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Strengthening personal growth: The effects of a strengths intervention on personal growth initiative

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Personal growth is not only a central individual need but also a key requirement for organizational success. Nevertheless, workplace interventions aimed at stimulating the personal growth of employees are still scarce. In this study, we investigated the effectiveness of an intervention that aimed at the identification, development, and use of employee strengths in stimulating personal growth initiative. We conducted a field experiment with a sample of 84 educational professionals who were either assigned to a strengths intervention or a wait-list control group. In a 1-month follow-up study, we found that the intervention had a direct effect on general self-efficacy (GSE) and an indirect effect on personal growth initiative. Moreover, in line with plasticity theory we found that the intervention was especially effective for participants with low to medium initial levels of GSE. We conclude that a strengths intervention may provide a brief and effective tool for organizations that aim for self-directed learning among their staff, in particular when offered to employees who lack confidence in their own abilities.

Practitioner points

- In a 1 month follow-up study, we found that a strengths intervention had a positive direct effect on general self-efficacy and an indirect effect on personal growth initiative.
- In line with plasticity theory, we found that the strengths intervention was especially effective for participants with low to medium initial levels of general self-efficacy.

Because of ongoing changes in the nature of work, traditional notions of training as episodic interventions to enhance job-relevant knowledge and skills have evolved into broader notions of continuous employee development, including voluntary and informal activities that are related to long-term personal effectiveness and career development (Hurtz & Williams, 2009). In today's society, workers are confronted with the challenges to be innovative and to continuously update their knowledge and skills (Gijbels, Raemdonck, & Vervecken, 2010; Hashim, 2008). Even though everyday work practices are full of potential learning processes which are necessary for becoming more expert at one's profession (Gijbels *et al.*, 2010), many workers are not aware of their personal learning goals and do not know which are the learning processes that will lead to those

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goals (Caffarella & O'Donnell, 1987; Doornbos, Bolhuis, & Simons, 2004; Nieuwenhuis & Van Woerkom, 2007). The extent to which workers will benefit from the learning potential of the workplace is therefore largely an expression of their agency and ability to shape their situation (Billet & van Woerkom, 2008; Hennessy & Sawchuk, 2003), in other words, their skills for self-improvement. Personal growth initiative (PGI) refers to a set of skills for self-improvement and includes readiness for change and planfulness as cognitive skills, and using resources and intentional behaviour as behavioural skills (Robitschek *et al.*, 2012). Previous studies have shown that PGI is a predictor of self-actualization (Ivtzan, Chan, Gardner, & Prashar, 2013), adaptive coping skills, and career development (Robitschek & Cook, 1999). Further, people with high levels of PGI are protected against psychological distress by perceiving stressors as opportunities for growth and seeing themselves as capable of making positive changes (Robitschek *et al.*, 2012). Because PGI is a prerequisite for becoming a self-directed learner, it should be a strategic imperative for organizations that require their workers to continuously update their knowledge and skills. Nevertheless, research on personal growth in the organizational context has been sparse (Niessen, Sonnentag, & Sach, 2012) and little is known about how PGI can be developed.

Most developmental processes in organizations are based on a deficit model in which a person's weaknesses are seen as their greatest opportunity for development (van Woerkom *et al.*, 2016). However, advancements in the field of positive psychology (Seligman & Csikszentmihalyi, 2000) have inspired scholars to advocate the benefits of identifying and using individual strengths as a pathway to further development. In particular, the use of strengths is supposed to be beneficial for individuals, with prior strengths awareness as a prerequisite for use (Seligman, Steen, Park, & Peterson, 2005). Strengths theory (Peterson & Seligman, 2004) specifies that using signature strengths is related to a range of positive outcomes, such as feelings of competence, efficacy, and mastery, rapid learning curves when the to-be-learned themes are aligned with strengths, etc. In line with this theory, scholars have found empirical evidence for direct effects of strengths interventions, which target an increase in strengths use, on outcomes such as self-efficacy (e.g., Toback, Graham-Bermann, & Patel, 2016). However, strengths theory does not yet specify how the various positive effects of strengths use or strengths interventions are interrelated, and what the mechanisms are in accomplishing these effects. This is in line with two systematic literature reviews on strengths interventions (Ghielen, van Woerkom, & Meyers, 2018; Quinlan, Swain & Vella-Brodrick, 2012) that conclude that there is a lack of knowledge regarding the mediating mechanisms that explain the effectiveness of strengths interventions. Tentatively, Quinlan *et al.* (2012) suggest that using strengths may lead to feelings of competence which, in turn, have the power to trigger virtuous cycles. In this study, we therefore aim to uncover whether general self-efficacy (GSE) is a mechanism that explains the effect of a strengths interventions on PGI. Encouraging employees to use their strengths at work increases the likelihood that these employees will attain their work-goals, providing employees with mastery experiences (van Woerkom, Oerlemans, & Bakker, 2015), thereby stimulating their GSE, which in turn predicts PGI (Hong, Liao, Raub, & Han, 2016). As plasticity theory suggests that individuals with low initial levels of GSE are especially susceptible to the external influence of a training intervention (Chen, Gully, & Eden, 2001), it is also likely that strengths interventions are particularly beneficial for low GSE individuals. For this reason, we expect GSE to play a moderating and a mediating role in the relation between strengths interventions and PGI.

This study contributes to the literature in three ways. First, although there is an upsurge of research on the construct of PGI using student samples (Meyers, van Woerkom, de Reuver, Bakk, & Oberski, 2015; Robitschek *et al.*, 2012; Thoen &

Robitschek, 2013), to our knowledge this is the first study to investigate PGI in an organizational context. From a scientific point of view, investigating PGI in organizational contexts is necessary because research results tend to differ for student and non-student samples (Gordon, Slade, & Schmitt, 1986; Scandura & Williams, 2000). These differences can be explained by the unique characteristics of students samples that make them more open to external influences than the general population: Among others, students display strong cognitive abilities, have a tendency to comply with authority, and do not possess a highly crystallized sense of self yet (Sears, 1986).

Second, we aim to investigate experimentally whether a strengths intervention can help workers to develop higher levels of PGI. This is an important extension of existing, primarily correlational studies showing that strengths use at work is associated with employee outcomes such as work engagement, GSE and well-being (Harzer & Ruch, 2012, 2013; van Woerkom & Meyers, 2015; van Woerkom *et al.*, 2016). Moreover, while two recent experimental studies on strengths interventions in the work context attest to the positive effects of these interventions on worker well-being (Harzer & Ruch, 2016; Meyers & van Woerkom, 2016), investigating effects on employee skills (i.e., PGI) represents an important next step.

Third, our paper supplements the still limited knowledge about individual characteristics that modify and mechanisms that mediate the effects of strengths interventions (Quinlan *et al.*, 2012) by including pre-intervention GSE as a moderator and post-intervention GSE as a mediator in our study. In doing so, this study also strives to answer the recent call for much needed research that explores how and for whom organizational interventions work (Nielsen & Miraglia, 2017).

