Enhancing Psychological Capital and Personal Growth Initiative: Working on Strengths or Deficiencies

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Personal growth initiative (PGI), defined as being proactive about one's personal development, is critical to graduate students' academic success. Prior research has shown that students' PGI can be enhanced through interventions that focus on stimulating developmental activities. Within this study, we aimed to investigate whether an intervention that stimulates development in the area of one's personal strengths (strengths intervention) has more beneficial effects on students' PGI than an intervention that stimulates development in the area of individual deficiencies (deficiency intervention). We conducted 2 longitudinal field experiments to investigate the effects of the 2 interventions on students' PGI (Experiment 1) and the potential mediating role of psychological capital (PsyCap) in this regard (Experiment 2). In Experiment 1, 105 ($N = 105$) university students participated in either a strengths intervention or a deficiency intervention. Results indicated that the strengths intervention increased the students' PGI in the short but not in the long term, whereas the deficiency intervention did not affect PGI. Ninety students ($N = 90$) participated in Experiment 2, in which we slightly refined both interventions by putting a stronger emphasis on the ongoing development of strengths (strengths intervention) or correction of deficiencies (deficiency intervention) by adding posttraining assignments. Results suggested that participating in both interventions led to increases in PGI over a 3-month period, but that these increases were bigger for the strengths intervention group. Furthermore, the relationship between the strengths intervention and PGI was mediated by hope as one component of PsyCap.

Keywords: higher education, personal growth initiative, positive psychology, psychological capital, strengths interventions

A positive and proactive stance toward change and continuous self-improvement, in other words personal growth initiative (PGI), is a critical resource for today's graduate students facilitating not only academic but also future career success. The critical role of PGI for students can be underpinned by three key arguments. First, research evidence corroborates that PGI favorably affects students' psychological, social, and emotional well-being while they are at the university (Robitschek & Keyes, 2009), and triggers them to actively explore different career opportunities (Robitschek & Cook, 1999). Second, scholars have reasoned that personal growth initiative facilitates the transition from university to employment because students with high levels of PGI are certain about their roles in life, know what their career goals are, and pin down action points that will help them reach their goals (Stevic & Ward, 2008). Finally, personal growth initiative is said to help individuals to cope with the multitude of challenging situations requiring change and adaptation, which they will inevitably encounter throughout their careers (Robitschek, 1998; Robitschek et al., 2012).

Results of prior research indicate that PGI of students can be enhanced through purposeful interventions, in particular, through interventions that stimulate personal growth (Thoen & Robitschek, 2013). However, individuals can either grow by overcoming their deficiencies or by building up their strengths, and this differentiation has, to our knowledge, not been considered in prior research. We hypothesize that interventions that aim at building up strengths (strengths interventions) as well as interventions that aim at overcoming deficiencies (deficiency interventions) will have positive effects on the participants' PGI, but that these effects will be stronger for strengths interventions. The reason why we expect more pronounced effects for strengths interventions is that using strengths has theoretically been linked to intrinsic motivation and fast learning (Peterson & Seligman, 2004), which, in combination, facilitate the intentional pursuit of growth activities. We furthermore hypothesize that the positive effects of the strengths intervention on PGI will be mediated by psychological capital (PsyCap), a state-like higher-order construct encompassing self-efficacy, optimism, hope, and resilience (Luthans et al., 2007). Again, we expect stronger effects for the strengths intervention, because working on strengths enhances the participants' confidence, success expectations, perseverance, and the ability to cope with setbacks (Govindji & Linley, 2007), which, in turn, trigger proactive behaviors with regard to one's personal growth (Ogunyemi, 2007).

To investigate our research hypotheses, we conducted two field experiments in which we compared the effects of a strengths and

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a deficiency intervention on graduate students' personal growth initiative (Experiments 1 and 2) and PsyCap (Experiment 2). In doing so, the present article contributes to literature on personal growth initiative by aiming to explore how PGI-enhancing interventions should be designed to achieve optimal outcomes. To the best of our knowledge, this study is the first to address the question whether effects on PGI might arise because of an intervention's general focus on personal development and growth, or whether the effects depend on the content and focus of the intervention. On a related note, this article is among the first to investigate PsyCap as a potential operating mechanism through which PGI-enhancing interventions work, which will enhance our understanding of how to design or frame these interventions even further.

Personal Growth Initiative

PGI has been defined as the "active, intentional engagement in the process of personal growth" (Robitschek, 1998, p. 184), and can be understood as a developed set of skills that helps people to work toward self-change (Robitschek et al., 2012). By definition, the construct is multidimensional and encompasses cognitive as well as behavioral components (Robitschek et al., 2012). That means that, on the one hand, people with high scores on PGI can be characterized by a readiness or preparedness for change and by the ability to make specific plans with regard to their personal growth (cognitive components). On the other hand, they have the ability to seek out and use external resources that might help them grow, and display intentional or purposeful behaviors directed at self-change (behavioral components; Robitschek et al., 2012; Weigold, Porfeli, & Weigold, 2013).

In line with the conceptualization of PGI as a developed and modifiable set of skills (Robitschek et al., 2012; Weigold et al., 2013), two empirical studies have shown that PGI can be enhanced through interventions (Robitschek, 1997; Thoen & Robitschek, 2013). The first of these studies found that adults who were seeking life or career change experienced significant increases in PGI after participating in an 8- to 15-day wilderness experience program. This program consisted of outdoor activities that helped participants to get to know themselves and to explore their perceived limits (Robitschek, 1997). In the second study, Thoen and Robitschek (2013) designed a 1-week training intervention that explicitly aimed at increasing personal growth initiative (Intentional Growth Training). To this end, student participants were introduced to theory about intentional personal growth and were asked to plan and carry out a personal growth activity that would urge them to step out of their comfort zone (Thoen & Robitschek, 2013). Results suggested that the latter part, planning and carrying out a personal growth activity, was the key to enhancing PGI, which was explained by the assumption that "experiencing (and surviving) the discomfort associated with engaging in something challenging, for the purpose of personal growth, leads to an increase in PGI" (Thoen & Robitschek, 2013, p. 160). Building on this, the present study focusses on enhancing PGI through the stimulation of personal growth activities.

Enhancing PGI Through Personal Growth Activities: Focusing on Strengths or Deficiencies?

Traditionally, interventions targeting personal growth and development have had a focus on the weak characteristics and abilities of individuals, and have often departed from a needs or problem analysis in which actual and desired end states were compared (Swanson & Holton, 2001). In contrast to this traditional approach, recent advancements in positive psychology, which is the research field dedicated to positive qualities in life (Seligman & Csikszentmihalyi, 2000), have inspired scholars to advocate the benefits of personal growth in the area of individual strengths (Buckingham & Clifton, 2001). Personal growth activities meant to enhance PGI might thus either focus on identifying and correcting individual deficiencies or on identifying and building up strengths.

On the one hand, one could argue that the focus of a personal growth activity does not matter, because stimulating development—no matter whether it regards building on strengths or mending deficiencies—will lead to increases in participants' growth or incremental mindsets, that is, the inherent believe that people or characteristics of people can change (Dweck, 2012). Research has shown that increases in growth mindsets positively predict the search for learning opportunities, self-regulation, and goal striving (Dweck, 2012), so that a link between a change in incremental mindset and PGI is possible. On the other hand, stimulating either the development of strengths or the remedy of deficiencies might trigger different motivational processes leading to different effects on PGI. For instance, while developing strengths might trigger students to engage in personal growth because using strengths is an energizing experience in itself (Govindji & Linley, 2007; Peterson & Seligman, 2004), developing deficiencies might enhance PGI because mastering difficult tasks boosts students' positive affective responses and engagement in learning activities (Guskey & Pigott, 1988). To our knowledge, prior research has not yet explored these possible differences between growth activities directed at correcting deficiencies or at building up strengths.

