



# The efficacy of employee strengths interventions on desirable workplace outcomes

Alexandra J. Bratty<sup>1</sup> · Nicole C. Dennis<sup>2</sup>

Accepted: 27 December 2023  
© The Author(s) 2024

## Abstract

Recent data suggest that only about one-third of employees thrive at work, while most are disengaged. This lack of employee productivity costs U.S. companies billions of dollars annually. Consequently, there is great interest in workplace interventions designed to increase employee performance and engagement. Strengths interventions are one such approach because there is evidence that when employees can identify, use, and develop their strengths at work, it is associated with a range of desirable outcomes. Still, there is a need for experimental research that facilitates causal analysis and the development of reliable strengths interventions that can be applied in organizations. Two longitudinal studies examined the impact of different strengths interventions. The first study tested a 2-week intervention measuring the impact on strengths use, job performance, and flourishing at work. Only job performance improved significantly over time. The second study deployed a 4-week intervention measuring the impact on strengths use, job performance, organizational citizenship behavior (OCB), and engagement, with significant increases in all variables over time. Post hoc analyses indicated that results might have been influenced by the extent to which strengths use changed. If strengths use declined, there were no significant outcomes. However, when strengths use increased, there was a significant improvement in job performance with a large effect size and OCB and engagement with very large effect sizes. These findings suggest strengths interventions can lead to favorable workplace outcomes, though levels of strengths use might impact results. Limitations and future areas of research are discussed.

**Keywords** Character strengths · Strengths · Workplace intervention · Positive psychology · Job performance · Organizational citizenship behavior · Engagement · Flourishing

## Introduction

Recent data suggest that only about one-third of employees thrive at work, while most are disengaged, and almost half report watching for or actively seeking a new job (Gallup, 2023). This lack of employee engagement and productivity is estimated to cost U.S. companies between \$450 to \$550 billion annually (Silsbee, 2020). Consequently, there is great interest in workplace interventions designed to increase employee performance and engagement (Bakker & van Wingerden, 2021).

In recent years, much research has indicated that when employees are able to identify, use, and develop their strengths at work, it is associated with a range of desirable outcomes. These include increased performance (Harzer & Ruch, 2014), job satisfaction, organizational citizenship behavior (OCB), productivity (Lavy & Littman-Ovadia, 2017), well-being, finding meaning at work (Littman-Ovadia & Steger, 2010), and engagement (Littman-Ovadia et al., 2017). These studies and various meta-analyses (Ghielen et al., 2018; Miglianico et al., 2019; Schutte & Malouff, 2019) provide evidence of the relationship between strengths use and positive results. However, there is still a need for experimental research that facilitates causal analysis and the development of reliable strengths interventions that can be applied in organizations (Littman-Ovadia et al., 2021).

There is much evidence that it is more beneficial to encourage employees to focus on strengths development rather than improving weaknesses (e.g., Buckingham & Clifton, 2001; Rath & Conchie, 2009). Indeed, strengths

---

✉ Alexandra J. Bratty  
alex@alexbratty.com

<sup>1</sup> AB Research Consulting, Las Vegas, NV, USA

<sup>2</sup> Capella University, Minneapolis, MN, USA

theory posits that strengths are positive and naturally occurring abilities that enable optimal human functioning (Linley & Harrington, 2006; Peterson & Seligman, 2004). Accordingly, the theory postulates that when employees can use their strengths at work regularly, they are energized and invigorated, leading to greater performance. Moreover, the theory also suggests that it can be draining and less productive for employees to focus on remedying their deficits (Rath & Conchie, 2009; Peterson & Seligman, 2004; Gradito Dubord & Forest, 2023).

Numerous studies support the premise that using strengths in the workplace yields positive outcomes. For example, using strengths at work was associated with well-being and more meaning (Littman-Ovadia & Steger, 2010). Moreover, use of strengths has been described as a “driver” of employee engagement (Crabb, 2011) and linked with greater productivity, OCB, job satisfaction (Lavy & Littman-Ovadia, 2017; Littman-Ovadia & Davidovitch, 2010), creativity (Avey et al., 2012), and performance (Littman-Ovadia et al., 2017). Strengths have also been correlated to coping at work and serving as protective factors against work-related stress on job satisfaction (Harzer & Ruch, 2015). Conversely, a lack of opportunities to use strengths each day was associated with employees feeling strain at work (Merritt et al., 2018). Consequently, the research suggests that the use of strengths at work contributes to various desirable outcomes.

Still, the question of whether to prioritize deficit reduction or strength development has long been discussed, particularly because organizations often emphasize the need for employees to work on their weaknesses rather than allowing them to focus on their strengths (Hodges & Asplund, 2010; Biswas-Diener et al., 2017; van Woerkom et al., 2016). Certainly, a singular focus on strengths or overuse of strengths can have adverse consequences (Grant & Schwartz, 2011; Kaiser & Overfield, 2011; Niemiec, 2018). Moreover, recent research suggests that individuals can benefit from both a strengths-based and deficit-based approach (Mahomed & Rothmann, 2019; Meyers et al., 2015; Mphahlele et al., 2018). Thus, while much evidence suggests prioritizing strengths in the workplace is beneficial, it seems there is also room for addressing weaknesses, though perhaps to a lesser degree.

Consequently, the purpose of this paper is to examine the impact of strengths use in the workplace and offer further evidence regarding the salience of prioritizing strengths versus deficits. The two studies presented aimed to make three specific contributions. First, both studies contribute to the growing body of research examining the impact of strengths interventions and their application in the workplace, responding to the call for more experimental research in this area (Littman-Ovadia et al., 2021; Miglianico et al., 2019). Second, each study offers further evidence supporting the foundational tenet of strengths theory—that strengths

use and development leads to positive outcomes (Linley & Harrington, 2006; Peterson & Seligman, 2004). Finally, the first study also tests a central hypothesis of strengths theory. Namely, focusing on strengths yields superior outcomes to focusing on deficits. Despite this long-standing claim, relatively few studies have examined the impact of interventions that address strengths-only, deficits-only, or a combination of strengths and deficits (Biswas-Diener et al., 2017; Gradito Dubord & Forest, 2023).

## Theoretical background

While there is no universal strengths theory, there is broad agreement over what constitutes a strengths-based approach (Bakker & van Woerkom, 2018). Personal strengths are defined as individual qualities, traits, and abilities that are energizing to use and facilitate optimal functioning (Linley & Harrington, 2006; Peterson & Seligman, 2004; Wood et al., 2011). Though strengths are thought to be trait-like, they are also considered malleable and, therefore, can be cultivated and called on as needed depending on the context (Peterson & Seligman, 2004; Biswas-Diener et al., 2011; Biswas-Diener et al., 2017). Thus, in the workplace context, a strengths-based approach emphasizes the development and use of employees’ strengths rather than focusing on improving their weaknesses (Buckingham & Clifton, 2001).

A range of literature demonstrates that becoming aware of and using strengths leads to positive outcomes. In a general population study, people who became aware of their top strengths were more likely to flourish than those who were unaware, and those who used their top strengths were more likely to flourish than those who did not (Hone et al., 2015). Moreover, using strengths in new ways has demonstrated lower levels of depressive symptoms and an increase in happiness (Gander et al., 2013; Seligman et al., 2005). In psychotherapy, focusing on strengths has yielded a greater positive impact on clients than traditional treatment methods (Seligman et al., 2006). In education, a strengths-based approach has been associated with increased engagement and accomplishment (Linkins et al., 2015). Finally, in the workplace, strengths use has been correlated with multiple favorable outcomes (e.g., Harzer & Ruch, 2012, 2013, 2014, 2015). Thus, there is evidence that a strengths-based approach can have numerous benefits across various domains.

Several theories explain why strengths use and development leads to such positive outcomes. For example, per self-determination theory (SDT; Ryan & Deci, 2000), Gradito Dubord and Forest (2023) found that strengths use at work led to need satisfaction and autonomous motivation while also inhibiting need frustration and controlled motivation, thereby explaining how a strengths-based approach can lead

to enhanced performance. Similarly, via jobs demands-resources theory (JD-R; Bakker & Demerouti, 2014), it has been proposed that strengths use is a personal resource and can, therefore, enhance work engagement (Bakker & van Wingerden, 2021). Finally, positive psychology's broaden-and-build theory (Fredrickson, 1998, 2001) suggests that as individuals use their strengths, they experience positive emotions, thereby broadening their cognitive and social capacities, leading to better performance (Ashby et al., 1999; Isen et al., 1987).

## Strengths

There are several classifications of personal strengths, each with a specific purpose. For example, the CliftonStrengths (Gallup Strengths Center, 2021) are focused on work-related strengths, while the VIA classification (Peterson & Seligman, 2004) inventories different character strengths that can be called on and used in any facet of life (Niemiec, 2018). Additionally, Realise2 (now StrengthsProfile; Linley et al., 2010), is a classification of 60 strengths and how they relate to optimal human functioning. Thus, personal strengths can be identified and measured using various instruments. The present studies focused on the VIA classification (Peterson & Seligman, 2004) because research on character strengths intervention studies in the workplace is still relatively nascent (Ruch et al., 2020).

## Character strengths

Character strengths (CS) are positive personal traits that benefit the self and others, and are considered ubiquitous across countries, religions, and cultures (Niemiec, 2018). Some examples of CS include curiosity, prudence, gratitude, leadership, social intelligence, and honesty. Although some researchers have challenged whether CS are universal (Kinghorn, 2017), an analysis of over one million adults across 75 nations revealed significant convergence in CS identification across cultures (McGrath, 2015), suggesting that they are indeed globally consistent. CS are considered to be the core of and the building blocks to human flourishing (Seligman, 2011), and numerous studies have demonstrated that using CS is correlated with positive outcomes, including in the workplace (Miglianico et al., 2019; Schutte & Malouff, 2019).

Most CS intervention studies have focused on the general population or student audiences and have measured constructs such as life satisfaction, happiness, positive affect, and depression (Ghielen et al., 2018; Quinlan et al., 2012; Schutte & Malouff, 2019). The few CS workplace intervention studies point to potential benefits for employers and employees, yet more knowledge is needed for optimal deployment. Peláez et al. (2020) found that a 5-week

strengths-based intervention enhanced work engagement and job performance. Additionally, Forest et al. (2012) demonstrated that a CS intervention significantly increased harmonious passion, well-being, and use of top strengths among working students.

Other research indicated that participation in CS interventions increased employee positive affect, psychological capital (Meyers & van Woerkom, 2017), life satisfaction, and perceiving work as a calling (Harzer & Ruch, 2016). Still, another study by Dubreuil et al. (2016) identified that employees reported greater strengths use and well-being following a CS intervention. However, no significant difference was found for performance, harmonious passion, vitality, and concentration. Further investigation indicated that employees who reported the greatest increase in using strengths did, in fact, demonstrate significant increases in performance and harmonious passion. These findings suggested that employees' level of strengths use might play a role in achieving favorable outcomes, though more investigation is needed to substantiate this speculation. Consequently, the present studies aimed to evaluate two different CS interventions for increasing desirable work-related outcomes among full-time employees.