The influence of a strengths intervention on PGI, mediated by GSE

Individual strengths can be defined as specific individual characteristics, traits, and abilities that, when employed, are energizing and allow a person to perform at his or her personal best (Linley & Harrington, 2006; Wood, Linley, Maltby, Kashdan, & Hurling, 2011). Most strengths researchers agree that strengths are moderately stable characteristics that are (at least partly) anchored in genes (Steger, Hicks, Kashdan, Krueger, & Bouchard, 2007) but can be developed by practice and the accumulation of related knowledge and skills (Biswas-Diener, Kashdan, & Minhas, 2011). According to strengths theory as proposed by Peterson and Seligman (2004), people typically possess three to seven signature strengths. Furthermore, Peterson and Seligman propose a range of positive effects of using these strengths, among others, feelings of competence, efficacy, and mastery, and rapid learning curves. However, strengths theory does not yet propose how rapid learning curves come about, and what the mechanisms are in accomplishing these effects. In fact, two systematic reviews of empirical strengths intervention research conclude that there still is a lack of knowledge regarding the mediating mechanisms that explain the effectiveness of these interventions (Ghielen *et al.*, 2018; Quinlan *et al.*, 2012). Tentatively, the authors of one of these reviews suggest that the increased feelings of competence that result from using strengths may bring about other positive outcomes by triggering a virtuous circle (Quinlan *et al.*, 2012). In line with this idea, our study focuses on GSE as a potential mechanism in the relationship between a strengths intervention and the accomplishment of personal growth initiative. We expect that GSE is an important mechanism that explains the relationship between participation in the intervention and PGI. GSE refers to ‘individuals’ perception of their ability to perform across a variety of different situations’ (Judge, Erez & Bono, 1998, p. 170). Although GSE is

believed to be more stable than task-specific self-efficacy (Chen, Gully, & Eden, 2004), several studies have shown that training or coaching can elicit positive changes in GSE (Eden & Aviram, 1993; Sharma & Morwitz, 2016). By participating in a strengths intervention, employees develop more insight into the characteristics, traits, and abilities that allow them to perform at their personal best and are encouraged to apply their strengths in their job, thereby boosting their GSE. Because participants are stimulated to attribute their performance to factors within personal control, this leads to higher GSE compared to when individuals attribute performance to factors outside their personal control (Martocchio & Dulebohn, 1994). Individuals who are encouraged to use their strengths at work and to develop these strengths by learning to use them in the appropriate context and in the appropriate amount (Biswas-Diener *et al.*, 2011) are more likely to be successful in attaining their work-related goals. Goal attainment, in turn, will provide them with positive feedback, mastery experiences, and reduced job demands (Bakker, 2011), thereby promoting their GSE (Bandura, 1997).

We expect that GSE, in turn, inspires PGI, which refers to a set of cognitive skills (i.e., readiness for change and planfulness) and behavioural skills (i.e., using resources and intentional behaviour) to actively and intentionally change the self (Robitschek *et al.*, 2012). Readiness for change reflects positive beliefs, attitudes, and values related to personal growth enabling individuals to identify the areas in which they want to grow, whereas planfulness refers to the ability to develop specific and realistic plans to achieve that growth. The behavioural skills include the intentional implementation of the action plan created for personal growth (i.e., intentional behaviour) and the use of resources that facilitate the achievement of growth-oriented goals (i.e., using resources) (Robitschek *et al.*, 2012).

GSE may bring about higher levels of PGI because it stimulates a positive appraisal of the future and of the things to happen (Karademas, 2006), thereby enhancing positive beliefs, attitudes, and values related to personal growth (readiness for change). GSE will facilitate the ability to develop specific and realistic plans to achieve that growth (planfulness) by making people more task diagnostic instead of self-diagnostic (Kanfer, 1987) and by inspiring people to set challenging goals instead of dwelling on their personal deficits (Bandura, 1991). GSE may stimulate the implementation of action plans for personal growth (intentional behaviour) by making people more perseverant and confident in trying different strategies (Lorsbach & Jinks, 1999) and exert greater effort to master challenges (Locke & Latham, 1990). Finally, GSE will encourage the use of resources that facilitate the achievement of growth-oriented goals (using resources) by making people feel less threatened by their need for help and more likely to secure necessary help (Ryan, Pintrich, & Midgley, 2001).

Based on the reasoning above, we hypothesize:

Hypothesis 1: The positive effect of participation in the strengths intervention on (1) readiness for change; (2) planfulness; (3) using resources; and (4) intentional behaviour is mediated by GSE (T2).

The moderating role of initial GSE

According to Brockner's (1988) behavioural plasticity theory, people who are low in self-esteem are more uncertain about the appropriateness of their own attitudes and behaviours and therefore more susceptible to external influences than individuals with higher levels of GSE (Saks & Ashforth, 2000). Support for this idea has been provided by

research showing that GSE negatively moderates the effects of experimental treatments on motivation and performance (Eden & Aviram, 1993; Eden & Zuk, 1995). Applied to our research, we propose that having a high GSE makes individuals less susceptible to the influence of a strengths intervention compared to low GSE individuals (Chen *et al.*, 2001). In contrast, the strengths workshop may give low GSE individuals what they lack, namely the confidence that they have the personal resources that they need for personal growth. Building on our hypotheses that the strengths intervention has an indirect effect on PGI via GSE, we expect a moderated mediation effect. Because workers who are before the workshop lower in GSE are expected to respond stronger to the intervention compared to workers high in GSE, we propose that they will make more improvement in their GSE, which will be associated with higher improvements in their PGI compared to their co-workers with higher initial levels of GSE.

Hypothesis 2: The indirect positive effect of participation in a strengths intervention on (1) readiness for change; (2) planfulness; (3) using resources; and (d) intentional behaviour via GSE (T2) is stronger for employees with low compared to employees with high initial levels of GSE.

Method

Participants and procedure

Participants were educational professionals, managers, and teaching assistants working for an association of five elementary schools. After the management of the schools agreed to participate in the study, staff members were invited to participate in two consecutive strengths workshops and to fill in a pre- and post-intervention online questionnaire. Participation in the workshops was not mandatory but was highly encouraged by the management of the schools. Because interventions in organizations are likely to influence all employees in one department or team (Nielsen & Miraglia, 2017), we employed cluster randomization, assigning the teachers and staff members from two schools to the experimental group and the educational professionals from three other schools to a wait-list control group. By assigning all educational professionals from the same school to the same experimental condition instead of randomly assigning individual educational professionals to one of the conditions, we prevented contamination between the experimental group and the wait-list control group because teachers who belong to the same elementary school are quite likely to discuss the content of the intervention with each other. In addition, participants in the experimental group were asked not to discuss the content of the workshops with their colleagues from other schools who were assigned to the wait-list control group. Although we did not need to submit our study to a research ethics committee according to university policies at the time our study was conducted, we complied with APA's policy of ethical treatment of participants.