When closely inspecting the curriculum of a social sciences master's program at our university, we saw an opportunity to close this gap in research. In line with the traditional approach toward growth, graduate students in this program used to receive a 1-day personal skills training directed at preparing them for the labor market. In the context of this training, they identified gaps between their current level of skills and the skills that are required in their future jobs, and were stimulated to work on these identified areas for improvement. In other words, they were stimulated to engage in growth activities directed at correcting deficiencies (deficiency intervention). Inspired by positive psychology, we then developed another, comparable 1-day training intervention that also aimed at preparing students for the labor market, but in which students identified their strong points and were encouraged to work on them. In the context of this intervention, students were stimulated to engage in growth activities directed at further enhancing their strengths (strengths intervention). In the following, the expected effects of both strengths and deficiency interventions on PGI will be described in more detail.

Individual Deficiencies, Deficiency Interventions, and Effects on PGI

Deficiencies can be defined as ways of behaving, thinking, or feeling that do not come natural to an individual, which he or she does not enjoy doing, but in which he or she can achieve competent functioning if trained accordingly (cf. definition of strengths by Quinlan, Swain, & Vella-Brodrick, 2012). Training interventions that are directed at mending deficiencies encompass two important components. First, individual deficiencies have to be identified based on a thorough problem or needs analysis in which the present individual performance is compared with desirable performance standards (Moore & Dutton, 1978; Swanson & Holton, 2001). Second, the gaps between the actual and desirable performance of training participants are narrowed through practice that can take place during the training setting itself, in another safe (virtual) learning environment, or in a real-life context (e.g., on the job for employees). To increase the transfer of training, a time slot needs to be reserved for setting individual goals, and for making a plan that specifies how training participants can further work on correcting their deficiencies after the training (Burke & Hutchins, 2007).

Based on goal-setting theory (Locke & Latham, 1990; Locke & Latham, 2002), we expect a positive effect of deficiency interventions on personal growth initiative. Participants of a deficiency intervention set individual-level goals regarding the desired levels of performance they want to achieve triggering a number of mechanisms that are conducive to personal growth initiative. When individuals set goals for themselves, they will direct more attention and effort toward goal-related activities (Locke & Latham, 2002). In addition, setting goals energizes individuals and increases their persistence when facing difficult tasks (Locke & Latham, 2002), which might translate into devoting more effort to their personal development. Even though working on deficiencies can be tedious and challenging at times, we expect that students are willing and motivated to work on their shortcomings because they are aware of the fact that this will increase their chances of finding a job and succeeding when entering the labor market. Pursuing an important and personally meaningful goal such as increasing one's employability, in turn, is said to further enhance the beneficial effects of goal-setting (Locke & Latham, 1990; Locke & Latham, 2002).

Evidence for the effectiveness of development based on deficiencies stems from research on mastery learning, a group-based approach to teaching in which the same performance standards are defined for the whole group, and in which individuals who fail to meet these standards receive extra attention, tutorials, practice time, and feedback until they do. Meta-analyses revealed that mastery learning benefits students' academic performance, engagement in and time spent on learning activities, as well as positive affective variables such as students' academic self-concept, grade expectations, and attitudes toward the subject under study (Guskey & Pigott, 1988). Building on the above theoretical and empirical arguments, we formulated the following hypothesis:

Hypothesis 1: Participating in a deficiency intervention leads to increases in personal growth initiative.

Individual Strengths, Strengths Interventions, and Effects on PGI

Individual strengths have been defined as "ways of behaving, thinking or feeling that an individual has a natural capacity for, enjoys doing, and which allow the individual to achieve optimal functioning while they pursue valued outcomes" (Quinlan et al., 2012, p. 1146). In our understanding, there neither is a fixed number of strengths, nor are there strengths that are more or less beneficial: We reason that individuals simply benefit from developing and using whatever strengths they possess. Strengths interventions are processes that aim at increasing individual well-being and performance by helping individuals to identify their strong points and by stimulating strengths use and development (Quinlan et al., 2012). More specifically, strengths interventions typically start by strengths identification exercises such as gathering feedback on strong points from one's surrounding (cf. reflected best self exercise; Spreitzer, Stephens, & Sweetman, 2009), and proceed with exercises directed at the development of strong points (Biswas-Diener, Kashdan, & Minhas, 2011). In addition, strengths intervention comprise a third component, strengths use, which usually aims at encouraging individuals to use their most prominent strengths either more often or in new ways (Seligman, Steen, Park, & Peterson, 2005).

A review of prior research on strengths interventions has shown that they consistently result in well-being gains for children, adolescents, and adults, with small to moderate effect sizes (for a review, see Quinlan et al., 2012). Informed by several theoretical and empirical arguments, we moreover reason that strengths interventions can be used as a tool to enhance PGI. First and foremost, strengths interventions stimulate participants to set individual-level goals regarding the development and use of their strengths, so that the same PGI-enhancing mechanisms that were described in the context of the deficiency intervention will apply to the strengths intervention (Locke & Latham, 2002). Furthermore, we argue that focusing on growth in the area of an individual's strengths is particularly beneficial because strengths researchers claim that individuals have an intrinsic motivation or a sense of yearning for developing and using their strengths (Govindji & Linley, 2007; Peterson & Seligman, 2004). Individuals who put effort into strengths development will soon detect learning progress because learning curves tend to be steep when people get the chance to further develop their best skills and abilities (Peterson & Seligman, 2004). These initial learning successes are likely to further motivate students to develop themselves. Working on strengths has moreover been found to create energy, vigor, and vitality (Govindji & Linley, 2007; Wood, Linley, Maltby, Kashdan, & Hurling, 2011), which can serve as the driving force for intentional growth and development. Based on the theoretical and empirical arguments presented above, this study will test the following research hypothesis:

Hypothesis 2: Participating in a strengths intervention leads to increases in personal growth initiative.

Comparing the Effects of Deficiency and Strengths Interventions on PGI

Whereas we expect that both the deficiency and the strengths intervention trigger PGI because they ask participants to set per-

sonally meaningful goals (Locke & Latham, 2002), strengths interventions should exert a bigger positive effect on PGI because, as mentioned in the previous paragraph, developing and using strengths is inherently enjoyable, energizing, and motivating (e.g., Peterson & Seligman, 2004). Adding these effects to the positive effects of goal-setting, growth activities directed at building up strengths should lead to more intentional engagement in the process of personal growth than growth activities directed at correcting deficiencies. Building on this, we formulated the following hypothesis:

Hypothesis 3: Participating in a strengths intervention leads to higher increases in personal growth initiative than participating in a deficiency intervention.

The Effects of Interventions That Stimulate Personal Growth on PsyCap

We reason that next to increasing PGI, interventions that focus on personal development will also increase an individual's psychological capital defined as:

An individual's positive psychological state of development and is characterized by: (1.) having confidence (self-efficacy) to take on and put in the necessary effort to succeed at challenging tasks; (2.) making a positive attribution (optimism) about succeeding now and in the future; (3.) persevering toward goals, and when necessary, redirecting paths to goals (hope) in order to succeed; and (4.) when beset by problems and adversity, sustaining and bouncing back and even beyond (resiliency) to attain success. (Luthans, Youssef, & Avolio, 2007, p. 3)

By definition, PsyCap is a state-like construct that can be developed through purposeful interventions (Luthans et al., 2007). Personal growth interventions such as both the strengths and the deficiency intervention are likely to enhance psychological capital because they lead to mastery experiences as a consequence of the learning process, and because mastery experiences, in turn, are an important predictor of self-efficacy (Bandura, 1997). Similarly, these interventions invite participants to set self-concordant learning goals, which is a useful means to increase hope (Luthans et al., 2008). Furthermore, learning to master new tasks and assignments creates positive expectations regarding the outcomes of future learning endeavors (optimism). Finally, personal growth interventions might increase students' resilience, because they foster the belief that a person or characteristics of a person can change (cf. growth mindsets), which might help students to deal with and overcome setbacks (Dweck, 2012). As these theoretical arguments are applicable to both types of interventions we investigated in this research, we formulated the following two hypotheses.