## Strengths versus deficits

Strengths are human characteristics and abilities that are enjoyable to use and allow individuals to function at their best (Linley & Harrington, 2006; Peterson & Seligman, 2004; Wood et al., 2011). By contrast, deficits are defined as characteristics, behaviors, or ways of thinking that do not come naturally and might not be enjoyable (Meyers et al., 2015). Particularly in the workplace context, most organizations have long accentuated deficit correction rather than strengths development (Buckingham & Clifton, 2001; Rath & Conchie, 2009). Strengths proponents argue that a deficit-based approach has limited benefit because it is more challenging and deflating to spend time working on what we are not good at (Buckingham & Clifton, 2001; Peterson & Seligman, 2004; Rath & Conchie, 2009; Seligman, 1999). Still, there is evidence that deficit improvement yields valuable results. A deficit-based approach was associated with increased work performance (Abdullah et al., 2009; Aguinis & Kraiger, 2009), more job satisfaction (Lee & Bruvold, 2003), and improved work engagement (Salas et al., 2012). Still, strengths-based approaches have also been linked with greater productivity, job satisfaction (Lavy & Littman-Ovadia, 2017; Littman-Ovadia & Davidovitch, 2010), and performance (Bakker & van Woerkom, 2018). Additionally, Gradito Dubord and Forest (2023) found that a strengths-based approach was more beneficial than a deficit-based approach. However, they did not preclude the need for working on weaknesses, suggesting that the impact of a

deficit-based approach might be influenced more by how it is implemented than the approach itself. Therefore, it seems possible that individuals and organizations could benefit from both strengths development and deficit correction.

Some studies indicated that a combined approach of working with strengths and weaknesses could be beneficial. Perceived organizational support (POS) for strengths use and deficit correction were both positively correlated with work engagement, yet only POS for deficit correction significantly predicted long-term work engagement (Mphahlele et al., 2018). Similarly, POS for strengths use and deficit correction predicted thriving at work, and POS for both strengths use and deficit improvement yielded more job satisfaction than only POS for strengths use (Mahomed & Rothmann, 2019). Another study comparing strengths-based versus deficit-based interventions among college students found that both produced increases in personal growth initiative; however, the increases were larger for the strengths group (Meyers et al., 2015). Consequently, there is some evidence that both strengths-based and deficit-based approaches can offer desirable outcomes.

## Overview and objectives of the studies

The present studies aimed to contribute knowledge regarding strengths theory and the application of CS interventions in the workplace. Additionally, each study had specific objectives.

Study 1 sought to investigate further the ongoing question of whether it is more productive to focus on developing strengths versus shoring up deficits. The intervention in Study 1 was developed based on the AID (attitude, identification, development) method proposed by Biswas-Diener et al. (2017), where participants first orient their *attitude* towards a strengths-based approach, then they *identify* their strengths, and are encouraged to *develop* them. The outcome measures selected were based on a review of the literature and relevancy for organizations: strengths use, job performance, and flourishing at work. Strengths use and employee performance are obvious concerns for most organizations, and flourishing at work was selected because becoming aware of and using CS has been described as a conduit to flourishing (Seligman, 2011). However, few studies have examined this proposed connection, particularly in the workplace context.

Study 2 deployed an intervention based on the *Strengths Builder* program developed by Niemiec and McGrath (2019). This intervention was more comprehensive than that used for Study 1 and followed Niemiec's (2018) aware-explore-apply model, where participants first become *aware* of their own strengths and those of others, then they *explore* various aspects of their strengths, before *applying*

them contextually. This study's primary objectives were to evaluate if the more comprehensive intervention improved outcomes and to address some of Study 1's shortcomings, which are discussed later. Four outcome variables were measured in Study 2, two of which were consistent with Study 1 to facilitate some comparison: strengths use and job performance. Two new variables were incorporated to expand how performance was being measured: organizational citizenship behavior (OCB) and work engagement.

## Study 1

### Objectives and hypotheses

The first study examined the impact of using top strengths, bottom strengths (i.e., deficits), or both on strengths use, job performance, and flourishing at work, with the following hypotheses.

H<sub>1</sub>: There will be an increase in participants' (a) strengths use, (b) job performance, and (c) flourishing at work after the intervention.

H<sub>2</sub>: Compared to a placebo-control group, the intervention groups will experience a significant increase in (a) strengths use, (b) job performance, and (c) flourishing at work.

H<sub>3</sub>: Compared to the group asked to use their bottom strengths, the groups asked to use their top strengths or both top and bottom strengths will demonstrate a significantly greater increase in (a) strengths use, (b) job performance, and (c) flourishing at work.

## Method

### Participants

Study 1 was conducted among  $N = 148$  full-time working adults, ages 18–65, located in the United States. The sample was drawn from MTurk (Amazon Mechanical Turk, 2018) via CloudResearch (2021). Recent data from the CloudResearch database indicated that 226,000 of the 250,810 active MTurk workers were U.S.-based. Almost all of them were between the ages of 18–65 (94% were aged 18–59), and 68% were employed (Litman & Robinson, 2021). Participants were required to have high-speed Internet access because the study was administered online. Additionally, participants had to have completed at least 5000 Human Intelligence Tasks (HITs) with a minimum 95% approval rate, per MTurk best practices for increasing the retention rate for longitudinal projects (Litman & Robinson, 2021). Table 1 displays the demographic information for the sample.

**Table 1** Demographic information for Study 1 participants

	Count	Percentage
Gender		
Male	73	49.3%
Female	75	50.7%
Mean Age ( <i>SD</i> )	41.2 (10.57)	NA
Occupation		
Professionals	71	48.0%
Managers	31	20.9%
Clerical	25	16.9%
Sales	14	9.5%
Blue Collar	6	4.1%
No response	1	0.7%
Region		
Northeast	39	26.4%
Midwest	35	23.6%
South	47	31.8%
West	27	18.2%

Professionals included positions such as analyst, accountant, teacher, etc. Clerical included positions such as secretary, administrator, etc. Blue collar included positions such as courier, production operator, etc.

The four groups did not differ significantly on the demographic variables: gender [ $\chi^2(3) = 2.59$ ,  $p = .459$ ], age [ $F(3, 144) = .384$ ,  $p = .765$ ], occupation [ $\chi^2(15) = 12.25$ ,  $p = .660$ ], and U.S. region [ $\chi^2(9) = 11.54$ ,  $p = .240$ ]. Nor were there any significant differences between the participants who completed the entire study ( $N = 148$ ) versus those who dropped out at some point ( $n = 41$ ): gender [ $\chi^2(1) = .795$ ,  $p = .372$ ], age [ $t(84.32) = -1.24$ ,  $p = .219$ , two-tailed], occupation [ $\chi^2(5) = 8.25$ ,  $p = .143$ ], and U.S. region [ $\chi^2(3) = 7.02$ ,  $p = .071$ ].

## Procedure

Three intervention groups and one placebo-control group participated in a 2-week online program. Participants were randomly assigned to one of the four groups. The intervention groups were encouraged to use their (a) top strengths, (b) bottom strengths, or (c) both. A participant's top and bottom strengths were identified when an individual took the VIA CS assessment (VIA Institute on Character, 2022) and received a personalized report ranking all 24 CS. Top strengths, also referred to as "signature" strengths, are the three to seven top-ranking strengths that "a person owns, celebrates, and frequently exercises" (Peterson & Seligman, 2004, p. 18). Bottom strengths, also known as lesser strengths, are the three to seven lowest-ranking strengths that an individual expresses or uses to a lower degree (Proyer et al., 2015).

All groups completed the baseline questionnaire and the VIA CS assessment (VIA Institute on Character, 2022). The placebo-control group received instructions to keep a daily journal of early memories. The three intervention groups watched a 15-minute video providing an overview of CS, and examples of how participants might use their strengths in new and different ways at work, followed by instructions based on prior CS interventions (Proyer et al., 2015; Seligman et al., 2005).

1. Intervention Group 1: use top strengths in different ways at work. Participants were directed to select one top strength to focus on for the first week and a different top strength in the second week.
2. Intervention Group 2: use bottom strengths in different ways at work. Participants were instructed to select one bottom strength to focus on for the first week and a different bottom strength in the second week.
3. Intervention Group 3: use both top and bottom strengths in different ways at work. Participants in this group focused on using top strengths for 1 week and bottom strengths for the other week. Random assignment was used so that approximately half the respondents were allocated to use a top strength in the first week and a bottom strength in the second week. The other half was assigned to use a bottom strength in the first week and a top strength in the second week.

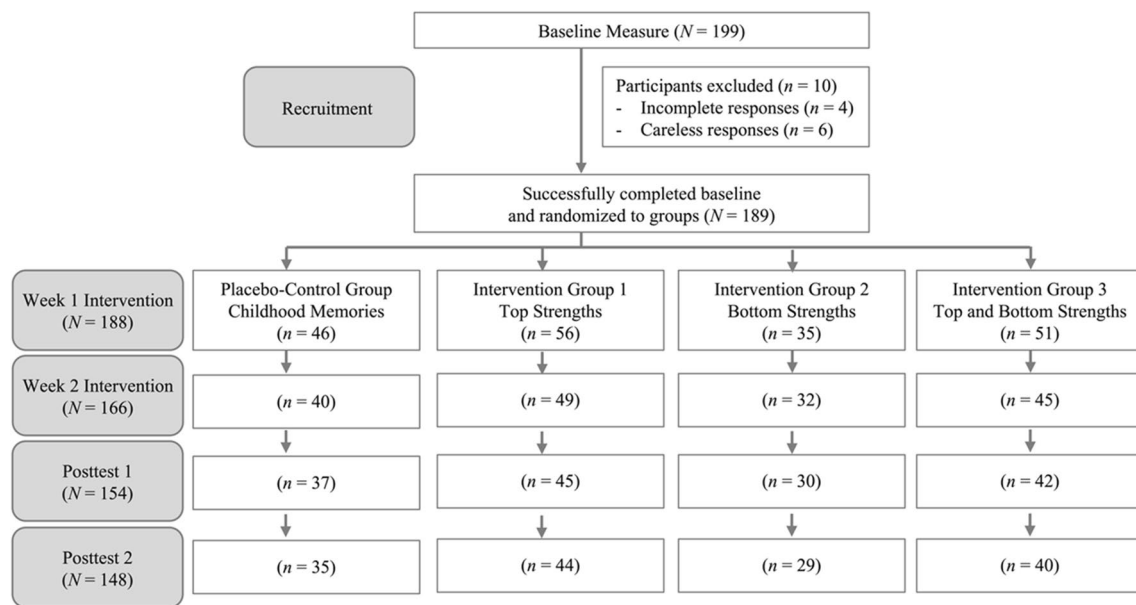
Incentives were used to encourage participation and reduce the rate of attrition, according to MTurk (Amazon Mechanical Turk, 2018) best practices (Litman & Robinson, 2021). The total incentive amount for the study was \$26.00, divided across the four study HITs as \$6 for the first three HITs and \$8 for the fourth HIT. There were three points of measurement, during which the three outcome variables were measured. The baseline was administered prior to the intervention, the first posttest after it, and the second posttest 4 weeks after completion of the intervention. The overall retention rate from the baseline ( $N = 189$ ) to final point of measurement ( $N = 148$ ) was 78%. Figure 1 displays the flow-chart of participants and sample sizes for all groups at each point during the study.

## Measures

### Strengths use

Strengths use was measured by the Strengths Use Scale (Govindji & Linley, 2007). It is a 14-item scale with statements describing different experiences in using strengths. Participants respond using a 7-point Likert-type scale ranging from *strongly disagree* to *strongly agree*. Previous





**Fig. 1** Flowchart of study 1 participants. *Note.* Posttest 1 was administered after completion of the 2-week intervention. Posttest 2 was completed 4 weeks after the 2-week intervention

studies demonstrated a single-factor structure (Govindji & Linley, 2007) and satisfactory internal reliability ranging from  $\alpha = .89$  to  $\alpha = .97$  (Govindji & Linley, 2007; Wood et al., 2011). In the present study, the internal reliability scores were also acceptable, with Cronbach alpha values ranging from .95 to .96.