The study consisted of a baseline questionnaire, approximately 1 month before the intervention started and a 1 month follow-up questionnaire after the second part of the intervention. The baseline questionnaire (T1) and the follow-up questionnaire (T2) were the exact same questionnaires including all the study variables. A total number of 108 participants took part in this study ($n = 47$ in the experimental group and $n = 61$ in the control group). Of these 108 participants, 84 responded to both questionnaires (77.77%). Most participants were teachers, although some were managers, educational assistants, remedial teachers, or school janitors. Of these participants, 74 (88.1%) were female, which is similar to the proportion of females working in elementary schools in the

Netherlands (86%) (OECD.Stat, 2017). The average age of the participants was 43.36 years ($SD = 10.90$) which is similar to the average age of employees in the educational sector in the Netherlands (44 years; CBS, 2016). Most of the participants had completed a bachelor's degree ($n = 71$, 84.5%). Ten respondents had an intermediate vocational education (11.9%) and three completed a master's degree (3.6%). Furthermore, participants had an average job tenure of 13.60 years ($SD = 10.06$). A more detailed presentation of the demographic characteristics of the participants (experimental and control group) is shown in Table 1.

Based on calculations in G*power (Faul, Erdfelder, Buchner & Lang, 2009), we concluded that a sample size of 84 is sufficient to detect small to medium effect sizes ($f^2 = .096$) in a regression model with four predictors.

The strength intervention

The strength intervention consisted of two workshops led by two professional trainers. Both workshops had a duration of 3 hr. In designing the workshop, we drew on the work of Quinlan *et al.* (2012) who define strengths interventions as training processes aiming at the identification, development, and use of the participants' strengths, whatever these strengths may be. Because strengths interventions are commonly based on the 'identify and use' approach (Biswas-Diener *et al.*, 2011), there is hardly any knowledge available about the distinct effects of strengths awareness and strengths use, especially since authors usually do not include a manipulation check in their study. Even though one study (Seligman *et al.*, 2005) showed that interventions focused on identifying and using strengths led to more sustained results than interventions that are exclusively focused on strengths identification, a recent systematic review of strengths interventions (Ghielen *et al.*, 2018) found that both types of interventions seem to produce similar results. However, since only four out of the eighteen studies that were included in their review focused exclusively on identifying strengths, we cannot draw firm conclusions based on these findings. For this reason, we chose to comply to the commonly used 'identify and use' approach and to investigate to what extent our strengths intervention indeed did have an effect on strengths awareness and strengths use with a manipulation check.

Table 1. Demographic characteristics ($N = 86$) subdivided into experimental ($n = 36$) and control group ($n = 48$)

Description	Mean/% Experimental group	Mean/% Control group
Number of participants	57.1% ($N = 36$)	42.9 ($N = 48$)
Gender		
Male	5.6% ($N = 2$)	16.7% ($N = 8$)
Female	94.4% ($N = 34$)	83.3% ($N = 40$)
Average age in years	43.44 ($SD = 11.29$)	43.29 ($SD = 10.71$)
Educational background		
Intermediate vocational education	8.3% ($N = 3$)	14.6% ($N = 7$)
Higher vocational education (BA)	86.1% ($N = 31$)	83.3% ($N = 40$)
University (MA)	5.6% ($N = 2$)	2.1% ($N = 1$)
Average organizational tenure in years	13.33 ($SD = 10.41$)	13.79 ($SD = 9.89$)

Note. None of the differences between the experimental group and control group were significant.

In line with Quinlan *et al.* (2012), we used a classification with an accompanying questionnaire, combined with an open-ended approach to identify participants' strengths. Prior to the first workshop, participants had to fill out the Strengths Finder 2 (Rath, 2007) as a tool to develop more insight into their top five strengths. The first workshop was focused on the further discovery of strengths with open-ended approaches, for example, by means of feedforward interviews (Bouskila-Yam & Kluger, 2011) in which participants describe an experience at work during which they felt energized and identify the individual strengths that were responsible for this experience. To motivate the participants in their pre-contemplation stage of change (Prochaska, DiClemente, & Norcross, 1992), the trainers addressed why many people do not apply their strengths at work and the negative consequences when this is the case. Because content relevance, goal-setting, and practice enhance transfer of training (Burke & Hutchins, 2007), at the end of the first workshop, participants were challenged to come up with a personal plan regarding the use of their personal strengths in their own work situation in the upcoming 4 weeks. To strengthen their commitment in the preparation phase of their behavioural change process (Prochaska *et al.*, 1992), participants were asked to share their plans with the other participants. These personal plans could be either about the general application of strengths in daily work activities, or about the specific use of strengths to cope with difficult or energy consuming tasks. To provide social support to participants in the action stage of their change process (Prochaska *et al.*, 1992), a second workshop took place 4 weeks later. After discussing the results of the implementation of the personal plans at the beginning of this second workshop, the concept of crafting was introduced as a way to align one's work better with one's personal strengths (Wrzesniewski & Dutton, 2001). Subsequently, participants were asked to identify their diverse job tasks including the time they spent on each of them, the energy the tasks generate or consume, and the importance of the tasks for the organization. Based on this task analysis, participants were asked to decide what element of their job they wanted to craft in line with their strengths, which served as the input for another personal plan for strengths use.

Measures

Personal growth initiative

Participants completed the Dutch version of the 16 item PGIS-II developed by Luyckx and Robitschek (2014) assessing readiness for change (four items, e.g., 'I am ready to make specific changes in myself'), planfulness (five items, e.g., 'I set realistic goals for what I want to change about myself'), using resources (three items, e.g., 'I ask for help when I try to change myself'), and intentional behaviour (four items, e.g., 'I take every opportunity to grow as it comes up'). All items were answered on a six-point Likert scale ranging from zero (0 = 'totally disagree') to five (5 = 'totally agree'). Because the PGI scale has never been used in the context of working adults, we chose to investigate the validity of this scale in our sample by conducting CFA. CFA analyses data showed that the fit of a four-factor model with readiness for change, planfulness, using resources and intentional behaviour loading on four separate factors was suboptimal (T1 $\chi^2 = 263.937$, $df = 98$; CFI = .87, SRMR = .07, T2 $\chi^2 = 212.669$, $df = 98$; CFI = .88, SRMR = .06), but significantly better compared to a two-factor model with readiness for change and planfulness loading on one factor, and using resources and intentional behaviour loading on the other factor (T1 $\Delta\chi^2 = 65.63$, $df = 5$, $p < .001$; CFI = .82, SRMR = .08 T2

$\Delta\chi^2 = 87.12$, $df = 5$, $p < .001$; CFI = .80, SRMR = .08), as well as a model with all four constructs loading on one factor (T1 $\Delta\chi^2 = 124.593$, $df = 6$, $p < .001$; CFI = .78, SRMR = .08; T2 $\Delta\chi^2 = 147.491$, $df = 6$, $p < .001$; CFI = .74, SRMR = .09). After deleting the items 'I figure out what I need to change about myself' (readiness for change) and 'I know steps I can take to make intentional changes in myself' (planfulness), the fit of the four-factor model was acceptable and significantly better compared to the four-factor model including all items (T1 $\Delta\chi^2 = 104.094$, $df = 27$, $p < .001$; CFI = .92, SRMR = .05; T2 $\Delta\chi^2 = 82.487$, $df = 27$, $p < .001$; CFI = .93, SRMR = .06). All subscales had good reliabilities (α planfulness T1 = .89, T2 = .87, α readiness for change T1 = .82, T2 = .78, α using resources T1 = .83 T2 = .87, α intentional behaviour T1 = .89, T2 = .87).

