BUILDING TOWARDS ENGAGEMENT:
An individual perspective

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Printed by: Ipskamp Drukkers BV, Enschede

BUILDING TOWARDS ENGAGEMENT:
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BOUWEN AAN BEVLOGENHEID:
Een individueel perspectief
(met een samenvatting in het Nederlands)

Proefschrift

ter verkrijging van de graad van doctor aan de Universiteit Utrecht op gezag van de rector magnificus, prof.dr. G.J. van der Zwaan, ingevolge het besluit van het college voor promoties in het openbaar te verdedigen op vrijdag 15 juni 2012 des middags te 2.30 uur

door

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geboren op 23 juli 1982, te Oostburg

Voor mijn lieve papa en mama

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The studies in this thesis were financially supported by “Foundation Institute GAK” (Hilversum, The Netherlands).

Contents

Chapter 1.
Introduction: Exploring literature and practice

Partly based on:

Ouweneel, E., Schaufeli, W.B., & Le Blanc, P.M. (2009). Van preventie naar amplitie: interventies voor optimaal functioneren. [From prevention to amplition: Interventions for functioning optimally]. Gedrag & Organisatie, 2, 118-135.

1.1. Developments in research and practice towards engagement

About nine months after this PhD project started, a worldwide financial crisis emerged and the end is not yet in sight. Organizations are struggling to survive, and more than ever before, they are dependent on the productiveness of their employees. Research has shown that engaged employees are more productive than non-engaged employees (Harter, Schmidt & Hayes, 2002). Therefore, it cannot come as a surprise that a Google search on the term *work engagement* yields 434.000.000 hits (January 13th 2012). Both in science and practice work engagement seems to be a booming concept. Besides the financial crisis, there are three main developments that resulted in a strong(er) focus on work engagement: (1) increased importance of psychological concepts for contemporary jobs, (2) a renewed focus on positive (organizational) psychology in science, and (3) the integration of Human Resource Management (HRM) with Occupational Health Psychology (OHP).

The first development is related to changes regarding the nature and content of work during the past decades. The emergence of knowledge work has resulted in a growing importance of psychological capabilities of employees in order to perform. So, mental capital is becoming one of the most important resources for today's organizations to survive (Weehuizen, 2008). Due to the fact that the nature of work has changed from mostly physically depleting work to mostly psychologically demanding work, employees nowadays have to make emotional and cognitive investments instead of exerting themselves physically. According to Ulrich (1997), a leading HRM-scholar, "employee contribution becomes a critical business issue because in trying to produce more output with less employee input, companies have no choice but to try to engage not only the body, but also the mind and the soul of every employee" (p. 125). So, organizations are in need of employees who are willing to psychologically invest in their work. Business is getting 'psychologized' as performance of organizations is increasingly dependent on the affective, cognitive, behavioral, and motivational characteristics of employees. But what do these 'psychologically investing' employees look like? It seems that they are energetic, dedicated, intrinsically motivated, committed and proactive, and are fully absorbed in their work, which comes close to the characteristics of engagement (Macey & Schneider, 2008). According to Weehuizen (2008), nowadays employees are supposed to set meaningful goals and to orchestrate their external and internal resources (i.e., thoughts, feelings, and behavior) in such a way as to achieve these goals. In other words, employees themselves, instead of their organizations, are primary responsible for their own well-being and their own career, and they are empowered to take charge of their own occupational life (Spreitzer, 1995). So, merely being healthy and able to work is not enough in today's business; instead employees need to be engaged to face contemporary organizations' demands. In conclusion, due to changes such as the

emergence of emotionally and cognitive demanding jobs and the trend of empowerment of employees, engagement has become of the utmost importance in practice.

Secondly, developments within psychological science itself have led towards a stronger focus on engagement. Up until the end of the twentieth century, empirical studies in psychology have mostly focused on negative psychological states. Based on analyses of the content of Psychological Abstracts, Myers (2000) found a ratio of 14:1 between publications on negative versus positive psychological states. Thus, our knowledge on psychological complaints and diseases was way more profound than our knowledge on strengths and potentials of individuals (Linley, Joseph, Harrington & Wood, 2006). Hence, it was time for a change that was initiated with a 'new' scientific perspective: *positive psychology* (Seligman & Csikszentmihalyi, 2000). "The aim of positive psychology is to begin to catalyze a change in the focus of psychology from preoccupation only with repairing the worst things in life to also building positive qualities" (Seligman & Csikszentmihalyi, 2000, p. 5). In short, this perspective focuses on human strengths and optimal functioning. By now, over one decade after its introduction, the added value of positive psychology is well established, also within organizational psychology. More and more, the focus in research is on characteristics of employees that positively influence well-being and performance at work (Luthans & Youssef, 2007). For example, Peterson and Byron (2008) found that employees who were more hopeful performed better at work. Within positive organizational psychology, work engagement is one of the most established constructs to assess whether employees are happy and productive at work (Bakker & Schaufeli, 2008). Research has shown that engaged employees are satisfied with their work, are committed and loyal to their organization, show proactive behavior at work, walk 'the extra mile' for the organization, and feel healthy and energetic (see Schaufeli & Salanova, 2007, for an overview). Also, they perform better. For example, engaged employees received better customer evaluations regarding the quality of their service than less engaged colleagues (Salanova, Agut & Peiró, 2005) and engaged employees of a fast-food restaurant generate higher financial turnover (Xanthopoulou, Bakker, Demerouti & Schaufeli, 2009a). All in all, it seems important to enhance work engagement, not only because enhancing well-being at work is a goal in itself (Zwetsloot & Pot, 2004), but also because it serves organizations and the (economic) society as a whole.

Finally, the integration of HRM with OHP resulted in a key role of the concept of work engagement. OHP is mainly concerned with monitoring, investigating, and improving mental health of employees, while HRM is mainly focused on the relationship between motivation and performance of employees. Work engagement seems to bridge the gap between these objectives of OHP and HRM since it represents a combination of both mental health and motivation. This fusing of HRM and OHP results in a comprehensive, integrated system: *Integrated Health Management*

(*IHM*; Zwetsloot & Pot, 2004), a strategic approach that not only focuses on reducing sickness absence, but also on promoting health and well-being among employees. Hence, IHM focuses on care for all personnel instead of merely people with health problems.

IHM is the result of the evolution in OHP (and HRM) towards the practice of positive individual psychological interventions. This development is analogous to that in occupational medicine (Hosman, 2000). Initially, mainly curative interventions were performed to remedy (psychological) problems, disorders and diseases, i.e., *curation*. Next, the attention was focused mainly on preventing (mental) health problems, i.e., *prevention*. Within OHP, these interventions were mostly designed to treat or prevent burnout (Le Blanc & Schaufeli, 2008; Schaufeli, Bakker, Hoogduin, Sheep & Kladler, 2001). Nowadays, there is an increasing focus on enhancing positive psychological states such as work engagement (Bakker & Schaufeli, 2008). Following this, the interest in the development of interventions to promote such positive states increases as well. In analogy to curation and prevention, we would like to dub these types of positive interventions as *amplition*, from the Latin word *amplio*, which means to strengthen or enhance. In contrast to treatment (i.e., curation) or forestalling (i.e., prevention) of negative states such as burnout, positive interventions are focused on promoting positive states (i.e., amplition), such as engagement and physical fitness. By introducing the concept of amplition, we go beyond the medical model in that no disease or risk thereof has to occur in order to intervene; rather it fits within objective of both OHP and HRM: enhancing mental well-being and motivation in order for employees to function optimally. The range of interventions aimed at amplition is greater than that of curative or preventive interventions, because in essence these types of interventions are directed at all people. After all, everyone can potentially benefit from such a positive, strengthening-oriented approach: things can always get better. Amplition, as a cornerstone of IHM, is expanding rapidly in practice. Even more so, a whole industry of enhancing work engagement has risen. However, this industry is not yet evidence-based. The current thesis provides the first steps in this direction by empirically validating interventions aimed at enhancing work engagement.

In conclusion, developments in organizations, psychological science, and OHP and HRM, respectively, converge and all point in the same direction, namely that enhancing work engagement among individual employees is essential. However, knowledge on individual antecedents of work engagement and how engagement could be enhanced by means of individual-level interventions is not yet well-established. We do have quite some empirical knowledge on the way that individual antecedents such as positive emotions and (personal) resources relate to general well-being based on *Broaden-and-Build (B&B) theory* of Fredrickson (2001). In this thesis, we embrace this knowledge by using B&B theory to develop theory on an individual perspective on engagement. We will start this endeavor by exploring the nature of work engagement as a domain-specific type of well-being.

1.2. Engagement as domain-specific well-being

The focal construct of this thesis, engagement, is a multidimensional, positive, and affective-cognitive state which is mostly used within a work-related context. Work engagement is defined as "a positive, fulfilling, and work-related state of mind that is characterized by vigor, dedication and absorption" (Schaufeli & Bakker, 2004, p. 295). Vigorous employees experience high levels of energy at work and motivation to invest effort into work. Employees are dedicated by being strongly involved into work and experiencing feelings of pride and enthusiasm about their work. Finally, absorption refers to being immersed in and focused on work so that employees feel that time at work is flying. Engaged employees work for the fun of it; they are intrinsically motivated to work hard and take on challenges at work (Van Beek, Hu, Schaufeli, Taris & Schreurs, 2012). In an interview study with highly engaged employees, we confirmed these notions on work engagement (Van Wijhe, Ouweneel, Schaufeli, Le Blanc & Peeters, 2012). For instance, we interviewed Mark, who is a senior advisor and is greatly enjoying his work as it offers him the opportunity to really express himself. He gives more than a 100% because he likes the way he is challenged. Mary is a director of a service desk for students, and she states that her work provides her with joy and fulfillment. Her work-related activities inspire her. Although she spends significant amounts of time and energy to her work, she gets more energy out of her work than she invests in it. So, engaged employees experience a large amount of positivity in the workplace.

Conceptually speaking, work engagement is comparable to happiness. Like work engagement, *happiness* is defined as a positive affective-cognitive state (Diener, Suh, Lucas & Smith, 1999). Although many operationalizations of happiness circulate (see Lyubomirsky, King & Diener, 2005a, for an overview), it is mostly defined in terms of *subjective well-being* (Lyubomirsky, Sheldon & Schkade, 2005b). According to Ryan and Deci (2001, p. 144), subjective well-being: "… consists of three components: life satisfaction, the presence of positive mood, and the absence of negative mood, together often summarized as happiness". In short, happiness is defined as a positive affective-cognitive state that comprises of feeling good (i.e., affect) as well as thinking positively of your life (i.e., cognition). The same applies to work engagement; it entails both feeling good at work and evaluating your work positively. However, happiness is context-free and relates to life in general, whereas engagement is considered a positive affective-cognitive state with regard to specific life-domains, such as work. For that reason, we consider work engagement as a domain-specific form of happiness.

Work characteristics in terms of resources and demands, play an important role in determining how engaged people feel at work (Schaufeli & Bakker, 2004). Several studies have confirmed this, not only cross-sectionally but also over time (see Halbesleben, 2010, for a review). However, to explain why people react differently to similar environments

and to know how to individually enhance work engagement, we have to learn more about individual antecedents of engagement. Recently, research has indeed shifted its focus from the impact of the work environment to the impact of individual antecedents of engagement (e.g., Judge & Bono, 2001; Vink, Ouweneel & Le Blanc, 2011; Weigl, Hornung, Parker, Petru, Glaser & Angerer, 2010; Xanthopoulou, Bakker, Demerouti & Schaufeli, 2007; Xanthopoulou, Bakker, Demerouti & Schaufeli, 2009b). Since engagement is both affective and cognitive in nature (Schaufeli, Salanova, González-Romá & Bakker, 2002b), we decided to study affective as well as cognitive individual antecedents of engagement: that is, *positive emotions* and *personal resources* (i.e., *hope*, *optimism*, *self-efficacy*, and *resilience*), respectively. Positive emotions are described as relatively intense affective experiences that are focused on specific objects or situations (Gray & Watson, 2001). Personal resources are cognitive beliefs that are valued by the employee and could serve as a means to attain other resources such as objects, energies, or work conditions (Xanthopoulou et al., 2007). In the following paragraphs, the research questions of the present thesis will be introduced and explained in more detail.

1.3. The role of positive emotions

Whereas positive emotions are immediate responses to the environment, engagement is more enduring in nature (Schaufeli et al., 2002b). More specifically, positive emotions and engagement are interrelated but differ in duration, focus, and intensity in that emotions are momentary and intensive, and linked to a specific experience, whereas engagement is a prolonged, longer-term mood, linked to a specific domain (e.g., work) (Gray & Watson, 2001). Therefore, it is plausible to assume that positive emotions precede engagement (Schaufeli & Van Rhenen, 2006). Previous research has indeed established that positive emotions may lead to increased levels of energy and vigor (Marks, 1977), and being more open to engage in a certain role (Rothbard, 2001). Higher levels of positive emotions have also been found to lead to more social integration and higher levels of work engagement (Avey, Wernsing & Luthans, 2008; Giardini & Frese, 2008; Salanova et al., 2005; Wright & Staw, 1999).

B&B theory (Fredrickson, 2001) specifies the relationship between positive emotions and work engagement by stating that positive emotions 'build' personal resources, which in turn, lead to a state of well-being, like engagement. The theory consists of two main hypotheses: the *broaden hypothesis* and the *build hypothesis*. That is, positive emotions momentarily broaden people's attention and thinking, enabling them to draw on a wider range of ideas. In turn, this broadened outlook helps people to discover and build consequential personal resources (Fredrickson, 2001). Put simply, B&B theory states that positive emotions widen people's outlooks in ways that, step by step, reshape who they are and what they can do

(Cohn, 2008). This thesis focuses specifically on the build hypothesis. Fredrickson, Cohn, Coffey, Pek, and Finkel (2008) confirmed this hypothesis in a study in which they evaluated the effect of a loving-kindness intervention, using mindfulness meditation. Results showed that the intervention caused an increase in daily experiences of positive emotions over time, which, in its turn, built personal resources, such as hope and social support. Successively, these increased resources predicted enhanced life satisfaction. In a similar vein, other studies found that positive emotions predict personal resources, for example, hope (Vilaythong, Arnau, Rosen & Mascaro, 2003), optimism (Fredrickson, Tugade, Waugh & Larkin, 2003), self-efficacy (Salanova et al., 2011), and resilience (Cohn, Fredrickson, Brown, Mikels & Conway, 2009; Tugade & Fredrickson, 2007). This suggests that momentary emotional states may contribute to the building of personal resources which are relatively more enduring (i.e., 'state-like').

In summary, positive emotions not only signal the presence of optimal well-being in making people feel good at a particular point in time, but they may also predict future well-being, either directly or indirectly via personal resources. Although evidence has been found in context-free settings, this build hypothesis has not been tested yet in a work context, using work engagement as an indicator of work-related well-being. In this thesis, we will investigate whether the build hypothesis holds within domain-specific settings such as work, by investigating the role of positive emotions in enhancing engagement.

Question 1: What is the role of positive emotions in enhancing engagement?

1.4. The role of personal resources

Individuals who possess personal resources are more likely to take advantage of opportunities, effectively meet challenges, and thus, become more successful and happy. As such, personal resources are functional in achieving goals, and stimulate personal growth and development (Xanthopoulou et al., 2009b). Research has shown that personal resources indeed positively influence well-being (Judge, Bono, Erez & Locke, 2005; Judge, Van Vianen & De Pater, 2004). More recently, a work-related set of personal resources has emerged in organizational psychology, namely *Psychological Capital* (*PsyCap*; Luthans & Youssef, 2007). PsyCap refers to a positive psychological state that is characterized by having confidence, making a positive contribution, persevering towards work-related goals, and bouncing back from set backs at work (Luthans & Youssef, 2007). PsyCap consists of *hope*, *optimism*, *self-efficacy*, and *resilience*. *Hope* is a positive cognitive state that is based on a sense of successful goal-directed determination and planning to meet these goals (Snyder, Irving & Anderson, 1991). *Optimism* is the tendency to believe that one will generally experience good outcomes in life (Scheier, Carver & Bridges, 2001). *Efficacy beliefs* are defined as "one's conviction (or confidence) about one's abilities to mobilize

motivation, cognitive resources or courses of action needed to successfully execute a specific task within a specific context" (Stajkovic & Luthans, 1998, p. 66). Finally, Luthans (2002) defines *resilience* as "the capacity to rebound or bounce back from adversity, conflict, failure, or even positive events, progress, and increased responsibility" (p. 702). The beneficial effects of these personal resources on well-being have been demonstrated in previous research. PsyCap was linked to emotional, mental, and physical well-being among employees (Avey, Luthans, Smith & Palmer, 2010; Gallagher & Lopez, 2009). Also, a limited amount of research has provided evidence that suggests a positive relationship between personal resources and work engagement (see Salanova, Schaufeli, Xanthopoulou & Bakker, 2010, for an overview). Firstly, because hope is the motivated persistent pursuit of goals and the expectation that goals can be achieved (Sweetman & Luthans, 2010), it enables a person to direct energy in dedicatedly pursuing a goal, i.e., in being engaged (Gallagher & Lopez, 2002). Secondly, optimists are better able to changing circumstances because they adopt active coping strategies (Iwanaga, Yokoyama & Seiwa, 2004), and as a result they feel more engaged (e.g., Xanthopoulou et al., 2009b). Further, self-efficacy beliefs contribute to motivation by influencing the effort individuals spend and their perseverance when facing obstacles or unexpected situations (Bandura, 1997). Self-efficacious employees have been found to experience higher levels of flow (Salanova, Bakker & Llorens, 2006) as well as higher levels of engagement (e.g., Llorens, Schaufeli, Bakker & Salanova, 2007; Salanova, Llorens & Schaufeli, 2011). We expect that self-efficacy is positively related to engagement because it leads to a greater willingness to spend additional energy and effort on completing a task, and hence to more task involvement and absorption (Schaufeli & Salanova, 2007). Finally, central to resilience is the capacity of an individual to bounce back and perhaps even prosper from negative stressful circumstances (Luthans, Vogelgesang & Lester, 2006). As described by Masten and Reed (2002), the individual possessing resilience not only survives hard times, but also thrives through positive adjustment. Resilience resources can thus produce a buffering effect, whereby work engagement is maintained despite stressful job demands (Bakker, Demerouti & Euwema, 2005). Taken together, the synergistic potential of hope, optimism, efficacy, and resilience would seem to be a powerful predictor of work engagement. Given this potentially powerful relationship, we propose that a key component in developing work engagement can be found in developing PsyCap (Sweetman & Luthans, 2010).

Question 2: What is the role of personal resources (PsyCap) in enhancing engagement?

Up to this point, most research has studied only one component of PsyCap, namely self-efficacy, in relation to work engagement (e.g., Salanova et al., 2011). To advance research on the relationship between all PsyCap elements and work engagement, we integrate

PsyCap into B&B theory. An integration of B&B theory and PsyCap provides a comprehensive framework in which both positive emotions and personal resources, either directly or indirectly, are positively related to work engagement. Based on this framework, boosting positive emotions and increasing personal resources seems to be a good starting point for individual interventions to enhance engagement.

1.5. Individual positive psychology interventions

In the current thesis, we tested three types of individual interventions to promote engagement: behavioral, cognitive, and motivational interventions. These three types of interventions ware derived from a classification of Lyubomirsky et al. (2005b) and focus on behavioral change, change in cognitions, and change in motivation towards personal goals, respectively. Whereas a *behavioral* intervention actually affects the environment because positive behavior improves the social and interpersonal climate, a *cognitive* intervention is related to the perception of the environment. Specific patterns of thought can 'construct' positive perceptions of the workplace, for instance, by focusing on the positive aspects of work and distracting attention from its negative aspects. Finally, a *motivational* intervention relates to the acquisition of specific skills (goal setting, planning, and resilience building) that make it easier for the individual to pursue his or her desired goals. In the course of time, these types of interventions have been investigated with regard to their effects on happiness (e.g., Seligman, Steen, Park & Peterson, 2005), but rarely in relation to a specific context such as the workplace.

When thinking about developing interventions that promote engagement, we should perhaps first pose the question whether such positive states can be influenced at all. With regard to happiness-levels, ample research has investigated whether or not these can be influenced. A number of researchers argue that the ability to experience happiness is largely determined by either personality (McCrae & Costa, 1990) or genotype of the person (Lykken & Tellegen, 1996). Lykken and Tellegen (1996) concluded, based on their famous twin research, that "It may be that trying to be happier is as futile as trying to be taller and therefore is counterproductive" (p. 189). It is estimated that about half of the variation in happiness-levels is determined by stable personal and genetic factors (Lyubomirsky et al., 2005b). Ten per cent of variation in happiness-levels is determined by the personal situation that is relatively difficult to influence, such as employment level, social-economic status, and physical health. The remaining forty per cent is the share of variance in happiness that we can influenced by means of *intentional activities* (Lyubomirsky et al., 2005b). Intentional or self-initiated activities are activities that are behavioral, cognitive, or motivational in nature, and that individuals may use in their pursuit of happiness (Lyubomirsky et al, 2005b). Sheldon and Lyubomirsky (2006) indicate that changes in happiness are often short-lived. This is caused by the

phenomenon known as *hedonic treadmill* or *hedonic adaptation*. This means that a lasting increase in happiness is often not achieved because people quickly adapt to positive changes (Lyubomirsky et al., 2005b). For instance, when people win a large sum of money in a lottery, although initially they seem happier, after about one year they return to their previous largely predetermined happiness set-point (Brickman, Coates & Janoff-Bulman, 1978). The same applies – but in reverse – for people who become unemployed, divorced, or whose partner dies (Diener, Lucas & Scollon, 2006).