## Job performance

Job performance was measured by the In-Role Behavior (IRB) Work Performance Scale (Williams & Anderson, 1991), which is a 7-item scale presenting statements related to an individual's job performance. Each item is rated using a 5-point Likert-type scale ranging from *strongly disagree* to *strongly agree*. Williams and Anderson (1991) developed the scale for supervisors to rate subordinates, verified the single-factor structure, and reported internal consistency of  $\alpha = .91$ . In the present study, it was modified for self-report. Other studies that have used a self-report version of this measure reported a satisfactory internal consistency of  $\alpha = .86$  (Lavy & Littman-Ovadia, 2017; Littman-Ovadia et al., 2017). In the current study, the internal reliability scores were also acceptable, within range of  $\alpha = .75$  to  $\alpha = .82$ .

## Flourishing at work

Flourishing at work was measured by the Workplace PERMA Profiler (Kern, 2014). It is a 23-item questionnaire comprising three items measuring each of the five PERMA pillars (positive emotions, engagement, relationships,

meaning, and accomplishment) identified by Seligman (2011). There are eight filler items: three for negative emotions, three for health, one for loneliness, and one for overall happiness. Respondents use 11-point Likert-type scales to score each item, ranging from responses of *not at all*, *never*, or *terrible* to *completely*, *always*, or *excellent*. Normative data and information related to validity and reliability for the English-language Workplace PERMA Profiler are limited. However, the Workplace PERMA Profiler has been translated into German, Korean, and Japanese, and each version has demonstrated good validity and reliability (Choi et al., 2019; Harzer et al., 2017; Watanabe et al., 2018). In these prior studies, internal reliability for the overall flourishing score was satisfactory, ranging from  $\alpha = .91$  to  $\alpha = .96$  (Choi et al., 2019; Harzer et al., 2017; Watanabe et al., 2018). In the present study, the internal reliability scores were also acceptable, with Cronbach alpha values ranging from .94 to .95.

## Results

### Primary analyses

A series of two-way mixed ANOVAs were used to analyze the data in IBM SPSS v26.0. The data were non-normal and were transformed using logarithmic transformations for strengths use and flourishing at work and an inverse transformation for job performance. After transformation, all variables were normally distributed with skewness scores

ranging from  $-1.64$  to  $.51$  and kurtosis scores from  $-1.30$  to  $1.89$ . When running the two-way mixed ANOVAs, tests of within-subjects were consulted first to establish if there was a significant interaction between time and group. Subsequently, differences between groups at each time interval were examined, as well as changes within each group over time. The Bonferroni correction was used for pairwise comparisons. Significance was evaluated using the standard alpha level of  $p < .05$ .

As shown in Table 2, the mean scores for strengths use, job performance, and flourishing at work all increased from baseline to first posttest except among Group C, who were asked to focus only on their bottom strengths during the 2-week intervention.

Results revealed only one significant outcome, as indicated in Table 3. All results for strengths use were nonsignificant. Results for job performance were partially significant. The main effect of time showed a significant difference across time points with a small effect size. Ad hoc analysis determined a significant increase in job performance mean scores from baseline to first posttest ( $p = .007$ ). Results for flourishing at work were nonsignificant across all measures of group and time.

### Post hoc analysis

Study 1 results were somewhat surprising and contradicted previous research, which has supported significant positive relationships between CS and desirable work-related outcomes (e.g., Harzer & Ruch, 2016; Lavy & Littman-Ovadia, 2017; Littman-Ovadia & Davidovitch, 2010; Meyers & van Woerkom, 2017; Peláez et al., 2020). Still, the findings were

**Table 3** Study 1: two-way mixed ANOVA results for outcome variables

Variable	df	<i>F</i>	Sig.	Partial $\eta^2$
<b>Strengths Use</b>				
Time*Group	6, 288	1.17	.325	.024
Time	2, 288	.24	.791	.002
Group	3, 144	.66	.577	.014
<b>Job Performance</b>				
Time*Group	6, 288	1.31	.255	.026
Time	2, 288	4.42	.013	.030
Group	3, 144	2.03	.112	.041
<b>Flourishing at Work</b>				
Time*Group	5.57, 267.21	.29	.932	.006
Time	1.86, 267.21	.46	.620	.003
Group	3, 144	.50	.684	.010

Time\*Group represents the interaction between time and group

not an anomaly. A study by Dubreuil et al. (2016) found that employees reported significantly greater strengths use and levels of well-being following a CS intervention. Yet, their results also showed no significant difference for several other variables, including work performance, harmonious passion, vitality, and concentration. Therefore, based on the present study's primary results that showed a marginal increase in all variables from baseline to first posttest for all groups except Group C (bottom strengths), a post hoc analysis was performed to evaluate if different levels of strengths use impacted the outcomes for job performance and flourishing at work. The post hoc analysis followed the same approach adopted by Dubreuil and colleagues.

**Table 2** Study 1: mean scores for outcome variables across all groups

Variables	Groups			
	Group A ( $n = 35$ ) (Placebo Control) <i>M</i> ( <i>SE</i> )	Group B ( $n = 44$ ) (Top Strengths) <i>M</i> ( <i>SE</i> )	Group C ( $n = 29$ ) (Bottom Strengths) <i>M</i> ( <i>SE</i> )	Group D ( $n = 40$ ) (Top and Bottom Strengths) <i>M</i> ( <i>SE</i> )
<b>Strengths Use</b>				
Baseline	5.54 (0.85)	5.80 (0.93)	5.73 (0.77)	5.50 (1.17)
First Posttest	5.68 (0.88)	5.84 (0.97)	5.63 (0.67)	5.56 (0.99)
Second Posttest	5.59 (0.89)	5.79 (0.91)	5.76 (0.79)	5.52 (1.07)
<b>Job Performance</b>				
Baseline	4.56 (0.39)	4.77 (0.31)	4.80 (0.38)	4.72 (0.32)
First Posttest	4.65 (0.54)	4.81 (0.28)	4.80 (0.30)	4.76 (0.33)
Second Posttest	4.63 (0.42)	4.77 (0.30)	4.79 (0.30)	4.72 (0.41)
<b>Flourishing at Work</b>				
Baseline	7.10 (1.75)	7.15 (1.91)	7.35 (1.49)	6.75 (1.99)
First Posttest	7.18 (1.78)	7.19 (1.84)	7.24 (1.65)	6.79 (1.96)
Second Posttest	7.16 (1.69)	7.20 (1.79)	7.39 (1.41)	6.88 (1.82)

The post hoc analysis was performed in several steps. The difference between baseline and first posttest strengths use was calculated, the results converted to standardized  $z$  scores, and three groups were generated from this new variable. Group 1 represented participants with  $z$  scores of less than  $-.5$  ( $n=40$ ), indicating their strengths use declined from baseline to first posttest ( $M=-0.52$ ,  $SD=0.26$ ). Group 2 included participants with  $z$  scores ranging from  $-.5$  to  $.5$  ( $n=75$ ), suggesting their change in strengths use was minimal or average ( $M=0.04$ ,  $SD=0.16$ ). Group 3 was defined as participants with  $z$  scores above  $.5$  ( $n=33$ ), indicating their strengths use increased from baseline to first posttest ( $M=0.73$ ,  $SD=0.45$ ).

Another series of two-way mixed ANOVAs were performed, this time with the three strengths groups and examining only two time points (i.e., baseline and first posttest). As indicated in Table 4, the mean scores for job performance and flourishing at work declined among those whose strengths use also declined during the 2-week intervention (Group 1). However, for those whose change in strengths use was minimal/average (Group 2) or increased (Group 3), there was an improvement from baseline to first posttest for both outcome variables.

There was a significant interaction between strengths group and time for job performance with a medium effect size,  $F(2, 145)=4.49$ ,  $p=.013$ , partial  $\eta^2=.058$ . Still, there was no significant simple main effect of strengths group for baseline performance,  $F(2, 145)=.84$ ,  $p=.435$ , partial  $\eta^2=.011$ , nor for first posttest performance,  $F(2, 145)=.21$ ,  $p=.810$ , partial  $\eta^2=.003$ . However, there were some significant findings for the simple main effect of time. There was no significant effect of time on performance for Group 1 (decline in strengths use),  $F(1, 39)=.63$ ,  $p=.434$ , partial  $\eta^2=.016$ . Yet, there was a significant effect of time on performance for Group 2 (average/minimal change in strengths use) with a large effect size,  $F(1, 74)=14.10$ ,  $p<.001$ , partial  $\eta^2=.160$ . Moreover, there was a significant effect of

time on job performance for Group 3 (increase in strengths use) with a large effect size,  $F(1, 32)=5.44$ ,  $p=.026$ , partial  $\eta^2=.145$ .

There was no significant interaction between group and time for flourishing at work,  $F(2, 145)=2.55$ ,  $p=.082$ , partial  $\eta^2=.034$ . The main effect of time was not significant,  $F(1, 145)=.24$ ,  $p=.626$ , partial  $\eta^2=.002$ . However, the main effect of group indicated there was a significant difference between strengths groups with a medium effect size,  $F(2, 145)=4.45$ ,  $p=.013$ , partial  $\eta^2=.058$ . Pairwise comparisons indicated that Group 2 mean scores for flourishing at work were significantly different than those for Group 3 ( $p=.037$ ), regardless of time. There was no significant result between Groups 1 and 2 ( $p=.067$ ) or between Groups 1 and 3 ( $p=1.000$ ). Despite the lack of significant findings across time for the groups, it is worth noting that the greatest increase in flourishing at work was among the group whose strengths increased after the 2-week intervention (Group 3).

## Discussion

The aim of Study 1 was to evaluate the impact of various strengths interventions on strengths use, job performance, and flourishing at work—specifically, whether using top strengths, bottom strengths, or a mix of both resulted in differing outcomes. The results were mostly nonsignificant. The first hypothesis that outcome variables would increase after the 2-week intervention was only supported for job performance. The second hypothesis, that the strengths interventions groups would increase significantly more than the placebo-control group for each variable was not supported. The third hypothesis that groups asked to use their top strengths or top and bottom strengths would fare better on all variables than those asked only to use their bottom strengths was somewhat supported in the data, though the results were nonsignificant. These initial findings suggested the strengths interventions were not that effective in increasing strengths use, performance, or flourishing at work, and no more effective than a placebo activity.

However, a post hoc analysis revealed that the extent to which strengths use changed over time had an influence on outcomes. Participants whose strengths use decreased had lower mean scores for job performance and flourishing at work after the 2-week intervention. Meanwhile, those who demonstrated a minimal or average change in strengths use and those who increased their strengths use posted higher mean scores for both outcome variables after the intervention, and the improvement was significant for job performance. These post hoc findings suggest that levels of strengths use could affect the impact of strengths interventions.