General GSE

General GSE was measured with a Dutch version of the four-item version of New General GSE Scale (Meyers *et al.*, 2015). The following four items of the original 8-item scale were selected based on factor loadings and content analysis: 'When facing difficult tasks, I am certain that I will accomplish them', 'I will be able to successfully overcome many challenges', 'I am confident that I can perform effectively on many different tasks', 'Even when things are tough, I can perform quite well'. A CFA confirmed that all four items loaded on one component (T1 $\chi^2 = .459$, $df = 2$; CFI = 1.00, SRMR = .07, T2 $\chi^2 = 7.924$, $df = 2$; CFI = .96, SRMR = .03). Cronbach's alpha for T1 was .85 and for T2 .84.

CFA analyses showed that a five-factor model with the mediator (GSE at T2) and the dependent variables (readiness for change, planfulness, using resources and intentional behaviour at T2) loading on five separate factors ($\chi^2 = 206.108$, $df = 125$; CFI = .92, SRMR = .07), fitted significantly better to the data than a four-factor model with GSE and planfulness loading on one factor and readiness for change, using resources and intentional behaviour loading on three separate factors ($\Delta\chi^2 = 85.107$, $df = 4$, $p < .001$; CFI = .84, SRMR = .09), as well as a model with all five constructs loading on one factor ($\Delta\chi^2 = 256.648$, $df = 10$, $p < .001$; CFI = .67, TLI = .63, RMSEA = .16, SRMR = .11).

Strengths awareness and strengths use

To check whether our intervention worked as intended, we measured strengths awareness and strengths use before and after the intervention. Strengths use was measured with a six-item scale developed by van Woerkom *et al.* (2016) (e.g., 'I organize my job to suit my strong points'). Cronbach's alpha for this scale was .88 for T1 and .92 for T2. Strengths awareness was measured with five items of the strengths knowledge scale (Govindji & Linley, 2007) (e.g., 'I know when I am at my best'). Cronbach's alpha for this scale was .93 for T1 and .94 for T2.

Analyses

Shapiro-Wilk tests indicated that the distributions of four of our dependent variables (our mediator GSE T2, seeking resources, planfulness and readiness for change) were different from a normal distribution ($p < .05$), whereas intentional behaviour did not differ significantly from a normal distribution. However, parametric statistics such as ANOVA and linear regression are generally highly robust for non-normal

distributions when sample sizes are not too small, as in our case (Hayes, 1996; Norman, 2010).

Next, we investigated pre-intervention differences between the intervention and wait-list control groups. A one-way ANOVA indicated no significant differences on GSE ($F(1,82) = .20, p = .66$), readiness for change ($F(1,82) = 2.94, p = .09$), planfulness ($F(1,82) = .15, p = .70$), using resources ($F(1,82) = .46, p = .50$), or intentional behaviour ($F(1,82) = .71, p = .40$). We also found no significant differences on the baseline measurements of two variables that we used to check whether our intervention worked as intended, namely on strengths awareness ($F(1,82) = 1.63, p = .21$) and strengths use ($F(1,82) = .18, p = .68$) or on descriptive variables such as age ($F(1,82) = .00, p = .95$), gender ($F(1,82) = 2.43, p = .12$), educational level ($F(1,82) = 1.85, p = .18$), organizational tenure ($F(1,82) = .04, p = .84$).

Regarding the linearity of our relations, we investigated the normal P-P plots in regression analyses in which we predicted our mediation variable (GSE T2) from the experimental condition and the baseline level of GSE. In a next regression analysis, we added the product term of GSE T1*experimental condition. Both plots indicate linear relationships. Also the normal P-P plots for regression analyses in which we predicted the dependent variables (seeking resources, planfulness, readiness for change, intentional behaviour) from GSE2, controlling for the direct effect of the experimental condition and the baseline level of the dependent variable indicate linear relationships. All plots can be requested from the first author. Furthermore, we investigated the Variance Inflation Factor (VIF) in our multiple regressions. All VIF values were around 1, except for the analysis in which we included our product term. However, this is not something to be concerned about because the p -value for the product term is not affected by the multicollinearity (Aiken & West, 1991).

To assess the relation between the strengths intervention and PGI (Hypothesis 1) mediated by GSE at T2 (Hypothesis 2) and to test the potential moderation effect of general GSE at T1 in this relationship (Hypothesis 3), we conducted conditional process analysis and constructed a 95% bootstrap CI with 5,000 bootstrap samples (Shrout & Bolger, 2002) with the SPSS PROCESS application (Model 7) developed by Hayes (2013). Conditional process analysis is based on procedures for investigating mediation effects as suggested by MacKinnon, Fairchild and Fritz (2007), in combination with procedures for examining interaction effects as suggested by Muller, Judd and Yzerbyt (2005). It calculates the association between an indirect effect and a moderator and generates an index of moderated mediation that quantifies whether the mediated buffer effect is significant (see Hayes, 2015). In all analyses, we controlled for the T1 values of personal growth initiative implying that regression coefficients can be interpreted as predictors of changes in the dependent variables.

Results

Descriptive statistics

Table 2 presents the means, standard deviations, and correlations of the study variables. As can be seen from this table, there were no significant correlations between the intervention and general GSE and the components of PGI at T2. GSE at T2 was positively correlated with readiness for change (T2), planfulness (T2), using resources (T2), and

Table 2. Means, standard deviations, and Pearson correlations between the study variables