A study by Sheldon and Lyubomirsky (2006) has shown that individuals do far less habituate to self-initiated changes than to changes that happened to them (like winning a lottery, or becoming unemployed). In other words, the effects of the hedonic treadmill can be greatly reduced by self-initiated activities, so that the level of happiness may be affected for a longer term, and perhaps even permanent. Based on this reasoning, we conclude that the effects on levels of happiness or engagement of changes put in operation by others than by the workers themselves are likely to be more short-lived than self-initiated changes. This is substantiated by many studies (e.g., Judge, Locke, Durham & Kluger, 1998; Spector, Cooper, Sanchez, O'Driscoll & Sparks, 2002) which have shown that when people feel that they can exert influence on their environment by displaying certain behaviors, they are more motivated and experience a higher level of well-being (see Ng, Sorensen & Eby, 2006, for an overview). The possibility of adjusting to changes such as salary increase, reduced workload, and promotion will be limited in comparison with changes initiated by workers themselves, such as using the opportunity to learn in one's job, developing themselves personally, and adopting new and challenging goals. This is the reason that the current thesis focuses on interventions at the individual level instead of the environment. Indeed, individual interventions, by definition build on the intention of people to change, whereas interventions focused on changing the environment relate to the conditions in which employees function, making it less likely that this type of interventions may affect their level of engagement in the longer term. This is in line with the current trend of *empowerment*, a principle by which people are intrinsically motivated to take initiative and make decisions to solve problems, improve their performance, and enhance their well-being (Spreitzer, 1995). Empowerment is based on the idea that providing individuals with resources and opportunities for development, as well holding them responsible and accountable for the outcomes of their own actions, leads them to contribute to their own resources and engagement (Spreitzer, 1995). In this sense, intentional activities seem to represent a suitable method towards a more engaged workforce. So, besides building theory on the individual perspective on engagement, this thesis also has the objective to develop and evaluate individual-level interventions to promote engagement. These types of interventions are based on the idea of amplition – enhancing the positive – and focus on enhancing positive

emotions and building personal resources in order to increase work engagement.

Question 3: Are happiness interventions, i.e., intentional activities, useful in enhancing engagement?

1.6. Employees versus students

The current thesis uses both student and employee samples. In our view, student samples are useful and appropriate for conducting preliminary studies as regard work-related constructs. In addition, student samples were also used in evaluating the effectiveness of general happiness interventions (e.g., Sheldon & Lyubomirsky, 2006). However, by focusing on happiness, these studies investigated context-free well-being among students, whereas we examine well-being specifically related to students' activities, i.e., student or study-related well-being. From a psychological point of view, students' core activities can be considered as 'work' (Salanova, Schaufeli, Martínez & Bresó, 2009). Namely, people not only engage in paid work to earn their living – which is the obvious function of employment –, but work also has five unintended psychological by-products, the so-called latent functions of employment (Jahoda, 1981). These latent functions are time structure, social contact, collective purpose, social status, and activity. Like employees, students are involved in structured activities (e.g., doing assignments, attending class) that are directed toward a specific goal (e.g., passing exams, acquiring a degree), have social contact with fellow students as well as teachers, get social status from being a student, and remain active throughout the study. Hence, students could also experience engagement regarding their studies. So, analogously to work engagement, *study engagement* (or *academic engagement*) is characterized by feeling vigorous, being dedicated to one's studies, and being absorbed in study-related tasks (Schaufeli, Martínez, Marques Pinto, Salanova & Bakker, 2002a).

Study engagement received less attention from researchers than work engagement. However, thus far similar results were found as for employees. Students with high levels of efficacy appeared to be more engaged in their studies (Bresó, Schaufeli & Salanova, 2011). Furthermore, studies found a positive relationship between study engagement and academic achievement; the more engaged students felt, the better they performed with regard to specific tasks (Salanova, Llorens, Cifre, Martínez & Schaufeli, 2003) and the higher their Grade Point Averages (Salanova et al., 2009). Additionally, dedicated, and enthusiastic students are more likely to set challenges for themselves, and report higher self-control as well as higher grades (Howell, 2009). In conclusion, since students can be engaged in their studies like employees can be engaged in their work, we question whether students can 'build' towards engagement in the same way as employees do. This leads us to our fourth and final research question:

Question 4: Can students build towards engagement in the same way as employees do?

1.7. Outline of this thesis

Chapter 2 aims to unravel the relationships between positive emotions, personal resources, and study engagement. Based on B&B theory, we tested the hypothesis that the experience of positive emotions predicts students' future personal resources and study engagement. Moreover, we expected that a longitudinal relationship exists between personal resources and study engagement. Finally, we also investigated whether positive emotions, personal resources, and study engagement are reciprocally related. As such, Chapter 2 covers both Question 1 and 2.

The main objective of *Chapter 3* is to examine longitudinal relationships between positive emotions, personal and job resources, and work engagement. Similar to Chapter 2 and in line with B&B theory, we assumed that by experiencing positive emotions, employees enhance their personal and job resources, which, in turn, may lead to a more enduring positive state of work engagement. Again, we examined whether positive emotions, resources, and work engagement are reciprocally related to each other. So, Chapter 3 also tries to answer both Question 1 and 2, though this time in a sample of employees.

Chapter 4 consists of a study that looked at the potential positive within-person relationships between positive emotions, work-related hope, and the three dimensions of work engagement on a daily level (i.e., vigor, dedication, and absorption). Following Question 1 and 2 as well as B&B theory, we expected that the experience of positive emotions would cause hope, which in its turn, would lead to engagement. We conducted this study among employees, who filled in a diary questionnaire for five consecutive working days, twice a day.

Chapter 5 reports on a field study and an experimental study among university students, to answer the question whether changes in students' self-efficacy levels co-vary with similar changes in study engagement and study performance. Thereby, we aimed to uncover the relationship between self-efficacy, being the most important element of PsyCap, and study engagement (Question 2). As opposed to Chapters 2-4, in this Chapter we adopted a person-centered approach. That is, instead of looking at a sample as a whole, we created 'natural' (Study 1) and manipulated (Study 2) subgroups based upon changes in self-efficacy over time, and examined whether these subgroups showed similar changes over time in engagement and performance. Both studies were designed to test the assumption that – changes in – self-efficacy may have a significant impact on students' – changes in – cognition and motivation (i.e., engagement), as well as behavior (i.e., performance).

Chapter 6 tests the potential of a behavioral and a cognitive positive psychology

intervention to enhance study-related positive emotions and study engagement, and to reduce study-related negative emotions among university students. We modified two existing positive interventions that are aimed at increasing general happiness for use in an academic context. Thereby, these studies investigate the effects of activities to increase happiness within a specific, academic domain (Question 3). These interventions focused on 'thoughts of gratitude' (i.e., cognitive) and 'act of kindness' (i.e., behavioral), respectively. We monitored the participants on a daily basis during the one-week intervention, and we carried out additional pre-, post-, and follow-up assessments.

Chapter 7 investigates the effects of an online positive psychology intervention designed to enhance positive emotions, self-efficacy, and work engagement within a sample of employees. The intervention consisted of three types of online self-initiated activities: happiness activities to stimulate positive emotions, goal setting activities, and resource building activities. Therefore, this intervention program entailed behavioral, cognitive, as well as motivational activities. This study thus examines Question 3 in that it assessed the utility of happiness interventions within a specific, work-related context.

With regard to Question 4, Chapters 2 and 5 look into the role of positive emotions (Chapter 2) and resources (Chapters 2 and 5) in enhancing engagement among university students, whereas Chapters 3 and 4 investigate the same relationships among employees. By comparing the results of these Chapters we thus can answer Question 4. Furthermore, Chapters 6 and 7 report on interventions in a student sample (Chapter 6) and an employee sample (Chapter 7), respectively. To answer Question 4, we compare the results of Chapters 6 and 7.

In the final Chapter, *Chapter 8*, we summarize the results and conclusions of all empirical studies and discuss their theoretical implications. Further, we discuss three main issues that were raised by the results of our studies. These issues are related to the research designs that we used, to the concept of engagement, and to the motivation to participate in positive psychology interventions. In reference to these issues, we elaborate on the limitations of our studies. To conclude, we provide recommendations – including potential improvements – for further research and for designing and implementing positive psychology interventions.

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Chapter 2.
Flourishing students: A longitudinal study on positive emotions, personal resources, and study engagement

Based on:

Ouweneel, E., Le Blanc, P.M., & Schaufeli, W.B. (2011). Flourishing students: A longitudinal study on positive emotions, personal resources, and study engagement. *The Journal of Positive Psychology*, *6*, 142-153.

2.1. Introduction

The appearance of *work engagement* coincides with the rise of *positive psychology* that has shifted the focus from human malfunctioning toward human strengths and optimal functioning (see Seligman & Csikszentmihalyi, 2000). Work engagement is defined as "…a positive, fulfilling, and work-related state of mind that is characterized by vigor, dedication and absorption" (Schaufeli & Bakker, 2004, p. 295). More recently the notion of *study engagement* was introduced. It was maintained that from a psychological point of view, students' core activities can be considered as 'work' (Salanova, Schaufeli, Martinez & Bresó, 2009). Namely, like employees, students are involved in structured, coercive activities (e.g., doing assignments, attending class) that are directed toward a specific goal (e.g., passing exams, acquiring a degree). Hence, students could also experience engagement regarding their studies. So, analogously to work engagement, study engagement is characterized by feeling vigorous, being dedicated to one's studies, and being absorbed in study-related tasks (Schaufeli, Martínez, Marques Pinto, Salanova & Bakker, 2002a).

Earlier studies found a positive relationship between engagement and academic achievement; the more engaged students felt, the better they performed (Salanova, Llorens, Cifre, Martinez & Schaufeli, 2003; Salanova et al., 2009). Additionally, dedicated and enthusiastic students are more likely to adopt mastery approaches, and report higher self-control as well as higher grades (Howell, 2009). Moreover, up until now, the relationship between personal resources and engagement has only been demonstrated cross-sectionally among students. Accordingly, it is important to investigate this relationship longitudinally as well. Previous studies –using samples of employees– have focused mainly on environmental resources (*job resources*) as antecedents of engagement, using the *Job Demands-Resources (JD-R) model* as a theoretical framework. The JD-R model states that the presence of job resources (e.g., supervisory support, autonomy) predicts work engagement among employees through a motivational process (Schaufeli & Bakker, 2004). Positive relationships between job resources and work engagement have indeed been well established (Bakker, Demerouti, Taris, Schaufeli & Schreurs, 2003; Hakanen, Bakker & Schaufeli, 2006; see Halbesleben, 2010, for a review), not only within time but also over time (e.g., Mauno, Kinnunen & Ruokolainen, 2007; Schaufeli, Bakker & Van Rhenen, 2009). The same seems to apply for students: study resources (e.g., task autonomy, teacher support) enhance study engagement (Salanova et al., 2009). However, the role of personal resources (e.g., hope, self-efficacy), which may also be important determinants of optimal functioning and well-being (Hobfoll, 1989; Judge & Bono, 2001), is not yet investigated among students. This is noteworthy because among employees personal resources have been found to be positively related to engagement (Xanthopoulou, Bakker, Demerouti & Schaufeli, 2007). Similarly, with one exception (Schaufeli & Van Rhenen, 2006), the role of short-term emotional states in relation to the more enduring state of engagement has not yet been explored. The study

by Schaufeli and Van Rhenen (2006) – which was cross-sectional in nature – found that positive emotions are positively related to work engagement among managers and suggests that these emotions play a mediating role in the relationship between job resources and engagement.

The present study was aimed at investigating the motivational process of the JD-R model among university students. Instead of focusing on the role of study resources on study engagement, the objective of this study was to uncover the role of positive emotions as well as personal resources in predicting study engagement. Below we will explain our research model which is based on two theoretical frameworks: *the Conservation of Resources (COR) theory* (Hobfoll, 1989, 2002) and the *Broaden-and-Build (B&B) theory* (Fredrickson, 1998, 2001; Fredrickson & Joiner, 2002).

2.1.1. Personal resources and engagement

Personal resources are those personal characteristics that are valued by the individual and could serve as a means for attainment of other personal characteristics, objects, energies or (study) conditions (Xanthopoulou et al., 2007). As such, personal resources are functional in achieving goals, and stimulate personal growth and development (Xanthopoulou, Bakker, Demerouti & Schaufeli, 2009). According to COR theory (Hobfoll, 1989), it is unlikely that resources exist in isolation of each other because people try to accumulate their resources. COR theory predicts that, in the long run, this accumulation of resources will result in positive personal outcomes like engagement (Hobfoll, 2002). It has indeed been confirmed that certain combinations of personal resources are positively related to work engagement (Gorgievsky & Hobfoll, 2008). For example, self-efficacy, hope, optimism, and resilience appeared to explain additional variance in employee well-being (i.e., engagement) over time (after controlling for baseline levels of engagement) (Avey, Luthans, Smith & Palmer, 2010). Similarly, organizational-based self-esteem, self-efficacy, and optimism have been found to be positively related to work engagement (Xanthopoulou et al., 2007).

In the present study, the following personal resources were taken into account: self-efficacy, hope, and optimism. The beneficial effects of each of these three personal resources on well-being have been shown in previous research among employees (e.g., Avey et al., 2010; Gallagher & Lopez, 2009). Bandura's Social-Cognitive theory (SCT) defines self-efficacy as the "…belief in one's capabilities to organize and execute the course of action required to produce given attainments" (Bandura, 1997, p. 3). It is expected that (academic) self-efficacy is positively related to (study) engagement because self-efficacy leads to a greater willingness to spend additional energy and effort on complete a task or an assignment and hence to more task involvement and absorption (Schaufeli & Salanova, 2007). Hope is defined as "a cognitive set that is based on a reciprocally-derived sense of succesful agency (goaldirected determination) and pathways (planning to meet goals)"

(Snyder et al., 1991, p. 571). It can be assumed that hope enables a person to direct energy in dedicatedly pursuing a goal (i.e., to being engaged). Therefore, we expect hope to be an antecedent to (study) engagement too.

Finally, optimism is characterized by the belief that good things will happen (Scheier & Carver, 1985). More specifically, optimists utilize an expectancy framework, in which success is expected when one is presented with a challenge. As opposed to self-efficacy, optimism does not depend upon one's own capabilities (Avey, Wernsing & Luthans, 2008). Therefore, it is more likely that an optimist will take on a certain task, given the expectation of a positive outcome. This, in turn, might lead to engagement through a higher level of task involvement (Kahn, 1990).

In addition to the predictive value of personal resources (i.e., self-efficacy, hope, and optimism) for study engagement, it is assumed that positive emotions are positively related to personal resources as well as to study engagement.

2.1.2. Positive emotions and engagement

B&B theory (Fredrickson, 1998, 2001) posits that positive emotions signal the presence of optimal well-being. In addition, positive emotions not only make people feel good at a particular time, but these emotions may also predict future well-being (Fredrickson & Joiner, 2002). Thus, positive emotions also *produce* well-being. That is, positive emotions 'broaden' thought-action repertoires by inducing exploratory behaviors that create learning opportunities and goal achievement, and help to 'build' enduring (personal) resources. Thus, by experiencing positive emotions, people will enhance their personal resources, which in turn may lead to a more enduring positive state of well-being. The current study focuses specifically on the latter assumption which is referred to as the 'build hypothesis'. This hypothesis was previously confirmed in a study of Fredrickson, Cohn, Coffey, Pek and Finkel (2008) in which the effect of a loving-kindness intervention, using mindfulness meditation, was evaluated. Results showed that the intervention caused an increase in daily experiences of positive emotions over time, which in turn built several personal resources (e.g., mindfulness, purpose in life). In turn, these increased personal resources predicted enhanced life satisfaction over time.

As stated, the well-being measure that is used in the present study is study engagement. This construct is of a somewhat different nature than life satisfaction, which has mostly been used in the context of B&B theory. The first reason why we decided to use study engagement as our focal well-being measure is that we wanted to apply B&B theory to a study setting. Therefore, we chose a measure that is context-specific as it refers to study as opposed to life in general. Secondly, engagement has been recognized as an active (instead of passive like satisfaction) measure of well-being and – as such – it is often used in (organizational) psychology (e.g., Schaufeli & Bakker, 2004). That is, engagement is

characterized by activation, whereas satisfaction is characterized by satiation. Furthermore, positive emotions have been linked previously to engagement in both survey and experimental studies (Salanova, Llorens & Schaufeli, 2011). An explanation for the effect of positive emotions on engagement is that positive emotions facilitate approach behavior which prompts individuals to be engaged in particular activities (Cacioppo, Gardner & Berntson, 1999).

All in all, based on theorizing and on the results of empirical studies, it seems plausible to expect that positive emotions together with the synergetic potential of self-efficacy, hope, and optimism are powerful predictors of engagement. Therefore, this study was aimed at investigating whether students' positive emotions are related to increased levels of personal resources and study engagement over time. Furthermore, it was expected that a longitudinal relationship existed between personal resources and study engagement. This way, the current study is aimed at integrating two major theories in the domain of positive psychology, namely B&B theory and COR theory.

2.1.3. Reciprocal relationships: gain cycles

Although B&B theory posits an initiating role of positive emotions in the enhancement of personal resources and well-being, the *Cognitive Mediation Theory* of emotions specifies the relationship between emotions and well-being in a different way (Weiss & Cropanzano, 1996). Namely, this alternative theory states that personal resources lie at the core of experiencing more positive emotions and ultimately lead to a more enduring state of well-being therefore posing a mediating role of positive emotions. Indeed, in a study among Spanish secondary school teachers, positive emotions mediated the positive relationship between self-efficacy and engagement (Salanova et al., 2011). Consequently, it seems somewhat simplistic to propose exclusively one-directional relationships between resources and well-being, and not to take reciprocal causation into account. In fact, recent studies provide empirical evidence for both reversed causation as well as reciprocal relationships (gain cycles) between positive emotions and personal resources with regard to well-being (see for an overview Salanova, Schaufeli, Xanthopoulou & Bakker, 2010). For example, a gain cycle of job resources (e.g., autonomy, supervisory coaching), personal resources (e.g., self-efficacy, optimism), and work engagement was found by Xanthopoulou et al. (2009). Moreover, positive emotions, self-efficacy and activity engagement appeared to be reciprocally related among Spanish secondary school teachers (Salanova et al., 2011). Additionally, it seems that self-efficacy may precede, as well as follow, engagement (Llorens, Schaufeli, Bakker & Salanova, 2007). This finding suggests the existence of a gain cycle in which self-efficacy and engagement are positively related to each other, which is in line with SCT theory (Bandura, 2001). Finally, Hakanen, Perhoniemi and Toppinen-Tanner (2008) studied a sample of Finnish dentists and found a gain cycle of job resources, engagement,

personal initiative, and innovativeness. Hence, the studies mentioned above, support the notion of a motivational gain cycle in which people experience more positive emotions and (job or personal) resources, and in turn more engagement, and vice versa.

2.1.4. Present study

The objective of the present study is twofold: (1) to investigate whether positive emotions predict students' future experience of personal resources (self-efficacy, hope, and optimism), and whether positive emotions and personal resources predict future study engagement, and; (2) to test whether positive emotions, personal resources, and study engagement are reciprocally related. Based on the line of reasoning laid out in the preceding paragraphs, the following hypotheses are formulated:

Hypothesis 1a: positive emotions at Time 1 (T1) are positively related to personal resources (self-efficacy, hope and optimism) at Time 2 (T2), and; *Hypothesis 1b*: T1 positive emotions are positively related to study engagement at T2, and; *Hypothesis 1c*: T1 personal resources are positively related to study engagement at T2.

Hypothesis 2: Positive emotions, personal resources (self-efficacy, hope, and optimism), and study engagement are reciprocally related. It is hypothesized that, personal resources (self-efficacy, hope, and optimism) at T1 also have a lagged positive effect on positive emotions at T2 (*Hypothesis 2a*), and that study engagement at T1 has a lagged positive effect on personal resources (self-efficacy, hope, and optimism) at T2 (*Hypothesis 2b*).

2.2. Method

2.2.1. Participants and procedure

The study sample consisted of 403 Dutch university students who were recruited by means of leaflets in the university cafeteria. They voluntarily participated in the study in which they were asked to fill out an online questionnaire, asking them about their emotions in the last couple of weeks, their personal resources, and their study engagement. Four weeks later, they were asked to fill out the same questionnaire again. This time lag of four weeks is in line with the recommendations by Daniels and Guppy (1994), who state that a time lag of a month between two measurements is suitable to explore the relationships among study variables regarding well-being. They state that one month provides a time-interval that on the one hand is long enough to allow well-being to change, but on the other hand is short enough to allow some stability in the lives of the participants. Participants who took part in both measurements received course credits in return. Twelve participants were excluded from data analysis because of missing or incomplete data, leaving a total of 391 participants. Of these participants, 16.1% were male students. Participants' mean age was 20.90 years (*SD* = 2.00).

2.2.2. Measures

Positive emotions. Positive emotions were measured with a shortened 12-item Dutch version (Schaufeli & Van Rhenen, 2006) of the Job-related Affective Well-being Scale (Van Katwyk, Fox, Spector & Kelloway, 2000). For the purpose of the present study, the scale instruction was adjusted to students by substituting 'work' by 'studies'. Two types of positive emotions were distinguished: (a) *positive active emotions* of which an example of an item is: "The last couple of weeks I felt inspired", and; (b) *positive non-active emotions* of which an example of an item is "The last couple of weeks I felt relaxed". All items were scored on a five-point Likert scale (1 = never, 5 = always).

Personal resources. Three different types of personal resources were measured: (a) *academic self-efficacy* (translated from the six-item scale of Midgley et al., 2000). A sample item is: "Even if the task is hard, I can learn it"; (b) *study-related hope* (study-adjusted version based on the six-item scale of Snyder, Sympson, Ybasco, Borders, Babyak & Higgins, 1996). A sample item is: "Right now I see myself as being pretty successful", and; (c) *study-related optimism* (study-adjusted version based on the Life Orientation Test of Scheier & Carver, 1985; shortened into a six-item scale by Luthans, Avolio, Avey & Norman, 2007) of which an example item is: "With respect to my study, I always look on the bright side". All items were scored on a five-point Likert scale (1 = strongly disagree, 5 = strongly agree).