**Table 4** Study 1: mean scores for outcome variables across strengths groups

Variables	Groups		
	Group 1 ( $n=40$ ) (Decline) $M$ ( $SE$ )	Group 2 ( $n=75$ ) (Minimal/Average) $M$ ( $SE$ )	Group 3 ( $n=33$ ) (Increase) $M$ ( $SE$ )
Job Performance			
Baseline	4.78 (0.28)	4.69 (0.38)	4.68 (0.37)
First Posttest	4.74 (0.36)	4.76 (0.42)	4.79 (0.30)
Flourishing at Work			
Baseline	6.92 (1.49)	7.49 (1.58)	6.29 (2.37)
First Posttest	6.78 (1.52)	7.50 (1.68)	6.54 (2.24)



Various limitations of Study 1 may have impacted the results. The 2-week intervention might not have been long enough. Although some strengths interventions have been effective over shorter periods (e.g., Seligman et al., 2005), others conducted in the workplace have been lengthier, spanning 4 weeks (Harzer & Ruch, 2016), 5 weeks (Peláez et al., 2020), and 8 weeks (Pang & Ruch, 2019). Additionally, there might not have been enough context about strengths use for participants in the current study, which provided only a 15-min introductory video and basic instructions and examples for each week of the intervention. Although some strengths interventions used a similar approach and yielded significant results (e.g., Proyer et al., 2015; Seligman et al., 2005), others have included more support. For example, strengths interventions that included workshop sessions (Pang & Ruch, 2019; Peláez et al., 2020) and one-on-one coaching (Peláez et al., 2020). Consequently, intervention length and the support provided in the first study might have impacted the effectiveness of the interventions.

Moreover, Dubreuil et al. (2016) noted that applying strengths in an organizational context requires an investment of time and effort from participants, which might not have been present in the current study. Participants were full-time employees who also engaged in HITs on MTurk (Amazon Mechanical Turk, 2018), presumably in their spare time. Therefore, these participants had not expressed a prior interest in CS and might not have been as focused on the intervention as participants who actively sought to develop their strengths. In summary, there were multiple limitations to the present study that could have affected the results. Consequently, a second study was conducted that aimed to address several of the first study's shortcomings.

## Study 2

### Objectives and hypotheses

The second study examined if a strengths intervention would improve strengths use, job performance, OCB, and engagement at work. The study was designed with the limitations of Study 1 in mind, and two key aspects were adjusted. First, a lengthier (4 weeks), more comprehensive, and integrative intervention was used. Second, participants were recruited based on their interest in strengths with a substantially lower incentive. Additionally, given the significant increases in job performance in Study 1, some different measures of job performance (OCB, engagement) were incorporated into Study 2. Finally, Study 2 employed a wait-list control design. The following hypotheses were proposed.

H<sub>1</sub>: There will be an increase in participants' (a) strengths use, (b) job performance, (c) OCB, and (c) engagement at work after the intervention.

H<sub>2</sub>: Compared to the wait-list control group, the intervention group will experience a significant increase in (a) strengths use, (b) job performance, (c) OCB, and (c) engagement at work after the intervention.

## Method

### Participants

Study 2 was conducted among  $N=82$  full-time working adults, ages 18–65. The initial recruitment attempt enlisted participants from the VIA website (<https://www.viacharacter.org>) in an effort to attract those with a predisposed interest in CS. Visitors to the site were randomly invited to participate and offered a \$10 incentive after they completed the free VIA strengths survey (VIA Institute on Character, 2022). However, the intervention completion rate over 4 months was 1.3%. Consequently, MTurk (Amazon Mechanical Turk, 2018) was used as the second recruitment source, but with a different approach than Study 1. To mitigate the potential for recruiting “professional” survey-takers, the study was open to all MTurk workers aged 18–65 employed in full-time work. Additionally, a \$10 incentive was used, approximating to \$1 per task during the intervention, and \$5 to complete the final survey. These rates were intentionally below the standard \$6 per hour (Litman & Robinson, 2021) to attract participants who were sincerely interested in developing their strengths. This second recruitment approach yielded a 4.2% completion rate. Samples from the two sources were compared, and no significant differences were found across gender [ $\chi^2(2)=3.94, p=.139$ ] and occupation [ $\chi^2(5)=3.65, p=.601$ ]. However, there were significant differences for mean age [ $t(80)=4.91, p<.001$ , two-tailed] and country of residence [ $\chi^2(10)=33.53, p<.001$ ]. The mean age for the VIA-sourced sample was 49.80 versus 37.85 for the MTurk-sourced sample, and the MTurk-sourced sample had  $n=25$  participants from India, while the VIA-sourced sample had none. Demographic information for the total sample of  $N=82$  participants is provided in Table 5.

Demographic variables of participants who completed the entire study versus those who dropped out after completing the baseline survey were compared. The VIA sample yielded a total of  $N=288$  participants who completed the baseline survey and  $n=15$  who completed the study, while  $n=273$  dropped out. There were no significant differences across these groups: gender [ $\chi^2(2)=.48, p=.785$ ], age [ $t(286)=-1.44, p=.150$ , two-tailed], occupation [ $\chi^2(6)=7.84, p=.250$ ], and country [ $\chi^2(40)=50.31, p=.127$ ]. The MTurk (Amazon Mechanical Turk, 2018)

**Table 5** Demographic information for Study 2 participants

	Count	Percentage
Gender		
Male	45	54.9%
Female	36	43.9%
Another identity	1	1.2%
Mean Age ( <i>SD</i> )	40.4 (9.66)	NA
Occupation		
Professionals	48	58.5%
Managers	17	20.7%
Sales	8	9.8%
Clerical	5	6.1%
Blue Collar	4	4.9%
Country		
United States	45	54.9%
India	25	30.5%
Other countries	12	14.6%

Professionals included positions such as analyst, accountant, teacher, etc. Clerical included positions such as secretary, administrator, etc. Blue collar included positions such as courier, production operator, etc. Other countries included Australia, Ecuador, France, Italy, Pakistan, Sweden, UAE, United Kingdom, and Trinidad & Tobago

sample yielded a total of  $N=891$  participants who completed the baseline survey and  $n=73$  who completed the study. However,  $n=6$  participants were removed for having suspicious IP addresses, as recommended by Kennedy et al. (2020). Thus  $n=67$  who completed the study were compared with  $n=818$  who dropped out. There were no significant differences across these groups: gender [ $\chi^2(2)=5.17$ ,  $p=.076$ ], age [ $t(84.09)=-.70$ ,  $p=.486$ , two-tailed], occupation [ $\chi^2(6)=4.29$ ,  $p=.638$ ], and country [ $\chi^2(24)=35.87$ ,  $p=.057$ ].

### Procedure

Participants were randomly assigned to an intervention group and a wait-list control group and participated in a 4-week intervention. The intervention group engaged in the 4-week program first, then the wait-list control group participated. At the beginning of each week, participants watched a short instructional video (ranging from approximately 7–16 minutes), were assigned their activity for the week, and provided with resources to support their efforts (e.g., worksheets and sample activities). The intervention closely adhered to the 4-week *Strengths Builder* program developed by Niemiec and McGrath (2019) and was modestly adapted for the study's online and workplace application with their permission.

Week 1: recognizing and appreciating strengths in others.

Week 2: exploring and using top-ranking strengths.

Week 3: applying strengths to everyday work challenges.

Week 4: making strengths a habit.

There were three points of data collection, during which all four outcome variables were measured. The first measurement was the baseline survey, administered before participants were randomly assigned to groups. The second measurement (midpoint) occurred after the intervention group completed the 4-week program. The third measurement (final) occurred 4 weeks later, after the wait-list control group completed the intervention. Figure 2 displays the flowchart of participants for the study.

## Measures

### Strengths use

Similar to Study 1, strengths use was measured by the Strengths Use Scale (Govindji & Linley, 2007). In Study 2, the internal reliability scores were acceptable, with Cronbach alpha values ranging from .95 to .97.

### Job performance

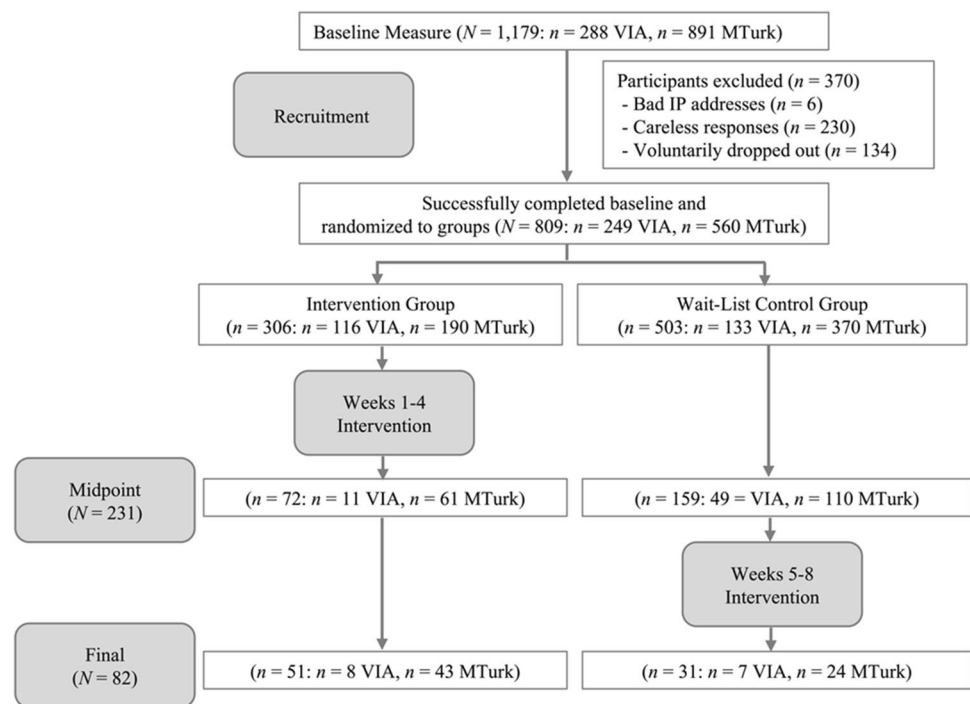
Like Study 1, job performance was measured by the In-Role Behavior (IRB) Work Performance Scale (Williams & Anderson, 1991). In Study 2, the internal reliability scores were acceptable, from  $\alpha=.87$  to  $\alpha=.89$ .

### Organizational citizenship behavior

OCB was measured by the Organizational Citizenship Behavior Questionnaire (Lee & Allen, 2002), a 16-item scale that presents statements describing different work behaviors. Eight items focus on individual behaviors, and eight on organizational behaviors. Participants respond to each item using a 7-point Likert-type scale to indicate how often they engage in each behavior (*never* to *always*). Previous studies indicated the scale had good internal consistency of  $\alpha=.79$  (Lavy & Littman-Ovadia, 2017; Littman-Ovadia et al., 2017). In the present study, the two subscales were combined into one composite OCB score. The internal reliability scores for the composite score were acceptable, with a Cronbach alpha score of .94 at each point of measurement.

### Engagement at work

Engagement at work was evaluated using the 9-item Utrecht Work Engagement Scale (UWES-9; Schaufeli et al., 2006). The scale is comprised of three subscales, measuring vigor, absorption, and dedication. A Likert-type scale from *never* to *always* indicates how often respondents feel

**Fig. 2** Flowchart of study 2 participants

a certain way about their job. Prior studies demonstrated good internal consistency with Cronbach's  $\alpha = .94$  (Lavy & Littman-Ovadia, 2017; Littman-Ovadia et al., 2017). In the present study, the three subscales were merged to create one aggregate engagement score that demonstrated acceptable internal reliability scores, ranging from  $\alpha = .94$  to  $\alpha = .96$ .

## Results

### Primary analyses

Like Study 1, all data analysis was performed using IBM SPSS v26.0. The data were non-normal and were transformed using Templeton's (2011) two-step transformation process. After transformation, all variables were normally distributed with skewness scores from  $-0.86$  to  $0.29$  and kurtosis scores from  $-1.26$  to  $0.73$ . A series of two-way mixed ANOVAs were used for analysis. The Bonferroni correction was used for pairwise comparisons, unless otherwise indicated. Significance was evaluated using the standard alpha level of  $p < .05$ .