	M	SD	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22				
Gender	-	-																										
Age	43.36	10.90	-.26*																									
Educational level	-	-	-.16	-.09																								
Org tenure	13.60	10.06	-.26*	.67**	.05																							
Intervention	-	-	.17	.01	.15	-.02																						
Strengths awareness T1	5.38	1.10	-.01	.06	-.07	-.05	-.14																					
Strengths awareness T2	5.62	.81	.06	.13	.03	.05	.13	.61**																				
Strengths use T1	4.62	.87	-.06	.05	-.06	.13	.05	.69**	.41**																			
Strengths use T2	4.86	.81	-.16	.11	-.03	.16	-.00	.60**	.57**	.69**																		
General GSE T1	3.55	.65	-.09	.05	.07	.12	-.05	.53**	.41**	.56**	.45**																	
General GSE T2	3.71	.58	.01	.055	.04	-.01	.15	.43**	.55**	.38**	.67**	.67**																
Readiness for change T1	4.23	.79	-.12	-.02	.11	.06	-.19	.55**	.38**	.45**	.33**	.47**	.35**															
Readiness for change T2	4.38	.65	-.05	.03	.10	-.10	-.05	.41**	.49**	.23**	.35**	.26*	.39**	.59**														
Planfulness T1	4.17	.83	-.20	.06	.09	.08	-.04	.57**	.44**	.49**	.50**	.53**	.48**	.79**	.56**													
Planfulness T2	4.29	.73	-.08	.03	.08	-.04	.01	.40**	.44**	.22*	.47**	.34**	.55**	.44**	.70**	.69**												
Using resources T1	4.00	.93	-.12	-.09	.06	.06	-.07	.25**	.14	.24*	.23*	.35**	.27*	.63**	.48**	.55**	.41**											
Using resources T2	4.27	.73	-.12	-.15	.12	-.02	.01	.08	.08	.14	.23*	.16	.24*	.40**	.57**	.42**	.46**	.58**										
Intentional behaviour T1	4.30	.90	-.05	-.04	.03	-.01	-.09	.35**	.24*	.38**	.33**	.40**	.39*	.61**	.49**	.57**	.44**	.62**	.50**									
Intentional behaviour T2	4.39	.74	-.10	-.04	.16	-.02	.04	.26**	.30**	.28*	.40**	.33**	.47**	.38**	.54**	.52**	.61**	.48**	.61**	.75**								

Note. * $p < .05$, ** $p < .01$; gender (1 = male, 2 = female), educational level (1 = intermediate vocational education, 2 = higher vocational education, 3 = university); intervention (0 = no intervention, 1 = intervention).

intentional behaviour (T2) ($r = .39, p < .01$; $r = .55, p < .01$; $r = .24, p < .01$; $r = .47, p < .01$ respectively).

Manipulation check

As a first step in our analyses, we investigated the extent to which the intervention enhanced the strengths awareness and strengths use of participants. To do so, we used GLM repeated measures ANOVA, with time as the within-subject variable and group (experimental vs. control) as the between-subject variable. The result of this analysis showed that for strengths awareness the interaction between time and experimental condition was significant ($F(1,82) = 7.539, p = .007$), whereas the interaction between time and experimental condition was not significant for strengths use ($F(1,82) = .357, p = .552$). Furthermore, to investigate whether changes in strengths awareness/use due to the experimental condition were linked to changes in GSE, we constructed a 95% bootstrap CI with 5,000 bootstrap samples (Shrout & Bolger, 2002) with the PROCESS application (Model 4) developed by Hayes (2013), controlling for initial levels of strengths awareness/use and GSE. These analyses pointed out that the confidence interval for the indirect effect of the intervention on GSE, mediated by strengths awareness was significant (95% CI [.01, .21]), whereas the confidence interval for the indirect effect of the intervention on GSE, mediated by strengths use was not significant (95% CI [-.07, .03]).

Table 3. Results of moderated mediation analysis on GSE T2 and readiness for change

	B	SE	t	p	R ²
DV: GSE T2					.52
$F(4,79) = 21.08^{***}$					
Constant	.76	.39	1.93	.06	
Intervention	1.32	.51	2.56	.01	
GSE T1	.71	.10	6.99	.00	
Intervention* GSE T1	-.31	.14	-2.16	.03	
Readiness for change T1	.07	.07	1.14	.26	
DV: Readiness for change T2					.39
$F(3,80) = 17.06^{***}$					
Intervention	.03	.12	.23	.82	
GSE T2	.23	.11	2.16	.03	
Readiness for change T1	.43	.08	5.42	.00	
Bootstrap results for conditional indirect effect of intervention on readiness for change by GSE T1					
	Effect	Boot SE	LL 95% CI	UL 95% CI	
Low GSE (-1 SD)	.10	.06	.01	.28	
Average GSE (.00)	.05	.03	.01	.16	
High GSE (+1 SD)	.01	.03	-.05	.08	
Index of moderated mediation	Index	Boot SE	LL 95% CI	UL 95% CI	
	-.07	.06	-.24	-.00	

Note. *** $p < .001$; $N = 84$. DV = dependent variable. Bootstrap sample size = 5,000; intervention (0 = no intervention, 1 = intervention).

Test of the hypotheses

The direct and (conditional) indirect effects of the strengths intervention on the four different aspects of PGI are presented in Table 3 (readiness for change), Table 4 (planfulness), Table 5 (using resources), and Table 6 (intentional behaviour). As can be seen, the intervention did not have a significant direct effect on readiness for change (see Table 3: $B = .03$, ns), planfulness (see Table 4: $B = -.01$, ns), using resources (see Table 5: $B = .06$, ns), and intentional behaviour (see Table 6: $B = .11$, ns). The intervention did, however, have an effect on GSE at T2 in all models ($p < .05$), and GSE at T2 was significantly related to readiness for change (see Table 3: $B = .23$, $p < .05$), planfulness (see Table 4: $B = .36$, $p < .01$), and intentional behaviour (see Table 6: $B = .24$, $p < .05$). GSE was, however, not related to using resources (see Table 5: $B = .11$, ns). The bootstrap results for the indirect effect of the intervention on readiness for change, planfulness, and intentional behaviour mediated by GSE at T2 support hypothesis 1 a, b, and d by indicating that this effect was significant when the moderator value was zero, with confidence intervals excluding zero (lower levels at .01 and upper levels between .10 and .23). The confidence interval for the indirect effect of the intervention on using resources was not significant ($-.02$ to $.10$), thereby not providing support for hypothesis 1c. Furthermore, results revealed that the indirect effects on readiness for change, planfulness, and intentional behaviour were significant for low GSE (T1) ($p < .05$) and average GSE (T1) ($p < .05$) participants, but not for high GSE (T1) participants ($p > .05$). The confidence interval probing the indirect effect on using resources included

Table 4. Results of moderated mediation analysis on GSE T2 and planfulness

	B	SE	t	p	R ²
DV: GSE T2					.53
$F(4,79) = 22.43^{***}$					
Constant	.74	.36	2.06	.04	
Intervention	1.23	.50	2.44	.02	
GSE T1	.66	.11	6.28	.00	
Intervention* GSE T1	-.29	.14	-2.04	.04	
Planfulness T1	.13	.06	1.99	.05	
DV: Planfulness T2					.54
$F(3,80) = 30.85^{**}$					
Intervention	-.01	.11	-.08	.93	
GSE T2	.36	.11	3.26	.00	
Planfulness T1	.48	.08	6.24	.00	

Bootstrap results for conditional indirect effect of intervention on planfulness by GSE T1

	Effect	Boot SE	LL 95% CI	UL 95% CI
Low GSE (-1 SD)	.14	.10	.02	.42
Average GSE (.00)	.08	.05	.01	.23
High GSE (+1 SD)	.01	.04	-.08	.09

Index of moderated mediation	Index	Boot SE	LL 95% CI	UL 95% CI
	-.10	.09	-.34	-.00

Note. *** $p < .001$; ** $p < .01$; $N = 84$. DV = dependent variable. Bootstrap sample size = 5,000; intervention (0 = no intervention, 1 = intervention).