Hypothesis 4: Participating in a deficiency intervention leads to increases in psychological capital.

Hypothesis 5: Participating in a strengths intervention leads to increases in psychological capital.

Comparing the Effects of Deficiency and Strengths Interventions on PsyCap

Even though we expect that both interventions have a positive effect on psychological capital, we assume that the effects of the strengths interventions on PsyCap will be stronger than the effects of the deficiency intervention. The main reason for our assumption is the likelihood or frequency of mastery experiences triggered through the interventions. On the one hand, strengths interventions do not only foster future mastery experiences such as other personal growth interventions, they also emphasize past mastery experiences during the strengths identification process. This additional emphasis on past successes should not only lead to an additional boost in self-efficacy (Bandura, 1997), but might also foster optimism and hope regarding future successes (Luthans, Avey, Patera, 2008). Furthermore, mastery experiences are likely to occur very quickly when people develop their strong points, because people learn effortlessly and swiftly when the learning material builds on their strengths (Buckingham & Clifton, 2001). Developing deficiencies, on the other hand, is more tedious and often requires numerous practice trials before a new task is finally mastered (Buckingham & Clifton, 2001; Ericsson, Krampe, & Tesch-Römer, 1993). In addition, strengths can be understood as personal assets that can buffer against stressors and help to overcome setbacks (Park, 2004). That is, for instance, an individual scoring high on humor can make use of this strength to cheer himself or herself and others up when facing difficulties. Therefore, raising awareness for and further building on one's strong points by means of a strengths intervention might be related to additional increases in resilience (Luthans et al., 2007).

Based on the theoretical reasoning, we expect the following:

Hypothesis 6: Participating in a strengths intervention leads to higher increases in PsyCap than participating in a deficiency intervention.

The Mediating Role of PsyCap in the Relationship Between Strengths Interventions and PGI

Even though we do expect a small positive effect of the deficiency intervention on PsyCap, we assume that only the strengths intervention produces a positive effect on PsyCap that is strong enough to trigger subsequent gains in PGI. A positive effect of PsyCap on PGI can be expected based on the argument that PsyCap can serve as a core motivating force in the academic domain (Siu, Bakker, & Jiang, 2013). It has been argued that students scoring high on PsyCap expect positive outcomes and believe that they can successfully obtain desired results (Luthans et al., 2007). Consequently, these students are more likely to intensify their learning efforts and to initiate growth processes than students who score low on PsyCap. In fact, it has been found in prior research that self-efficacy, a subcomponent of PsyCap, predicts personal growth initiative of university students (Ogunyemi, 2007). Similarly, the better a students' ability to cope with setbacks, that is, the higher their resilience, the more willing they will be to take the risk of practicing new behaviors or exploring new (career-related) opportunities. Furthermore, the PsyCap component hope enables students to identify pathways toward reaching their developmental goals and energizes the subsequent goal-pursuit (Siu et al., 2013). In this sense, hope and PGI share some conceptual overlap because the two constructs are both oriented toward the future and involve setting clear goals, making plans to reach goals, and being ready to implement the plans that have been made (Shorey, Little, Snyder, Kluck, & Robitschek, 2007). Re-

search has, however, shown that they are distinct constructs: While hope captures global, positive expectations about achieving goals, PGI encompasses a more narrow focus on achieving goals regarding personal (life) change (Shorey et al., 2007). Hope has also been defined as a purely cognitive construct capturing an individual's determination to reach goals and the belief that one can draw up pathways toward one's goals (Snyder et al., 1996), whereas PGI encompasses cognitive and behavioral components (Robitschek et al., 2012). In fact, it has been argued that the active and intentional pursuit of personal growth lies at the very heart of PGI (Robitschek et al., 2012), so that it can be clearly set apart from hope. Building on this, we reason that strengths interventions evoke hope—as a cognitive set that relates to broad goal-directed thinking (Snyder et al., 1996)—which then initiates thoughts about goals with regard to personal change processes as well as intentional behaviors to achieve these specific goals. To the best of our knowledge, empirical studies on the effects of PsyCap as a whole on PGI are still lacking to date. However, initial empirical research supports the relationship between PsyCap and academic motivation and success (Luthans, Luthans, & Jensen, 2012; Siu et al., 2013). Similarly, our knowledge regarding mechanisms through which strengths intervention operate is still limited because of a lack of empirical studies (Quinlan et al., 2012). When investigating personal growth initiative as an outcome variable it can, however, be expected that psychological capital acts as a mediator, because positive psychology interventions have been found to increase PsyCap (Luthans, Avey, & Patera, 2008), and because subcomponents of PsyCap have been linked to PGI before (Ogunyemi, 2007; Shorey et al., 2007). Based on the above reasoning, we formulated the final research hypothesis.

Hypothesis 7: The positive relationship between participating in a strengths intervention and personal growth initiative is mediated by PsyCap.

Experiment 1

We conducted Experiment 1 as a pilot study to test and refine the strengths- and deficiency intervention. In addition, we used this study as an initial test of Hypothesis 1 to 3 regarding the positive effect of the interventions on personal growth initiative.

Method

Participants and procedure. We conducted a longitudinal field experiment with three measurement waves (t0 = baseline, ~1 week before the intervention, t1 = immediate postmeasurement, and t2 = 1-month follow-up). A cohort of graduate students ($N = 114$) in a social sciences master's program at a Dutch university participated in the study. 74.6% of the participants were female and their mean age was 23.22 years. Most of the students ($N = 105$) filled in all three research questionnaires (attrition rate = 7.9%). An attrition analysis revealed that there were no significant differences between the students who left and the students who remained in the study.

The field experiment was conducted within the context of an obligatory course aiming at the development of personal skills. All students of the program in question were invited to enroll in one of the eight seminar groups of this course without knowing that the

course content would differ across the groups. Four of the eight groups received a 1-day training focusing on strengths, hereafter referred to as the strengths intervention ($N = 52$). The other four groups received a 1-day training focusing on areas of improvement, hereafter referred to as the deficiency intervention ($N = 53$). Both trainings were classroom trainings and had between 12 and 15 participants. We worked with two experienced trainers, who both facilitated two strengths intervention groups and two deficiency intervention groups, respectively. Trainers were briefed about the fact that we conducted research and that we aimed to investigate how the two interventions affected students differentially without referring to specific expectations or hypotheses. We checked the official course evaluations to see whether the students evaluated the two trainers or the courses differently, but found no differences between them.[1]

The strengths intervention. Before participating in the strengths training, students gathered feedback on situations in which they used their strengths and excelled from five to seven people in their surroundings (cf. reflected best self exercise; Spreitzer et al., 2009). The 1-day training intervention itself comprised four major tasks focusing on strengths. First, students had to discuss their own strengths within a small group, followed by an individual reflection on strengths. Second, they got the task to design an individual promotion poster highlighting their strengths and how they use them in their daily lives. Third, they worked in groups to compare their own strengths profiles to multiple requirement profiles of recently published job vacancies that corresponded to their educational background. Students were asked to think about how they could use and develop their strengths to optimize the fit between them and the function(s) in question. Fourth, we asked them to work on developing a 30-s elevator pitch, in which they briefly emphasized their greatest strengths and explained how they can use them for their imagined first job.