Study engagement. Study engagement was assessed by means of the Utrecht Work Engagement Scale – student version that consists of three subscales (UWES-SS; Schaufeli, Salanova, González-Romá & Bakker, 2002b): (a) *vigor* (6 items); a sample item is "When I'm doing my work as a student, I feel bursting with energy"; (b) *dedication* (6 items); a sample item is "I find my studies full of meaning and purpose", and; (c) *absorption* (5 items); a sample item is "Time flies when I am studying". All items were scored on a seven-point Likert scale (0 = never, 6 = always). All study variables appeared to have satisfactory internal consistencies at both measurement times; the values of Cronbach's alpha coefficients ranged from .71 to .86 (see Table 1).

2.2.3. Data analyses

Means, standard deviations, Cronbach's alpha coefficients and bivariate correlations were computed for every study variable on both T1 and T2. Next, a Harman's single-factor test (Podsakoff et al., 2003) was conducted which means that a measurement model including all scales was tested on T1 data by means of Confirmatory Factor Analysis (CFA) implemented by the AMOS software program (Arbuckle, 2005). Finally, Structural Equation Modeling (SEM), also by the AMOS program, was used to establish the relationships between the study variables. Zapf, Dormann and Frese (1996) argue that reciprocal relationships can be determined by means of SEM when all study variables are measured at both time points. The reason for this is that, when investigating cross-lagged paths, such a full-panel model

enables to control for both the variance explained by the T1 measurement of that same construct as well as the variances explained by the other study variables at T2. First, the *Stability Model* (Model 1; M1) was tested without cross-lagged structural paths but with temporal stabilities and synchronous correlations. Temporal stabilities were specified as correlations between the corresponding constructs at T1 and T2. Model 1 estimates the total stability coefficient between T1 and T2 without specifying the variance in direct or indirect paths (Pitts, West & Tein, 1996). Secondly, the fit of the stability model was compared to that of three more complex models: (a) the *Causality Model* (Model; M2), which is identical to Model 1 but includes additional cross-lagged structural paths from T1 positive emotions to T2 personal resources and to T2 study engagement, as well as from T1 personal resources to T2 study engagement; (b) the *Reversed Causality Model* (Model 3; M3), which is also identical to M1, but includes additional cross-lagged structural paths from T1 study engagement to T2 personal resources and T2 positive emotions, as well as from T1 personal resources to T2 positive emotions; (c) the *Reciprocal Model* (Model 4; M4), which includes additional reciprocal relationships between positive emotions, personal resources, and study engagement and thus includes all paths of M2 and M3. In addition, the measurement errors of the corresponding observed variables collected at different time points were allowed to co-vary over time (e.g., a covariance is specified between the measurement error of hope at T1 and the measurement error of hope at T2). While generally in cross-sectional models measurement errors should not co-vary, in longitudinal measurement models the measurement errors corresponding to the same indicator should be allowed to co-vary over time (McArdle & Bell, 2000; Pitts et al., 1996) in order to account for the systematic (method) variance that is associated with each specific indicator.

Maximum likelihood estimation methods were used and the input for each analysis was the covariance matrix of the items. The goodness-of-fit of the models was assessed by using absolute and relative indices. The absolute goodness-of-fit indices calculated were the χ^2 Goodness-of-Fit Statistic, Goodness-of-Fit Index (GFI), Adjusted Goodness-of-Fit Index (AGFI), and the Root Mean Square Error of Approximation (RMSEA). Because χ^2 is sensitive to sample size, the probability of rejecting a hypothesized model increases when sample size increases. To overcome this problem, the computation of relative goodness-of-fit indices is strongly recommended (Bentler, 1990). Three of such relative fit indices were computed: the Normed Fit Index (NFI), the Comparitive Fit Index (CFI), and the Incremental Fit Index (IFI).

Values smaller than .08 for the RMSEA are indicative of an acceptable fit, and values greater than .10 should lead to model rejection (Browne & Cudeck, 1993). For all other fit indices (i.e., GFI, AGFI, NFI, CFI, and IFI), values greater than .95 are considered as indicating a good fit (Hu & Bentler, 1999). Finally, we computed the Akaike Information Criterion (AIC; Akaike, 1987) to compare competing models because this index is particularly well suited for

the comparison of non-nested models that fit the same correlation matrix. A lower value of the AIC index indicates a better model fit.

2.3. Results

2.3.1. Preliminary analyses

Means, standard deviations, Cronbach's alpha coefficients, and bivariate correlations of all research variables are reported in Table 1. All alpha coefficients met the criterion of .70 (Nunnally & Bernstein, 1994). Furthermore, Table 1 shows that, in line with our expectations, positive active emotions as well as positive non-active emotions are positively related to the three personal resources (self-efficacy, hope, and optimism) and the three dimensions of study engagement (vigor, dedication, and absorption) within time at both T1 and T2. Moreover, with a few exceptions, all across-time correlations were positive and significant too.

Table 1. Means, standard deviations, correlations and Cronbach's alpha coefficients of the research variables on Time 1 and Time 2 (N = 391)

	M	*SD*	α	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1. Positive active emotions T1	3.36	.79	.79	1.00															
2. Positive active emotions T2	3.40	.74	.76	.39**	1.00														
3. Positive non-active emotions T1	3.89	.74	.77	.62**	.31**	1.00													
4. Positive non-active emotions T2	3.87	.68	.71	.33**	.62**	.40**	1.00												
5. Self-efficacy T1	3.68	.54	.80	.26**	.08	.28**	.12*	1.00											
6. Self-efficacy T2	3.66	.50	.79	.26**	.18**	.26**	.15**	.72**	1.00										
7. Hope T1	4.44	.60	.82	.38**	.31**	.39**	.33**	.50**	.47**	1.00									
8. Hope T2	4.52	.61	.82	.31**	.35**	.31**	.29**	.45**	.59**	.67**	1.00								
9. Optimism T1	4.53	.59	.71	.39**	.26**	.40**	.30**	.47**	.46**	.70**	.58**	1.00							
10. Optimism T2	4.51	.62	.73	.29**	.32**	.28**	.30**	.38**	.49**	.60**	.69**	.70**	1.00						
11. Vigor T1	3.13	.89	.81	.28**	.19**	.23**	.10*	.44**	.40**	.53**	.46**	.43**	.45**	1.00					
12. Vigor T2	3.10	.90	.81	.26**	.23**	.22**	.11*	.35**	.39**	.46**	.54**	.39**	.47**	.77**	1.00				
13. Dedication T1	3.77	.94	.85	.18**	.11*	.20**	.08	.25**	.22**	.40**	.37**	.40**	.35**	.61**	.51**	1.00			
14. Dedication T2	3.72	.95	.86	.15**	.17**	.19*	.11*	.16**	.21**	.32**	.39**	.32**	.39**	.49**	.62**	.75**	1.00		
15. Absorption T1	2.96	1.02	.85	.26**	.17**	.20**	.09	.32**	.31**	.38**	.39**	.31**	.33**	.80**	.66**	.66**	.56**	1.00	
16. Absorption T2	2.94	1.04	.86	.19**	.17**	.14**	.03	.28**	.33**	.27**	.40**	.29**	.36**	.62**	.78**	.56**	.71**	.74**	1.00

Note. ** $p < .01$; * $p < .05$; *M* = mean; *SD* = standard deviation; α = Cronbach's alpha

A Harman's single-factor test (Podsakoff et al., 2003) using CFA's on T1 data was computed to test whether the possible shortcoming of common method bias occurred and to distinguish among the constructs of positive emotions, personal resources, and study engagement. Two models were tested: (a) a one-factor measurement model which hypothesized that all three constructs loaded on a single latent factor; and (b) a three-factor oblique model which assumed that the factors were freely interrelated. Results showed that the one-factor model could not account for the variance in the model; the three-factor model fitted the data significantly better than the one-factor model ($\Delta\chi^2$ (3) = 425.89, $p < .001$; ΔAIC = 419.89). Even though the Chi-square value of the three-factor model was significant (χ^2 (17) = 77.45, $p < .001$), the relative fit indices were all meeting the criteria for an acceptable fit: RMSEA = .09; GFI = .96; AGFI = .91; NFI = .95; CFI = .96; IFI = .96; AIC = 131.45. Taken together, these results suggest that positive emotions, personal resources, and study engagement are interrelated, yet *distinct* constructs.

2.3.2 Model test

Table 2 shows the fit indices of the four competing models. [1] As can be seen, the *Causality Model* (M2) fitted the data significantly better than the *Stability Model* (M1) ($\Delta\chi^2$ (3) = 73.00, $p < .001$). This illustrates the relevance of cross-lagged paths from T1 positive emotions to T2 personal resources and T2 study engagement, as well as from T1 personal resources to T2 study engagement. Furthermore, the fit of the *Reversed Causality Model* (M3) is superior to that of the *Stability Model* (M1) as well ($\Delta\chi^2$ (3) = 79.25, $p < .001$). This suggests that the model with the cross-lagged paths from T1 personal resources to T2 positive emotions, and from T1 study engagement to T2 personal resources and T2 positive emotions (i.e., M3), also has a better fit to the data than the model including solely temporal stabilities and synchronous correlations (i.e., M1). Finally, Table 2 shows that the *Reciprocal Model* (M4) fits the data significantly better than M1, M2, and M3. This indicates that the model that includes reciprocal relationships among positive emotions, personal resources, and study engagement, is superior to all other alternative models.

[1] In line with B&B theory, which explicitly focuses on the role of positive emotions, we did not incorporate negative emotions in our research model. However, as potentially negative emotions could also influence well-being (cf. Fredrickson & Losada, 2005), we constructed a model in which we added negative emotions as an additional variable that predicts personal resources and study engagement. It appeared that this model was not meeting the criteria for a good fit (χ^2 (143) = 515.36, $p < .001$, RMSEA = .10; GFI = .87; AGFI = .84; NFI = .84; CFI = .88; IFI = .88; AIC = 689.36). Moreover, the model showed that negative emotions (T1) had no significant negative relationship with either personal resources at T2 (β = -.03) or work engagement at T2 (β = -.01). The reversed causational relationships between personal resources at T1 and negative emotions at T2 (β = .02) and between study engagement at T1 and negative emotions at T2 (β = .00) turned out non-significant as well. Hence, our additional analyses justified the exclusion of negative emotions as predictor variable in our research model.

Table 2.

Fit indices of the five different models (*N* = 391)

Model	χ^2	df	RMSEA	GFI	AGFI	NFI	CFI	IFI	AIC	Δ χ^2	Δdf
M1: Stability model	388.53***	87	.09	.89	.83	.91	.93	.93	518.53		
M2: Causality model	315.53***	84	.08	.91	.86	.93	.95	.95	451.53	M2-M1 = 73.00***	3
M3: Reversed causality model	308.78***	84	.08	.92	.86	.93	.95	.95	444.78	M3-M1 = 79.25***	3
M4: Reciprocal model	199.60***	81	.06	.94	.90	.95	.97	.97	341.60	M4-M1 = 188.93***	6
										M4-M2 = 115.93***	3
										M4-M3 = 109.18***	3
M5: Final model	207.61***	87	.06	.94	.91	.95	.97	.97	337.61	M5-M4 = 8.01^{ns}	6

Note. χ^2 = chi-square statistic; df = degrees of freedom; RMSEA = Root Mean Square Error of Approximation; GFI = Goodness-of-Fit Index; AGFI = Adjusted Goodness-of-Fit Index; NFI = Normed Fit Index; CFI = Comparitive Fit Index; IFI = Incremental Fit Index; AIC = Akaike Information Criterion; *** = $p < .001$; ns = non significant

Hypothesis 1a assumed that positive emotions at T1 are positively related to personal resources (self-efficacy, hope and optimism) at T2, *Hypothesis 1b* stated that T1 positive emotions are positively related to T2 study engagement at T2, and Hypothesis 1c stated that T1 personal resources are positively related to study engagement at T2. The Causality Model (M2) includes these three relationships, of which two turned out to be significant. Both the standardized effects of T1 positive emotions on T2 personal resources (β = .31) and the standardized effect of T1 personal resources on T2 study engagement (β = .45) appeared to be significant. However, the lagged effect of T1 positive emotions on T2 study engagement was not significant at $p < .001$. So, positive emotions are positively related to personal resources, which in turn, have a positive impact on study engagement. Thus, although *Hypothesis 1c* had to be rejected, Hypotheses 1a and 1b are supported: it is demonstrated that T1 positive emotions lead to T2 personal resources, and that T1 personal resources lead to T2 study engagement.

According to Hypothesis 2, positive emotions, personal resources (self-efficacy, hope and optimism), and study engagement are reciprocally related. More specifically, Hypothesis 2a predicted that T1 personal resources (self-efficacy, hope, and optimism) have a lagged positive effect on T2 positive emotions. The Reversed Causality Model (M3) that included this relationship indicated a significant reversed causal effect of T1 personal resources on T2 positive emotions (β = .43, p < .001). Thus, our results confirm

Hypothesis 2a, as personal resources at T1 are significantly, positively related to students' experience of positive emotions at T2. Moreover, a significant reversed causal effect of T1 study engagement on T2 personal resources was found (β = .42, p < .001). So, *Hypothesis 2b*, which stated that T1 study engagement has a lagged positive effect on the level of T2 personal resources, is confirmed as well. Finally, a non-significant reversed causal effect was found of T1 study engagement on T2 positive emotions.

So, both causal and reversed causal relationships exist simultaneously, which is confirmed by the model fit of the *Reciprocal Model* (M4). *The Final Model* (Model 5; M5), in which non-significant paths of M4 were excluded, is displayed in Figure 1. M5 explained 19% of variance in T2 positive emotions, 36% of variance in T2 personal resources, and 20% of variance in T2 study engagement. Note that for reasons of economy Figure 1 only shows the latent factors, not the observed variables. To summarize, our results confirmed the existence of reciprocal relations between the study variables: over time, positive emotions are positively related to personal resources and vice versa, and personal resources are positively related to study engagement and vice versa.

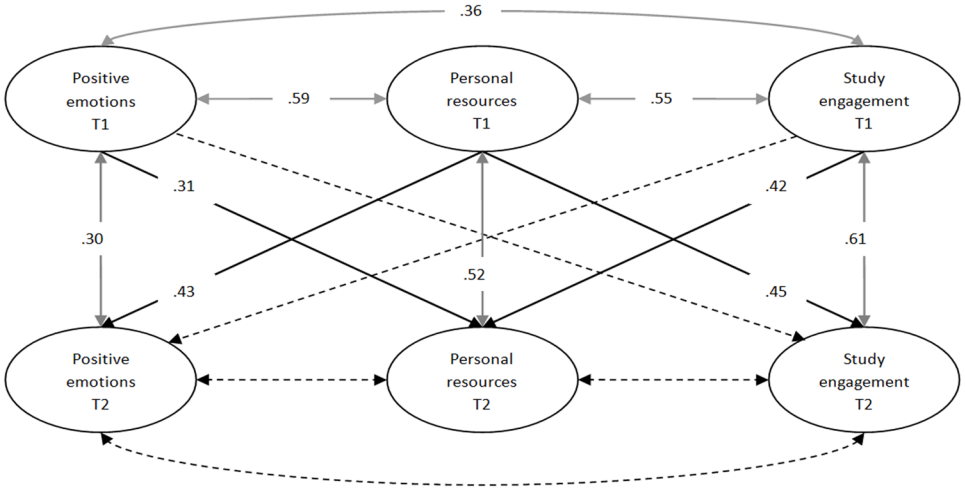

Figure 1. The final model (M5)

Note. Solid black lines indicate standardized coefficients (all are significant at $p < .001$). Solid grey lines represent the (auto)correlations between and factors and time points. The discontinuous lines are non significant paths and correlations

2.4. Discussion

2.4.1. Conclusions and theoretical implications

The aim of this study was to test a structural model of a gain cycle, which was based on Fredrickson's (1998) B&B theory and Hobfoll's (1989) COR theory. More specifically, the objective of the present study was twofold: (1) to investigate whether students'

experience of positive emotions and personal resources predict their future study engagement, and (3) to confirm the existence of reciprocal relationships between positive emotions, personal resources, and study engagement. In order to investigate these issues, a longitudinal (two-wave) questionnaire study among 391 Dutch university students was conducted with a four-week interval.

Our results confirm the hypothesis derived from B&B theory that positive emotions initiate the building of resources (build hypothesis). Moreover, these results support the assumption of COR theory that the availability of personal resources leads to well-being over time. Thus, the current study demonstrates that, in addition to job resources, personal resources are indeed important in predicting study engagement. In this way, the underlying study confirms the findings of previous studies among employees, which were presented in the introduction section (i.e., Avey et al., 2010; Salanova, et al., 2011; Xanthopoulou et al., 2007). Moreover, our study successfully integrated B&B theory and COR theory in the sense that positive emotions are followed by personal resources and personal resource are, in their turn, followed by study engagement. The fact that a cross-lagged relationship was found between positive emotions and personal resources, as well as between personal resources study engagement, but not between positive emotions and study engagement, supports the notion of a possible mediating role of personal resources in the relationship between positive emotions and study engagement. Although this study did not confirm the direct relationship between positive emotions and engagement, as demonstrated by Schaufeli and Van Rhenen (2006) in their cross-sectional study, it did provide a better understanding on how positive emotions eventually could lead to engagement, namely, via boosting personal resources.

Finally, the results of this study imply that none of the constructs included in this research model can be considered as a single cause or consequence, as reciprocal causation seems to occur. So, none of the observed relationships should be interpreted in isolation, rather, the psychological process described in this study is of a dynamic nature. Accordingly, the results of this study support the notion that it is too simplistic to pose a specific order when it comes to psychological constructs (Llorens et al., 2007). The robustness of this interpretation is supported by similar reciprocal relationships that were found in previous studies, as mentioned in the introduction (e.g., Llorens et al., 2007; Salanova et al., 2011; Xanthopoulou et al., 2009a).

2.4.2. Limitations and future research directions

Although a three-wave study is needed to confirm the mediating role of personal resources in the positive relationship between positive emotions and study engagement, the design of the current study enabled us to demonstrate reciprocal relations between our study variables (Taris, 2000). Namely, Zapf, Dormann and Frese (1996) state that when all study

variables are incorporated at both time points, it is justified to verify causal, reversed and reciprocal relationships between study variables (when using SEM) (see Method section). Although its longitudinal design enables the investigation of relationships among the focal variables over time, the results of this study should be interpreted with caution. In the first place, we used solely self-report measures, which could have caused the results to be contaminated by common method variance. Furthermore, our study included no control variables. Although we conducted a Harman's single-factor test (Podsakoff et al., 2003) to control for common method bias, it cannot be ruled out that the associations among our variables are inflated by 'third variables', such as unmeasured personality factors or common method variance (cf. Podsakoff et al., 2003). Therefore, following the recommendation by Podsakoff et al., we conducted an additional analysis in which we extended our model with a latent factor, with all the indicators of the latent variables that were already included in our model as its indicator. In other respects the model remained unchanged. In this way it is possible to distinguish between variance reflecting the presence of this unmeasured common factor, and variance that reflects the processes of interest. Although the magnitude of the estimates changed somewhat, this additional analysis revealed that all cross-lagged effects remained significant and that the direction of these effects remained unchanged (results available from the first author). Thus, the cross-lagged effects reported in the present study do not seem to result from common method variance or other unmeasured 'third variables'. Moreover, our final model is in line with current theories and with the results of previous empirical studies. Therefore, the model is likely to be a plausible representation of the relationships between the study variables. Nevertheless, for future research, it would be of added value to incorporate objective outcome variables, such as performance measures (i.e., exam grades) (Brown, Tramayne, Hoxha, Telander, Fan, & Lent, 2008).

The time lag of four weeks between the two measurements has been deliberately chosen and is in line with Daniels and Guppy (1994), who argue that a time lag of a month between two measurements is quite suitable regarding studies on well-being and its predictors. They state that a time interval is needed that allows enough time for well-being to change, but is also short enough to allow some constancy in the lives of those sampled. Indeed, our results showed that our study variables were not highly stable. So, there is variance to be explained within the variables over time, which indicates that a time lag of four weeks is suitable to study the interrelationships between our study variables. However, the current time lag did not enable us to explore the day-to-day variability in positive emotions, personal resources and engagement. Although it could be questioned whether engagement can be appropriately assessed on a daily basis, it would be interesting to conduct a diary study to measure fluctuations in momentary (positive) emotions more accurately.

Furthermore, because a relatively large proportion of the participants was female

(83.9%), it can be questioned whether the results can be generalized to the whole student population and beyond. For instance, it would be interesting to see whether the results of the current study can be replicated among younger students who are enrolled in compulsory education. It may be expected that this type of student experiences less engagement in their studies because they did not deliberately choose their education like older (university) students do. Next to that, it could also be worthwhile to study a sample of employees in order to confirm whether (a combination of) positive emotions and personal resources predict employee engagement as well (and vice versa).

Finally, based on B&B theory, which states that positive emotions are more important in the prediction of well-being and negative emotions in the prediction of ill-being (Fredrickson, 1998), we exclusively focused on positive emotions and their prediction of personal resources and study engagement (and vice versa). In an additional analysis we controlled for the effect of negative emotions and it indeed appeared that negative emotions did not have a significant effect on either personal resources or the level of study engagement. However, Fredrickson and Losada (2005) uncovered the importance of the ratio between positive and negative emotions and its predictive value for well-being. Therefore, a future study could investigate whether or not this ratio has a significant effect on personal resources and study engagement as well.

2.4.3. Conclusion

The results of the present study, a two-wave study with a four-week interval, showed that both positive emotions as well as personal resources like self-efficacy, hope, and optimism, can be considered predictors of study engagement. In turn, it was shown that work engagement influences these emotions and resources, thus constituting a gain cycle. The present findings advance our knowledge on the dynamic nature of the relationships among positive emotions, personal resources, and study engagement. By way of practical implication, focusing on enhancing positive emotions and personal resources among students would increase their study engagement. For example, training programs in which students set and plan to meet study-related goals could be implemented in order to induce a sense of positivity toward themselves, their studies and the future (Schunk, 1991). Moreover, Sheldon and Lyubomirsky (2006) have shown in their studies that positive emotions can be enhanced among students when they are asked to make an effort to think about the many things in your life that they are grateful for. Positive emotions also increased when they were asked to imagine themselves in the future, assuming everything has gone as well as it possibly could. Moreover, teachers can enhance positive emotions and personal resources among their students by providing them with positive feedback and by giving them rewards like compliments (Weaver, 2006). Performing field research on this issue could shed some light on how to effectively design and carry out such programs. However, though more

research is needed, the present findings can be considered a valuable addition to the current knowledge in the relatively new field of positive psychology.