Table 5. Results of moderated mediation analysis on GSE T2 and using resources

	B	SE	t	p	R ²
DV: GSE T2					.51
$F(4,79) = 20.50^{***}$					
Constant	.92	.37	2.51	.01	
Intervention	1.24	.52	2.39	.02	
GSE T1	.74	.10	7.15	.00	
Intervention* GSE T1	-.29	.14	-2.01	.05	
Using resources T1	.02	.05	.39	.70	
DV: Using resources T2					.35
$F(3,80) = 14.43^{***}$					
Intervention	.06	.13	.48	.63	
GSE T2	.11	.12	.89	.38	
Using resources T1	.44	.07	5.99	.00	

Bootstrap results for conditional indirect effect of intervention on using resources by GSE T1

	Effect	Boot SE	LL 95% CI	UL 95% CI
Low GSE (-1 SD)	.04	.05	-.03	.18
Average GSE (.00)	.02	.03	-.02	.10
High GSE (+1 SD)	.00	.02	-.02	.06
Index of moderated mediation	Index	Boot SE	LL 95% CI	UL 95% CI
	-.03	.04	-.16	.02

Note. *** $p < .001$; $N = 84$. DV = dependent variable. Bootstrap sample size = 5,000; intervention (0 = no intervention, 1 = intervention).

zero and was thus non-significant for low GSE (T1) ($p > .05$). In line with the above findings, the index of moderated mediation (Hayes, 2015) was significant for readiness for change ($B = -.07$, $p < .05$), planfulness ($B = -.10$, $p < .05$), and intentional behaviour ($B = -.72$, $p < .05$), but nor for using resources ($B = -.03$, ns). This means that the indirect effects on the former three PGI aspects are indeed moderated by GSE prior to the intervention, corroborating Hypothesis 2a, 2b, and 2d. Contrary to expectations, the indirect effect on using resources was not moderated by GSE (T1), thereby not providing support for Hypothesis 2c. Given our results and the fact that a significant index of moderated mediation indicates that 'any two conditional indirect effects estimated at different values of the moderator are significantly different from each other' (Hayes, 2015, p. 2), we can conclude that the significant indirect effects of the strengths intervention on readiness for change, planfulness, and intentional behaviour via GSE (T2) are stronger for individuals with low GSE (T1) than for individuals with an average level of GSE (T1). Figure 1 gives a visual representation of the interaction between GSE (T1) and the experimental condition on GSE (T2). Figure 2 gives an overview of the relationships between the strengths intervention, self-efficacy, and personal growth initiative.

Discussion

Both individual employees and organizations benefit from personal growth initiative. On the one hand, it allows individuals to fulfil their personal development needs (Alderfer,

Table 6. Results of moderated mediation analysis on GSE T2 and intentional behaviour

	B	SE	t	p	R ²
DV: GSE T2					.53
F(4,79) = 22.31***					
Constant	.70	.37	1.89	.06	
Intervention	1.28	.50	2.54	.01	
GSE T1	.69	.10	6.94	.00	
Intervention* GSE T1	-.30	.14	-2.13	.04	
Intentional behaviour T1	.11	.06	1.92	.06	
DV: Intentional behaviour T2					.61
F(3,80) = 21.08***					
Intervention	.11	.11	1.01	.32	
GSE T2	.24	.10	2.43	.02	
Intentional behaviour T1	.56	.06	8.91	.00	

Bootstrap results for conditional indirect effect of intervention on intentional behaviour by GSE T1

	Effect	SE	LL 95% CI	UL 95% CI
Low GSE (-1 SD)	.10	.05	.02	.25
Average GSE (.00)	.05	.03	.01	.14
High GSE (+1 SD)	.01	.03	-.05	.09

Index of moderated mediation	Index	SE	LL 95% CI	UL 95% CI
	-.72	.05	-.21	-.00

Note. *** $p < .001$; $N = 84$. DV = dependent variable. Bootstrap sample size = 5,000; intervention (0 = no intervention, 1 = intervention).

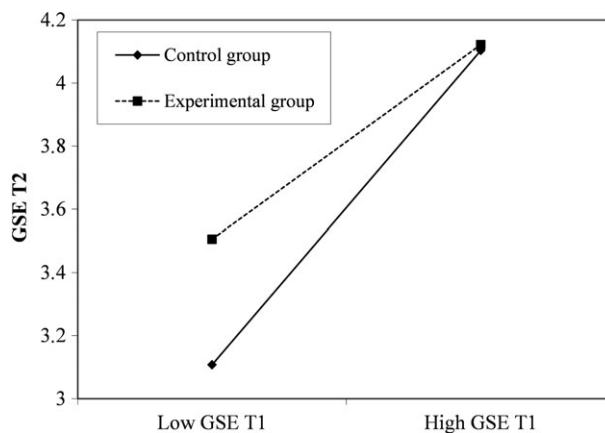


Figure 1. Plot of the two-way interaction effect of GSE T1 and experimental condition on GSE T2.

1969), helps them to attain career success in a work environment that necessitates continuous learning and adaptation (Meyers *et al.*, 2015), and contributes to their mental health and psychological functioning (Robitschek & Keyes, 2009; Weigold, Porfeli, &

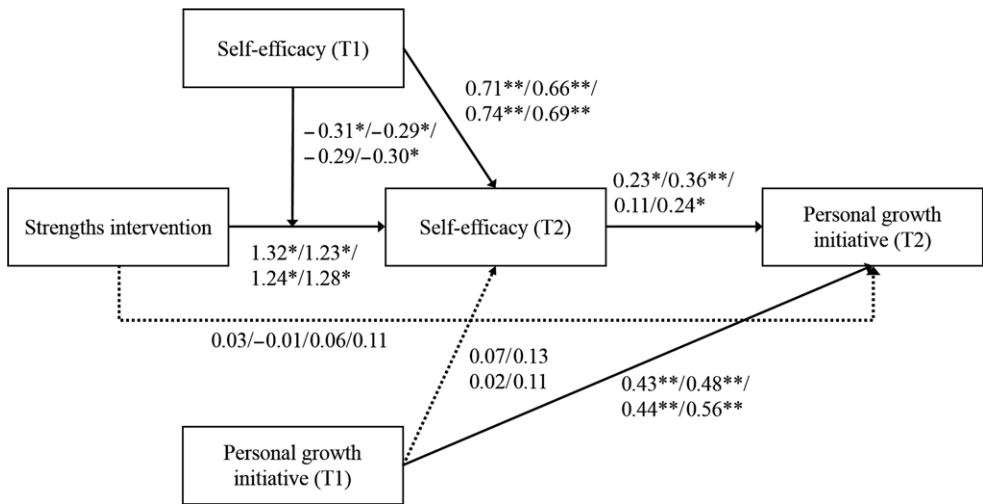


Figure 2. Overview of the relationships between the strengths intervention, self-efficacy, and personal growth initiative. All coefficients represent unstandardized coefficients. Paths for the four personal growth initiative sub-components are presented in the following order: readiness for change, planfulness, using resources, intentional behaviour. Solid lines indicate significant paths (for at least some of the sub-components), while dotted lines indicate non-significant paths. * $p < .05$. ** $p < .01$.