The deficiency intervention. Before participating in the intervention, students filled in a paper-and-pencil test about the way in which they are normally dealing with (nonescalated) conflict situations that arise in everyday interpersonal communication (De Reuver, 2003). We chose this focus for the preparatory assignment because adequate communication and interpersonal skills are crucial for the future career of social sciences students, and because experience has told us that students have difficulties in this domain. Again, the training itself consisted of several major parts. First, students determined their core qualities, pitfalls, and challenges according to the core quality theory (Ofman, 2004), similar to a SWOT analysis. Within small groups, they subsequently discussed how they could overcome their pitfalls, which result from overusing strengths, by focusing on their challenges. Second, the results of the conflict handling style test were discussed, and again the focus was put on overcoming the current shortcomings according to the test. Based on both diagnostic tests students formulated their individual learning goals. Third, students were asked to practice their deficiencies with regard to interpersonal communication in different role-plays and to give constructive

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[1] To comply with ethical standards, we made sure that all students had received the same two trainings before graduating. After data gathering for our study was completed, students who had participated in the strengths intervention, therefore, participated in the deficiency intervention and vice versa.

feedback to one another. Fourth, they were introduced to theory on resolving difficult social situations through intervening on different levels. Again, we asked them to practice applying this theory in role plays during the training and to reflect on possibilities for improvement.

Comparing the two interventions. We designed both trainings in such a way that they were comparable with regard to several components: most notably their length, their amount of social interaction, their amount of personal reflection, and their explicit focus on the participants' present (being a successful student) and future (being a successful employee) roles. In particular, both interventions were framed as trainings to prepare students for entering the labor market, and students were explicitly asked to reflect on either strengths or weaknesses that they would like to work on to improve their chance of success in their first job. However, the interventions also differed in some regards. First, the strengths interventions made use of a preparatory assignment in which participants gathered feedback from others to identify their strong points, whereas the deficiency intervention included a paper-and-pencil test to identify weak points in interpersonal communication. We did not ask the participants to gather feedback on their weak points, because we wanted to avoid that they would start the training with the negative feeling that this might cause. Second, the deficiency intervention had a more explicit focus on deficiencies with regard to interpersonal communication than the strengths intervention. However, in practice both interventions did not really differ with regard to this aspect. The deficiency intervention also included the identification of and reflection on more general areas for improvement (cf. core quality exercise; Ofman, 2004). In addition, the strengths intervention also led to the identification of many strengths with regard to interpersonal communication, because of its focus on skills that are relevant for the students' potential first job, and because of the fact that social sciences graduates need interpersonal skills in their careers. Third, one might assume that the tone of the deficiency intervention was much more negative than that of the strengths intervention and that the deficiency intervention was much more challenging. We did, however, pay careful attention to talk about deficiencies in a positive way, that is, to interpret them in the light of "chances" or "opportunities" for improvement instead of individual shortcomings. Moreover, our experience has taught us that identifying and working on strengths can provide a much bigger challenge to students than working on deficiencies, as they are used to talk about their areas for improvement but not about their areas of strengths.

Instruments. Personal growth initiative was measured by a nine-item scale developed by Robitschek (1998). A sample items is "I have a good sense of where I am headed in my life." Items were answered on a 6-point Likert scale from 1 (*totally disagree*) to 6 (*totally agree*). The originally English scale was translated into Dutch by means of a translation-back-translation procedure. In line with validation studies of the original scale (Robitschek, 1998), an exploratory factor analysis (EFA) provided clear evidence for the one-factor structure of the scale. Cronbach's α values were adequate for all measurement points (α t0 = .83, α t1 = .81, and α t2 = .89), in line with Cronbach's αs reported for the original scale (Robitschek, 1998).

Data analysis. Before conducting the main analysis, we calculated intraclass correlation coefficients (ICC(1); Bliese, 2000)

for PGI scores of the four strengths and the four deficiency intervention groups at all three time points to check whether the nested nature of our data (students nested in intervention groups) posed a threat to the assumption of independence of observations. ICCs ranged between −.04 and .002 (median ICC(1) = −.03) for the deficiency intervention groups and between .05 and .18 (median ICC(1) = .08) for the strengths intervention group. In general, these small values indicate that there is little variance in PGI scores that is explained by group membership, meaning that the assumption of independence of observations has not been violated. Note that the only slightly higher ICC(1) value of .18 was found at baseline measurement before the groups got together for the first time, and is thus a likely artifact of nonrandom sampling and not of differences between the training interventions. Subsequently, we used SPSS 19 to conduct a mixed between-within subjects analysis of variance (ANOVA) (Tabachnick & Fidell, 2007) with the experimental condition as a between-subjects factor and time as a within-subject factor.

Results

A preliminary analysis revealed that there were no significant group differences on PGI at baseline measurement (t0), $F(1, 106) = 2.59$, $p = .11$. The mean values and *SD*s of PGI at the three measurement points for both groups can be found in Table 1.

Results of the mixed between-within subject ANOVA revealed significant main effects for both time (Wilks' $\lambda = .83$, $F(2, 102) =$

Table 1
Means and SDs of PGI and PsyCap Across Measurement Points for Experiment 1 and Experiment 2

Measurement point	Variable	Strengths intervention		Deficiency intervention	
		M	SD	M	SD
Experiment 1					
t0	PGI	4.20	.75	3.99	.61
t1	PGI	4.56	.61	4.04	.53
t2	PGI	4.17	.97	4.03	.65
Experiment 2					
t0	PGI	3.85	.71	3.78	.56
	Self-efficacy	3.80	.50	3.69	.46
	Hope	5.59	.94	5.56	.78
	Optimism	3.98	.49	3.72	.51
	Resilience	3.60	.64	3.39	.65
t1	PGI	4.27	.68	4.00	.58
	Self-efficacy	4.11	.44	3.84	.36
	Hope	6.07	.92	5.75	.84
	Optimism	4.10	.49	3.91	.53
	Resilience	3.72	.66	3.35	.62
t2	PGI	4.22	.73	4.06	.57
	Self-efficacy	3.95	.48	3.75	.46
	Hope	5.94	1.18	5.72	.89
	Optimism	4.09	.49	3.77	.53
	Resilience	3.70	.69	3.24	.67
t3	PGI	4.38	.65	4.01	.62
	Self-efficacy	4.15	.46	3.87	.43
	Hope	6.24	.95	5.81	.82
	Optimism	4.13	.56	3.90	.56
	Resilience	3.77	.63	3.33	.61

Note. PGI = personal growth initiative; PsyCap = psychological capital; t0 = preintervention; t1 = postintervention; t2 = 1-month follow-up; t3 = 3-month follow-up.

10.74, $p < .001$, partial $\eta^2 = .17$) and group ($F(1, 103) = 7.06$, $p < .01$, partial $\eta^2 = .06$). In addition, the Time*Group interaction effect was significant (Wilks' $\lambda = .88$, $F(2, 102) = 7.19$, $p = .001$, partial $\eta^2 = .12$), meaning that the changes in PGI over time were different for the two intervention groups. An interaction plot revealed that the strengths intervention group experienced gains in PGI at the postintervention measurement, but did not maintain these gains over the 1 month follow-up period (see Figure 1a). These observations were backed up by paired-sample t tests revealing that the strengths intervention group experienced a significant increase in PGI from t0 to t1, $t(54) = 5.19$, $p < .001$, but no significant change in PGI from t0 to t2 ($t(51) = .85$, ns). PGI scores of the deficiency intervention group remained relatively stable over time, and paired-sample t tests revealed no significant differences between the t0 score and, respectively, scores of t1 and t2 for this group.

