increases—to occur because contextual factors such as manager support determine to what extent newly developed knowledge and skills can be applied at work (e.g., Colquitt et al., 2000; Tannenbaum & Yukl, 1992). Our finding that vitality is a predictor of performance, even in the absence of learning, supports the idea that both components of thriving are valuable for performance (Porath et al., 2012). However, the effects may be stronger when a person experiences both vitality and learning (i.e., thriving) at the same time (Porath et al., 2012).

The fact that we did not find evidence for most of the direct and indirect effects in our total sample may indicate that a strengths intervention is not capable of providing teachers with the right tools to cope with the work demands that they face and support their thriving (and in turn their performance). Current reviews argue that the effects of positive psychology interventions are rather small (e.g., Carr et al., 2021; White et al., 2019), and that this might be because the effects of PPIs depend on individual characteristics (Nielsen & Miraglia, 2017). Our study suggests that age is an important characteristic to consider in this respect. In support of the idea of Nielsen and Miraglia (2017) and the positive activity model (Lyumbomirsky & Layous, 2013), that specific PPI's might work better for certain people than for others, we found that as a result of participating in a strengths intervention, older aged teachers built an increased feeling of vitality, which, in turn, was related to an increase in performance. These findings support our assumption that older teachers might be more motivated to play to their strengths in comparison to their younger counterparts. Hence, a strengths-based intervention might be a relevant tool within the educational sector since the teacher population is aging.

The fact that we did not find an effect of the intervention for younger aged teachers contradicts previous research that shows that a strengths intervention leads to favorable outcomes for students (e.g., Meyers et al., 2015). Therefore, we expect that in the context of the teacher profession, the needs of younger teachers do not fully align with strengths interventions. According to SST (Carstensen, 2006), younger people are more inclined to perceive the future as open ended and therefore tend to focus on future oriented goals like career development. Therefore, younger teachers might be less interested in capitalizing on their strengths and be keener to remediate deficits that are crucial for the progression in their career. Hence, a strengths intervention that acknowledges past successes and a person's qualities might not fit with their needs to focus skill improvement, especially when the work pressure is high and the time to work on personal development is limited.

Contrary to our expectations, our results suggest that a strengths intervention was not able to fully support the thriving of older teachers, because we found only increases in the vitality component but not the learning component of older teacher's thriving. Although research indicates that older people are less inclined to focus on future-oriented goals like learning and development (Carstensen, 2006), we expected that helping teachers to consider their strengths as a starting point for their further development would give them with a new perspective on learning that better suits their needs. However, acknowledging the qualities of older teachers may also trigger the development of a fixed mindset by emphasizing that individuals already have what it takes to be successful (Biswas-Diener et al., 2011). This may further de-emphasize the necessity that older people feel to develop themselves hence decreasing the older teachers' perceived urgency of learning. Therefore, future researcher of strengths interventions might consider to explicitly address a growth mindset in their intervention, by emphasizing that existing qualities can be further refined and built upon.

5.1 Limitations and Future Research

The results of this study are subject to several limitations. First, to avoid possible treatment contamination, we assigned complete teachings teams to one of the conditions. Furthermore, we assigned teams sequentially (i.e., based on even, uneven) instead of randomly to the conditions because not all teams were enrolled at the same time, and the busy schedules of the teams required us to plan their training sessions right after their enrollment in the study. Furthermore, after the teams were assigned to the conditions, some teams indicated that they were only available during a specific period after which we had to manually switch those teams between the conditions. Therefore, a selection bias may have occurred despite our efforts to avoid it (Larzelere et al., 2004). However, as mentioned in the method section, we did not find any difference between the experimental and control condition at baseline except for age and learning, which were both included in the analyses. Related to this point, due to the drop-out of teams in the experimental condition (reason for drop-out is unknown), the control condition was significantly larger (experimental condition $n = 56$, control condition $n = 96$) than the experimental condition and seemed more motivated to participate in the study (higher and faster response on the survey). This might indicate that the anticipation of future participation in the training increased the motivation of the participants in the wait-list control condition to fill out the surveys. Future studies should control for this effect by applying a research design in which the control condition does not have to wait for participation in the trainings. For example, with the use of an active control condition in which the control condition participates in a similar activity that does not target the desired outcome and which takes place at the same time as the experimental condition (e.g., Boot et al., 2013).