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Chapter 3.
Don’t leave your heart at home: Gain cycles of positive emotions, resources, and engagement at work

Based on:
Ouweneel, E., Le Blanc, P.M., & Schaufeli, W.B. (submitted). Don’t leave your heart at home: Gain cycles of positive emotions, resources, and engagement at work.

When people go to work, they shouldn't have to leave their hearts at home - Betty Bender

3.1. Introduction

Why are some employees happier at work than others? As of the beginning of this century, quite some research on work engagement has tried to answer this question. Work engagement is an active type of well-being (Warr, 1990), which is defined as "a positive, fulfilling, and work-related state of mind that is characterized by vigor, dedication and absorption" (Schaufeli & Bakker, 2004, p. 295). Vigorous employees experience high levels of energy at work and motivation to invest effort into work. They are dedicated by being strongly involved into work and experiencing feelings of pride and enthusiasm about their work. Finally, absorption entails immersion in and concentration on work, as well as the feeling that time is flying at work. Obviously, the work environment, in terms of resources and demands, plays an important role in determining how engaged employees feel at work. Using the *Job Demands-Resources (JD-R) model* (Demerouti, Bakker, Nachreiner & Schaufeli, 2001) as a theoretical framework, several studies have confirmed this, not only cross-sectionally but also over time (see for a review Halbesleben, 2010). However, this does not explain why employees react differently to similar work environments. *Individual antecedents* of work engagement could shed some light on this issue (Judge & Bono, 2001; Xanthopoulou, Bakker, Demerouti & Schaufeli, 2007). More recently the role of individual antecedents, also termed personal resources, in predicting work engagement is investigated as well (e.g., Xanthopoulou, Bakker, Demerouti & Schaufeli, 2009; Weigl, Hornung, Parker, Petru, Glaser & Angerer, 2010). *Broaden-and-Build (B&B) theory* (Fredrickson, 1998; 2001) states that the experience of positive emotions can build resources and may predict well-being in the long run. Taking B&B theory as a starting point, it would be interesting to investigate what role positive emotions play in the process of initiating the build of resources within a work-related context and predicting work engagement among employees.

The present study was aimed at investigating the predictive value of positive emotions, personal resources, and job resources for work engagement over time. Our research is innovative because we focus on positive emotions as a 'novel' variable in the context of resources and engagement. Although positive emotions have been studied before as predictors of resources (e.g., Fredrickson, Cohn, Coffey, Pek & Finkel, 2008) or as predictors of engagement (e.g., Salanova, Llorens & Schaufeli, 2011), so far they have not been combined with personal resources, job resources, and work engagement into one conceptual model. By combining these four constructs, our research model integrates B&B theory with the motivational process of the JD-R model. More specifically, the current study tested the existence of gain cycles; that is, reciprocal relationships between positive emotions, personal and job resources, and work engagement. In doing so, we also explore to what extent B&B theory can be applied in occupational settings.

In short, our study has three unique features: (1) it examines the role of emotions in a comprehensive conceptual framework that includes personal resources, job resources, and work engagement; (2) it integrates B&B theory with the motivational framework of the JD-R model; and (3) it applies B&B theory to occupational well-being.

3.1.1. Building resources

Work-related positive emotions are described as relatively intense, short-lived affective experiences that are focused on specific objects or situations at work (Gray & Watson, 2001). Whereas positive emotions are immediate responses to the work environment, work engagement is relatively more enduring in nature (Schaufeli, Salanova, González-Romá & Bakker, 2002). Therefore, it is plausible to assume that short-term positive emotions precede work engagement (Schaufeli & Van Rhenen, 2006). B&B theory posits that positive emotions not only make people feel good at a particular point in time, but these emotions may also predict future well-being (Fredrickson & Joiner, 2002). That is, positive emotions produce well-being. According to B&B theory, positive emotions broaden thought-action repertoires by inducing exploratory behaviors that create learning opportunities and goal achievement, and help to build enduring resources. Thus, by experiencing positive emotions, people enhance their resources, which, in turn, may lead to a more enduring positive state of well-being, for instance, work engagement. The current study focuses specifically on these assumed relationships that are part of the 'build hypothesis'. Fredrickson et al. (2008) previously confirmed this hypothesis in a study in which they evaluated the effect of a loving-kindness intervention, using mindfulness meditation. Results showed that the intervention caused an increase in daily experiences of positive emotions over time, which, in turn, built personal resources such as social support and hope. Successively, these increased resources predicted enhanced life satisfaction. In a similar vein, positive emotions were found to predict resources such as resilience (Cohn, Fredrickson, Brown, Mikels & Conway, 2009; Tugade & Fredrickson, 2007), optimism (Fredrickson, Tugade, Waugh & Larkin, 2003), and creativity in problem solving (Estrada, Isen & Young, 1994). Moreover, positive emotions were also found to be related to engagement in previous research, both directly (Avey, Wernsing & Luthans, 2008; Salanova et al., 2011) and indirectly via personal resources (Ouweneel, Le Blanc & Schaufeli, 2011).

In line with these results, we assume that positive emotions are not only directly related to work engagement, but also build personal resources. Personal resources are characteristics of the individual that are valued by the employee and could serve as a means to attain other positive personal characteristics, objects, energies or work conditions (Xanthopoulou et al., 2007). As such, personal resources are functional in achieving goals, and stimulate personal growth and development (Xanthopoulou et al., 2009). Next, it is likely to assume that an employee's emotional state positively influences the amount of job

resources that are provided at work. Job resources refer to those physical, psychological, social, or organizational aspects of the job that are valued as such by the employee. Presumably, positive emotions have motivational properties in that they energize employees to seek social support and learn new things at work, and as such, increase job resource availability (e.g., Kanfer & Ackerman, 1989). Tellingly, employees set higher goals when they experience positive emotions, and thus create the necessary job resources to achieve those goals (Ilies & Judge, 2005). All in all, *Hypothesis 1a* poses that positive emotions at Time 1 (T1) directly relate to work engagement at Time 2 (T2). Moreover, we assume that positive emotions build resources as well. More specifically, we hypothesize that T1 positive emotions lead to both T2 personal resources and T2 job resources (*Hypothesis 1b*).

3.1.2. Resources facilitate work engagement

Next to the direct relationship between positive emotions and personal and job resources as well as work engagement, we also assume direct relationships between personal and job resources on the one hand, and work engagement on the other hand. As previously stated, B&B theory posits that resources ultimately lead to a state of well-being. Resources are likely to accumulate, thus creating a positive gain cycle of resources, which, in turn, is likely to have positive mental health-promoting effects (Hobfoll, 2002). In addition, the JD-R model entails the assumption that resources lead to work engagement (Schaufeli & Bakker, 2004). In other words, the JD-R model states that the presence of job resources predicts work engagement among employees through a motivational process (e.g., Hakanen, Bakker, & Schaufeli, 2006; Schaufeli & Bakker, 2004; Schaufeli, Bakker & Van Rhenen, 2009). In more detail, job resources are assumed to play either an intrinsic motivational role because they foster employees' growth, learning and development, or an extrinsic motivational role because they are instrumental in achieving work goals (Schaufeli & Bakker, 2004).

Job resources can be considered intrinsic motivators in the sense that they fulfill basic human needs, such as the needs to belong, need for autonomy, and need for competence (Ryan & Frederick, 1997; Van den Broeck, Vansteenkiste, De Witte & Lens, 2008). In this study, *supervisory coaching*, *autonomy*, and *opportunities for development* are studied as job resources. Supervisory coaching and autonomy satisfy the need to belong and the need for autonomy, respectively, whereas opportunities for development promote learning, thereby increasing job competence. Moreover, as said, job resources may also play an extrinsic motivational role, because resourceful work environments foster the willingness to dedicate one's efforts and abilities to the work task (Meijman & Mulder, 1998). In such environments, it is likely that the task will be completed successfully and that the work goal will be attained. For instance, supervisory coaching and autonomy increase the likelihood of being successful in achieving one's work goals. In any case, either through the satisfaction of employees' basic needs or through the achievement of work-related goals, job resources

seem to have positive consequences and are likely to result in work engagement (Schaufeli et al., 2009).

Consistent with these notions about the motivational role of job resources, several studies have shown a positive relationship between job resources and work engagement. For example, cross-sectional studies indicate that job resources such as supervisory coaching, autonomy, and opportunities for development relate positively to work engagement (Hakanen et al., 2006; Saks, 2006; Xanthopoulou et al., 2007). In addition, it was found among Finnish teachers that job resources predict work engagement, particularly when they were faced with high job demands (Bakker, Hakanen, Demerouti & Xanthopoulou, 2007). Moreover, in another Finnish sample of health care professionals, it was observed that autonomy leads to work engagement over time (Mauno, Kinnunen & Ruokolainen, 2007). Finally, positive longitudinal effects on work engagement have been found for supervisory coaching, autonomy, and opportunities for development (e.g., Xanthopoulou et al., 2009; Weigl et al., 2010).

Research on the effects of personal characteristics on well-being has shown that people's core self-evaluations (e.g., self-esteem, self-efficacy) positively influence well-being (Judge, Bono, Erez & Locke, 2005; Judge, Van Vianen & De Pater, 2004). More recently, a work-related set of personal characteristics has emerged as research topic in organizational psychology, namely Psychological Capital (PsyCap). PsyCap refers to a positive psychological state of development of an individual that is characterized by having confidence, making a positive contribution, persevering towards work-related goals and bouncing back from set backs at work (Luthans & Youssef, 2007). The present study focuses on three elements of PsyCap, i.e., *hope*, *optimism*, and *self-efficacy*. The beneficial effects on well-being of these personal resources have been demonstrated in previous research among employees (e.g., Avey, Luthans, Smith & Palmer, 2010; Gallagher & Lopez, 2009). Also, some research has provided evidence that suggests a positive relationship between personal resources and work engagement specifically (see Salanova, Schaufeli, Xanthopoulou & Bakker, 2010, for an overview).

Hope is the motivated persistent pursuit of goals and proactive determination of pathways to the goals; work-related hope is the perception that work-related goals can be set as well as achieved (Snyder, Sympson, Ybasco, Borders, Babyak & Higgins, 1996). In other words, hope, or positive expectancy, enables a person to direct energy in dedicatedly pursuing a goal, i.e., in being engaged (Gallagher & Lopez, 2009). Thus, when employees believe to be able to set goals and achieve them they would feel more enthusiastic and energetic at work (Sweetman & Luthans, 2010).

Similarly, optimism, which is the tendency to believe that one will generally experience good outcomes in life, is related to higher levels of well-being (Scheier, Carver & Bridges, 2001). Optimists are better able to confront threatening situations because they

adopt active coping strategies (Iwanaga, Yokoyama, & Seiwa, 2004), and as a result they adapt well at work (Luthans & Youssef, 2007), and feel more engaged at work (e.g., Xanthopoulou et al., 2009).

Finally, efficacy beliefs are defined as "one's conviction (or confidence) about one´s abilities to mobilize motivation, cognitive resources or courses of action needed to successfully execute a specific task within a specific context" (Stajkovic & Luthans, 1998, p. 66). Self-efficacy beliefs contribute to motivation by influencing the effort individuals spend, and their perseverance when facing obstacles, problems, or unexpected situations (Bandura, 1997). Self-efficacious employees have been found to experience higher levels of flow (Salanova, Bakker, & Llorens, 2006) as well as higher levels of work engagement (e.g., Llorens, Schaufeli, Bakker & Salanova, 2007). We expect that work-related self-efficacy is positively related to work engagement because it leads to a greater willingness to spend additional energy and effort on completing a task, and hence to more task involvement and absorption (Schaufeli & Salanova, 2007). In conclusion, based on theorizing and previous empirical findings, we assume that experiencing a combination of self-efficacy, hope, and optimism predicts work engagement over time. Therefore, *Hypothesis 1c* states that both T1 personal resources and T1 job resources are related to T2 work engagement.

3.1.3. Reciprocal relationships

Although B&B theory and the motivational process of the JD-R model posit a specific sequence of variables, namely that positive emotions predict resources, which, in their turn, lead to work engagement, some empirical studies revealed reversed relationships. For example, in a longitudinal week-level study, Sonnentag, Mojza, Binnewies and Scholl (2008) found that engaged employees are more likely to experience positive emotions at work. So, according to this study, work engagement *precedes* rather than results from positive emotions. A two-wave longitudinal study of Xanthopoulou et al. (2009) revealed that work engagement was related to both personal and job resources over time. Consequently, it seems somewhat simplistic to propose exclusively one-directional relationships between positive emotions, resources, and work engagement, and not to take reversed causation into account. In fact, recent studies successfully incorporated both causal as well as reversed causal – thus reciprocal – relationships between positive emotions and personal and job resources and well-being into one model. A set of constructs that are positively and reciprocally related to each other over time is also referred to as a 'gain cycle' (see Salanova et al., 2011, for an overview). For example, Xanthopoulou et al. (2009) found a gain cycle of job resources (supervisory coaching, autonomy, and opportunities for development) and personal resources (organization-based self-esteem, optimism, and self-efficacy) with work engagement with a time lag of two years. Weigl et al. (2010) found similar results in a three-wave study among German hospital physicians with job control and work relationships as

job resources, and active coping as a personal resource, and work engagement as a measure of well-being. More specifically, in their study, Weigl et al. (2010) found that resources led to work engagement over time, which, in its turn, led to more resources. Moreover, positive emotions, self-efficacy and activity engagement appeared to be reciprocally related among Spanish secondary school teachers (Salanova et al., 2011), and it seems that self-efficacy may precede, as well as follow, engagement (Llorens et al., 2007). This last finding suggests the existence of a gain cycle in which self-efficacy and engagement are positively related to each other. Hakanen, Perhoniemi, and Toppinen-Tanner (2008) studied a sample of Finnish dentists and found a gain cycle of job resources, engagement, personal initiative, and innovativeness. Hence, all studies mentioned above, support the notion of a motivational gain cycle in which employees experience positive emotions and job or personal resources, and in turn, feel engaged in their work, and vice versa. Therefore, *Hypothesis 2* states that all study variables - positive emotions, personal resources, job resources, and work engagement - are reciprocally related over time. More specifically, work engagement is not only predicted by positive emotions and resources, but also the reversed relationships are assumed to occur. Moreover, personal and job resources are assumed to be reciprocally related to positive emotions as well as to each other.

3.2. Method

3.2.1. Participants

The study sample consists of 200 employees of a Dutch university. They were invited via e-mail to voluntary participate in a questionnaire study. On T1, 341 participants filled out the questionnaire, with a response rate of 46%. On T2, six months later, 200 employees completed the same questionnaire (58.65%). Of this panel sample, 64.50% was female and participants' age ranged from 23 to 66 years (M = 39.00; SD = 12.04).

In order to test whether drop-out was selective, we compared the drop-outs (N = 141) with the panel group (N = 200). The results of Multivariate Analyses of Variance showed that the drop-outs did not significantly differ from the panel group members, neither with regard to demographics (age, gender, marital status, years of working experience at university, and type of job) ($F(5, 322) = 1.72$, $p = .13$) nor the T1 study variables ($F(8, 332) = 1.29$, $p = .24$). So, drop-out appeared not to be selective.

3.2.2. Measures

Positive emotions. The experience of *positive emotions* was assessed using the positive items of the Job-related Affective Well-being Scale (JAWS; Van Katwyk, Fox, Spector & Kelloway, 2000; translated into Dutch and shortened by Schaufeli & Van Rhenen, 2006). A sample item is "The last couple of weeks, my work made me feel relaxed". The participants answered using a five-point Likert scale (1 = (almost) never, 5 = (almost) always).

Personal resources. Three types of personal resources were assessed: (a) *hope* was measured using a six-item scale (work-adjusted version of State Hope Scale (SHS); Snyder et al., 1996), of which a sample item is: "I can think of many ways to reach my current work-related goals"; (b) *optimism* was measured using a six-item scale by Luthans, Avolio, Avey, and Norman (2007) (work-adjusted and shortened version of the Life Orientation Test (LOT); Scheier & Carver, 1985), of which an example item is: "With respect to my work, I always look on the bright side", and; (c) *self-efficacy* was assessed with a five-item scale that was constructed so that it could be applied in an occupational setting, following the recommendations of Bandura (http://www.des.emory.edu/mfp/self-efficacy.html), of which a sample item is: "I can always manage to solve difficult problems at work if I try hard enough". All personal resources items were scored on a six-point Likert scale (1 = strongly disagree, 6 = strongly agree).
Job resources. Three types of resources were assessed: (a) *supervisory coaching* was measured using five items from the Dutch adaptation (Le Blanc, 1994) of the Leader-Member Exchange scale (LMX; Graen & Uhl-Bien's, 1991), of which a sample item is: "My supervisor uses his/her influence to help me solve my problems at work"; (b) *autonomy* was measured using a three-item scale (deducted from the Dutch Questionnaire on Experience and Evaluation of Work (VBBA); Van Veldhoven & Meijman, 1994), of which an example item is: "Do you have control over how your work is carried out?" and; (c) *opportunities for development* were assessed using four-item scale of the Job Content Instrument (JCI; Karasek, 1985), of which an example item is: "My job offers me the opportunity to learn new things". All job resources items were scored on a five-point Likert scale (1 = strongly disagree, 5 = strongly agree).
Work engagement. We used the short version of the Utrecht Work Engagement Scale (UWES; Schaufeli, Bakker & Salanova, 2006) to measure work engagement. The scale consists of nine items. A sample item is "At my work, I feel bursting with energy". All items were scored on a seven-point Likert scale (0 = never, 6 = always).

3.2.3. Data analyses

Means, standard deviations, Cronbach's alpha coefficients, and bivariate correlations were computed for every study variable on both T1 and T2. Next, measurement models including all scales were tested on T1 data by means of Confirmatory Factor Analysis (CFA) as implemented by the AMOS software program (Arbuckle, 2005). We tested five separate factor models: (a) a one-factor measurement model which hypothesized that all four constructs loaded on a single latent factor; and (b) a two factor model in which all four constructs were separated into two factors, namely well-being (positive emotions and work engagement), and resources (personal resources and job resources); and (c) a three factor model with a well-being factor (positive emotions and work engagement), a factor of personal resources, and a factor of job resources; and (d) another three factor model, with

positive emotions as a separate factor, resources (personal resources and job resources) as a combined factor, and work engagement as a separate factor; and finally (e) a four factor model in which all four constructs were incorporated as four separate factors, namely positive emotions, personal resources, job resources, and work engagement. The factor models with multiple factors ((b)-(e)) were oblique models in which the factors were assumed to be interrelated.

Finally, Structural Equation Modeling (SEM) by the AMOS program was used to establish the relationships over time between the study variables. Four models were tested. First, we tested the Stability Model (Model 1; M1) with temporal stabilities and synchronous correlations, without cross-lagged structural paths. Temporal stabilities were specified as autoregressive paths between the corresponding constructs at T1 and T2. Model 1 estimates the total stability coefficient between T1 and T2 without specifying the variance in paths between the research variables (Pitts, West & Tein, 1996). Secondly, we compared the fit of the stability model to that of three more complex models: (a) the *Causality Model* (Model; M2), which is identical to Model 1 but includes six additional cross-lagged structural paths from T1 positive emotions to T2 personal resources, to T2 job resources, and to T2 work engagement, from T1 personal resources to T2 job resources, and to T2 work engagement, as well as from T1 job resources to T2 work engagement; (b) the *Reversed Causality Model* (Model 3; M3), which is also identical to M1, but includes six additional cross-lagged structural paths from T1 work engagement to T2 job resources, to T2 personal resources, and to T2 positive emotions, from T1 job resources to T2 personal resources, and to T2 positive emotions, as well as from T1 personal resources to T2 positive emotions; (c) the *Reciprocal Model* (Model 4; M4), which includes twelve reciprocal relationships between positive emotions, personal resources, job resources, and work engagement and thus includes all cross-lagged structural paths of M2 and M3. In all four models, the measurement errors of the corresponding observed variables collected at the two time points were allowed to co-vary over time (e.g., a covariance is specified between the measurement error of hope at T1 and the measurement error of hope at T2). While in cross-sectional models measurement errors should not co-vary, in longitudinal measurement models the measurement errors corresponding to the same indicator should be allowed to co-vary over time in order to account for the systematic (method) variance that is associated with each specific indicator (Pitts et al., 1996; McArdle & Bell, 2000). Because of our relatively small sample size, we decreased the complexity of our hypothesized SEM by using manifest variables where possible (Jöreskog & Sörbom, 1993). More specifically, variables consisting of one validated scale were inserted in the model as manifest variables (positive emotions and work engagement); variables consisting of multiple and separate validated scales were inserted in the model as latent factors with observed indicators (personal resources and job resources). This was done to keep the model as simple as possible.

We used maximum likelihood estimation methods with the covariance matrix of the items as input for each analysis. We assessed goodness-of-fit of the models by using absolute and relative indices. The absolute goodness-of-fit indices calculated were the χ^2 Goodness-of-Fit Statistic, Goodness-of-Fit Index (GFI), and the Root Mean Square Error of Approximation (RMSEA). Because χ^2 is sensitive to sample size, the computation of relative goodness-of-fit indices is strongly recommended (Bentler, 1990). We computed three of such relative fit indices: the Tucker-Lewis Index (TLI), the Comparative Fit Index (CFI), and the Incremental Fit Index (IFI). Values smaller than .08 for the RMSEA are indicative of a good fit, and values greater than .10 should lead to model rejection (Browne & Cudeck, 1993). For all other fit indices, i.e., GFI, TLI, CFI, and IFI, values greater than .90 indicate an acceptable fit, and values greater than .95 are considered as indicating a good fit (Hu & Bentler, 1999).