Discussion

In our first experiment, we did not find any support for Hypothesis 1 regarding the positive effect of the deficiency intervention on PGI. Hypotheses 2 and 3, however, were partly corroborated by the results. We found that the strengths intervention led to significant short-term but not long-term increases in students' PGI, and that the strengths intervention had stronger effects on PGI than the deficiency intervention. Because we did not find long-term effects of either intervention, we reasoned that the transfer of training to the real-life learning environment might have been challenging for the student participants, and that, therefore, the interventions did not succeed in motivating students to keep on developing them-

selves. Consequently, we decided to add two posttraining assignments to both interventions as a measure to facilitate the positive transfer of training (Wexley & Baldwin, 1986). Both assignments we used stimulated the reflection on either strengths or deficiencies, but whereas the first tool was a pure reflection exercise, the other tool was comparable to a reflective learning journal, which not only stimulates reflection but also encourages individuals to apply the knowledge they gained during the training (Brown, McCracken, & O'Kane, 2011).

Experiment 2

The purpose of Experiment 2 was to expand the results of the first experiment by exploring the direct effect of the strengths and deficiency interventions on PsyCap, as well as the indirect effect of the strengths intervention on PGI mediated by PsyCap.

Method

Experiment 2 and Experiment 1 were very similar in terms of the methods we used so that this section will only address the factors that differ between them.

Participants and procedure. Experiment 2 was a longitudinal field experiment with four measurement waves: baseline, ~1 week before the intervention (t0), postintervention, immediately after the intervention (t1), 1-month follow-up (t2), and an additional 3-month follow-up (t3). All participants were master students of a social sciences program at a Dutch university ($N = 98$). For Experiment 2, we used the cohort that graduated 1 year after the cohort in Experiment 1, so that there was no overlap in
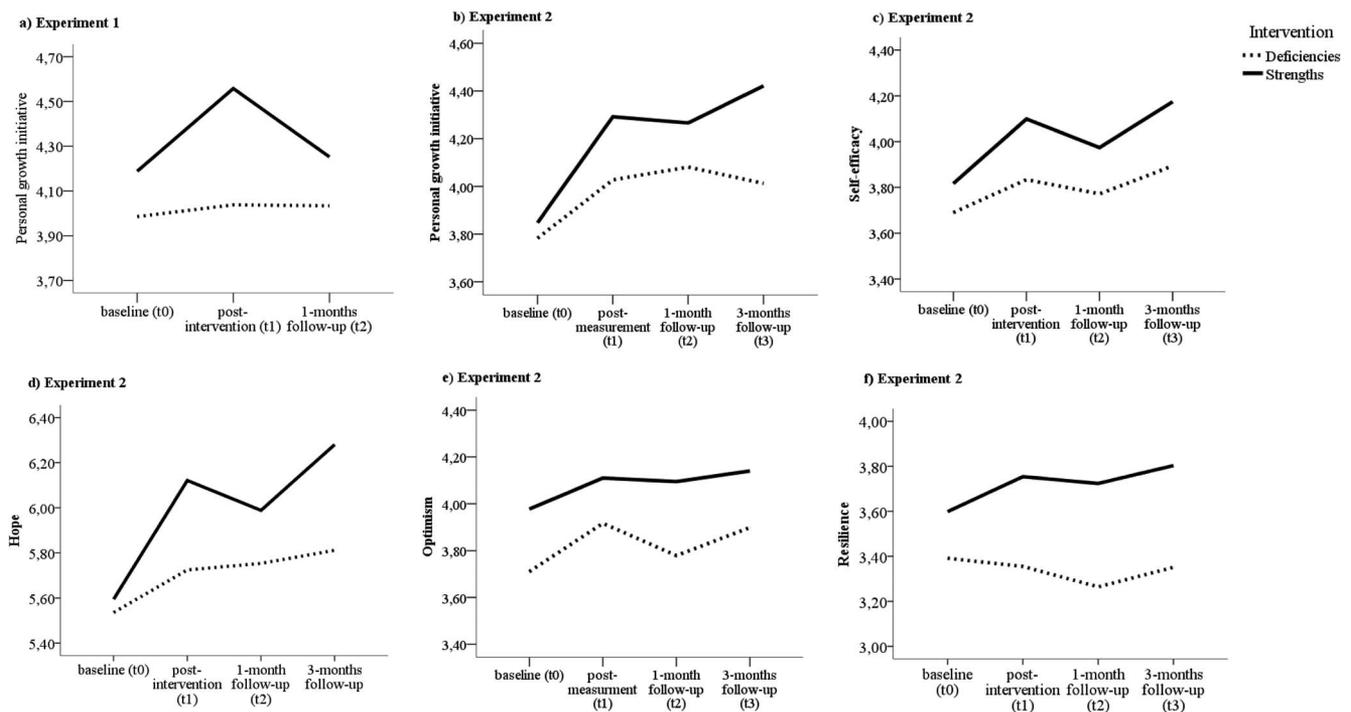

Figure 1. Graphic representations of the changes in group means of PGI, self-efficacy, hope, optimism, and resilience over time for the strength and deficiency intervention groups.

participants. Seventy-nine percent (79%) of the sample was female and participants' mean age was 22.9 years. Of the initial participants $N = 90$ filled in all four research questionnaires (attrition rate: 8.2%). We used the same procedure for recruiting study participants as in Experiment 1, but assigned students randomly to the two different interventions ($N = 46$ for the deficiency intervention; $N = 44$ for the strengths intervention). In Experiment 2, the two intervention procedures described under Experiment 1 were extended by two short posttraining homework assignments that were comparable in terms of the required effort and matched the respective intervention goals. First, students had to hand in a short reflection on either their strengths or their deficiencies 2 weeks after the intervention. In both interventions, they were asked to freely choose strengths/deficiencies to focus on based on the insights they gained during the training and their own appraisal, while thinking about skills that would benefit them in their future career. Second, ~2 months after the intervention they had to hand in a journal, in which they described at least four situations in which they either developed and used their strengths, or worked on their deficiencies.

Measures. PGI was measured by the same 9-item PGI scale by Robitschek (1998) as in Experiment 1. Cronbach's α values were adequate for all measurement points (α t0 = .75, α t1 = .80, α t2 = .83, and α t3 = .83). The four *PsyCap* components were measured by the eight-item New General Self-efficacy Scale (Chen, Gully, & Eden, 2001), the six-item revised Life Orientation Test (LOT-R measuring optimism; Scheier, Carver, & Bridges, 1994) translated into Dutch by ten Klooster et al. (2010), the six-item State Hope Scale (Snyder et al., 1996), and the six-item Brief Resilience Scale (Smith et al., 2008). All scales except for the LOT-R, for which a translation was available, were translated into Dutch by means of the translation-back translation procedure. Sample items are "I will be able to achieve most of the goals that I have set for myself" (self-efficacy); "In uncertain times, I still expect the best" (optimism); "At the present time, I am energetically pursuing my goals" (hope); and "I have a hard time making it through stressful events" (resilience, reverse coded). To capture the state-like nature of the constructs, respondents were asked to indicate the extent to which they would agree with each of the items at the present moment. If necessary, scales were adapted by reformulating phrases in such a way that generalized statements ("usually," "always," "rarely," and "hardly ever") were omitted. All scales were scored on a 5-point Likert scale from 1 (*strongly disagree*) to 5 (*strongly agree*), except for the State Hope Scale that had an 8-point answer scale from 1 (*strongly disagree*) to 8 (*strongly agree*). Our sample size did not allow us to investigate structural validity of the five Dutch scales by means of a confirmatory factor analysis (CFA), but we inferred information about the validity of the scales based on three other indicators. First of all, we conducted EFAs and these indicated that all scales (PGI, self-efficacy, hope, optimism, and resilience) had one-factor structures just as the original English scales. Second, the Cronbach's α values we found in this study were greatly in line with the values reported for the original scales, which indicates internal consistency of the scales (for self-efficacy: α t0 = .80, α t1 = .75, α t2 = .82, and α t3 = .84; for hope: α t0 = .76, α t1 = .82, α t2 = .87, and α t3 = .86; for resilience: α t0 = .83, α t1 = .84, α t2 = .87, and α t3 = .84; and for optimism: α t0 = .69, α t1 = .66, α t2 = .70, and α t3 = .75). Third, we found that the correlations of our