As shown in Table 6, the mean scores for all outcome variables increased from baseline to midpoint (immediately following the intervention) and again to the final measurement for the active group. In the wait-list control group, mean scores dropped from baseline to midpoint (non-active wait time) for all variables except performance. Then they increased across the board from midpoint to final after completing the intervention.

**Table 6** Study 2: mean scores for outcome variables across groups

Variables	Groups	
	Intervention Group (n = 51) M (SE)	Wait-List Group (n = 31) M (SE)
<b>Strengths Use</b>		
Baseline	5.48 (1.07)	5.78 (0.97)
Midpoint	5.70 (0.86)	5.59 (1.18)
Final	5.76 (0.84)	6.11 (0.81)
<b>Job Performance</b>		
Baseline	4.44 (0.63)	4.51 (0.56)
Midpoint	4.51 (0.56)	4.53 (0.60)
Final	4.54 (0.52)	4.64 (0.55)
<b>OCB</b>		
Baseline	5.25 (1.03)	5.58 (0.92)
Midpoint	5.43 (0.93)	5.49 (0.89)
Final	5.48 (0.89)	5.90 (0.82)
<b>Engagement</b>		
Baseline	4.21 (1.35)	4.43 (1.35)
Midpoint	4.25 (1.14)	4.41 (1.26)
Final	4.30 (1.22)	4.75 (0.87)

The intervention group received the intervention between baseline and midpoint. The control group received the intervention between midpoint and final

The analyses revealed some significant outcomes. As displayed in Table 7, Results for strengths use showed no significant interaction between time and group and no

**Table 7** Study 2: two-way mixed ANOVA results for outcome variables

	df	<i>F</i>	Sig.	Partial $\eta^2$
<b>Strengths Use</b>				
Time*Group	2, 160	2.64	.075	.032
Time	2, 160	7.54	.001	.086
Group	1, 80	1.34	.251	.016
<b>Job Performance</b>				
Time*Group	2, 160	0.64	.530	.008
Time	2, 160	5.13	.007	.060
Group	1, 80	0.25	.621	.003
<b>OCB<sup>a</sup></b>				
Time*Group	1.86, 148.91	3.48	.037	.042
Time (Intervention)	2, 100	4.09	.020	.076
Time (Wait-List)	1.56, 46.88	4.93	.017	.141
Group (Baseline)	1, 80	1.74	.191	.021
Group (Midpoint)	1, 80	0.05	.823	.001
Group (Final)	1, 80	4.79	.032	.057
<b>Engagement</b>				
Time*Group	2, 160	1.19	.308	.015
Time	2, 160	3.69	.027	.044
Group	1, 80	1.26	.266	.015

Time\*Group represents the interaction between time and group

a. Simple main effects are displayed for time and group because there was a significant time and group interaction

significant difference for the main effects of group. However, the main effects of time were significant with a medium effect size. Pairwise comparisons indicated a significant increase between the baseline and final measures ( $p = .003$ ) and between the midpoint and final measures ( $p = .005$ ). Results for job performance followed the same pattern. The main effect of time was significant with a medium effect size. Pairwise comparisons showed a significant increase between the baseline and final measurements ( $p = .015$ ).

Results for OCB were significant. There was a significant interaction between time and group. The simple main effect of time was significant for both groups. First, for the intervention group with a medium effect size. Second, for the control group with a large effect size. The simple main effects of group were nonsignificant for the baseline and midpoint measures, but significant for the final measure with a medium effect size.

Results for engagement were akin to those for strengths use and performance, with only the main effect of time as significant with a small effect size. Still, pairwise comparisons showed no significant result between specific time points, perhaps because of the overly conservative nature of the Bonferroni correction (VanderWeele & Mathur, 2019). However, with the Least Significant Difference (LSD) adjustment, there were significant increases between the

**Table 8** Study 2: mean scores for outcome variables across strengths groups

Variables	Groups		
	Group 1 ( $n = 28$ ) (Decline) <i>M (SE)</i>	Group 2 ( $n = 32$ ) (Minimal/Average) <i>M (SE)</i>	Group 3 ( $n = 22$ ) (Increase) <i>M (SE)</i>
<b>Job Performance</b>			
Baseline	4.54 (0.62)	4.48 (0.62)	4.36 (0.57)
Final	4.54 (0.58)	4.57 (0.59)	4.64 (0.37)
<b>OCB</b>			
Baseline	5.59 (0.94)	5.45 (1.09)	5.00 (0.83)
Final	5.56 (0.83)	5.67 (0.96)	5.68 (0.86)
<b>Engagement</b>			
Baseline	4.64 (1.08)	4.24 (1.46)	3.91 (1.43)
Final	4.50 (0.99)	4.42 (1.27)	4.51 (1.07)

baseline and final measurements ( $p = .028$ ) and between the midpoint and final measures ( $p = .020$ ).

## Post hoc analysis

Though Study 2 yielded more significant results than Study 1, the same post hoc analysis was performed to evaluate if the change in strengths use once again influenced outcomes. Using the same method as Study 1, participants were re-grouped by the change in their strengths use scores from baseline to final. Group 1 was participants whose strengths use scores declined ( $n = 28$ ,  $M = -.42$ ,  $SD = .30$ ). Group 2 was participants whose strengths use scores showed minimal or average change ( $n = 32$ ,  $M = .28$ ,  $SD = .24$ ). Group 3 represented those whose strengths use scores increased ( $n = 22$ ,  $M = 1.23$ ,  $SD = .70$ ). As shown in Table 8, the mean scores for those whose change in strengths use was minimal/average (Group 2) or increased (Group 3), improved for job performance, OCB, and engagement from baseline to final. However, the scores for all variables stayed the same or dropped from baseline to final among those whose strengths use declined over time.

There was a significant interaction for time (baseline and final) and group (three strengths groups) for job performance with a medium effect size,  $F(2, 79) = 3.78$ ,  $p = .027$ , partial  $\eta^2 = .087$ . Moreover, the simple effects of time were significant for Group 3 with a large effect size, but not for Groups 1 and 2, suggesting that if strengths use increased, so too did performance. Group 1:  $F(1, 27) = .003$ ,  $p = .958$ , partial  $\eta^2 = .000$ . Group 2:  $F(1, 31) = 2.40$ ,  $p = .132$ , partial  $\eta^2 = .072$ . Group 3:  $F(1, 21) = 10.754$ ,  $p = .004$ , partial  $\eta^2 = .339$ . Finally, there were no significant results for the simple main effect of group at either time point. Baseline:

$F(2, 79) = .893, p = .413$ , partial  $\eta^2 = .022$ . Final:  $F(2, 79) = .088, p = .916$ , partial  $\eta^2 = .002$ .

Interaction results for OCB were also significant:  $F(2, 79) = 5.96, p = .004$ , partial  $\eta^2 = .131$ . Additionally, like performance, the simple main effects of time were significant for Group 3 with a very large effect size, but not for Groups 1 and 2, suggesting that if strengths use increased, OCB also increased. Group 1:  $F(1, 27) = .009, p = .926$ , partial  $\eta^2 = .000$ . Group 2:  $F(1, 31) = 2.93, p = .097$ , partial  $\eta^2 = .086$ . Group 3:  $F(1, 21) = 13.77, p = .001$ , partial  $\eta^2 = .396$ . There were no significant results for the simple main effect of group at either time point. Baseline:  $F(2, 79) = 1.94, p = .150$ , partial  $\eta^2 = .047$ . Final:  $F(2, 79) = .161, p = .852$ , partial  $\eta^2 = .004$ .

Engagement at work displayed the same pattern of results. There was a significant interaction between time and group,  $F(2, 79) = 6.62, p = .002$ , partial  $\eta^2 = .144$ . The simple effects of time were significant for Group 3, with a very large effect size, but not for Groups 1 and 2, indicating that if strengths use increased, engagement also increased. Group 1:  $F(1, 27) = 1.09, p = .307$ , partial  $\eta^2 = .039$ . Group 2:  $F(1, 31) = 3.34, p = .077$ , partial  $\eta^2 = .097$ . Group 3:  $F(1, 21) = 12.08, p = .002$ , partial  $\eta^2 = .365$ . There were no significant results for the simple main effect of group at either time point. Baseline:  $F(2, 79) = 1.77, p = .177$ , partial  $\eta^2 = .043$ . Final:  $F(2, 79) = .032, p = .968$ , partial  $\eta^2 = .001$ .

## Discussion

The aim of Study 2 was to evaluate the impact of a more comprehensive CS intervention on strengths use, job performance, OCB, and engagement at work. The results of Study 2 were more encouraging than for Study 1. The first hypothesis was supported in that participants' strengths use, job performance, OCB, and engagement increased after the 4-week intervention. Thus, the use of a longer and more comprehensive intervention appears to have had an impact on outcomes. However, the second hypothesis was not supported—that compared to the wait-list control group, the strengths intervention groups would experience a significant improvement across all variables. Indeed, there were non-significant findings across groups for all variables except for OCB at the final measurement.

The post hoc analyses reinforced the findings to Study 1. Namely, there was a significant increase in the outcome variables among participants whose strengths use increased after the intervention. Moreover, similar to Study 1, this phenomenon was observed in the job performance outcome with a large effect size, and it extended in Study 2 to the other measures of work performance (i.e., OCB and engagement), with very large effect sizes. These post hoc results provide further evidence supporting the idea that strengths

interventions might only yield beneficial results if participants can substantially increase their strengths use at work.

Like Study 1, Study 2 had several limitations. Online administration might have diminished outcomes compared to other interventions that included in-person support (Pang & Ruch, 2019; Peláez et al., 2020). Additionally, despite efforts to recruit participants from the VIA website, the second study also included MTurk (Amazon Mechanical Turk, 2018) workers who are accustomed to being paid for their work (as opposed to participating due to interest only). Still, the second study sought to mitigate the effect of “professional” participants by limiting the incentive to \$10 instead of \$26 in the first study. Finally, all performance measures (i.e., job performance, OCB, and engagement) were self-reported, and the study might have been strengthened by incorporating supervisor ratings of performance. In summary, Study 2 yielded more encouraging results by addressing some of the shortcomings of Study 1. Nonetheless, there were limitations.

## Overall discussion

The two studies aimed to contribute knowledge relevant to strengths theory and the use of CS interventions in the workplace. Regarding strengths theory, both studies provided evidence that identifying, developing, and applying strengths led to an increase in favorable work-related outcomes: job performance, OCB, and engagement at work. This finding is consistent with the literature on strengths-based approaches (e.g., Biswas-Diener et al., 2011; Biswas-Diener et al., 2017; Linley & Harrington, 2006; Peterson & Seligman, 2004; Wood et al., 2011) and prior CS work intervention studies (e.g., Harzer & Ruch, 2016; Pang & Ruch, 2019; Peláez et al., 2020). Indeed, the fact that more significant results were found among those who increased their strengths use over time suggests that an organizational culture that adopts a strengths-based approach could reap several benefits from a higher-performing workforce.