Second, the influence of contextual factors on the transfer of the trainings were not captured in our research. The teacher profession is known for its working environment characterized by high demands (e.g., high work pressure) and lack of resources (e.g., teacher involvement in decision making) to deal with these demands (e.g., Skaalvik & Skaalvik, 2011; Bakker et al., 2007) which could possibly influence the success of the strengths trainings. This is in line with research on transfer of training (e.g., Botke et al., 2018; Burke & Hutchins, 2007) that describes how contextual factors can hinder knowledge transfer from the training to work. Since we did not measure any of the contextual factors with our survey, we do not know how these contextual factors influenced the effect of the intervention. Therefore, it is recommended for future research to assess the fit between the needs of the participants and the intervention and to include contextual factors that might influence the transfer in the surveys.

Third, performance was measured using a one-item scale indicating general performance at work. Although the multi-dimensionality of job performance has been acknowledged (e.g., Motowidlo & Van Scotter, 1994), previous research by Wright and Staw (1999) has shown that a one-item rating of general performance was significantly correlated ($r = 0.69$, $p < 0.0001$) with a four-dimension construct of performance. Moreover, the use of a single-item scale is reasonable when the construct is judged to be concrete and if the goal of the study is to investigate the general nature of the construct (Lee, et al., 2000; Sackett & Larson, 1990), as was the case in this study. However, for future research, it might be interesting to investigate whether thriving is equally important for different facets of performance (e.g., task performance and contextual performance; Borman & Motowidlo, 1997).

Fourth, the dropout rate of this study was quite high (41.2%). Although participants were informed about the goal of the trainings, were frequently reminded about the surveys, and participation in all three the surveys was rewarded with a gift voucher, participants still dropped out due to various reasons (e.g., work pressure, different expectations from the training). Additional analyses show that the group of participants that dropped out scored significantly lower on thriving than the rest of the participants at baseline. This was the case for vitality ($F(1, 228) = 5.68$, $p = 0.02$, Drop-outs: $M = 3.66$, $SD = 0.59$, Participants: $M = 3.85$, $SD = 0.56$) and learning ($F(1, 228) = 4.13$, $p = 0.04$, Drop-outs: $M = 3.87$, $SD = 0.58$, Participants: $M = 4.04$, $SD = 0.65$) but not for age ($F(1, 228) = 0.29$, $p = 0.59$) and performance ($F(1, 228) = 1.85$, $p = 0.18$). It is therefore possible that the sample was not completely representative of the teacher population and further research should be concerned with keeping participants with lower levels of thriving involved.

5.2 Practical Implications

Traditionally, organizations emphasize the deficits and difficulties that older workers experience since they are experiencing age related declines (e.g., Cau-Bareille, 2014; Jaoul & Kovess, 2004; Josten & Vlasblom, 2015). However, our results indicate that shifting the focus towards the strengths of older employees might be more beneficial in terms of increased vitality and performance. Enabling especially older teachers to feel vital and to perform better is important since the teacher population is aging and teacher shortage is large and a growing problem (Adriaens et al., 2019; Phillips & Sui, 2012). Therefore, it is important to put a stop to the premature drop-out of older teachers to reduce further teacher shortages.

In accordance with recent developments in research that emphasize the importance of person-intervention fit (e.g., Lyumbomirsky & Layous, 2013; Nielsen & Miraglia, 2017), our results underline the value of selecting the right intervention for the right people. By specifically targeting older teachers for participation in a strengths intervention, training costs could be saved for the younger and middle-aged teachers who might not benefit that much from a strengths training when it comes to their vitality and performance. Moreover, a strengths intervention might not be the right tool to invest in when the goal is to increase teacher learning. It is therefore important to invest in the evaluation of the needs of the target group and select the right intervention that will meet those needs.

Related to the importance of a fit between the person and the intervention, we also argue that the effectiveness of the intervention depends on the effect of the context in which it is implemented. It is well known that the teacher profession is characterized by a demanding work environment and lack of resources to deal with job demands (e.g., Bakker et al., 2007; Skaalvik & Skaalvik, 2011). This could make it harder to successfully transfer the knowledge and skills that have been learned in a training. It is therefore recommended to invest in the evaluation of possible hindering contextual factors before investing in a PPI.

6 Conclusion

The importance of teacher thriving instead of surviving has started to get more attention in research (e.g., Taneva & Arnold, 2018). The present study shows that a strengths intervention can stimulate the vitality and performance of relatively older teachers. Therefore, our study highlights the value of a strengths intervention for the teaching profession, and, in addition, the importance of including both mechanisms and boundary conditions that might explain the (in) effectiveness of strengths interventions.

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Declarations

Conflict of interest We have no conflicts of interests to disclose.

Ethical Approval The study was approved by the local research ethics committee of Tilburg University (#EC-2019.12) and was carried out in accordance with APA Ethical Standards (American Psychological Association, 2002) regarding research with human participants. Participation in the study was voluntary and all participants gave informed consent after being fully informed about the study and having had the opportunity to have any questions answered.

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