translated scales among each other are similar to what has been found in other studies based on the original scales (or validated translations of them). For instance, Shorey et al. (2007) reported a zero-order correlation of $r = .65$ between PGI and hope, which is in line with our findings ($r_{t0} = .64$). Smith et al. (2008) reported that their brief resilience scale correlated with $r = .45$ to $r = .69$ with the LOT-R, which is again comparable to our findings for the correlation between the same scales ($r_{t0} = .44$). Using validated Hebrew adaptations of the scales, Feldman, Davidson, and Margalit (2014) found correlations of $r = .28$ to $r =$. Forty-three between self-efficacy and hope (compared to $r_{t0} = .51$ in our study), of $r = .28$ to $r = .52$ between self-efficacy and optimism (compared to $r_{t0} = .52$ in our study), of $r = .30$ to $r = .43$ between hope and optimism (compared to $r_{t0} = .48$ in our study).

Analysis. In a first step, we checked whether our data violated the assumption of independence of observations by calculating ICC(1) values (Bliese, 2000) for PGI, self-efficacy, hope, optimism, and resilience at all four time points separately for the four strengths and the four deficiency intervention groups. ICC(1) values for all five study variables ranged from −.07 to .12 (median ICC(1) = −.002) for the deficiency group and from −.07 to .13 (median ICC(1) = −.02) for the strengths group. Out of 40 calculated ICCs, only three exceeded the threshold of marginal to small ICCs (<.10) (Bliese & Ployhart, 2002), which indicates that there is no serious threat to the assumption of independence of the data. In a second step, we conducted five mixed between-within subject ANOVAs to investigate the effects of the strengths intervention on PGI and the four PsyCap components over time. In addition, to investigate group effects on both PsyCap and PGI and to investigate the potential mediating effect of PsyCap, we tested an autoregressive, cross-lagged model (Schlueter, Davidov, & Schmidt, 2007) in MPlus 7.1.

Results

Results of a between-groups multivariate analysis of variance (MANOVA) with PGI, self-efficacy, hope, optimism, and resilience at baseline measurement (t0) as dependent variables indicated that there were no differences between the two groups on the combined dependent variable (Wilks' λ = .92, $F(5, 85) = 1.53$, $p = .19$; partial η² = .08). When considering the results for the dependent variables separately, a significant group difference was found for optimism, $F(1, 89) = 6.19$, $p = .02$, with higher scores for the strengths intervention group. Means and *SD*s of PGI, self-efficacy, hope, optimism, and resilience at all measurement points can be found in Table 1. The results of the five mixed between within-subject ANOVAs with PGI, self-efficacy, hope, optimism, and resilience as dependent variables are summarized in Table 2 and Figure 1.

We found significant Time*Group interaction effects for both PGI and hope, which indicates that the changes in these variables over time differed across the two experimental groups. Inspecting the interaction plots (Figure 1b and 1d) clarifies that both groups experienced gains in these variables over time (paired samples *t* tests revealed that these increases were marginally significant or significant for both groups at all time points), but that these gains were bigger for the strengths intervention group. We also found a marginally significant Time*Group interaction effect for resilience. The interaction plot (Figure 1f) shows that only the strengths

Table 2
Results of Mixed Between- Within-Subject ANOVAs With Group as a Between-Subject and Time as a Within-Subject Factor Predicting PGI and the Four PsyCap Components

Dependent variable	Main effect time			Main effect group		Interaction effect Time*Group		
	Wilks' λ	F(df$_b$,df$_w$)	Partial η²	F(df$_b$,df$_w$)	Partial η²	Wilks' λ	F(df$_b$,df$_w$)	Partial η²
PGI	.61	18.16 (3,84)***	.39	3.81 (1,86)†	.04	.89	3.46 (3,84)*	.11
Self-efficacy	.64	15.87 (3,85)***	.36	7.65 (1,87)**	.08	.96	1.35 (3,85)	.05
Hope	.69	13.05 (3,86)***	.31	7.55 (1,88)†	.03	.91	2.75 (3,86)*	.09
Optimism	.77	8.57 (3,86)***	.23	6.59 (1,88)*	.07	.97	0.97 (3,86)	.03
Resilience	.95	1.66 (3,86)	.06	9.83 (1,88)**	.10	.92	2.57 (3,86)†	.08

Note. df$_b$ = degrees of freedom between subjects; df$_w$ = degrees of freedom within subjects; Partial η² = partial eta-squared.
† $p < .10$.   * $p < .05$.   ** $p < .01$.   *** $p < .001$.

intervention group experienced gains in this variable over time (paired sample *t* tests revealed that these increases were significant or marginally significant for all time points), whereas the deficiency intervention group experienced slight decreases (paired sample *t* tests revealed a marginally significant decline from t0 to t2).

We did not find significant Time*Group interactions effect for self-efficacy and optimism, but we did find significant main effects of time for both variables. Interaction plots show that both groups displayed increases in these variables over time (see Figure 1c and 1e). Paired-sample *t* tests revealed that the increases in self-efficacy and optimism over time were significant for both groups at all-time points (with the exception of nonsignificant changes from t0 to t2 for the deficiency group). Taken together, these results provide full support for Hypothesis 1, 2, 3, and 5 and partial support for Hypothesis 4 and 6. We found that participating in the strengths intervention group entailed increases in PGI and all four PsyCap components (Hypothesis 1 and 5), while participating in the deficiency intervention entailed increases in PGI, self-efficacy, hope, and optimism (Hypothesis 2 and 4). Furthermore, we found that increases in PGI, hope, and resilience were more pronounced for participants of the strengths intervention (Hypothesis 3 and 6).

When conducting two multiple regression analyses with, respectively, PGI at t2 and t3 as dependent variables and the four PGI components at either t1 or t2 as independent variables, we found that hope was the only significant predictor of PGI. These results combined with the results of the mixed between-within subject ANOVAs hint at the potential mediating role of hope in the relationship between the strengths intervention and PGI, and we, therefore, proceeded by fitting an auto-regressive cross lagged model (Schlueter et al., 2007) to our four-wave data on hope and PGI using MPlus 7.1. Four different cross-lagged models were analyzed, with and without the group effect and allowing all cross-lagged and stability parameters to be free or restrict them to be equal across waves. The results from the most-restrictive well-fitting model are reported below (see Table 3 for model comparison).

The final model (see Figure 2) comprises the stability coefficients for hope and PGI, the mutual cross-lagged effects from hope to PGI and vice versa, the direct effect of group on PGI, and the mediated effect of group on PGI via hope. Both the stability and the cross-lagged effects are set equal across measurement occasions. This model showed a good fit to the data ($\chi^2 = 67.18$, *df* = 22, RMSEA = 0.15, CFI = 0.91), which is not significantly worse

than the fit of the model where cross-lagged and stability effects are free (χ^2dif = 12.96, *df* = 8, *p* = .11). Results indicate that both hope and PGI have a high stability over time (the standardized regression coefficients for hope are β_{t1} = .62; β_{t2} = .63; β_{t3} = .65; and for PGI are β_{t1} = .53; β_{t2} = .60; β_{t3} = .56). This shows that there is a high stability in the relative rank order of individuals between two or more points in time (Finkel, 1995; Schlueter et al., 2007).