Concerning the use of CS interventions in the workplace, the studies offered evidence that such programs have the potential to improve employee performance. This finding is consistent with various studies that have identified an association between CS and aspects of job performance or tested CS interventions in a work setting (e.g., Dubreuil et al., 2016; Harzer & Ruch, 2012, 2016; Lavy & Littman-Ovadia, 2017; Littman-Ovadia & Davidovitch, 2010; Peláez et al., 2020). Still, in the present studies, there were fewer participants whose strengths use increased after the interventions ( $n = 33, n = 22$ , respectively) than those whose strengths declined ( $n = 40, n = 28$ ) or experienced a minimal/average change ( $n = 75, n = 32$ ). This observation suggests that CS interventions might be most beneficial for



individuals who have frequent opportunities to use their strengths at work or the greatest potential for increasing their level of strengths use. Conversely, the interventions may be less helpful for those who are already using their strengths at work or who do not have an opportunity to do so regularly. Thus, the studies demonstrated that CS interventions could have a positive impact on desirable work-related outcomes, but results may be tempered by the degree to which participants increase their strengths use.

Still, another reason that most participants either experienced a decrease in strengths use or only a minimal positive change in strengths use might be related to their interest and investment in the intervention. Both studies experienced the challenge of recruiting and retaining participants committed to developing their strengths. Though different approaches were used to attract participants, each study enrolled employees who were asked to engage in the intervention individually, with no organizational support. Moreover, despite efforts to enroll participants who had expressed an interest in strengths development by independently taking the CS inventory on the VIA website (VIA Institute on Character, 2022), relatively few recruited in this manner completed the program. Consequently, it is possible that several participants in each study were not predisposed to strengths development and subsequently not that engaged with the interventions. Indeed, an individual's motivation to participate and the degree to which they feel supported in their efforts can impact the effectiveness of interventions (Lyubomirsky & Layous, 2013). Therefore, CS interventions might yield better results if participants are vested in the development of their strengths and are encouraged to do so within their organization.

Study 1 also provided further investigation into the long-discussed issue of whether it is more productive to cultivate strengths rather than ameliorate deficits. Though the results were nonsignificant between groups who used top strengths, bottom strengths (i.e., deficits), or both, the mean scores from before and after the 2-week intervention offered some directional guidance—strengths use, job performance, and flourishing at work all modestly improved except among the group asked to focus only on bottom strengths. Thus, strengths proponents might view these findings as marginal evidence supporting their belief that it is more beneficial to focus on top strengths (Buckingham & Clifton, 2001; Peterson & Seligman, 2004; Rath & Conchie, 2009; Seligman, 1999). Still, the results also suggest that adopting a combined approach of working with strengths and weaknesses may be helpful, as found in other studies (Mahomed & Rothmann, 2019; Meyers et al., 2015; Mphahlele et al., 2018). In any event, Study 1's findings were inconclusive on this particular point, and future research should consider examining the strengths versus deficits issue further.

Finally, a comparison of the studies suggests that a longer intervention with more information, resources, and ongoing support may lead to better results. Though some different variables were used across the two studies, strengths use and job performance were consistent for both. In Study 1, with a briefer intervention, there were no significant findings for strengths use, while job performance increased significantly over time with a small effect size. In Study 2, there were significant findings for both variables over time, each with a medium effect size, suggesting that the intervention design may have impacted outcomes. Study 2 employed a 4-week intervention that adopted Niemiec's (2018) aware-explore-apply model and a more comprehensive approach than in Study 1, which lasted for just 2 weeks. In both interventions, participants were made aware of their CS by taking the VIA survey (VIA Institute on Character, 2022) and watching an introductory video. However, Study 2 also incorporated a first week of helping participants acclimate to observing strengths in themselves and others. This in-depth phase of awareness was absent from Study 1. Moreover, the *explore* and *apply* elements of Niemiec's (2018) model were more deeply facilitated in Study 2 during 3 weeks of participants contemplating their top strengths and using them in new and different ways, to overcome challenges, and embedding strengths use as a habit. By contrast, Study 1 simply asked participants to use top strengths, bottom strengths, or both in new and different ways at work. No component in Study 1 helped participants use their strengths to deal with adversity or create habitual usage. Consequently, these studies suggest that the quality and length of a CS intervention may influence outcomes.

Of course, strengths interventions are just one method of enhancing individual performance in organizations. Other positive psychology-based interventions (PPIs), focused on elements such as job crafting, gratitude, psychological capital, and well-being have also demonstrated positive findings for enhancing favorable outcomes (e.g., engagement, OCB, job satisfaction, etc.) and reducing unfavorable outcomes (e.g., absenteeism, turnover intentions, etc.). (Donaldson et al., 2019). Additionally, other research has indicated that achieving an increase in employee performance may require a combination of factors, including perceived organizational justice, support, and identity that can boost job satisfaction, engagement, and commitment, which in turn impacts performance (Abdullah & Al-Abrrow, 2022). Still, when compared with other workplace PPIs, strengths interventions had stronger effect sizes for desirable outcomes (Donaldson et al., 2019). Moreover, in examining the content of some interventions, awareness and development of strengths appear to be a core component. For example, psychological capital interventions focus on developing self-efficacy, optimism, hope, and resilience. Self-efficacy is the belief that one can successfully accomplish specific tasks (Bandura,

1989), which, arguably, requires an individual to be aware of and apply their strengths. Similarly, job crafting is the process of adapting aspects of a job to achieve an optimal fit between the job demands and an individual's needs and strengths (Wrzesniewski & Dutton, 2001). Thus, as demonstrated in the present studies, standalone strengths interventions may offer significant workplace benefits. However, they may also lay the groundwork for further personal and professional employee development.

## Practical implications

These studies offered important implications for practice. The results are informative for several stakeholders, including industrial/organizational psychologists, positive psychologists, employers, and managers concerned with enhancing workplace outcomes. Primarily, that implementing strengths interventions can offer desirable benefits, such as increases in job performance, OCB, and engagement in the workplace. Secondarily, that a longer and more comprehensive intervention seems to yield better results as participants have more context, support, and time to explore and apply their strengths. For instance, Miglianico et al. (2019) recommended using a five-step integrative model with sufficient training, feedback, and support to yield optimal results. Additionally, Harzer and Ruch (2016) speculated that workers might need more than just a few weeks to integrate strengths use and experience benefits. Thus, stakeholders should consider these factors when designing a strengths-based intervention for the workplace.

Importantly, however, practitioners should bear in mind that participants' change in strengths use could play a role in outcomes. Specifically, that at least a minimal increase in strengths use may be required to produce favorable outcomes. Thus, employees' strengths use should be evaluated before and after implementing a strengths-based intervention. Additionally, this finding could be used to identify employees who might benefit the most from a strengths intervention. Namely, those who score lower on strengths use before an intervention and, therefore, have greater potential to increase their strengths use and possibly their levels of job performance, OCB, engagement or flourishing at work.

## Limitations and future research

Various elements of each study design presented limitations. These included self-reported measures, convenience samples, sample size, and intervention length, content, and delivery. The dependent variables were measured by self-report questionnaires rather than observation. Although this was the most feasible way to complete each study, it may have presented issues, particularly with the In-Role Behavior

Work Performance Scale (Williams & Anderson, 1991). Most participants rated their performance highly across all time points in both studies. This scale has been used in a self-report form in prior studies with a mean score of 4.36 (Lavy & Littman-Ovadia, 2017; Littman-Ovadia et al., 2017). However, in the present studies, the mean score for performance was higher (4.56 to 4.81 in Study 1 and 4.44 to 4.64 in Study 2). Thus, performance might be better measured by supervisor observation than by self-report.

The sample for Study 1 and most of the sample for Study 2 was recruited from MTurk (Amazon Mechanical Turk, 2018). Respondents received an incentive for participation, which raises the question of whether they were genuinely engaged in either intervention or more focused on making money. A more modest incentive was used for Study 2. Still, MTurk workers may be more motivated by money than topic interest. Additionally, the sample in both studies was not representative of all U.S. (Study 1) or global (Study 2) full-time employees. Therefore, the results cannot be generalized. Additionally, the relatively small sample sizes for each study may have reduced statistical power for the analyses.

As discussed above, a shorter and less comprehensive intervention (Study 1) had several limitations. Indeed, in a meta-analysis of various positive psychology interventions (PPIs), Sin and Lyubomirsky (2009) found that longer-duration interventions yielded larger effect sizes. Thus, the relatively short intervention used in Study 1 might not have offered enough time for participants to integrate their strengths use fully.

Finally, the effectiveness of both interventions could have been impacted by being conducted online instead of in-person. In a meta-analysis of 18 strengths interventions, Ghielen et al. (2018) detected no significant difference between the effect sizes of studies conducted online versus in-person. However, in-person PPIs often have superior outcomes than those that are self-administered (Sin & Lyubomirsky, 2009). Consequently, it is unknown if online delivery diminished the effectiveness of the current intervention studies, but it might have been a limiting factor.

Future research should address these limitations and explore new areas of investigation. To address limitations, future studies should consider recruiting participants from organizations interested in bolstering their strengths-based culture. Interventions should be at least 4 weeks in length and use an integrative model to provide time, context, and support for participants. Additionally, a future study could be conducted in-person or employ a hybrid approach of in-person and online sessions so participants can receive more feedback and support.

To explore new areas of comprehension, qualitative research should be conducted. Asking participants to share their experiences in learning about and applying their strengths would facilitate a better understanding of

the process through which strengths interventions work. It would also provide researchers and practitioners with valuable insights to modify existing interventions and develop new ones. Finally, the post hoc analyses in both studies illuminate the need for further investigation into the phenomenon that change in strengths use plays a role in outcomes. Future research could examine if change in strengths use is a moderating or mediating factor in the outcome of strengths interventions. Such an investigation would provide more insight for the community concerned with studying strengths in the workplace. In turn, it may also inform the practical application of strengths-based approaches in organizations.

## Conclusion

The present studies indicate that an increase in strengths use from CS interventions leads to an increase in favorable work outcomes. Two interventions designed to help employees become more aware of and use their CS in the workplace demonstrated that when strengths use increased, job performance was significantly enhanced with a large effect size. Furthermore, in Study 2, which deployed a longer and more thorough intervention, OCB and engagement also improved significantly with very large effect sizes among those whose strengths use increased. The findings suggest that implementing CS interventions may be a worthwhile endeavor in organizations. To optimize results, researchers and practitioners should be mindful of factors that might impact effectiveness. For example, the present studies suggest it is more beneficial to use a protracted intervention (i.e., a minimum of 4 weeks) based on an integrative model that provides comprehensive information, context, and support. Moreover, CS interventions might yield varying results depending on the method of administration, participants' commitment to developing their strengths, change in strengths use levels, and the opportunity to apply strengths at work.

**Acknowledgements** The authors would like to express their gratitude and appreciation for Shana Pack, PhD and Kathleen Hughes, PhD, who provided guidance in developing the research protocol for Study 2.

**Funding** The authors did not receive support, financial or otherwise, from any organization for the submitted work.

**Data availability** The datasets generated and analyzed during the current study are not publicly available because participants in these studies did not agree in the consenting process to have their data shared and expect their data to be kept strictly confidential.

## Declarations

The authors have no relevant financial, non-financial interests, or competing interests to disclose. Both studies were approved by the Capella University Institutional Review Board and were performed in accordance with the American Psychological Association (APA, 2017) standards and Belmont Principles (U.S. Department of Health,

Education, and Welfare, 1979). Informed consent was obtained from all individual participants included in these studies.

**Conflict of interest** On behalf of all authors, the corresponding author states that there is no conflict of interest.