3.3. Results

3.3.1. Preliminary analyses

Means, standard deviations of the study variables of T1 and T2, Cronbach's alpha coefficients and bivariate correlations of all variables are reported in Table 1. All alpha coefficients met the criterion of .70 (Nunnally & Bernstein, 1994), except for T2 autonomy ($\alpha = .66$). Furthermore, Table 1 shows that, in line with our expectations, positive emotions, personal resources (hope, optimism, and self-efficacy), job resources (supervisory coaching, autonomy, and opportunities for development), and work engagement are positively related to each other within time at both T1 and T2. Moreover, with three exceptions (between T1 opportunities for development and T2 self-efficacy; $r = .08$, between T1 supervisory coaching and T2 self-efficacy; $r = .13$, and between T1 supervisory coaching and T2 hope; $r = .11$), all across-time correlations were positive and significant as well.

Table 1. Means, standard deviations, correlations, and Cronbach's alpha coefficients (on the diagonal) of the research variables on Time 1 and Time 2

	M	*SD*	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1. positive emotions T1	3.60	0.63	(.85)															
2. positive emotions T2	3.51	0.63	.68	(.83)														
3. hope T1	4.53	0.69	.61	.55	(.88)													
4. hope T2	4.51	0.60	.38	.51	.54	(.83)												
5. optimism T1	4.29	0.71	.62	.54	.66	.38	(.74)											
6. optimism T2	4.27	0.66	.50	.59	.45	.50	.61	(.71)										
7. self-efficacy T1	4.36	0.69	.47	.42	.73	.42	.65	.42	(.88)									
8. self-efficacy T2	4.40	0.71	.33	.43	.44	.61	.42	.55	.56	(.89)								
9. supervisory coaching T1	3.67	0.91	.33	.32	.34	.11^{ns}	.35	.21**	.23	.13^{ns}	(.93)							
10. supervisory coaching T2	3.55	0.93	.31	.36	.34	.24	.34	.33	.21**	.15*	.79	(.93)						
11. autonomy T1	4.18	0.62	.29	.26	.33	.22	.31	.22**	.30	.22**	.22	.28	(.74)					
12. autonomy T2	4.12	0.55	.21**	.29	.32	.26	.22**	.16*	.21**	.16*	.19**	.28	.59	(.66)				
13. opportunities for development T1	3.49	0.89	.47	.36	.38	.18*	.16*	.27	.25	.08^{ns}	.40	.41	.47	.40	(.87)			
14. opportunities for development T2	3.35	0.82	.42	.42	.35	.33	.27	.38	.23	.16*	.32	.45	.46	.47	.77	(.85)		
15. work engagement T1	3.64	1.11	.74	.62	.56	.39	.38	.41	.42	.25	.30	.33	.35	.27	.59	.54	(.93)	
16. work engagement T2	3.52	1.04	.61	.72	.53	.52	.41	..48	.39	.36	.27	.36	.35	.35	.46	.56	.82	(.92)

Note. *M* = mean; *SD* = standard deviation; ns = non significant, * $p < .05$, ** $p < .01$, all other correlations are significant at $p < .001$

We conducted CFA's [2] on T1 data to distinguish amongst the constructs of positive emotions, personal resources, job resources, and work engagement. Results showed that the one-factor, two-factor model, and the two three-factor models, which are described in the method section, could not account sufficiently for the variance in the model; the four-factor model, with positive emotions, personal resources, job resources, and work engagement as separate factors, fitted the data significantly better than all other factor models. Even though the Chi-square value of the four-factor model was significant (χ^2 (48) = 143.75, p < .001), the relative fit indices were all meeting the criteria for an acceptable fit, except for the GFI (RMSEA = .10; GFI = .89; TLI = .91; CFI = .94; IFI = .94). Taken together, these results, which are presented in Table 2, suggest that positive emotions, personal resources, job resources, and work engagement are interrelated, yet *distinct* constructs.

Table 2.

Fit indices of the five different factor models

Model	χ^2	df	RMSEA	GFI	TLI	CFI	IFI	Δ χ^2	Δ df
1: One factor model	374.28***	54	.17	.73	.74	.79	.79		
2: Two factor model	282.54***	53	.15	.79	.81	.85	.85	M2 – M1 = 91.74***	1
3A: Three factor model	222.00***	51	.13	.83	.85	.89	.89	M3A – M1 = 152.28***	3
3B: Three factor model	215.73***	51	.13	.85	.86	.89	.89	M3B – M1 = 158.55***	3
4: Four factor model	143.75***	48	.10	.89	.91	.94	.94	M4 – M1 = 230.53***	6
								M4 – M2 = 138.79***	5
								M4 – M3A = 76.25***	3
								M4 – M3B = 71.98***	3

Note. χ^2 = chi-square statistic; df = degrees of freedom; RMSEA = Root Mean Square Error of Approximation; GFI = Goodness-of-Fit Index; TLI = Tucker-Lewis Index; CFI = Comparitive Fit Index; IFI = Incremental Fit Index; *** p < .001; Two factor model: well-being (positive emotions and work engagement), and resources (personal resources and job resources); Three factor model (A): well-being (positive emotions and work engagement), personal resources, and job resources; Three factor model (B): positive emotions, resources (personal resources and job resources), and work engagement; Four factor model: positive emotions, personal resources, job resources, and work engagement.

[2] Before conducting CFA's, we checked our data for normality (see Muthén & Kaplan, 1985). The assumption of normality was not violated. The results of the analyses can be obtained from the first author upon request.

3.3.2. Model test

Table 3 shows the fit indices of the four competing models. As can be seen, the *Causality Model* (M2) fitted the data better than the *Stability Model*, although the difference was not significant (M1) ($\Delta \chi^2$ (6) = 9.87, p = ns). Furthermore, the fit of the *Reversed Causality Model* (M3) is superior to that of the *Stability Model* (M1) ($\Delta \chi^2$ (6) = 19.37, $p < .01$). This suggests that the model with cross-lagged reversed causal paths from T1 to T2 variables (i.e., M3), has a better fit to the data than the model including solely temporal stabilities and synchronous correlations (i.e., M1). Finally, Table 3 shows that the *Reciprocal Model* (M4) fits the data better than M1, M2, and M3. This indicates that the model that includes reciprocal relationships among positive emotions, personal resources, job resources and work engagement, is superior to all other alternative models. All hypotheses are interpreted on the basis of the *Final model* (M5), which is displayed in Figure 1. The model contains the reciprocal relationships of M4 except for the non-significant paths of M4.

Table 3.

Fit indices of the five different path models

Model	χ^2	df	RMSEA	GFI	TLI	CFI	IFI	$\Delta \chi^2$	Δ df
M1: Stability model	139.47***	86	.06	.92	.96	.97	.98		
M2: Causality model	129.60***	80	.06	.93	.96	.98	.98	M2 – M1 = 9.87	6
M3: Reversed causality model	117.10**	80	.05	.93	.97	.98	.98	M3 – M1 = 19.37**	6
M4: Reciprocal model	108.41**	74	.05	.94	.97	.98	.98	M4 – M1 = 31.06** M4 – M2 = 21.19** M4 – M3 = 8.69	12 6 6
M5: final model	111.76*	82	.04	.94	.98	.99	.99	M5 – M4 = 3.35	12

Note. χ^2 = chi-square statistic; df = degrees of freedom; RMSEA = Root Mean Square Error of Approximation; GFI = Goodness-of-Fit Index; TLI = Tucker-Lewis Index; CFI = Comparitive Fit Index; IFI = Incremental Fit Index; *** $p < .001$, ** $p < .01$, * $p < .05$

Hypothesis 1a states that T1 positive emotions are directly related to T2 work engagement. *Hypothesis 1b* states that T1 positive emotions are related to T2 personal resources and T2 job resources. *Hypothesis 1c* states that T1 personal resources and T1 job resources are related to T2 work engagement. Of these five hypothesized relationships, two turned out to be partly confirmed. The standardized effect of T1 positive emotions on T2 personal resources (β = .17) and of T1 personal resources on T2 work engagement (β = .11) appeared to be significant. However, the lagged effects of T1 positive emotions on T2 job resources and on T2 work engagement, and of T1 job resources on T2 work engagement were not

significant at $p < .05$. Thus, *Hypothesis 1a* is rejected and *Hypothesis 1b* and *1c* are partly confirmed.

According to *Hypothesis 2*, all study variables (positive emotions, personal resources, job resources, and work engagement) are reciprocally related over time. We found significant reciprocal relationships only between positive emotions and personal resources ($\beta = .17$ and $\beta = .22$ respectively). However, no significant reciprocal relationships were found between positive emotions and work engagement (only reversed causal: $\beta = .17$), or between personal resources and work engagement (only causal: $\beta = .11$). Neither did we find a reciprocal relationship between positive emotions and job resources and between job resources and work engagement. Based on these results, *Hypothesis 2* is partly confirmed. Hence, our results show that both causal and reversed causal relationships exist simultaneously, which is confirmed by the good model fit of M5 (RMSEA = .04; GFI = .94; TLI = .98; CFI = .99; IFI = .99). Finally, the explained variance of M5 in T2 positive emotions was 53%. For T2 personal resources, the explained variance was 49%. For T2 job resources, the explained variance was 79%. Finally, the explained variance in T2 work engagement was 67%.

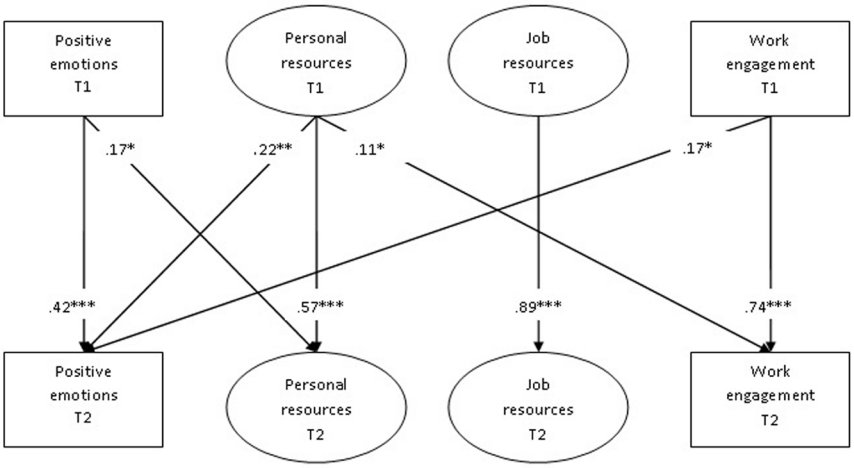

Figure 1. Final model (M5)

Note. *** $p < .001$, ** $p < .01$, * $p < .05$

3.4. Discussion

The main objective of our study was to examine longitudinal relationships between positive emotions, personal and job resources, and work engagement over two waves. It was hypothesized that the variables were reciprocally related over time in a way that is compatible with the notion of a gain cycle. Indeed, compared to alternative models, it

appeared that the reciprocal model represented the data best. Accordingly, the relationships between positive emotions, personal resources, job resources, and work engagement are best interpreted when all effects are taken into account simultaneously. So, it was demonstrated that the study variables are reciprocally related over time (*Hypothesis 2*). However, not all reciprocal relationships were significant. We only found a reciprocal relationship between positive emotions and personal resources. Furthermore, we found a causal effect of personal resources on work engagement and a reversed causal effect of work engagement on positive emotions. Most surprising was the fact that we did not find any relationships with job resources to be significant.

Based on our results we state that, to some extent, positive emotions, personal resources, and work engagement are related to each other in a way akin to a gain cycle, in which no specific causal sequence occurs. Instead, positive emotions, personal resources, and work engagement constitute a loop. These results partly confirm B&B theory, in that employees who experience positive emotions at a certain point in time are more like to experience personal resources at a later time point. So, whilst employees experience positive emotions at work, they are prone to feel more hopeful, optimistic and self-efficacious. In conclusion, employees who experience positive emotions are likely to feel more positive about their work-related abilities. In another study among students, similar results were found: positive emotions led to study-related hope, optimism, and self-efficacy over time (Ouweneel et al., 2011).

Personal resources appeared to have a significant effect on work engagement over time. In line with B&B theory, we confirmed that personal resources lead to well-being, i.e., work engagement, over time. Previous studies confirmed this relationship as well (e.g., Hakanen et al., 2008; Weigl et al., 2010; Xanthopoulou et al., 2009). More specifically, personal resources represent the positive cognitive evaluations of one's future in work (i.e., hope and optimism) and of oneself as an employee (i.e., self-efficacy), which influence how engaged employees are. Either way, it has been stated that personal resources should not only function as a 'mean' for job success, but should also considered to be an 'end' in the sense that personal resources support adaptation to and coping with the work environment by employees (Bakker & Demerouti, 2007; Gorgievski & Hobfoll, 2008).

In our study, work engagement was not related to future personal or job resources. Apparently, work engagement has limited 'building capacities' despite its positive affective component. Researchers have proposed that engagement stands at the beginning of the building process (e.g., Salanova et al., 2010; Xanthopoulou et al., 2009). However, our results do not confirm such an assumption; rather, work engagement acts as an outcome measure in the current model. Nevertheless, work engagement appeared to have a significant relationship with positive emotions over time. In other words, the outcome of the building process, work engagement, has a positive relationship with the initiators of the building

process, i.e., positive emotions, thereby closing the gain cycle between positive emotions, personal resources, and work engagement.

Also, we did not find any relationships between job resources and any of the other research variables. The reason that positive emotions do not build job resources, could be because job resources are dependent on environmental factors, more so than personal resources which are more close to the employees' self. Therefore, it would be more likely to observe significant relationships between positive emotions and personal resources than between positive emotions and job resources. Moreover, although job resources have been found to predict work engagement in previous research (e.g., Xanthopoulou et al., 2009), our study shows that the effects of job resources are 'overruled' by individual factors (i.e., positive emotions and personal resources) in the prediction of work engagement. We will not make the statement that the work environment is not important in predicting employees' work engagement; however, we do say that it is important to take the individual factors into account as well.

In summary, our results support the notion that positive emotions only indirectly (and not directly; *Hypothesis 1a*) predict work engagement, via the build of personal resources (*Hypothesis 1b*). However, positive emotions were not related to job resources. Furthermore, we found that only personal resources – and not job resources – were related to work engagement (*Hypothesis 1c*). So, although the reciprocal models fitted the data best, not all reciprocal relationships appeared significant (*Hypothesis 2*). All in all, *Hypothesis 1a* was rejected, whereas *Hypotheses 1b*, *1c*, and *2* were partly confirmed. In conclusion, our study adds to the existing literature in the sense that our research model entailed positive emotions as a 'novel' variable in the context of resources and work engagement. Including positive emotions in our model seemed relevant since they had a reciprocal relationship with personal resources, which in turn were related to work engagement. So, by adding positive emotions to a model of personal and job resources, and work engagement, we were able to integrate B&B theory into the motivational process of the JD-R model. This combined model recognizes the building capacity of positive emotions as well as the potential of personal resources in predicting work engagement.

3.4.2. Limitations and research suggestions

This study consisted of a longitudinal sample with a reasonable large sample size. Despite these strong points of the study, there were also some limitations. Even though the design was longitudinal, causal conclusions should be interpreted with caution. Because we exclusively used self-report measures to assess positive emotions, resources, and work engagement, the cross-paths might have been inflated. However, because of the affective and cognitive nature of the study variables, it is difficult to see in what other way our study variables could have been measured. Finally, CFA's showed that the study variables were

correlated though separate constructs, in that the four-factor model fitted the data better than the one-, two-, and three-factor models. Nonetheless, in future research objective measures would be of added value to separate objective from perceived changes (Weigl et al., 2010). That way, it would be possible to actually test the promise of positive gain cycles, not only for the well-being of employees, but also for their performance and thus organizational profits.

Another explanation for the fact that some hypothesized paths were non-significant could be the use of 'overall' factors of personal resources and job resources. Perhaps, specific combinations of resources have a particular strong effect on work engagement. For example, high levels of self-efficacy in combination with many opportunities for development are likely to have a significant interaction effect on work engagement. Therefore, instead of investigating the effect of overall factors of resources on engagement, it would be innovative to explore different combinations of resources and their mutual effects on work engagement. Finally, it has been suggested previously (Xanthopoulou et al., 2009; Weigl et al., 2010) that correlational studies are not best suited to test gain cycles; strictly speaking, experimental or intervention studies are required. More specifically, future studies should focus on inducing positive emotions or resources in an experimental setting or by means of interventions to really test for their added value in predicting engagement, and to control for external factors that influence the mean scores of positive emotions, resources, and engagement.

3.4.3. Practical implications

Our results showed that taking individual factors into account is fertile in the prediction of work engagement. This knowledge is very important for practitioners and managers in enhancing workers' engagement, in that it is relevant to create positive experiences and strengthen personal resources in the workplace. In other words, not only workplace programs to develop job resources (e.g., Cifre, Salanova & Rodríguez-Sánchez, 2011) are valuable, individual programs to enhance personal resources (e.g., Luthans, Avey, Avolio, Norman & Combs, 2006) and positive emotions could have potential to (indirectly) increase work engagement as well. Research has shown that positive emotions can be boosted by means of meditation (Fredrickson et al., 2008), expressing gratitude (Sheldon & Lyubomirsky, 2006), and sharing good news (Gable, Reis, Impett & Asher, 2004). By applying these practices at work, positive emotions may trigger gain cycles among employees - or even *gain spirals*, which indicate increased levels of positive emotions, resources, and work engagement over time, next to positive reciprocal relationships - that are beneficial to both employees and organizations. In essence, our results imply that it is possible to use both workplace and individual intervention strategies to enhance work engagement. However, short-lived activities like expressing gratitude and sharing good news also have great potential in this respect.

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Chapter 4.
Good morning, good day: A diary study on positive emotions, hope, and work engagement

Based on:

Ouweneel, E., Le Blanc, P.M., Schaufeli, W.B., & Van Wijhe, C.I. (in press). Good morning, good day: A diary study on positive emotions, hope, and work engagement. *Human Relations*.

4.1. Introduction

The emergence of knowledge work has resulted in a growing importance of psychological capabilities of employees in order to perform. In other words, mental health of employees has become more essential for organizations to survive (Weehuizen, 2008). In this sense, it is important that employees feel engaged in their work. Ample research has addressed the long-term effects of environmental factors like job resources and home resources on work engagement (e.g., Hakanen, Schaufeli & Ahola, 2008). Recently, individual characteristics such as self-efficacy and optimism have been linked to work engagement too (e.g., Xanthopoulou, Demerouti, Bakker & Schaufeli, 2009b). These individual characteristics have been recognized as being relatively stable. Yet, every employee probably experiences good and bad working days, relative to their own baseline characteristics (Sheldon, Ryan & Reis, 1996). A relevant question then is: what makes employees engaged on a daily basis? In this study, we take on an individual, daily perspective on work engagement. More specifically, we explore whether the experience of positive emotions and hope can be considered daily antecedents of work engagement. This way, we hope to illuminate what makes a good working day, thereby providing advice for practitioners and organizations on how to engage the workforce on a daily level.

4.1.1. Work engagement: A daily perspective

The appearance of work engagement coincides with the rise of positive psychology that has shifted the focus from malfunctioning towards human strengths and optimal functioning (Seligman & Csikszentmihalyi, 2000). Work engagement is a particular interesting well-being measure in that it can be considered as an *active* measure of well-being instead of a *passive* measure, like job satisfaction that is characterized by satiation. Hence, it is argued by Bakker and Demerouti (2008) that engaged employees are activated towards performing better and behaving positively in the workplace. As such, work engagement is often used as an outcome variable in organizational psychology research. Work engagement is a multidimensional affective-cognitive measure of well-being, and is defined as “a positive, fulfilling, and work-related state of mind that is characterized by vigor, dedication and absorption” (Schaufeli & Bakker, 2004, p. 295). Vigor refers to high levels of energy at work and motivation to invest effort into work. Dedication means being strongly involved into work and experiencing feelings of pride and enthusiasm about work. Absorption finally entails immersion in and concentration on work. Absorbed employees feel that time is flying at work (Schaufeli & Bakker, 2004).

Schaufeli, Salanova, González-Romá, and Bakker (2002) state that engagement is not a momentary and specific state, but rather, it is “a more persistent and pervasive affective-cognitive state that is not focused on any particular object, event, individual, or behavior” (p. 74). From this perspective, daily fluctuations in work engagement are viewed

as error variance, because they are only deviations from what is to be predicted, namely, the baseline level of the employees' level of engagement (Sheldon et al., 1996). However, recently the concept of engagement has been explored at a weekly (Bakker & Bal, 2010) and daily level as well (e.g., Simbula 2010; Sonnentag, 2003; Tims, Bakker & Xanthopoulou, 2011; Xanthopoulou, Bakker, Heuven, Demerouti & Schaufeli, 2008; Bakker & Xanthopoulou, 2009; Xanthopoulou, Bakker, Demerouti & Schaufeli, 2009a). In contrast to the perspective of Schaufeli et al. (2002), this new line of diary research advocates that employees' engagement is likely to fluctuate over short periods of time; that is, engagement could be considered an experiential state (Sonnentag, Dormann & Demerouti, 2010). In other words, employees are not equally engaged across days. On some days, an employee feels more engaged than on other days (Bakker, Albrecht & Leiter, 2011). Following this lead, Sonnentag et al. (2010) advise against generalizing the concept of engagement and disregarding these daily fluctuations. Instead, they suggest investigating day-specific engagement levels to gain better understanding of how work engagement is related to its antecedents and consequences. This enables to investigate within-person processes. Accordingly, in the present study, we will focus on state work engagement that fluctuates within persons and within days, thereby exploring the experience of work engagement in greater detail. Moreover, Sonnentag et al. (2010) recommend differentiating between the three components of daily work engagement, since it is likely that employees do not experience vigor, dedication, and absorption simultaneously. Therefore, we will look at the three dimensions of work engagement separately.