The two alternative causal models for hope and PGI were investigated, that is either with PGI predicting hope or vice versa. Results revealed that hope has a significant cross-lagged effect on PGI (the standardized β is close to .20, *p* < .01). At the same time PGI has no significant cross-lagged effect on hope (the standardized β = .04, *p* = .50). As such our hypothesis that hope has an effect on PGI (and not the other way around) is supported. The expected mediation effect (Hypothesis 7) of hope in the relationship between the strengths intervention and PGI is also partially supported by the data. The group has a significant effect on hope at Time 1 and 3 (both at time and Time 3 the effect is β = .17, *p* = .02), but not at Time 2 (β = −.01, *p* = .92). Therefore, based on the significant direct effect of the strengths intervention on hope at t1, and the significant cross-lagged effect of hope t1 on PGI t2, we can conclude that hope at t1 mediates the relationship between the intervention and PGI at the 1-month follow-up. As there is no direct effect of the strengths intervention on hope at t2, the mediating effect has not been supported for the relationship between strengths intervention group and PGI at the 3-month follow-up (t3). There is, however, a direct effect of the intervention on both PGI at postmeasurement (t1) (β = .15, *p* = .04) and at the 3-month follow-up (t3) (β = .20, *p* < .01).

Table 3
Model Comparison of Four Different Autoregressive Cross-Lagged Models

Cross-lagged and autoregressive effects	Group effect	χ^2 (*df,p*)	RMSEA	CFI
Free	Absent	52.77 (14, .00)	.17	.92
Free	Present	54.22 (14, .00)	.17	.92
Equal	Absent	64.97 (22, .00)	.14	.91
Equal	Present	67.18 (22, .00)	.15	.91

Note. χ^2 = chi square; RMSEA = root mean square error of approximation; CFI = comparative fit index.
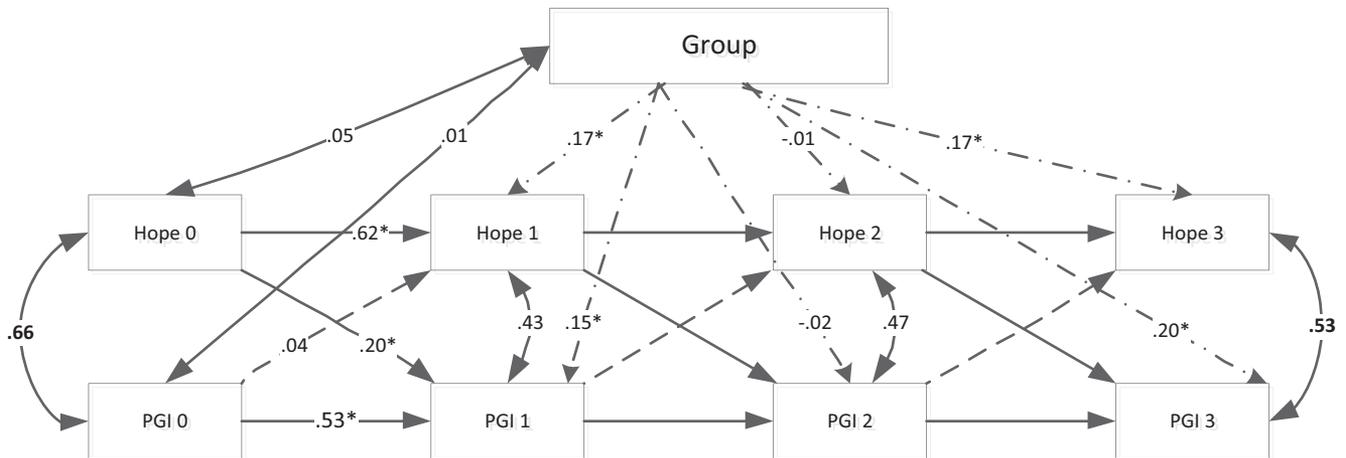
Figure 2. Graphic representation of the final autoregressive cross-lagged model with standardized coefficients. Cross-lagged and stability effects are set equal across measurement occasions.

Discussion

The present study aimed to compare the effects of a strengths and a deficiency intervention on graduate students' PGI and Psy-Cap. Results indicated that the students' scores on PGI as well as on the PsyCap components self-efficacy, hope, and optimism increased after participating in either one of the interventions. The increases in PGI and hope were found to be bigger for participants of the strengths intervention. Similarly, participating in the strengths intervention entailed increases in resilience, the fourth PsyCap component, whereas participating in the deficiency intervention entailed slight decreases in this variable.

These findings are largely in line with our expectations about the positive effects of both interventions on PsyCap and PGI. The positive effects on PGI can be explained by the fact that both interventions stimulate personal development by asking participants to set meaningful goals with regard to their personal growth, and to engage in growth activities. Growth activities, in turn, supposedly lead to more intentional personal growth, because tackling and mastering challenging activities motivates individuals to develop themselves even further (Thoen & Robitschek, 2013). Similarly, setting meaningful goals contributes to PGI by facilitating proactive learning, drive, self-regulation, and persistence (Locke & Latham, 2002). The fact that both interventions make use of goal-setting might also be an explanation for the positive effects of both interventions on PsyCap. Prior research has found that goal-setting is an effective way to enhance hope (Luthans et al., 2008). In addition, both intervention aim to induce mastery experiences, and these experiences help to create self-efficacy, as another PsyCap component (Bandura, 1997).

The effects that we found have to be interpreted with some caution because the present research did not include a no-intervention or placebo control group. One could, therefore, argue that the positive effects that became visible after both interventions are caused by the participants' interpretation of the (training) situation (e.g., their perception of being directed toward personal growth) and the adaption of their own behavior according to this interpretation (Adair, 1984). However, this argument cannot account for the fact that participants of the deficiency intervention

experienced decreases in resilience but increases in all other Psy-Cap components, whereas participants of the strengths intervention experienced increases in resilience (as well as the other PsyCap components). We can explain this finding by theory—that is, only becoming aware of and using one's strengths provides individuals with the feeling that they have the necessary personal resources to deal with hardships (Park, 2004)—but not by the assumptions that the interventions induced the participants to focus on developing their PsyCap. In addition, prior empirical studies comparing strengths interventions to placebo control interventions found support for the expected, positive effects of strengths interventions (Mitchell, Stanimirovic, Klein, & Vella-Brodrick, 2009; Seligman et al., 2005).

The assumption that all research participants (irrespective of the group) were primed to focus on personal growth and PsyCap does not represent a good explanation for the fact that the strengths intervention had comparatively stronger positive effects on PGI and hope than the deficiency intervention either. One could argue that the two trainers might have expected that the strengths intervention would elicit more positive effects than the deficiency intervention, which would then influence their behavior during the training (e.g., being more positive or supportive). However, this argument cannot account for the fact that both interventions had the same (positive) effect on self-efficacy and optimism. The latter finding also casts doubt on the possible allegations that the trainings might have differed in the conveyed tone or atmosphere, and that the deficiency intervention might have been a potential negative or frustrating experience for the participants. Based on anecdotal experience and the overall course evaluations, we know that the students appreciated and liked both interventions.