**Open Access** This article is licensed under a Creative Commons Attribution 4.0 International License, which permits use, sharing, adaptation, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons licence, and indicate if changes were made. The images or other third party material in this article are included in the article's Creative Commons licence, unless indicated otherwise in a credit line to the material. If material is not included in the article's Creative Commons licence and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder. To view a copy of this licence, visit <http://creativecommons.org/licenses/by/4.0/>.

## References

- Abdullah, H. O., & Al-Abrow, H. (2022). Impact of perceived organisational justice, support and identity on workplace behaviour through job attitudes: Verification in the role of LOC. *International Journal of Organizational Analysis*. <https://doi.org/10.1108/IJOA-01-2022-3099>
- Abdullah, Z., Ahsan, N., & Alam, S. S. (2009). The effect of human resource management practices on business performance among private companies in Malaysia. *International Journal of Business and Management*, 4(6), 65–72. <https://doi.org/10.5539/ijbm.v4n6p65>
- Aguinis, H., & Kraiger, K. (2009). Benefits of training and development for individuals and teams, organizations, and society. *Annual Review of Psychology*, 60, 451–474. <https://doi.org/10.1146/annurev.psych.60.110707.163505>
- Amazon Mechanical Turk (2018). *Amazon Mechanical Turk*. <https://www.mturk.com/>
- American Psychological Association (APA) (2017). Ethical principles of psychologists and code of conduct. <http://www.apa.org/ethics/code/index.aspx>
- Ashby, F. G., Isen, A. M., & Turken, A. U. (1999). A neuropsychological theory of positive affect and its influence on cognition. *Psychological Review*, 106(3), 529–550. <https://doi.org/10.1037/0033-295X.106.3.529>
- Avey, J. B., Luthans, F., Hannah, S. T., Sweetman, D., & Peterson, C. (2012). Impact of employees' character strengths of wisdom on stress and creative performance. *Human Resource Management Journal*, 22(2), 165–181. <https://doi.org/10.1111/j.1748-8583.2010.00157.x>
- Bakker, A. B., & Demerouti, E. (2014). Job demands–resources theory. *Wellbeing: a complete reference guide*, 1–28. <https://doi.org/10.1002/9781118539415.wbwell019>
- Bakker, A. B., & van Wingerden, J. (2021). Do personal resources and strengths use increase work engagement? The effects of a training intervention. *Journal of Occupational Health Psychology*, 26(1), 20–30. <https://doi.org/10.1037/ocp0000266>
- Bakker, A. B., & van Woerkom, M. (2018). Strengths use in organizations: A positive approach of occupational health. *Canadian Psychology/Psychologie Canadienne*, 59(1), 38. <https://doi.org/10.1037/cap0000120>
- Bandura, A. (1989). Human agency in social cognitive theory. *American Psychologist*, 44(9), 1175–1184. <https://doi.org/10.1037/0003-066X.44.9.1175>

- Biswas-Diener, R., Kashdan, T. B., & Minhas, G. (2011). A dynamic approach to psychological strength development and intervention. *The Journal of Positive Psychology*, 6(2), 106–118. <https://doi.org/10.1080/17439760.2010.545429>
- Biswas-Diener, R., Kashdan, T. B., & Lyubchik, N. (2017). Psychological strengths at work. In L. G. Oades, M. Steger, A. Delle Fave, & J. Passmore (Eds.), *The Wiley Blackwell handbook of the psychology of positivity and strengths-based approaches at work* (pp. 34–47). Wiley. <https://doi.org/10.1002/9781118977620>
- Buckingham, M., & Clifton, D. O. (2001). *Now, discover your strengths*. Simon & Schuster.
- Choi, S. P., Suh, C., Yang, J. W., Ye, B. J., Lee, C. K., Son, B. C., & Choi, M. (2019). Korean translation and validation of the workplace positive emotion, engagement, relationships, meaning, and accomplishment (PERMA)-profiler. *Annals of Occupational and Environmental Medicine*, 31(1), 1–13. <https://doi.org/10.35371/aoem.2019.31.e17>
- CloudResearch (2021). *CloudResearch*. <https://www.cloudresearch.com/>
- Crabb, S. (2011). The use of coaching principles to foster employee engagement. *The Coaching Psychologist*, 7(1), 27–34.
- Donaldson, S. I., Lee, J. Y., & Donaldson, S. I. (2019). Evaluating positive psychology interventions at work: A systematic review and meta-analysis. *International Journal of Applied Positive Psychology*, 4, 113–134. <https://doi.org/10.1007/s41042-019-00021-8>
- Dubreuil, P., Forest, J., Gillet, N., Fernet, C., Thibault-Landry, A., Crevier-Braud, L., & Girouard, S. (2016). Facilitating well-being and performance through the development of strengths at work: Results from an intervention program. *International Journal of Applied Positive Psychology*, 1(1–3), 1–19. <https://doi.org/10.1007/s41042-016-0001-8>
- Forest, J., Mageau, G. A., Crevier-Braud, L., Bergeron, É., Dubreuil, P., & Lavigne, G. L. (2012). Harmonious passion as an explanation of the relation between signature strengths' use and well-being at work: Test of an intervention program. *Human Relations*, 65(9), 1233–1252. <https://doi.org/10.1177/0018726711433134>
- Fredrickson, B. L. (1998). What good are positive emotions? *Review of General Psychology*, 2(3), 300–319. <https://doi.org/10.1037/1089-2680.2.3.300>
- Fredrickson, B. L. (2001). The role of positive emotions in positive psychology: The broaden-and-build theory of positive emotions. *American Psychologist*, 56(3), 218–226. <https://doi.org/10.1037/0003-066X.56.3.218>
- Gallup (2023). *State of the global workplace: 2023 report*. [https://www.gallup.com/workplace/349484/state-of-the-global-workplace.aspx?utm\\_source=news&utm](https://www.gallup.com/workplace/349484/state-of-the-global-workplace.aspx?utm_source=news&utm)
- Gallup Strengths Center (2021). *Live your best life using Clifton-Strengths*. <https://www.gallupstrengthscenter.com>
- Gander, F., Proyer, R. T., Ruch, W., & Wyss, T. (2013). Strength-based positive interventions: Further evidence for their potential in enhancing well-being and alleviating depression. *Journal of Happiness Studies*, 14(4), 1241–1259. <https://doi.org/10.1007/s10902-012-9380-0>
- Ghielen, S. T. S., van Woerkom, M., & Meyers, M. C. (2018). Promoting positive outcomes through strengths interventions: A literature review. *The Journal of Positive Psychology*, 13(6), 573–585. <https://doi.org/10.1080/17439760.2017.1365164>
- Govindji, R., & Linley, A. (2007). Strengths use, self-concordance and well-being: Implications for strengths coaching and coaching psychologists. *International Coaching Psychology Review*, 2(2), 143–153. [https://www.taosinstitute.net/wp-content/uploads/2020/05/Stelter-2007\\_Coaching-Pers-and-soc-meaning-making.pdf#page=31](https://www.taosinstitute.net/wp-content/uploads/2020/05/Stelter-2007_Coaching-Pers-and-soc-meaning-making.pdf#page=31)
- Gradito Dubord, M. A., & Forest, J. (2023). Focusing on strengths or weaknesses? Using self-determination theory to explain why a strengths-based approach has more impact on optimal functioning than deficit correction. *International Journal of Applied Positive Psychology*, 8(1), 87–113. <https://doi.org/10.1007/s41042-022-00079-x>
- Grant, A. M., & Schwartz, B. (2011). Too much of a good thing: The challenge and opportunity of the inverted U. *Perspectives on Psychological Science*, 6(1), 61–76. <https://doi.org/10.1177/1745691610393523>
- Harzer, C., & Ruch, W. (2012). When the job is a calling: The role of applying one's signature strengths at work. *The Journal of Positive Psychology*, 7(5), 362–371. <https://doi.org/10.1080/17439760.2012.702784>
- Harzer, C., & Ruch, W. (2013). The application of signature character strengths and positive experiences at work. *Journal of Happiness Studies: An Interdisciplinary Forum on Subjective Well-Being*, 14(3), 965–983. <https://doi.org/10.1007/s1092-012-012-9364-0>
- Harzer, C., & Ruch, W. (2014). The role of character strengths for task performance, job dedication, interpersonal facilitation, and organizational support. *Human Performance*, 27(3), 183–205. <https://doi.org/10.1080/08959285.2014.913592>
- Harzer, C., & Ruch, W. (2015). The relationships of character strengths with coping, work-related stress, and job satisfaction. *Frontiers in Psychology*, 6(1–12), Article 165. <https://doi.org/10.3389/fpsyg.2015.00165>
- Harzer, C., & Ruch, W. (2016). Your strengths are calling: Preliminary results of a web-based strengths intervention to increase calling. *Journal of Happiness Studies: An Interdisciplinary Forum on Subjective Well-Being*, 17(6), 2237–2256. <https://doi.org/10.1007/s10902-015-9692-y>
- Harzer C., Mubashar T., & Dubreuil P. (2017). Character strengths and strength-related person-job fit as predictors of work-related well-being, job performance, and workplace deviance. *Wirtschaftspsychologie*, 19(3), 23–38. [https://www.researchgate.net/publication/325650716\\_Character\\_strengths\\_and\\_strength-related\\_person-job\\_fit\\_as\\_predictors\\_of\\_work-related\\_well-being\\_job\\_performance\\_and\\_workplace\\_deviance](https://www.researchgate.net/publication/325650716_Character_strengths_and_strength-related_person-job_fit_as_predictors_of_work-related_well-being_job_performance_and_workplace_deviance)
- Hodges, T. D., & Asplund, J. (2010). Strengths development in the workplace. In P. A. Linley, S. Harrington, & N. Garcea (Eds.), *Oxford handbook of positive psychology and work* (pp. 213–220). Oxford University Press. <https://doi.org/10.1093/oxfordhdb/9780195335446.013.0017>
- Hone, L. C., Jarden, A., Duncan, S., & Schofield, G. M. (2015). Flourishing in New Zealand workers: Associations with lifestyle behaviors, physical health, psychosocial, and work-related indicators. *Journal of Occupational and Environmental Medicine*, 57(9), 973–983. <https://doi.org/10.1097/JOM.0000000000000508>
- Isen, A. M., Daubman, K. A., & Nowicki, G. P. (1987). Positive affect facilitates creative problem solving. *Journal of Personality and Social Psychology*, 52(6), 1122–1131. <https://doi.org/10.1037/0022-3514.52.6.1122>
- Kaiser, R. B., & Overfield, D. V. (2011). Strengths, strengths overused, and lopsided leadership. *Consulting Psychology Journal: Practice and Research*, 63(2), 89–109. <https://doi.org/10.1037/a0024470>
- Kennedy, R., Clifford, S., Burleigh, T., Waggoner, P. D., Jewell, R., & Winter, N. J. (2020). The shape of and solutions to the MTurk quality crisis. *Political Science Research and Methods*, 8(4), 614–629. <https://doi.org/10.1017/psrm.2020.6>
- Kern, M. L. (2014). *The workplace PERMA profiler*. [http://www.peggykern.org/uploads/5/6/6/7/56678211/workplace\\_perma\\_profiler\\_102014.pdf](http://www.peggykern.org/uploads/5/6/6/7/56678211/workplace_perma_profiler_102014.pdf)
- Kinghorn, W. (2017). The politics of virtue: An Aristotelian-Thomistic engagement with the VIA classification of character strengths. *The Journal of Positive Psychology*, 12(5), 436–446. <https://doi.org/10.1080/17439760.2016.1228009>
- Lavy, S., & Littman-Ovadia, H. (2017). My better self: Using strengths at work and work productivity, organizational citizenship