4.1.2. Work engagement: An individual perspective

Ample research has established the role of work characteristics as main initiators of the process that leads to employee well-being (Bakker & Demerouti, 2007). It has also been suggested that positive individual characteristics are crucial antecedents of employee well-being (Judge, Bono, Erez & Locke, 2005; Judge, Van Vianen & De Pater, 2004). Indeed, longitudinal research found that individual characteristics, like optimism and self-efficacy, are strong predictors of work engagement (Avey, Luthans, Smith & Palmer, 2010; Xanthopoulou et al., 2009b).

Since work engagement is both affective and cognitive in nature (Schaufeli et al., 2002), we selected an affective as well as a cognitive individual predictor of work engagement i.e., positive emotions, and hope, respectively. We believe that positive emotions and hope are not separate but intertwined constructs that together predict daily work engagement. Before we specify the relationships between the constructs, we first define positive emotions and hope. Work-related positive emotions are described as relatively intense affective experiences that are focused on specific objects or situations at work (Gray & Watson, 2001). Hope is defined as a positive cognitive state that is based on a

sense of successful goal-directed determination and planning to meet these goals (Snyder, Irving & Anderson, 1991). In other words, hope is the motivated persistent pursuit of goals and the expectation that work-related goals can be achieved (Sweetman & Luthans, 2010). In particular, hope as a day-level state can be considered a snapshot of a person's current goal-directed thinking (Snyder, Sympson, Ybasco, Borders, Babyak & Higgins, 1996). In that sense, daily hope differs from daily self-efficacy in that the latter is focused on feeling capable to overcome problems and unexpected events (Xanthopoulou et al., 2009a) and to handle whatever happens at work (Tims et al., 2011; Xanthopoulou et al., 2008), whereas to the construct of hope the expectation of attaining current work-related goals is central (Bryant & Cvengros, 2004).

We argue that especially positive emotions and hope represent individual characteristics that are expected to initiate employees in being engaged in their work. Firstly, positive emotions could have an effect on both hope and work engagement because they facilitate approach behavior, which prompts individuals to set goals and to be engaged in attaining these goals and work-related activities (Cacioppo, Gardner & Berntson, 1999). Subsequently, it is stated that hope, or positive expectancy, enables a person to direct energy in dedicatedly pursuing a goal, i.e., in being engaged (Gallagher & Lopez, 2002). Finally, like work engagement, positive emotions as well as hope are likely to fluctuate over days because they are state-like constructs which makes them suitable for studying at a daily level (Fisher, 2002; Snyder et al., 1996). Despite this theoretical reasoning, hope has never been considered as a single predictor of work engagement, neither in survey research nor in diary studies. The predictive role of positive emotions on engagement has not received much attention either, with a few exceptions (Avey, Wernsing & Luthans, 2008; Ouweneel, Le Blanc & Schaufeli, 2011). Therefore, Gallagher and Lopez (2002) and Magaletta and Oliver (1999) state that longitudinal research is needed on establishing hope's predictive value for well-being. All in all, on theoretical grounds, it seems plausible to assume that positive emotions and hope are powerful predictors of day-level work engagement, either directly or indirectly. In the following paragraph, we build upon *Broaden-and-Build (B&B) theory* (Fredrickson, 1998; 2001) and *Affective Events Theory* (AET; Weiss & Cropanzano, 1996) to explain how this process may come about.

4.1.3. Building towards engagement

Job resources are expected to be positively related to the occurrence of positive emotional reactions at work (Fisher, 2002). In the research of Herzberg, Mausner, and Snyderman (1959), the specific aspects to which employees reacted with positive emotions were achievement and recognition. Such events are more likely to occur in a resourceful job, with high levels of task significance, autonomy, and feedback. In turn, these events should give rise to momentary positive emotions such as enthusiasm, contentment, enjoyment, and

happiness. According to B&B theory (Fredrickson, 1998), positive emotions 'build' personal resources, like hope, which in turn lead to a state of well-being, like engagement. The theory consists of two main hypotheses: the 'broaden hypothesis' and the 'build hypothesis'. That is, positive emotions momentarily 'broaden' people's attention and thinking, enabling them to draw on a wider range of ideas. In turn, these broadened outlooks help employees to discover and build consequential personal resources (Fredrickson, 1998). Employees with these resources are more likely to take advantage of opportunities at work, effectively meet work's challenges and thus, becoming successful and happy at work. Put simply, B&B theory states that positive emotions widen employees' outlooks at work in ways that, step by step, reshape who they are and what they can do (Cohn, 2008). The broaden hypothesis has received a lot of research attention. Experimental studies have shown that the induction of positive emotions widens people's scope of visual attention (Fredrickson & Branigan, 2005; Wadlinger & Isaacowitz, 2006), broadens their repertoires of desired actions (Fredrickson & Branigan, 2005), and increases their openness to new experiences (Kahn & Isen, 1993). The build hypothesis was also confirmed in correlational studies, which have shown that people who experience positive emotions - more than others - show increases over time in, for example, optimism (Fredrickson, Tugade, Waugh & Larkin, 2003), proactivity (Fritz & Sonnentag, 2009), and resilience (Cohn, Fredrickson, Brown, Mikels & Conway, 2009). Moreover, the build hypothesis was confirmed in a quasi experimental study of Fredrickson, Cohn, Coffey, Pek, and Finkel (2008) in which the effect of a loving-kindness intervention, using mindfulness meditation, was evaluated in a work setting. Results showed that the intervention caused an increase in daily experiences of positive emotions over time, which built several personal resources, e.g., hope and purpose in life, measured eight weeks later.

Important to mention is that B&B theory was not designed to explain this building process on a daily basis. AET (Weiss & Cropanzano, 1996) provides an explanation on how positive emotions could have an instant effect on employees' cognitions. The theory states that events in the work environment result in emotional reactions of employees and that these reactions have an effect on employees' dispositional levels of affect (e.g., Conway & Briner, 2002). As such, events in the workplace may produce 'affective shocks', which are intense affective experiences. Because these shocks influence the current level of affect of employees, they are in need of further interpretation and reaction at a cognitive level (Grandey, Tam & Brauburger, 2002). In other words, emotional reactions cause employees to evaluate their work and, in turn, the employees' expectations regarding their working day are influenced (Weiss & Cropanzano, 1996). In this way, the experience of positive emotions may enhance employees' expectations regarding the attainment of work-related goals. So, the experience of positive emotions is likely to influence the level of hope in a positive way and on a daily level. However, to date, studies linking positive emotions to daily work-related hope are non-existent. In conclusion, we assume that positive emotions after work

are positively related to hope at the start of the next working day (*Hypothesis 1*).

Further, B&B theory states that resources ultimately lead to a state of well-being. In this study, we use work engagement as a context-specific (work-related) measure of well-being. As said before, work engagement is active in nature. Therefore, it matches the active nature of B&B theory which makes work engagement a suitable outcome measure in this theory. There is convincing empirical evidence that personal resources, due to their motivational potential, are important predictors of work engagement (Bakker & Demerouti, 2008). Positive expectations of employees regarding their capabilities to control and achieve their work-related goals result in more involvement at work. Therefore, these types of resources lead to engagement. Fredrickson et al. (2008) found, for example, that hope as a personal resources enhanced well-being over time. In line with this, Erez and Isen (2002) state that employees who expect to be successful and to achieve work-related goals, i.e., are hopeful, are more likely to experience a state of well-being. It can be assumed that this process is mediated by actual goal attainment. Feldman, Rand, and Kahle-Wobreski (2009) established a significant relationship between hope and goal attainment in a longitudinal study among students. Smith, Ntoumanis, and Duda (2007) found similar results in a study among athletes, i.e., having autonomous goals leads to actual attainment of these goals. This was caused by higher levels of effort invested by the athletes in attaining these goals. Next, they found that goal attainment resulted in higher levels of psychological well-being. In conclusion, experiencing hope spurs employees to dedicatedly and energetically work towards their goals. That way, employees may get completely absorbed into their work (Sweetman & Luthans, 2010). Thus far, empirical studies have not demonstrated the independent effect of hope on engagement. However, several longitudinal studies have shown that psychological capital (Luthans, 2002), consisting of self-efficacy, optimism, resilience, and hope, was positively related to work engagement among employees (Avey et al., 2010) and students (Ouweneel et al., 2011). On a daily basis, optimism, self-esteem, and self-efficacy were significantly related to work engagement (Tims et al., 2011; Xanthopoulou et al., 2008, 2009a). In the present study, we focus on the engaging value of another dimension of psychological capital, namely hope, on a daily basis. Based on theorizing, hope at the start of the working day is assumed to be positively related to the three dimensions of work engagement reported after that same working day, namely vigor (*Hypothesis 2a*), dedication (*Hypothesis 2b*), and absorption (*Hypothesis 2c*).

4.1.4. Building at a daily level

The relationship between positive emotions and work engagement, via hope, is also supported by B&B theory (Fredrickson, 1998). Namely, B&B theory posits that positive emotions not only make people feel good at a particular time, but that these positive emotions may predict future well-being as well (Fredrickson & Joiner, 2002). That is,

positive emotions produce well-being through building personal resources at a cognitive level. Importantly, as stated before, B&B theory was developed to understand the effect of positive emotions on long-term states of well-being. Fredrickson and Joiner (2002) concluded that it is unlikely that isolated experiences of positive emotions will result in building resources; instead, an accumulation of positive emotions would be necessary in order to actually build resources. This implies that it would take some time to actually get the building process in motion. However, would it also be possible that positive emotions build resources in an instant - as can be concluded based on AET- which would lead to well-being that same day? Possibly, the build hypothesis can be confirmed within one working day.

As mentioned before, some evidence for parts of the build hypothesis have been found in previous daily diary studies. Namely, positive emotions build proactivity (Fritz & Sonnentag, 2009), and resources like optimism and self-efficacy have been found to predict work engagement (Tims et al., 2011; Xanthopoulou et al., 2008, 2009a). Recently, Salanova, Llorens, and Schaufeli (2011) showed that positive emotions such as enthusiasm, satisfaction, and comfort predict work and task engagement. In contrast, Fredrickson et al. (2008) found in an experimental study that the direct effect of positive emotions on well-being was non-existent; instead, the relationship between positive emotions and well-being was mediated by resources such as hope. Based on the latter study, it seems plausible to assume that positive emotions lead to work engagement via personal resources, like hope. Thus far, no similar studies have been conducted to test the complete build hypothesis of B&B theory on a daily level. Therefore, in our study we aim to demonstrate the validity of the build hypothesis in this context and explore the relationships between positive emotions and hope, and between hope and work engagement within a daily work setting. In other words, we qualify the relationship between positive emotions and work engagement by adding hope as a mediator. That way, this study will look into how positive emotions are related to work engagement on a daily level.

In conclusion, we propose indirect relationships between positive emotions and work engagement; namely, that positive emotions after the working day are indirectly related to the three dimensions of work engagement after the next working day, through the level of hope at the start of the next working day. More specifically, positive emotions are indirectly related to vigor (*Hypothesis 3a*), dedication (*Hypothesis 3b*), and absorption (*Hypothesis 3c*) via hope. We expect that employees use their state of mind after the previous working day as a reference to establish their level of hope at the start of the next working day. Subsequently, we assume that the level of hope at the start of a working day predicts how things will go that day at work, and will therefore directly influence the reported levels of vigor, dedication, and absorption after that same working day. Our hypotheses and study design are depicted in Figure 1.

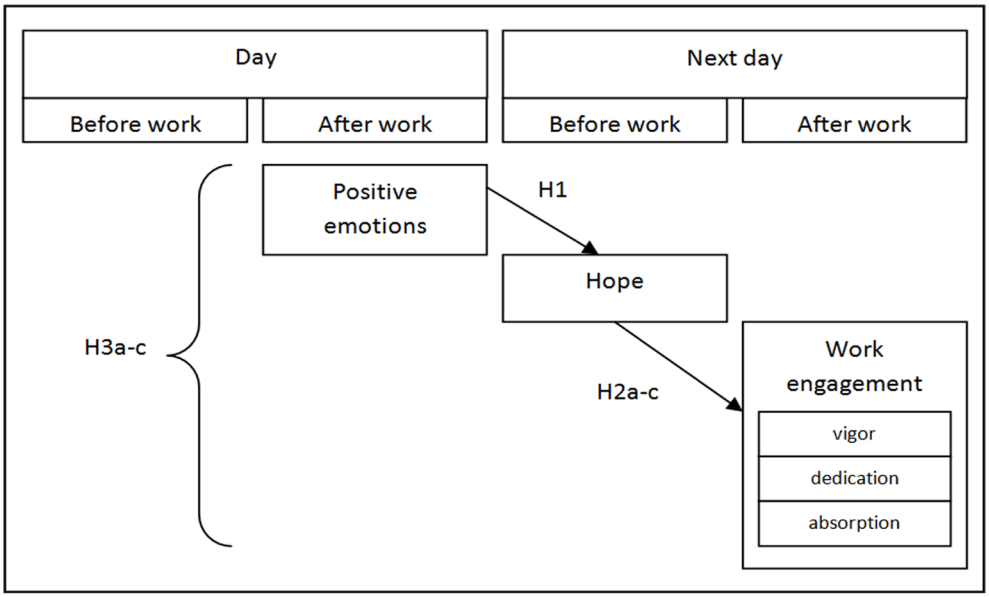

Figure 1. Hypothesized mediation model of daily positive emotions, hope, and work engagement (vigor, dedication, and absorption)

Note. H1 = Hypothesis 1, H2 = Hypothesis 2, H3 = Hypothesis 3

4.2. Method

4.2.1. Participants and procedure

An online questionnaire study was conducted among 113 employees (scientific or administrative staff) of a Dutch university, who were approached by email. After that, the study respondents were asked by email for voluntary participation in a diary study. Out of 113 participants, 52% agreed to participate in the diary study as well (*N* = 59 employees). After granting participation, the instructions for the diary procedure were given either face-to-face or by phone, depending on the preferences of the participant. Following Sonnentag (2003), the participants were told that they had to fill out a short questionnaire in a booklet for five consecutive working days (Monday-Friday), twice a day: before work (after waking up), and right after work. Every time participants were supposed to fill in a short questionnaire, they received a reminder per email or text message, depending on their own preference. All booklets were given a unique code to enable us to relate the diary results to the questionnaire data. After the diary week, participants were requested to return the diary to the researchers by mail. There were no drop-outs: all diaries were returned. After receiving the completed diaries, participants were rewarded with a 50 Euro (about $ 63) voucher of their own choice.

Analyses of variance revealed that the sample of the diary study (N = 59) did not significantly differ in demographics and scores on the study variables in comparison to the sample that only participated in the initial questionnaire study (N = 54): age (F (1,111) = 0.57, p = .45), gender (χ^2 (1) = 0.29, p = .59), job tenure (F (1,111) = 0.07, p = .80), education (F (1,111) = 0.50, p = .48), positive emotions (F (1,111) = 0.00, p = 1.00), hope (F (1,111) = 1.18, p = .28), vigor (F (1,111) = 0.18, p = .67), dedication (F (1,111) = 0.06, p = .80), and absorption (F (1,111) = 0.23, p = .64).

The diary sample included 19 men (32.2%) and 40 women (68.8%). Their mean age was 36.6 (SD = 11.1). All participants worked full-time. They had a mean tenure of 7.4 years, and 88% of the participants had a college degree. Of the participants, 10% had an administrative job, and 90% were scientific staff.

4.2.2. Measures

Questionnaire data. Baseline positive emotions were assessed using the positive emotion items of the Job-related Affective Well-being Scale (JAWS; Van Katwyk, Fox, Spector & Kelloway, 2000; shortened by Schaufeli & Van Rhenen, 2006). The seven items were formulated as follows: "The last couple of weeks, my work made me feel…at ease, energetic, happy, enthusiastic, relaxed, inspired, and satisfied". The participants answered using a five-point Likert scale (1 = (almost) never, 5 = (almost) always). The scale showed good reliability (α = .89).

Baseline (work-related) hope was measured using a work-adjusted version of the three-item 'agency' scale of the State Hope Scale (SHS; Snyder et al., 1996) since this is the most relevant and usable dimension in a daily context. We did not include the other dimension of hope, 'pathway', because this implies the presence of problems and obstacles at work, though it is reasonable to assume that these do not occur on a daily basis. A sample item is: "With regard to my work, I see myself as being pretty successful". All items were scored on a six-point Likert scale (1 = strongly disagree, 6 = strongly agree). The scale appeared to be reliable (α = .82).

Baseline vigor, *dedication*, and *absorption* were measured using the three scales of the short version of the Utrecht Work Engagement Scale (UWES; Schaufeli, Bakker & Salanova, 2006). The scales consist of three items each. For *vigor* a sample item is "At my work, I feel bursting with energy" (α = .93). For *dedication* a sample item is "I am proud of the work that I do" (α = .90). Finally, for *absorption* a sample item is "I get carried away when I am working" (α = .66). All items were scored on a seven-point Likert scale (0 = never, 6 = always).

Diary data. All daily scales were adjusted versions of the original baseline scales. These adjustments were conducted on the basis of face validity of the items and viability of the study to fit the current daily study design (Rodríguez-Sánchez, Schaufeli, Salanova, Cifre &

Sonnenschein, 2011).

Daily positive emotions were measured after work using a scale that was based on the JAWS (Van Katwyk et al., 2000) and consisted of five items: "Right now I feel…at ease, energetic, happy, enthusiastic, and relaxed". The average reliability over five days was good (α = .84, with a range of .83 - .86).

Daily hope was measured with a scale that consisted of two items, derived from the three-item agency scale of the SHS (Snyder et al., 1996), which was adjusted to fit the particular research context. The items were: "I expect to be successful at work today", and "I expect to reach the goals that I have set for today". Day-level hope was assessed by a two item-scale, so instead of a Cronbach's alpha value an inter-item correlation was calculated to establish the internal consistency. The average inter-item correlation over five days was good (*r* = .66, with a range of .56 - .73).

Daily vigor, dedication, and *absorption* were assessed with the three scales of a modified version of the UWES (Schaufeli et al., 2006) in order to fit the diary study design. The current scales consisted of two items each. For vigor the items were "I felt energetic at work today" and "I felt like going to work today", for dedication "I am proud at the things I did at work today", and "I was inspired by my work today", and for absorption "I was completely absorbed in my work today", and "When I was intensively working today, I felt happy". The average inter-item correlations over five days were acceptable for all three scales (*r* = .53, with a range of .49 - .57, *r* = .65, with a range of .55 - .83, and *r* = .66, with a range of .55 - .76, respectively). All day-level variables were rated on a seven-point scale (1 = not at all, 7 = to a great extent).

4.2.3. Data analyses

We analyzed our data with a hierarchical linear modeling approach, using MLwiN software (Rasbash, Browne, Healy, Cameron & Charlton, 2000). Multilevel models take into account any possible bias in standard errors and estimates resulting from the non-independent data (Kenny, Korchmaros & Bolger, 2003). Since our dataset exists of data of multiple measurements (N = 295) nested within persons (N = 59), multilevel modeling is a well-suited method of analysis. That is, this method offers the opportunity to distinguish the influence of variables on subject level (e.g., characteristics that distinguish between individuals, such as the baseline measurements of hope) from within-subject fluctuations of variables (e.g., do daily levels of positive emotions effect daily levels of hope regardless of the individual baseline and previous levels of hope?) (Sonnenschein, Sorbi, Van Doornen, Schaufeli & Maas, 2007). The day-level variables were centered at the person mean and person-level variables were centered at the grand mean, which is the mean of all participants (Ohly, Sonnentag, Niessen & Zapf, 2010). Centering day-level variables at the person mean implies that all between-persons variance in these variables is removed, and all interpretations

of our results referring to stable differences between persons can thereby be ruled out (Sonnentag, Binnewies & Mojza, 2008).

Multilevel analyses have often been used to analyze growth models. In these type of studies (e.g., Davila & Sargent, 2003; Kwon & Laurenceau, 2002) a time-model is used as starting point for multilevel analyses. In the current study, multilevel analyses are used to investigate within-person processes (Papp, 2004) in which within-person associations are examined over time. Therefore, time is included in the analyses as a control variable: in this way, it is possible to control for the fact that the dependent variable varies as a function of the five working days. Moreover, we looked at the possible effect of time as a quadratic effect (e.g., Cranford, Shrout, Iida, Rafaeli, Yip & Bolger, 2006) and looked at time as a separate factor per day, by composing dummy variables for every day.

In addition to time as a control variable, also the baseline level of the outcome measures are included in the models, as well as the previous day's level of the outcome measures. Including baseline levels enables us to investigate the daily fluctuations around the baselines of the employees, which is important because employees' general levels may affect their momentary states (Xanthopoulou et al., 2008). Moreover, adding previous day's levels in our models allows us to look specifically at daily changes in scores, and is therefore being advised by Sonnentag et al. (2010).

We used the Monte Carlo Method for Assessing Mediation (MCMAM; Selig & Preacher, 2008), using the program of R (Venables & Smith, 2010), to test our mediation hypotheses (*Hypotheses 3a*, *3b*, and *3c*). The design of this study allows us to examine mediation effects, because all three variables were measured at different successive points in time. The MCMAM was first described and evaluated by MacKinnon, Lockwood, and Williams (2004). Bauer, Preacher, and Gil (2006) used this method for examining mediation in multilevel models. Using the imputed parameter estimates and the associated standard errors, random draws from the a and b distributions are simulated and the product of these values is computed. This procedure was repeated 20,000 times and the resulting distribution of the *a*b* values is used to estimate a confidence interval around the observed value of *a*b*. That way, we were able to test the null hypotheses that there were no mediation effects in the population. If the null hypothesized value of *a*b* (zero) falls outside the interval, the null hypothesis of no mediation is rejected. In other words, if the confidence interval did not contain the value of zero, mediation is demonstrated (Selig & Preacher, 2008).