There were, however, some other differences in the interventions with a potential effect on the study outcomes. First, strengths were identified by means of feedback from others (combined with personal reflections), whereas deficiencies were identified by means of a paper-and-pencil test (combined with personal reflections). Although feedback from others can be a powerful tool to boost short-term increases in positive affective responses (Spreitzer et al., 2009), the identification of either strengths or deficien-

cies was merely a precondition that helped participants identify the areas for personal development they would like to work on. The hypotheses about the effects of the interventions on PsyCap and PGI are much more based on the actual engagement in growth activities than on the process of identifying areas for growth. In line with the reasoning that the processes of strengths and deficiency identification are only of limited influence, we found that putting a stronger emphasis on the ongoing engagement in personal growth by means of posttraining assignments was necessary for maintaining initial gains in PGI over a longer period of time. Only after adding posttraining assignments that encouraged the reflection on and ongoing application of training contents in Experiment 2 (Brown et al., 2011), did we see a positive effect of both interventions' PGI over a 3-month period (cf. literature on transfer of training; Brown et al., 2011; Wexley & Baldwin, 1986). These findings can be a hint that reflecting on areas for improvement and opportunities for strengths use might raise the students' awareness for the general process of personal growth, which helps to transfer the insights gained from engaging in one particular growth activity to other domains (comparable with the effect of the educational component of the intentional growth training; Thoen & Robitschek, 2013). A second difference in the interventions that might have affected the results was the slightly stronger emphasis on developing interpersonal or communication skills in the deficiency intervention. Even though this focus was less explicit in the assignments of the strengths intervention, both interventions highlighted that students' should focus on developing strengths or deficiencies that would benefit them in their future career—and when it comes to careers of social sciences graduates, interpersonal skills are often a prerequisite. In the end, students in both interventions typically worked on at least one growth area related to interpersonal communication. We particularly would like to stress that students in both interventions had considerable freedom in choosing their own focus for the posttraining assignments in Experiment 2. That is, the reflection on strengths/deficiencies and the strengths/deficiency journals could either be based on the insights students gained during the training or their own assessment as long as these assignments referred to skills that the students could apply in their potential first job.

Given these considerations, we do reason that the focus of growth activities matters. While encouraging students to engage in growth activities seems to be beneficial regardless of the focus (cf. Thoen & Robitschek, 2013), a focus on growth in the area of strengths appears to have an even stronger effect than growth in the area of deficiencies. This more pronounced effect can be explained by the inherently motivating features of strengths: working on strengths is said to make people feel good, energized, and invigorated (Peterson & Seligman, 2004), which can serve as the driving force for intentionally engaging in personal growth. Results also hinted at the potential mediating role of the PsyCap component hope in this regard. The analysis of cross-lagged effects clearly indicated that the strengths intervention had significant direct effects on both hope and PGI and that hope had a significant cross-lagged effect on PGI. PGI, by contrast, had no cross-lagged effect on hope. These findings are interesting in that they further our understanding of links between hope and PGI as two positive, future oriented constructs that are related to goal-setting (Shorey et al., 2007). Based on our results, it appears that the strengths intervention triggered hope in terms of general,

positive thoughts about working toward and achieving one's goals (Snyder et al., 1996), which, in turn, induced individuals to intentionally work on their goals with regard to personal change (Shorey et al., 2007). Both the deficiency and the strengths intervention probably exert a positive effect on hope because participants set personally meaningful goals (Luthans et al., 2008), which produces goal-directed energy. In contrast to participants of the deficiency intervention, participants of the strengths-intervention might, however, be able to generate a higher number of pathways toward these goals. Similar to the broadening effect of positive emotions (Fredrickson, 2001), focusing on positive qualities such as strengths might lead to more broad-minded thinking, which results in stronger positive effects on hope, and, subsequently, on PGI.

Taken together, the results of this study provide an essential contribution to theory on personal growth initiative. On the one hand, it is another piece of evidence for the (at least partially) malleable nature of the construct that can be developed through interventions (cf. Robitschek, 1997; Thoen & Robitschek, 2013). On the other hand, this study emphasizes the fact that the choice regarding the focus of these interventions matters because we found bigger gains in personal growth initiative after an intervention with a focus on developing strengths as compared with a focus on overcoming deficiencies. Furthermore, the study shows that PGI-enhancing interventions can indeed be tailored to a specific context or specific needs (in our study, preparing students for the labor market) as was already suggested by Thoen and Robitschek (2013). We would even go so far as to suggest that interventions that aim to foster growth that is relevant to the individual might exert stronger effects than a general intentional growth training (Thoen & Robitschek, 2013), because research on goal-setting has shown that personally meaningful goals are more powerful than other goals (Locke & Latham, 1990; Locke & Latham, 2002).

Based on our findings, we would advise universities to create more learning opportunities focusing on individual qualities, in particular for students who are about to graduate. Increases in students' personal growth initiative are highly desirable because it is an important set of skills predicting the effort students put into developing themselves and their overall attitudes toward learning and change (Robitschek et al., 2012). These attitudes not only benefit the students' success at the university, but can also boost their engagement in career exploration and development activities which might eventually facilitate their transition to the labor market (Robitschek et al., 2012).

Limitations and Future Research

The presented research project is subject to several limitations. Next to the lack of a no-intervention waitlist-control group, which we discussed earlier, a second limitation was that our research population and sample were skewed toward female participants not allowing for a broad generalization of results. However, we have no reason to assume that results are only applicable to female participants because other studies on personal growth interventions with more gender-heterogenous samples reported an overall positive effect of these interventions (e.g., Seligman et al., 2005). Third, our research was limited in terms of the time period of 3 months it covered. It would have been interesting to follow the graduate students over a longer period until after their graduation to further explore the effects of the personal growth interventions on the students' transition to the labor

market. It might, however, be that achieving longer-term effects would only be possible with a more time-intensive intervention with several training moments spread over several weeks. Fourth, this study focused on the four PsyCap components as the only mechanisms that transmit the effect of strengths interventions to PGI, but other mechanisms can be thought of as well. For instance, in line with prior theory and research (Peterson & Seligman, 2004; Wood et al., 2011), it could be reasoned that focusing on strengths produces energy and vigor that fuel the process of ongoing self-development. Fifth, this study uses the original, one-dimensional personal growth initiative scale PGIS (Robitschek, 1998) because the refined PGIS-II (Robitschek et al., 2012) that captures four different components of PGI (using resources, intentional behavior, readiness for change, and planfulness) had not been published at the onset of this study. Therefore, we did not have the possibility to investigate whether the intervention had differential effects on the cognitive and behavioral PGI components, and how these components related to hope. Sixth, the research relied on Dutch translations of existing English scales that have not been validated in prior research and that could not be extensively validated in the context of this study because of the small sample size. However, we found hints for strong internal consistency comparable with the original English scales, and we found that correlations between the variables in our study were comparable with correlations found in other studies using the original scales. Seventh, our analyses cannot account for the nested nature of our data (individuals nested within training groups). When inspecting ICC(1) values of the study variables at all time points, however, we did not find hints for a violation of the assumption of independence of the data. A final limitation of our study is the small to moderate effect sizes that we found. These effect sizes are, however, in line with prior research on the effects of strengths intervention on well-being (Quinlan et al., 2012). Effect sizes might be enhanced through extending the intervention period, or embedding the intervention in a strengths-based curriculum in which several courses emphasize the value of individual strengths.

One of the important tasks for future research is to aim at the optimization of personal growth interventions so that higher gains in PGI can be achieved. Research designs should be optimized by including an experimental group that receives a combination of the strength and deficiency intervention. Exploring possibilities to combine strengths and deficiency interventions in the pursuit of optimal outcomes is essential because initial evidence points to the effectiveness of working on strengths and deficiencies simultaneously (Rust, Diessner, & Reade, 2009). Furthermore, it is necessary to gain more detailed insights into the effects of personal growth interventions on the four subcomponents of PGI, and to explore the full range of variables that mediate the relationship between these interventions and PGI. Exploring the different mechanisms through which either strengths or deficiency interventions work can help to optimize the content and focus of these interventions. Similarly, much research needs to be done on moderators of this relationship so that personal or context factors that influence the effectiveness of strengths and deficiency interventions can be identified.

Conclusion

Our research results suggest that strengths interventions are more effective in stimulating graduate students' hope and PGI than interventions focusing on the development of individual deficiencies. Both

qualities contribute to students' academic and career success. These findings underline the importance of focusing on a person's best qualities for the purpose of stimulating individual development and growth.

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