- behavior, and satisfaction. *Journal of Career Development*, 44(2), 95–109. <https://doi.org/10.1177/08948453116634056>
- Lee, K., & Allen, N. J. (2002). Organizational citizenship behavior and workplace deviance: The role of affect and cognitions. *Journal of Applied Psychology*, 87(1), 131–142. <https://doi.org/10.1037/0021-9010.87.1.131>
- Lee, C. H., & Bruvold, N. T. (2003). Creating value for employees: Investment in employee development. *The International Journal of Human Resource Management*, 14(6), 981–1000. <https://doi.org/10.1080/0958519032000106173>
- Linkins, M., Niemiec, R. M., Gillham, J., & Mayerson, D. (2015). Through the strengths lens: A framework for educating the heart. *The Journal of Positive Psychology*, 10(1), 64–68. <https://doi.org/10.1080/17439760.2014.888581>
- Linley, P. A., & Harrington, S. (2006). Playing to your strengths. *The Psychologist*, 19(2), 86–89. <https://thepsychologist.bps.org.uk/volume-19/edition-2/playing-your-strengths>
- Linley, A., Willars, J., & Biswas-Diener, R. (2010). *The strengths book*. CAPP Press.
- Litman, L., & Robinson, J. (2021). *Conducting online research on Amazon mechanical Turk and beyond*. Sage Publications.
- Littman-Ovadia, H., & Davidovitch, N. (2010). Effects of congruence and character-strength deployment on work adjustment and well-being. *International Journal of Business and Social Science*, 1(3), 137–145. [http://www.ijbssnet.com/journals/Vol.\\_1\\_No.\\_3\\_December\\_2010/14.pdf](http://www.ijbssnet.com/journals/Vol._1_No._3_December_2010/14.pdf)
- Littman-Ovadia, H., & Steger, M. (2010). Character strengths and well-being among volunteers and employees: Toward an integrative model. *The Journal of Positive Psychology*, 5(6), 419–430. <https://doi.org/10.1080/17439760.2010.516765>
- Littman-Ovadia, H., Lavy, S., & Boiman-Meshita, M. (2017). When theory and research collide: Examining correlates of signature strengths use at work. *Journal of Happiness Studies: An Interdisciplinary Forum on Subjective Well-Being*, 18(2), 527–548. <https://doi.org/10.1007/s10902-016-9739-8>
- Littman-Ovadia, H., Dubreuil, P., Meyers, M. C., & Freidlin, P. (2021). VIA character strengths: Theory, research and practice. *Frontiers in Psychology*, 12(5–9), Article 653941. <https://doi.org/10.3389/fpsyg.2021.653941>
- Lyubomirsky, S., & Layous, K. (2013). How do simple positive activities increase well-being? *Current Directions in Psychological Science*, 22(1), 57–62. <https://doi.org/10.1177/0963721412469809>
- Mahomed, F. E., & Rothmann, S. (2019). Strengths use, deficit correction, thriving and performance of academics at universities of technology. *SA Journal of Industrial Psychology*, 45(1), 1–10. <https://doi.org/10.4102/sajip.v45i0.1577>
- McGrath, R. E. (2015). Character strengths in 75 nations: An update. *The Journal of Positive Psychology*, 10(1), 41–52. <https://doi.org/10.1080/17439760.2014.888580>
- Merritt, S., Huber, K., & Bartkoski, T. (2018). Application of signature strengths at work: A dual-level analysis. *The Journal of Positive Psychology*, 14(1), 113–124. <https://doi.org/10.1080/17439760.2018.1519589>
- Meyers, M. C., & van Woerkom, M. (2017). Effects of a strengths intervention on general and work-related well-being: The mediating role of positive affect. *Journal of Happiness Studies: An Interdisciplinary Forum on Subjective Well-Being*, 18(3), 671–689. <https://doi.org/10.1007/s10902-016-9745-x>
- Meyers, M. C., van Woerkom, M., de Reuver, R. S. M., Bakk, Z., & Oberski, D. L. (2015). Enhancing psychological capital and personal growth initiative: Working on strengths or deficiencies. *Journal of Counseling Psychology*, 62(1), 50–62. <https://doi.org/10.1037/cou0000050>
- Miglianico, M., Dubreuil, P., Miquelon, P., Bakker, A. B., & Martin-Krumm, C. (2019). Strength use in the workplace: A literature review. *Journal of Happiness Studies*, 21, 737–764. <https://doi.org/10.1007/s10902-019-00095-w>
- Mphahlele, P., Els, C., de Beer, L. T., & Mostert, K. (2018). Investigating strengths and deficits to increase work engagement: A longitudinal study in the mining industry. *South African Journal of Human Resource Management*, 16(1), 1–16. <https://doi.org/10.4102/sajhrm.v16i0.900>
- Niemiec, R. M. (2018). *Character strengths interventions: A field guide for practitioners*. Hogrefe Publishing.
- Niemiec, R. M., & McGrath, R. E. (2019). *The power of character strengths: Appreciate and ignite your positive personality*. VIA Institute on Character.
- Pang, D., & Ruch, W. (2019). Fusing character strengths and mindfulness interventions: Benefits for job satisfaction and performance. *Journal of Occupational Health Psychology*, 24(1), 150–162. <https://doi.org/10.1037/ocp0000144>
- Peláez, M. J., Cristián, C., & Salanova, M. (2020). Facilitating work engagement and performance through strengths-based micro-coaching: A controlled trial study. *Journal of Happiness Studies*, 21(4), 1265–1284. <https://doi.org/10.1007/s10902-019-00127-5>
- Peterson, C., & Seligman, M. E. P. (2004). *Character strengths and virtues: A handbook and classification*. American Psychological Association.
- Proyer, R. T., Gander, F., Wellenzohn, S., & Ruch, W. (2015). Strengths-based positive psychology interventions: A randomized placebo-controlled online trial on long-term effects for a signature strengths-vs. a lesser strengths-intervention. *Frontiers in psychology*, 6(1-14), article 456. <https://doi.org/10.3389/fpsyg.2015.00456>
- Quinlan, D., Swain, N., & Vella-Brodrick, D. (2012). Character strengths interventions: Building on what we know for improved outcomes. *Journal of Happiness Studies*, 13(6), 1145–1163. <https://doi.org/10.1007/s10902-011-9311-5>
- Rath, T., & Conchie, B. (2009). *Strengths based leadership: Great leaders, teams, and why people follow*. Gallup Press.
- Ruch, W., Niemiec, R. M., McGrath, R. E., Gander, F., & Proyer, R. T. (2020). Character strengths-based interventions: Open questions and ideas for future research. *The Journal of Positive Psychology*, 15(5), 680–684. <https://doi.org/10.1080/17439760.2020.1789700>
- Ryan, R. M., & Deci, E. L. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *American Psychologist*, 55(1), 68–78. <https://doi.org/10.1037/0003-066X.55.1.68>
- Salas, E., Tannenbaum, S. I., Kraiger, K., & Smith-Jentsch, K. A. (2012). The science of training and development in organizations: What matters in practice. *Psychological Science in the Public Interest*, 13(2), 74–101. <https://doi.org/10.1177/1529100612436661>
- Schaufeli, W. B., Bakker, A. B., & Salanova, M. (2006). The measurement of work engagement with a short questionnaire: A cross-national study. *Educational and Psychological Measurement*, 66(4), 701–716. <https://doi.org/10.1177/0013164405282471>
- Schutte, N. S., & Malouff, J. M. (2019). The impact of signature character strengths interventions: A meta-analysis. *Journal of Happiness Studies: An Interdisciplinary Forum on Subjective Well-Being*, 20(4), 1179–1196. <https://doi.org/10.1007/s10902-018-9990-2>
- Seligman, M. E. P. (1999). The President's address. *American Psychologist*, 55(8), 559–562. <https://doi.org/10.1037/0003-066X.54.8.537>
- Seligman, M. E. P. (2011). *Flourish: A visionary new understanding of happiness and wellbeing*. Free Press.
- Seligman, M. E. P., Steen, T. A., Park, N., & Peterson, C. (2005). Positive psychology progress: Empirical validation of interventions.



- American Psychologist*, 60(5), 410–421. <https://doi.org/10.1037/0003-066X.60.5.410>
- Seligman, M. E. P., Rashid, T., & Parks, A. C. (2006). Positive psychotherapy. *American Psychologist*, 61(8), 774–788. <https://doi.org/10.1037/0003-066X.61.8.774>
- Silsbee, L. (2020, February 14). Employee engagement is no laughing matter. . <https://www.forbes.com/sites/forbescoachescouncil/2020/02/14/employee-engagement-is-no-laughing-matter/?sh=2f8357694a92>
- Sin, N. L., & Lyubomirsky, S. (2009). Enhancing well-being and alleviating depressive symptoms with positive psychology interventions: A practice-friendly meta-analysis. *Journal of Clinical Psychology*, 65(5), 467–487. <https://doi.org/10.1002/jclp.20593>
- Templeton, G. F. (2011). A two-step approach for transforming continuous variables to normal: Implications and recommendations for IS research. *Communications of the Association for Information Systems*, 28(41–58), Article 4. <https://core.ac.uk/download/pdf/301377367.pdf>
- U.S. Department of Health, Education, and Welfare: The National Commission for the Protection of Human Subjects of Biomedical and Behavioral Research (1979, April). The Belmont report: Ethical principles and guidelines for the protection of human subjects of research. <https://www.hhs.gov/ohrp/regulations-andpolicy/belmont-report/read-the-belmont-report/index.html>
- van Woerkom, M., Mostert, K., Els, C., Bakker, A. B., de Beer, L., & Rothmann, S., Jr. (2016). Strengths use and deficit correction in organizations: Development and validation of a questionnaire. *European Journal of Work and Organizational Psychology*, 25(6), 960–975. <https://doi.org/10.1080/1359432X.2016.1193010>
- VanderWeele, T. J., & Mathur, M. B. (2019). Some desirable properties of the Bonferroni correction: Is the Bonferroni correction really so bad? *American Journal of Epidemiology*, 188(3), 617–618. <https://doi.org/10.1093/aje/kwy250>
- VIA Institute on Character (2022). *The VIA character strengths survey*. <https://www.viacharacter.org/survey/account/register>
- Watanabe, K., Kawakami, N., Shiotani, T., Adachi, H., Matsumoto, K., Imamura, K., Matsumoto, K., Yamagami, F., Fusejima, A., Muraoka, T., Kagami, T., Shimazu, A., & Kern, M. L. (2018). The Japanese workplace PERMA-profiler: A validation study among Japanese workers. *Journal of Occupational Health*, 60(5), 383–393. <https://doi.org/10.1539/joh.2018-0050-OA>
- Williams, L. J., & Anderson, S. E. (1991). Job satisfaction and organizational commitment as predictors of organizational citizenship and in-role behaviors. *Journal of Management*, 17(3), 601–617. <https://doi.org/10.1177/014920639101700305>
- Wood, A. M., Linley, P. A., Maltby, J., Kashdan, T. B., & Hurling, R. (2011). Using personal and psychological strengths leads to increases in well-being over time: A longitudinal study and the development of the strengths use questionnaire. *Personality and Individual Differences*, 50(1), 15–19. <https://doi.org/10.1016/j.paid.2010.08.004>
- Wrzesniewski, A., & Dutton, J. (2001). Crafting a job: Revisioning employees as active crafters of their work. *The Academy of Management Review*, 26(2), 179–179.

**Publisher's Note** Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.