4.3. Results

4.3.1. Preliminary analyses

Table 1 presents the means, and standard deviations of all study variables. None of the demographic variables (i.e., age, gender, tenure, type of job, and education) appeared to be significantly related to any of the dependent variables. Adding demographics would

have made the models unnecessary complex, and quite importantly, adding these control variables did not significantly change the parameter estimates of the predictor variables. The same applied for the quadratic factor of time and time as a set of dummy variables for each day. Therefore, demographics as well as the two types of time factors were excluded from further analyses.

Table 1. Means and standard deviations of the day level and baseline study variables

	Day level		Baseline	
	M	*SD*	*M*	*SD*
Positive emotions	4.92	0.98	3.61	0.65
Hope	5.20	1.14	4.49	0.80
Vigor	5.08	1.07	4.07	1.25
Dedication	4.89	1.37	4.36	1.22
Absorption	4.90	1.34	3.80	1.08

Note. *M* = mean, *SD* = standard deviation

To determine the amount of variance that is attributed at either the within-person level or at the between-person level, the within-person variances of daily hope and daily engagement, respectively – which were both used as dependent measures in one our analyses – were computed. Results indicated that 49.53% of the total variance of day-level hope could be explained within persons. Furthermore, it was found that 42.55% of the total variance of day-level vigor, 66.19% of the total variance of day-level dedication, and 62.28% of the total variance of day-level absorption was explained within persons. Overall, it can be concluded that a substantial portion of the variances in hope and the three dimensions of work engagement can be attributed to within-person variances. In other words, our results show that employees differ greatly from day-to-day in their levels of hope and work engagement.

Using Mplus software (Muthén & Muthén, 2004), we established the within-person and between-person relationships between the study variables, which are depicted in Table 2. The results indicated that the within-person relationships ranged from .04 to .88, and the between-person relationships ranged from .31 to .52.

Table 2. Within-person and between-person relationships with standard errors (in brackets) between the daily study variables

	Positive emotions	Hope - lagged	Vigor - lagged	Dedication - lagged	Absorption - lagged
Positive emotions		0.34*** (.11)	0.36*** (.10)	0.30** (.10)	0.31** (.11)
Hope - lagged	0.11** (.04)		0.49*** (.13)	0.46*** (.13)	0.52*** (.16)
Vigor - lagged	0.10* (.05)	0.33*** (.08)		0.49*** (.14)	0.48*** (.15)
Dedication - lagged	0.04 (.06)	0.13 (.08)	0.30*** (.09)		0.45* (.18)
Absorption - lagged	0.05 (.05)	0.15* (.07)	0.31*** (.08)	0.88*** (.14)	

Note. Within-person relationships are depicted below the diagonal, between-person relationships above the diagonal, *** $p < .001$, ** $p < .01$, * $p < .05$

Furthermore, we conducted multilevel confirmatory factor analyses using Mplus software in order to distinguish between the constructs of positive emotions and work engagement. Indicators of positive emotions were active positive emotions and non-active positive emotions, indicators of work engagement were its three dimensions: vigor, dedication, and absorption. Results showed that the one-factor model did not fit the data (χ^2 (10) = 93.22, $p < .001$; RMSEA = .18; TLI = .67; CFI = .84). The two-factor model, with positive emotions and work engagement as separate factors, fitted the data significantly better than the one-factor model ($\Delta\chi^2$ (2) = 67.88, $p < .001$, ΔAIC = 63.88). Even though the Chi-square value of the two-factor model was significant (χ^2 (8) = 25.33, $p < .01$), the relative fit indices were meeting the criteria for an acceptable fit (RMSEA = .09; TLI = .91; CFI = .97). Taken together, these results suggest that positive emotions and work engagement are interrelated, yet distinct constructs on a daily level.

4.3.2. Test of hypotheses

To test our hypotheses, we compared three models as regards their fit to the data. First, the *Null Model* was explored, which consisted only of the intercept predicting the dependent variable. Next, in *Model 1* we added time as a control variable as well as the baseline level and previous day's level of the dependent variable. Finally, in *Model 2*, the person-level predictor(s) was/were added. Tables 3, 4, 5, and 6 display information on the model fits, estimates of the control and predictor variables, and explained variances of the models.

Table 3 shows the findings from multilevel modeling for positive emotions after work, predicting hope at the start of the next working day (Hypothesis 1). Model 2 (-2 x log = 560.77), in which positive emotions were added as predictor, showed the best fit to the

data because the deviance of the model was significantly lower than the Null Model (Δ -2 x log = 45.86, $p < .001$) and than Model 1 (Δ -2 x log = 11.46, $p < .001$). Model 2 showed a significant effect of positive emotions on hope (γ = .21, SE = .08, $t = 2.79$, $p < .01$). So, Hypothesis 1 was confirmed. Taken together, the predictor variable and control variables explained 11.48% of the variance in hope at the within-person level and 9.88% at the between-person level. The explained variance was computed as follows: $R^2 = (\sigma^2_{\text{null model}} - \sigma^2_{\text{model 2}}) / \sigma^2_{\text{null model}}$.

Table 3. Multilevel estimates for models predicting daily hope at the start of the next working day (*Hypothesis 1*)

	Null Model			Model 1			Model 2		
Variable	Estimate	*SE*	*t*	Estimate	*SE*	*t*	Estimate	*SE*	*t*
Intercept	5.22	0.12	44.20***	4.99	0.13	38.42***	5.03	0.13	38.09***
Time (day)				0.16	0.05	3.29***	0.14	0.05	2.86**
Baseline level hope				0.35	0.14	2.50*	0.35	0.14	2.49*
Previous level hope				-0.22	0.08	2.75*	-0.24	0.08	3.00**
Positive emotions (after work)							0.21	0.08	2.79**
-2 x log			606.63			572.23			560.77
Δ -2 x log						34.40***			11.46***
df						3			1
						R^2			R^2
Level 1 within-person variance (SE)	0.64	0.07		0.59	0.07	7.08%	0.56	0.07	11.48%
Level 2 between-person variance (SE)	0.65	0.15		0.57	0.14	12.81%	0.58	0.14	9.88%

Note. *** $p < .001$, ** $p < .01$, * $p < .05$

Table 4 shows the findings from multilevel modeling for hope, predicting vigor (*Hypothesis 2a*). Model 2 (-2 x log = 470.39), in which hope and positive emotions were added as predictors, showed the best fit to the data since the deviance of the model was significantly lower than the Null Model (Δ -2 x log = 90.23, $p < .001$) and than Model 1 (Δ -2 x log = 42.26, $p < .001$). Model 2 showed a significant effect of hope on vigor (γ = .37, *SE* = .06, $t = 5.81$, $p < .001$). Thus, *Hypothesis 2a* was confirmed. Taken together, all predictor and control variables explained 32.40% of the variance in vigor at the within-person level and 14.81% at the between-person level.

Table 5 shows the findings from multilevel modeling for hope, predicting dedication (*Hypothesis 2b*). Model 2 (-2 x log = 538.71), in which hope and positive emotions were added as predictors, showed the best fit to the data because the deviance of the model was significantly lower than the Null Model (Δ -2 x log = 63.17, $p < .001$) and than Model 1 (Δ -2 x log = 11.87, $p < .01$). Model 2 showed a significant effect of hope on dedication (γ = .29, SE = .12, $t = 2.55$, $p < .05$). Thus, *Hypothesis 2b* was also confirmed. Overall, the predictor variables and control variables explained 8.32% of the variance in dedication at the within-person level and 43.06% at the between-person level.

Table 6 shows the findings from multilevel modeling for hope, predicting absorption (*Hypothesis 2c*). Model 2 (-2 x log = 634.16), in which hope and positive emotions were added as predictors, showed the best fit to the data because the deviance of the model was significantly lower than the Null Model (Δ -2 x log = 58.04, $p < .001$) and than Model 1 (Δ -2 x log = 15.33, $p < .001$). Model 2 showed a significant effect of hope on absorption (γ = .28, SE = .11, $t = 2.60$, $p < .01$). Thus, *Hypothesis 2c* was confirmed as well. Taken together, all predictor variables and control variables explained 6.56% of the variance in absorption at the within-person level and 39.17% at the between-person level.

Table 4. Multilevel estimates for models predicting daily vigor after the next working day (*Hypothesis 2a*)

	Null Model			Model 1			Model 2		
Variable	Estimate	*SE*	*t*	Estimate	*SE*	*t*	Estimate	*SE*	*t*
Intercept	5.05	0.12	4.28***	4.86	0.12	40.16***	4.87	0.12	41.08***
Time (day)				0.16	0.04	3.72***	0.10	0.04	2.62**
Baseline level vigor				0.31	0.08	3.68***	0.31	0.09	3.60**
Previous level vigor				-0.07	0.07	-0.97	-0.05	0.07	-0.63
Positive emotions (after work)							0.06	0.07	0.98
Hope (before work)							0.37	0.06	5.81***
-2 x log			560.62			512.65			470.39
Δ -2 x log						47.97***			42.26***
df						3			2
						R^2			R^2
Level 1 within-person variance (SE)	0.50	0.06		0.45	0.05	11.00%	0.34	0.04	32.40%
Level 2 between-person variance (SE)	0.68	0.15		0.52	0.12	23.11%	0.58	0.13	14.81%

Note. *** $p < .001$, ** $p < .01$, * $p < .05$

Table 5. Multilevel estimates for models predicting daily dedication after the next working day (*Hypothesis 2b*)

	Null Model			Model 1			Model 2		
Variable	Estimate	*SE*	*t*	Estimate	*SE*	*t*	Estimate	*SE*	*t*
Intercept	4.88	0.13	37.80***	4.64	0.15	31.54***	4.70	0.15	31.53***
Time (day)				0.18	0.07	2.54*	0.13	0.07	1.84
Baseline level dedication				0.42	0.09	4.82**	0.42	0.09	4.69***
Previous level dedication				-0.15	0.08	1.83	-0.17	0.09	1.91
Positive emotions (after work)							0.05	0.12	0.42
Hope (before work)							0.29	0.12	2.55*
-2 x log			714.32			663.02			651.15
Δ -2 x log						51.30***			11.87**
df						3			2
						R^2			R^2
Level 1 within - person variance (SE)	1.26	0.14		1.21	0.14	3.88%	1.16	0.14	8.32%
Level 2 between - person variance (SE)	0.63	0.19		0.33	0.13	48.00%	0.36	0.13	43.06%

Note. *** $p < .001$, ** $p < .01$, * $p < .05$

Table 6. Multilevel estimates for models predicting daily absorption after the next working day (*Hypothesis 2c*)

	Null Model			Model 1			Model 2		
Variable	Estimate	*SE*	*t*	Estimate	*SE*	*t*	Estimate	*SE*	*t*
Intercept	4.91	0.13	37.78***	4.78	0.14	33.18***	4.83	0.15	33.11***
Time (day)				0.09	0.07	1.32	0.04	0.07	0.64
Baseline level absorption				0.48	0.10	4.82***	0.47	0.10	4.65***
Previous level absorption				-0.14	0.08	1.63	-0.17	0.09	1.86
Positive emotions (after work)							0.12	0.12	0.99
Hope (before work)							0.28	0.11	2.60**
-2 x log			692.20			649.49			634.16
Δ -2 x log						42.71***			15.33***
df						3			2
						R^2			R^2
Level 1 within - person variance (SE)	1.11	0.13		1.12	0.13	0%	1.04	0.12	6.56%
Level 2 between - person variance (SE)	0.67	0.19		0.37	0.13	44.81%	0.41	0.14	39.17%

Note. *** $p < .001$, ** $p < .01$, * $p < .05$

In order to test our hypotheses, we constructed four separate models on partly the same data. However, in the case of more than one statistical model, the chance of finding at least one statistically significant result due to chance fluctuation in the total study, and to incorrectly declare a relationship to be true (Type I error), increases. For that reason, the alpha level should be adjusted downward to taken chance capitalization into account. Considering this, we performed the Holm-Bonferroni correction (Holm, 1979) on our results. Following Holm (1979), we started by ordering the p-values of the four effects from small to large: the effect of hope on vigor was the strongest and had the smallest *p*-value ($p = .000$), then the effect of positive emotions on hope ($p = .005$), then the effect of hope on absorption ($p = .009$), and finally the effect of hope on dedication ($p = .011$), which had the largest *p*-value. After that, we compared the *p*-values to their according criterion p-values: the smallest *p*-value to $\alpha/4 = .013$, the second smallest *p*-value to $\alpha/3 = .017$, the third smallest *p*-value to $\alpha/2 = .025$, and the largest *p*-value to $\alpha/1 = .05$. The results revealed that we were able to maintain all four effects, since the according *p*-values were smaller than the criterion p-values of the correction procedure.

Finally, *Hypotheses 3a*, *3b*, and *3c* stated that positive emotions are indirectly related to vigor, dedication, and absorption, via hope. To test these three mediation hypotheses, MCMAM (Selig and Preacher, 2008) was performed using the program of *R* (Venables & Smith, 2010). As stated before, MCMAM is a repeated simulation of a*b and the assumption is that in the case of no mediation effect, a*b would be zero. The simulation method drew from the a*b distribution, and mediation should be accepted if the 95% confidence interval does not contain zero. The results showed that all three hypotheses are confirmed, since all three confidence intervals did not contain zero. The indirect effect of positive emotions on vigor, via hope was .08 (*Hypothesis 3a*), on dedication .06 (*Hypothesis 3b*), and on absorption also .06 (*Hypothesis 3c*). The confidence intervals and parameter estimates of the three mediation tests are depicted in Table 7.

Table 7. Direct and indirect effects of positive emotions on vigor, dedication, or absorption, via hope, using MCMAM (*Hypotheses 3a*, *3b*, and *3c*)

Model	a (*SE*)	b (*SE*)	a*b	Lower bound	Upper bound	c' (*SE*)	c
Positive emotions→hope→vigor	.21 (.09)	.37 (.06)	.08	.0134	.1495	.06 (.07)	.14
Positive emotions→hope→dedication	.21 (.09)	.29 (.12)	.06	.0053	.1462	.05 (.12)	.11
Positive emotions→hope→absorption	.21 (.09)	.28 (.11)	.06	.0072	.1426	.12 (.12)	.17

Note. *SE* = standard error; the estimates depicted in this table are based on Model 2 of Table 3, 4, 5, and 6.
Note. a = regression coefficient for the association between the positive emotions and hope; b = regression coefficient for the association between hope and vigor, dedication, or absorption, when positive emotions is also a predictor of vigor, dedication, or absorption; c' = regression coefficient for the association between positive emotions and vigor, dedication, or absorption (direct effect); a*b = regression coefficient for the indirect association between positive emotions and vigor, dedication, or absorption, via hope (indirect effect); and c = sum of a*b and c' (total effect)

4.4. Conclusion and discussion

Our diary study was conducted with the objective to investigate the potential positive *within-person* relationships between positive emotions, work-related hope, and the three dimensions of work engagement, vigor, dedication, and absorption, on a daily level. Indirect relationships of positive emotions on the three engagement dimensions via hope have indeed been uncovered. More specifically, we found that positive emotions felt after a working day predicted how hopeful the participating employees were regarding their work at the start of the next working day (*Hypothesis 1*). Furthermore, the level of hope appeared to have an effect on the level of vigor (*Hypothesis 2a*), dedication (*Hypothesis 2b*), and absorption (*Hypothesis 2c*) that the participants reported after that same working day.

4.4.1. Interpretation of results

Participants use their daily emotional states at the end of the previous working day to establish their levels of hope regarding the working day that lies ahead. Based on B&B theory, this can be explained by the fact that positive emotions broaden employees' thinking, enabling them to draw on a wider range of ideas. In turn, these broadened outlooks help employees to build consequential personal resources, like hope. Moreover, a possible explanation lies in the fact that emotional reactions cause employees to evaluate their work and, as such, they change their expectations regarding their following working day accordingly. Positive emotions may cause employees to expect that they will attain the goals that they have set for themselves. So, the experience of positive emotions is likely to positively influence the level of hope.

In addition, the type of expectancies participants start their working day with do matter, since the current study showed that hope at the start of the working day is an important predictor of feelings of vigor, dedication, and absorption after that same working day. The reason why employees who start the day expecting to reach their own goals are more engaged could be that hope leads to higher levels of effort and actual goal attainment, which in turn is associated with psychological well-being (Smith et al., 2007; Feldman et al., 2009). Thus, experiencing hope motivates employees to dedicatedly and energetically work towards their goals. In this way, employees are completely absorbed into their work.

So, the findings of the current study are in line with B&B theory (Fredrickson, 1998) and AET (Weiss & Cropanzano, 1996) in that we indeed found that the experience of positive emotions build hope over time - either through a broadened mindset (Fredrickson & Branigan, 2005) or by cognitively evaluating the experienced positive emotions (Weiss & Cropanzano, 1996) - which, in turn, is related to work engagement. In conclusion, positive emotions and hope – as a personal resource – seem to predict vigor, dedication, and absorption at work, either indirectly or directly.

Our study has indicated that work engagement is a suitable work-related well-being measure to use in the context of testing B&B theory at work. Work engagement is an active form of well-being and is closely related to experiences at work and therefore predicted by positive emotions as well as work-related personal resources such as hope. Furthermore, our study has shown that, next to positive emotions, hope and the dimensions of work engagement are constructs that can be successfully studied within a daily context. Although some authors have suggested that the study variables at hand are of dispositional nature (hope: Snyder, 2002; affect: Watson, Wiese, Vaidya & Tellegen, 1999) or represent a more durable state level (work engagement: Seppälä, Mauno, Feldt, Hakanen, Kinnunen, Tolvanen & Schaufeli, 2009), we showed that employee's scores on these constructs not only vary across a relative short time period, i.e., working days, but they are also related to one another in predictable ways. Although it is generally accepted that average levels of well-being are at least partly

genetically determined (Lykken, 1999), our results convincingly show that daily fluctuations around this set-point do occur. This daily perspective was also shown to be relevant in previous studies on work engagement (e.g., Sonnentag, 2003; Sonnentag et al., 2008; Tims et al., 2011; Xanthopoulou et al., 2008; 2009a). In addition, it seems a worthwhile endeavour to distinguish between the three dimensions of work engagement, at least on a daily level. Although this has never been done before, except for a few studies in which only vigor was used as a separate outcome measure on a daily level (Cranford et al., 2006; Sonnentag & Niessen, 2008), this study shows that especially dedication and absorption fluctuate greatly within persons (see Preliminary analyses). Actually, the results indicated that especially vigor could be explained by differences at a personal level, i.e., levels of positive emotions and hope.

Next to a daily perspective on work engagement, an individual perspective on work engagement seems promising as well in the sense that individual antecedents like positive emotions and hope seem to predict engagement. Positive emotions are affective in nature (Gray & Watson, 2001), hope is cognitive in nature (Snyder, 2002), and engagement is defined as an affective-cognitive state of mind (Schaufeli & Bakker, 2001), hence combining both perspectives. The current study confirmed that affect and cognition are closely related to one another with regard to employee well-being. This close relationship was found in earlier longitudinal studies among employees (Avey et al., 2008; Fredrickson et al., 2008) as well as among students (Ouweneel et al., 2011).

In this study we controlled for several variables. First of all, we looked at the effect of time in three ways; time as a set of dummy variables to investigate the effects per working day separately, the quadratic effect of time to check for curvilinear patterns of the outcome variables, and finally, the linear effect of time to control for the fact that the outcome variables vary as a function of the five working days. The results indicated that time as a set of dummies and as a quadratic effect did not have significant effects on the results. This is in contrast with the findings of Cranford et al. (2006) who found that vigor - one of the dimensions of engagement - had a curvilinear effect throughout the week. It is likely that this is caused by the fact that Cranford et al. (2006) included weekends in their analyses, since in the weekends the reports on vigor were higher than during the week. So, in our analyses we only controlled for the linear effect of time. This is not common in diary studies in the field of organizational psychology. However, our results show that it is advisable to include time in multilevel analyses. Next to time, we controlled for previous day's and baseline levels of the outcome variables. Results indicated that the baseline levels of the outcome variables were important predictors of the daily levels of the variables. On the contrary, the previous day's levels did not have a significant effect on the outcome variables, with the exception of hope. In fact, it is shown that the relationships between the study variables were stronger when controlling for previous and baseline levels of the outcome variable. For example, the

within-subject relationship between positive emotions and absorption is not significant (.05 – see Table 2), whereas Table 7 shows that the relationship between positive emotions and absorption is much stronger when controlled for previous and baseline level of absorption (.12). Apparently, positive emotions are stronger predictors of change in absorption than of absolute levels of absorption. So, incorporating baseline and previous level of the outcome variable appeared to be of great theoretical relevance. In addition, Table 2 also shows that there are clear differences in within- and between-person relationships between the study variables. Whereas all between-person relationships were significant, the within-person relationships were not. For example, positive emotions are not related to next day's dedication and absorption at a within-person level. Although positive emotions and dedication and absorption are related to each other at the between-person level, over time, within a person, positive emotions are not related to these dimensions of daily work engagement. These results show that it is important to distinguish between within- and between-person relationships when conducting multilevel analyses on longitudinal data.

4.4.2. Strengths and limitations

The current diary study had a within-subject design with two measures per day (as advocated by Sonnentag et al., 2010) for five consecutive working days. To date, mostly between-subject, long-term questionnaire studies on work engagement have been conducted, with a small number of exceptions (e.g., Sonnentag, 2003; Tims et al., 2011; Xanthopoulou et al., 2008; 2009a; Xanthopoulou & Bakker, 2009). The advantage of diary studies over questionnaire studies with multiple waves is that it is more trustworthy to draw causal conclusions. That is, due to the small time lags between the time measurements, there is less chance of contextual variables interfering with the results. In addition, there is a vast reduction in the likelihood of (false) retrospection - referred to as the *retrospection bias* (Bolger, Davis & Rafaeli, 2003) - achieved by minimizing the amount of time elapsed between a certain experience and the account of this experience. In this way, participants hardly needed to remember or cognitively integrate their past experiences. Put differently, an essential benefit of diary methods is that they permit the examination of reported events and experiences in their natural habitat, providing valid and reliable information about the affective and cognitive well-being of employees, complementary to that obtained by more traditional questionnaire designs (Bolger et al., 2003). In addition, Sonnentag (2001) states that the time points of the daily measurements matter as well; she measured work-related well-being late at night and labelled that as a limitation of her study. Accordingly, not only by using brief time lags between the measurements but also by using the appropriate time points during the day for our assessments, i.e., hope right before work and engagement right after work, we obtained very accurate information on the study variables at suitable time points. Finally, in this study we were able to make a strong case for mediation since

the variables were measured at three successive points in time, and we used a resampling method to test our mediation hypotheses.