Weigold, 2013). On the other hand, personal growth initiative benefits organizations because employees who are proactive about their personal development are better equipped to stay healthy, vital, and productive in the face of highly demanding environments (London & Smither, 1999). Despite these supposed benefits, there is only little research on personal growth initiative in the context of work so that we do not yet know much about the factors that can initiate positive growth processes. In an attempt to close this gap in the literature, the present study aimed to investigate a strengths-based intervention as a means to foster personal growth initiative. Even though strengths theory (Peterson & Seligman, 2004) proposes that strengths use may bring about self-efficacy and development, it does not specify the mechanisms in accomplishing these effects. For this reason, we investigated to what extent GSE functions as a mechanism in the relationship between a strengths interventions and PGI.

Whereas we did not find evidence for a direct effect of the strengths intervention on personal growth initiative, we found evidence for a conditional indirect effect that was mediated and moderated by GSE. Our results suggest that participating in the strengths intervention contributes to building post-intervention self-efficacy among employees with low or medium levels of self-efficacy prior to the intervention, which, in turn, is related to increases in three out of four facets of personal growth initiative (readiness for change, planfulness, and intentional behaviour). These findings support the assumption that building on strengths fosters self-efficacy by providing positive feedback and facilitating goal attainment and mastery experiences. Moreover, results suggest that self-efficacy is a prerequisite for engaging in personal growth activities, which is consistent with the idea that learning activities are inherently risky as they may lead to failure and the recognition of one’s own limitations (Eden & Aviram, 1993). In line with literature that posits ‘can do’ beliefs as a key predictor of general personal initiative (Hong *et al.*, 2016),

we reasoned that individuals will only be proactive about their personal growth if they trust their own abilities to master challenges.

The finding that the indirect effect of the strengths intervention on PGI via self-efficacy was only significant for individual with low or average levels of GSE (as measured before the intervention), but not for high GSE individuals may indicate that the latter individuals already have what it takes to fuel their personal development. According to Bandura (1989), individuals high in self-efficacy make things happen because they set challenging goals and increase their efforts when facing failures or setbacks. Individuals with relatively low self-efficacy, however, are at risk of being drawn into a downward spiral where their low self-efficacy prevents risk-taking (Bandura, 1989), which leads to less learning, limited career progression and success, even fewer mastery experiences, lower self-efficacy, and so on. It seems that strengths interventions can halt or even invert potential downward spirals by highlighting individual qualities and by re-instilling confidence in one's own competence. As an alternative explanation, it might simply be more difficult to detect or achieve positive changes in high GSE individuals such that our results may be subject to a ceiling effect (Wang, Zhang, McArdle, & Salthouse, 2009).

Our manipulation check indicated that the strengths intervention led to increases in strengths awareness, but not strengths use. Considering that high self-efficacy means that people are already aware of their capabilities (Bandura, 1977), it is likely that these high GSE individuals only benefit from strengths interventions that increase the use of strengths. Possibly, the time span between the intervention and the second measurement was too short for participants to really make substantial changes in their work behaviour. Future research could therefore reconsider the content and length of the present strengths intervention to achieve an increase in strengths use. However, based on the discussions that our trainers had with the participants about the implementation of their personal plan, we can only conclude that strengths use of participants did increase after the workshop. Possibly, teaching participants more about the definition of strengths in general, and facilitating them in the identification of their own strengths led to a response shift (Sprangers, & Schwartz, 1999), referring to a change in the participants' internal standards of measurement or a redefinition of the target construct. Before the workshop, many participants tended to equate strengths with skills, and as a result of this, they might have overrated their level of strengths use. After participants learned in the workshop that strengths refer to any characteristics, traits, or abilities that, when employed, are energizing and allow them to perform at their personal best, they may have come to realize that their strengths use is in fact lower than they estimated before the workshop.

Moreover, based on an open-ended question in the last survey, we conclude that many participants would have liked to have more time in the second workshop for learning about the strengths of their colleagues and for discussing their strengths plans with others who are directly involved (e.g., one of their co-workers or their manager). Because few people exercise their strengths in isolation, the team context has an important influence on whether individuals' strengths will be noticed and appreciated by others and, ultimately, whether these strengths will be used (Biswas-Diener *et al.*, 2011; Quinlan *et al.*, 2012). Therefore, future studies may investigate the effect of strengths interventions that target teams of workers instead of individual workers.

Even though we did not find an effect of the intervention on participants' strengths use, we did find an effect of the intervention on GSE and, in turn, PGI for participants with low or medium initial levels of GSE. This finding is in line with studies that found beneficial effects of interventions that focused exclusively on identifying strengths on a range of positive outcomes (e.g., creative problem solving, work engagement). For example, three

studies reported positive effects of interventions that triggered participants to activate cognitive representations of the qualities they display when performing at their best (Cable, Gino, & Staats, 2013; Cable, Lee, Gino, & Staats, 2015; Lee, Gino, Cable, & Staats, 2016). Another example is a study that found a positive effect of an intervention that exclusively focuses on determining an individual's most prominent strengths by means of the Values In Action inventory of character strengths (VIA-IS; Duan, Ho, Tang, Li, & Zhang, 2014; Peterson & Seligman, 2004). Possibly, the activation of positive, self-relevant information is the most important factor that makes strengths interventions effective (Ghielen *et al.*, 2018). To shed more light on this matter, future studies should systematically compare the effects of interventions that focus on promoting strengths use to interventions that focus on promoting strengths awareness.

One interesting finding is that the positive, indirect effects via self-efficacy were not found for using resources, which is about seeking support in the growth process, for instance, by approaching family members, friends, colleagues, supervisors, or counselors. As such, using resources is an externally focused process, in contrast to the other three PGI sub-factors which refer to internal processes (Robitschek *et al.*, 2012). In fact, prior research has repeatedly pinpointed using resources as the least typical of the four PGI factors, displaying low correlations with the other sub-factors and with measures of psychological functioning (Robitschek *et al.*, 2012; Shigemoto, Thoen, Robitschek, & Ashton, 2015; Weigold *et al.*, 2013). It has been suggested that using resources may be less central to the overall growth process, because (1) not all growth processes require external assistance (Shigemoto *et al.*, 2015), (2) individuals in individualistic cultures may value independence and self-reliance over interdependence when it comes to their personal growth (Robitschek *et al.*, 2012), and because (3) resources might not always be available and/or trusted which forces individual to rely on internal growth mechanisms (Robitschek *et al.*, 2012; Weigold *et al.*, 2013).

Limitations and future research

The present study is subject to six limitations. The first limitation is that the sample is rather small and includes employees from the educational sector only. The latter point also means that a majority of the participants were female. While this is representative for primary education in the Netherlands (OECD.Stat, 2017), it limits generalizability to other occupations and sectors with a more equal gender distribution. However, prior studies on strengths interventions that controlled for gender did not find any hints of gender effects (Duan *et al.*, 2014; Meyers & van Woerkom, 2016).

The second limitation concerns the fact that although participation in the intervention was not mandated by the organization, it was strongly encouraged and to some extent implicitly expected. 'Forced' participation, however, has been found to weaken the effects of positive interventions because individuals who do not choose for an intervention themselves might doubt its effectiveness and have little motivation to partake (Sin & Lyubomirsky, 2009). While self-selected individuals are thus more likely to benefit from an intervention, we reason that self-selection and self-efficacy are negatively related, meaning that individuals who doubt their personal abilities tend to shy away from such activities due to dwelling on their shortcomings and overestimating the level of difficulty of tasks (Bandura, 1989). This is interesting because the present study has shown that individuals low in self-efficacy are more likely to derive advantage out of a strengths intervention. Future research should therefore explore whether there is a relationship between self-efficacy and self-selection: Opting for self-selection might come at the cost of

not reaching the group of individuals who would benefit the most from an intervention, whereas opting for mandatory participation might come at the cost of including many individuals who might benefit less from an intervention because they are already high on personal resources and/or not motivated to participate.

A third limitation is the timing of the measurement intervals, as we only had the opportunity to distribute one follow-up questionnaire approximately 1 month after the intervention. In general, it is a relevant avenue for future research to explore in more detail how long and what it takes to stimulate and maintain personal growth initiative in employees. As the present study has shown that self-efficacy is a central requirement for engaging in personal growth, studying other personal resources such as hope and resilience as predictors of PGI seems promising. On a related note, much more work needs to be done on personal or context factors that limit or boost the effectiveness of strengths interventions because it is necessary to know what will work and for whom (Nielsen & Miraglia, 2017).

A fourth limitation concerns the allocation of participants to the experimental conditions. In randomized controlled trials (RCT's), participants are randomly allocated to either an intervention or a control group, to make sure that any differences in effects in the two groups are attributable to the intervention rather than to any individual differences at baseline. In our study, we employed cluster randomization (Nielsen & Miraglia, 2017), assigning the teachers and staff members from two schools to the experimental group and the educational professionals from three other schools to a wait-list control group. Our reason for doing so was to prevent contamination between the experimental group and the wait-list control group that may arise when teachers from one elementary school discuss the content of the intervention with each other. However, because we found no pre-intervention differences between the intervention and wait-list control groups on GSE, the four aspects of PGI, strengths awareness, strengths use or on descriptive variables such as age, gender, educational level, or organizational tenure, it is unlikely that differences in effects in the two groups are attributable to individual differences at baseline rather than to the intervention.

A fifth limitation is that with the lack of an active control condition we are not able to isolate the content of the strengths intervention as the active ingredient in the intervention. Since we tested our intervention on employees in the work context, we felt it would be unethical to let employees participate in (and spend their valuable working time on) a workshop which we do not expect to benefit them. In addition, this might have discouraged employees from participating (Street & Luoma, 2002). Another reason to use a wait-list control design is indeed that research on strengths interventions in organizations is fairly recent, meaning that the active ingredients of such interventions have not yet been identified. Consequently, it is difficult to develop appropriate active control interventions that do not contain these active ingredients (Hart, Fann, & Novack, 2008). Finally, the wait-list control design is the most appropriate design when the intervention takes place over a relatively short period of time (Hart *et al.*, 2008), which was the case in our study. However, our additional analyses which indicate that the effect of the experimental condition on GSE was fully mediated by strengths awareness (and not strengths use), do suggest that strengths awareness is indeed the active ingredient in our intervention. Nevertheless, future research should aim to isolate the content of a strengths intervention as the active ingredient in the intervention.

Finally, even though our sample size of 84 gave our analyses a power of .8 for small to medium effect sizes ($f^2 = .096$), the power of our statistical analyses was only .249 for finding small effect sizes ($f^2 = .02$). Hence, it is possible that there were in fact small direct

effects of the experimental condition on the four different aspects of our dependent variable (personal growth initiative), but that our study did not have sufficient power to detect these effects.

Practical implications

The present study is aligned with two major developments in the field of employee development: First, the abandonment of approaches that expect that the largest potential for growth lies in the remediation of deficits, and second, a move towards recognizing workers as active agents that shape their own learning process (Guile & Griffiths, 2001). Our findings suggest that organizations that target self-directed learning among their staff need to focus on enhancing individual self-efficacy beliefs. A strengths intervention is a brief and focused intervention that can achieve this aim, in particular, among workers who suffer from low confidence in their own abilities. By showing that strengths interventions are particularly effective for workers low on GSE, this study suggests that training costs may be saved by not assigning highly efficacious workers to such a training and that training effectiveness may be improved by investigating what interventions work to stimulate the personal growth initiative of highly efficacious individuals.

Traditionally, employers bore the sole responsibility of providing growth opportunities to their workers, but today's employers increasingly expect their employees to take charge of their personal development themselves (Noe, Hollenbeck, Gerhart, & Wright, 2012). Strengths interventions are an example of sharing the responsibility for development, meaning that employers invest in short developmental interventions that inspire employees to further invest in their own growth trajectories. Although we see an increase in organizations' interest in strengths-based approaches to employee development, the importance and credibility of such approaches remains controversial (Cameron, Mora, Leutscher, & Calarco, 2011). Our study provides insights into the effectiveness of such an approach, thereby facilitating its implementation in practice.

Conclusion

While personal growth features prominently in the needs literature of the 50s and 60s – see, for instance, Maslow's *Hierarchy of Needs* (Maslow, 1954), and an adaptation thereof, Alderfer's *Existence, Relatedness, and Growth Theory* (Alderfer, 1969) – it has only generated a limited body of empirical work. This is surprising given that studies then (Betz, 1982; Porter, 1963a, 1963b) and now (PricewaterhouseCoopers, 2011) accentuate that opportunities for personal growth are highly important to employees. As Alderfer (1969) stated, a 'person experiences a greater sense of wholeness and fullness as a human being by satisfying growth needs' (p. 147). Initially, the organization was seen as responsible for providing growth opportunities to employees, but this responsibility has shifted, making personal growth initiative a key construct to investigate. The present study has shown that a brief strengths intervention can stimulate personal growth initiative of employees with average or low scores on self-efficacy by re-instilling confidence in their own abilities. As such, this study highlights the importance of research on (strengths) interventions that focus on the mechanisms through which these interventions work and the boundary conditions that limit or boost their effectiveness.

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