Despite these strengths of our design, our study had some limitations as well. For example, we exclusively used self-report measures to assess positive emotions, hope, and work engagement so that - at least potentially - the study results might have been inflated by common method variance. However, because of their affective and cognitive nature, it is difficult to see in what other way our study variables could have been measured. Furthermore, the diary items were formulated following the criteria of Experience Sampling Method (Csikszentmihalyi & Larson, 1987) to make the subjective measurements as 'objective' as possible. First, we wrote the diary items in the first person to initialize the participants' internal dialogue. This dialogue was further stimulated by using statements instead of questions and by formulating the items in everyday speech. Nonetheless, using additional, more objective measures like customer, subordinate, or supervisor ratings, and financial performance would be of added value in future research. Although Zwetsloot and Pot (2004) state that enhancing employee well-being should be an objective of practitioners and management in itself, the link with performance would obviously be relevant for organizations.

Furthermore, certain parts of the investigated processes stay unidentified. Firstly, the origins of positive emotions are unknown. As stated in the Introduction section, it is likely that achievement and recognition are the most common incidents to which employees react with positive emotions (Herzberg, 1959). No matter the origin of positive emotions, we found that positive emotions after the working day were related to hope the following morning, thereby confirming the build hypothesis at a daily basis. Additionally, we theorized in the Introduction section on how positive emotions after work could lead to next mornings' hope. However, since we did not look into what happens between the two working days in the evening, other explanations for the relationship between positive emotions after work and hope the following morning are possible. For example, it could be that the experience of positive emotions first leads to more creative thinking and exploratory behavior in the evening (Fredrickson, 2001), which, in turn, builds hope. It would therefore be interesting to include evening measurements on creative thinking and proactive behaviour into future diary studies. Moreover, it could be that positive emotions at night first lead to a better recovery before sleep which in turn leads to more hope about work the next day (see Sonnentag, 2003). Yet, another possibility is that positive emotions after work predict behavior such as active leisure activities (e.g., social, physical activities), where resources lost during the day are replenished during the evening which leads to more hope the following morning. Indeed, Sonnentag et al. (2008) found that positive experiences in the evening affect next morning's state of mind, so more insight in activities in the evening would be advisable in future diary studies as well. That way, it would be possible to better uncover *how* daily

positive emotions build resources. Finally, next to hope, other variables could have played a role in predicting the levels of vigor, dedication, and absorption. For example, job resources (Xanthopoulou et al., 2008, 2009a) have been found to be related to work engagement on a daily level. Therefore, as stated before, future research should combine environmental and personal antecedents of engagement and establish their effects on vigor, dedication, and absorption.

In this study, because of methodological reasons, only the agency dimension of hope was included. Although previous research has shown that this dimension of hope has the most important predictive value for well-being (Bailey, Eng, Frisch & Snyder, 2007), and is the strongest predictor of actual goal attainment (Feldman et al., 2009), future diary studies could incorporate the scale as a whole. Note however, that the study should than be conducted in a sample of employees who encounter obstacles on a daily basis, for example receptionists who work at complaints desks.

In line with B&B theory, the current study specifically focused on the indirect effect of positive emotions on engagement via a personal resource. However, it could also be interesting to see whether negative emotions have a direct effect on burn-out (antipode of work engagement; Maslach, Schaufeli & Leiter, 2001), or whether they are also indirectly influencing (un)well-being through negative cognitive beliefs like pessimism (Colligan, Offord, Malinchoc, Schulman & Seligman, 1994), negative perfectionism (Zhang, Gan & Cham, 2007), or an external locus of control at work (Ng, Sorensen & Eby, 2006).

4.4.3. Implications

Work engagement is an essential component of employee well-being and has been shown to have considerable impact on organizational outcomes. Hence, it is crucial to answer the question how work engagement can be boosted among employees (Salanova, Schaufeli, Xanthopoulou & Bakker, 2010). Several studies have provided evidence on the effectiveness of workplace interventions that aim to increase engagement by means of increasing job resources (e.g., Cifre, Salanova & Rodríguez-Sánchez, 2011). In addition, an individual perspective on work engagements has now emerged, which contains relevant information for the development of *individual* interventions that enhance and maintain work engagement. Our study has shown that daily positive emotions build daily positive expectancies, i.e., hope, which relates to daily experiences of vigor, dedication, and absorption at work. Positive emotions as well as hope are state-like constructs that can be influenced (Luthans, 2002). Indeed, there are already interventions at hand that enhance the experience of positive emotions and hopeful beliefs. For example, positive emotions can be positively influenced through a mindfulness meditation intervention (Fredrickson et al., 2008) or by expressing gratitude and visualizing positive self images (Sheldon & Lyubomirsky, 2006). In addition, hope has been found to be stimulated by a goal setting intervention in which personal goals

were determined and multiple pathways to these goals were generated (Luthans, Avey, Avolio, Norman & Combs, 2006). In conclusion, work engagement is a promising construct to explore using an individual perspective along with a daily perspective. The combination of these two perspectives on work engagement yields interesting knowledge for both research and practice. Moreover, future studies should explore the different antecedents and consequences of the three dimensions of daily work engagement separately.

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Chapter 5.
Believe, and you will achieve: A person-centered approach on changes over time in self-efficacy, engagement, and performance

Based on:

Ouweneel, E., Schaufeli, W.B., & Le Blanc, P.M. (submitted). Believe, and you will achieve: A person-centered approach on changes over time in self-efficacy, engagement and performance.

5.1. General introduction

Students' capabilities greatly determine their academic motivation and success; however, the extent to which they *believe* in their capabilities is important as well. The most influential concept to assess this capability belief is *self-efficacy*, which is referred to as the "…belief in one's capabilities to organize and execute the course of action required to produce given attainments" (Bandura, 1997, p. 3). Although self-efficacy has been subject of ample research, to date, research on the effects of self-efficacy on motivation and performance is mostly correlational in nature (e.g., Diseth, 2011; Ouweneel, Le Blanc & Schaufeli, 2011), assuming that students are homogeneous with regard to changes in their self-efficacy levels over time (Von Eye, Bogat & Rhodes, 2006). However, self-efficacy is context-specific (Bandura, 1997), so it is bound to change within relatively short periods of time. Because we believe that it is crucial to investigate individual differences in the development of self-efficacy and its effect on the development in motivation and performance, we used a longitudinal *person-centered* approach. This means that students are grouped into categories of certain patterns of *change or stability* in self-efficacy over time. These categories of students are then compared to one another with respect to changes in students' motivation and performance. We investigate the effects of changes in self-efficacy over time at two levels: the academic level (Study 1) and the task level (Study 2). Consequently, we report on two studies, both among students. In the first study, we explore the effects of academic self-efficacy within a field setting and in the second study we investigate the effects of task-related self-efficacy within an experimental setting. Both the field and the experimental study deal with a similar question: Do changes in students' self-efficacy levels over time correspond with similar changes in engagement and performance? This way, we cross-validate our findings across a real-life academic setting and a controlled experimental setting.

5.2. Theoretical background

The concept of self-efficacy was drawn up from *Social Cognitive Theory* (SCT; Bandura, 1997), which recognizes the influential contribution of self-efficacy to human cognition, motivation, and behavior. Particularly in psychology and education, self-efficacy has proven to be a more consistent predictor of behavioral outcomes than any other motivational construct (Graham & Weiner, 1996). Any external or internal factor influencing students' academic success depends on the core belief of having the power to achieve their personal goals by their own actions. We theorize that students will persevere in the face of difficulties (Salanova, Llorens & Schaufeli, 2011) because they believe that they can draw upon the necessary cognitive and motivational resources to successfully execute study-related tasks (see also Stajkovic & Luthans, 1998). In the current study, we specifically look at the correlations and effects of self-efficacy on engagement (i.e., cognition, motivation), and performance (i.e., behavior). Several studies have shown that self-efficacy is positively correlated with motivation and

performance. These studies are discussed in more detail in the light of the social cognitive perspective.

5.2.1. Engagement

Engagement is described as a positive and inspiring state of mind that is characterized by vigor, dedication and absorption (Schaufeli & Bakker, 2004). The concept was initially designed as a work-related well-being measure, but more recently the notion of *study engagement* (or academic engagement) was introduced. It was stated that from a psychological point of view, students' activities can be considered as 'work' (Salanova, Schaufeli, Martínez & Bresó, 2010). Namely, like employees, students are involved in structured, coercive activities (e.g., attending class) that are directed toward a specific goal (e.g., passing exams). So, analogously to work engagement, study engagement is characterized by feeling vigorous, being dedicated to one's studies, and being absorbed in study-related tasks (Schaufeli, Martínez, Marques Pinto, Salanova & Bakker, 2002a). Students are vigorous when they experience high levels of energy and mental resilience, the willingness to invest effort, and the persistence in the face of difficulties. Dedicated students feel a sense of significance, enthusiasm, inspiration, pride, and challenge with regard to their studies. Finally, students are absorbed when they are fully focused on their study tasks and feel that time is flying (Bresó, Schaufeli & Salanova, 2011).

Self-efficacy is positively related to engagement because it leads to a greater willingness to spend additional energy and effort on completing a task or an assignment, and hence to more task involvement and absorption (Ouweneel, Le Blanc & Schaufeli, 2011). Efficacious students are more likely to regulate their motivation by setting goals for themselves (Diseth, 2011), and are therefore more likely to be engaged. Obviously, goal setting and planning may contribute to engagement through goal attainment. Attainment, though, is not a necessary precondition linking goal setting and planning to engagement. Progress towards goals rather than attainment is the key to engagement. Students feel good when they think about achieving desirable future outcomes. Having meaningful goals and plans to pursue those goals is likely to result in higher levels of engagement in study tasks (Howell, 2009; MacLeod, Coates & Hetherton, 2008; Sansone & Thoman, 2006). Other field research has confirmed the positive relationship between self-efficacy and engagement as well, using correlational designs (e.g., Llorens, Schaufeli, Bakker & Salanova, 2007; Ouweneel et al., 2011). In fact, manipulated changes in self-efficacy levels are tied to corresponding changes in levels of vigor and dedication, as was shown in an intervention study among students (Bresó et al., 2011). In our field study (Study 1), we will investigate whether natural changes in self-efficacy are tied to changes in engagement as well.

Experimental studies have shown similar results (e.g., Salanova, Llorens, Cifre, Martínez & Schaufeli, 2003; Salanova et al., 2011; Vera, Le Blanc, Salanova & Taris, 2011). In

these experimental studies, self-efficacy levels were not manipulated; rather, the researchers studied the correlational effects of 'natural' levels of self-efficacy on engagement. In the present experimental study (Study 2), we will manipulate changes in self-efficacy, i.e., an increase and decrease in self-efficacy, respectively, and study the effects of this manipulation on the change in engagement levels over time.

5.2.2. Performance

Several factors influence students' study performance (or academic performance), for example, the environment in which they operate (Salanova et al., 2010), past performance (Elias & MacDonald, 2007), actual skills (Brown, Tramayne, Hoxha, Telander, Fan & Lent, 2008; Robbins, Lauver, Le, Davis & Langley, 2004), and health (Trockel, Barnes & Egget, 2000). Nonetheless, students' self-efficacy levels seem to be one of the strongest predictors of performance (Multon, Brown & Lent, 1991; Robbins et al., 2004). Efficacious students generally perform well because they tend to try other options when they do not achieve their goals at first, they exert high levels of effort in doing so, and deal more effectively with problematic situations by persevering and staying confident that they will find solutions and be successful in the end (Bandura, 1997).

Ample correlational research has shown that academic self-efficacy is positively related to grades (Elias & MacDonald, 2007; see for an overview Multon et al., 1991) and task performance (e.g., Bouffard-Bouchard, 1990; Niemivirta & Tapola, 2007). Like the studies on engagement previously discussed, the field studies were correlational in nature. With regard to the experimental studies, Bouffard-Bouchard (1990) compared manipulated levels of self-efficacy as regards their effects on cognitive task performance of the participants, and Niemivirta and Tapola (2007) looked at changes in 'natural' levels of self-efficacy and their effects on task performance. In both experimental studies, higher levels of self-efficacy were related to higher levels of performance. Following Bouffard-Bouchard (1990), we manipulated self-efficacy levels and investigated whether different types of changes in self-efficacy levels correspond with similar changes in objective task performance.

5.2.3. Present studies

Despite the large number of studies on self-efficacy in relation to motivation and performance, most studies have been correlational in nature, neglecting individual differences in changes in self-efficacy levels. These type of studies investigate the *normative stability* (Taris, 2000) of self-efficacy. As mentioned, we look at the effects of change in and stability of self-efficacy over time. That is, we made a distinction between groups of students who differ in changes of self-efficacy levels over time. This is referred to as *level stability* (Taris, 2000). In our studies, we make a distinction between groups of students who differ in changes of self-efficacy levels over time. Further, we compare the group means of these theoretically

meaningful subgroups across time rather than examine relationships between variables over time. This person-centered perspective enables us to examine the effects of different types of changes and stabilities in self-efficacy levels on the outcome variables. In Study 1, we composed different subgroups on the basis of their natural changes in self-efficacy scores over time. In Study 2, we actually imposed a change in self-efficacy by manipulating the level of self-efficacy differently in subgroups.

5.3. Study 1: academic context

5.3.1. Overview and hypotheses

Study 1 is designed as a 'theoretically specified subgroup design' (Taris & Kompier, 2003), or put differently, as a natural experiment. As such, the participants are categorized according to their changes in self-efficacy scores over time, resulting in the following four subgroups: stability-low (low at Time 1 (T1) – low at Time 2 (T2)), increase (lowT1-highT2), decrease (highT1-lowT2), or stability-high (highT1-highT2). In the next section, we explain how these subgroups are constructed. We investigate whether students in these different self-efficacy subgroups differ as regards the changes in their scores on study engagement and study performance over time. We expect interaction effects of time and group on study engagement, and on study performance, respectively. More specifically, we hypothesize that students of the four different subgroups of changes in self-efficacy scores show similar changes in scores on study engagement (*Hypothesis 1*), and study performance (*Hypothesis 2*). So, we assumed that (high and low) stable groups have stable levels of engagement and performance over time, and we expect an increase (low-high)/decrease (high-low) in self-efficacy to co-vary with a corresponding increase/decrease in engagement and performance.

5.3.2. Method

Participants and procedure

This study was conducted among 335 university students (15% men), with a mean age of 20.7 years (*SD* = 2.0). We recruited the participants via flyers and we invited those who wanted to participate to send an email to the first author (address reported on the flyer). We only used the email addresses of the participants to send an invitation to fill in an online questionnaire. The university students, who participated voluntarily, received course credits in return. The study consisted of two measurements. Considering that a semester – half of a study year – consists of two time periods ('blocks') of equal size, T1 was at the end of the first block of the semester and T2 was at the end of the second block of the semester. Next to online questionnaire data, we also included the grades obtained by the study participants in those two semester blocks.

Measures

Study-related self-efficacy. We measured self-efficacy with a six-item scale (Midgley et al., 2000). A sample item is: "Even if the study task is hard, I can learn it". All items were scored on a six-point Likert scale (1 = strongly disagree, 6 = strongly agree). The scale had a good reliability at both time points (α_{T1} = .81 and α_{T2} = .78).

Study engagement. We assessed study engagement by means of the Utrecht Work Engagement Scale – Student survey (UWES-S; Schaufeli et al., 2002a) that consists of 17 items. A sample item is "When I'm doing my work as a student, I feel bursting with energy". All items were scored on a seven-point Likert scale (0 = never, 6 = always). The scale had a good reliability at both time points (α_{T1} = .92 and α_{T2} = .93).

Study performance. We calculated the Grade Point Averages (GPAs) per semester block to assess study performance. We conducted this as follows: the GPA at T1 was assessed by computing the mean grade of all tests that were conducted at the first block of the semester and T2 was assessed by computing the mean grade of all tests of the second block of the semester. The grades were acquired from the university register. Although the Dutch grading system ranges from 1 (extremely poor) to 10 (excellent), all grades below 5.5 were lumped together in the university's records and considered 'insufficient'. For the purpose of the current study we recoded all 5.5 grades to 5, so that the true range of grades in our study was from 5 (insufficient) to 10 (excellent).

Data analyses

Creation of subgroups. First, self-efficacy was dichotomized at both time points in high and low, using a median split procedure (see also De Lange, Taris, Kompier, Houtman & Bongers, 2002), resulting in four subgroups (low(T1)-low(T2), low(T1)-high(T2), high(T1)-low(T2), and high(T1)-high(T2)). Thus, self-efficacy was used as a categorical variable to predict the changes in scores (T1-T2) on study engagement and study performance. The outcome variables were continuous variables. The average self-efficacy scores per subgroup and corresponding paired-samples t-values to compare the group means over time are presented in Table 1.

Table 1. Means, standard errors, number of participants, and paired-samples *t*-values (T1-T2) of the self-efficacy subgroups

	T1		T2			
Self-efficacy subgroups	*M*	*SE*	*M*	*SE*	*N*	*t*
Low-low	3.22	0.03	3.23	0.03	136	-0.51^{ns}
Low-high	3.40	0.05	3.88	0.05	39	-10.83***
High-low	3.97	0.05	3.44	0.05	43	10.21***
High-high	4.15	0.03	4.11	0.03	117	1.20^{ns}

Note. *M* = mean, *SE* = standard error, *N* = number of participants, ns = not significant, *** $p < .001$

Controlling for demographics. To check for possible effects of age and year of study, we performed an analysis of variance (ANOVA) to test whether the four groups differed with regard to these variables. Further, by means of χ^2 test, we checked for significant gender differences between the four groups. This way, we ensured that the composed subgroups differed significantly in levels of self-efficacy over time but not with regard to demographics.
Variance analyses and t-tests. To test our hypotheses, a 2 (time: T1 and T2) x 4 (group: low-low, low-high, high-low, and high-high) multivariate analysis of variance with repeated measures (RM-MANOVA) was carried out with time as a within-subject factor and group as a between-subject factor. This analysis was followed by two separate univariate RM-ANOVA's with study engagement and study performance as outcome variables. In case of a significant effect of time, we conducted post-hoc paired-samples *t*-tests to see whether the separate group means differed significantly across time. In case of a main effect of group, we then conducted post-hoc independent samples *t*-tests to see whether group means significantly differed within the two time points. Finally, because of the unequal group sizes (see Table 1), we conducted Levene's tests to check for (un)equality of variances across groups.

5.3.3. Results

Preliminary analyses

Controlling for demographics. ANOVA's revealed that the four self-efficacy subgroups neither differ with regard to age, $F(3, 334) = 2.44$, $p = .06$, nor to year of study, $F(3, 334) = 0.54$, $p = .65$. Neither did the groups differ significantly as regards to gender, $\chi^2(3) = 5.50$, $p = .14$. Therefore, we excluded demographics from further analyses.

Testing hypotheses

We analyzed the data using a RM-MANOVA with a within-subject factor representing time (T1 and T2) and a between-subject factor of change in self-efficacy scores (low-low, low-high, high-low, and high-high). The RM-MANOVA with study engagement and study performance as dependent variables revealed no main effect of time, *Wilks' Lambda* = .99,

$F(2, 329) = 1.58$, $p = .21$, but it did reveal a significant effect of group (i.e., change in self-efficacy), *Wilks' Lambda* = .84, $F(6, 660) = 9.70$, $p < .001$, $\eta^2 = .08$, as well as a significant interaction effect of time and group, *Wilks' Lambda* = .94, $F(6, 660) = 3.75$, $p < .001$, $\eta^2 = .03$.

Results of additional univariate RM-ANOVA's showed a significant main effect of group (i.e., change in self-efficacy) on both study engagement, $F(2, 330) = 10.84$, $p < .001$, $\eta^2 = .09$, and study performance, $F(2, 330) = 10.07$, $p < .001$, $\eta^2 = .08$. Moreover, we found a significant interaction effect of time and group on study engagement, $F(2, 330) = 6.69$, $p < .001$, $\eta^2 = .06$, but not on performance, $F(2, 330) = 1.06$, $p = .37$. The interaction effect on study engagement was in the assumed direction (see Table 2 and Figure 1), so *Hypothesis 1* was confirmed. However, because no interaction effect of time and group was found on performance, *Hypothesis 2* was rejected. Figure 1 shows the results of the analyses.

Table 2. Means and standard errors (in brackets) of the outcome variables as a function of time and group

	Self-efficacy subgroups per time point										
	Low-low (*N* = 136)		Low-high (*N* = 39)		High-low (*N* = 43)		High-high (*N* = 117)		Time	Group	Time x Group
	T1	T2	T1	T2	T1	T2	T1	T2	RM-(M)ANOVA *F*-values		
Variables									$F(2,329) = 1.58^{ns}$	$F(6,660) = 9.70^{***}$ $\eta^2 = .08$	$F(6,660) = 3.75^{***}$ $\eta^2 = .03$
Study engagement	3.08 (.07)	3.04 (.07)	3.18 (.13)	3.45 (.13)	3.40 (.12)	3.12 (.13)	3.60 (.07)	3.60 (.08)		$F(2,330) = 10.84^{***}$ $\eta^2 = .09$	$F(2,330) = 6.69^{***}$ $\eta^2 = .06$
Study performance	6.64 (.07)	6.79 (.05)	6.72 (.14)	6.94 (.10)	6.97 (.13)	6.88 (.09)	7.06 (.08)	7.18 (.06)		$F(2,330) = 10.07^{***}$ $\eta^2 = .08$	$F(2,330) = 1.06^{ns}$

Note. *** $p < .001$, ns = not significant, *N* = total of participants

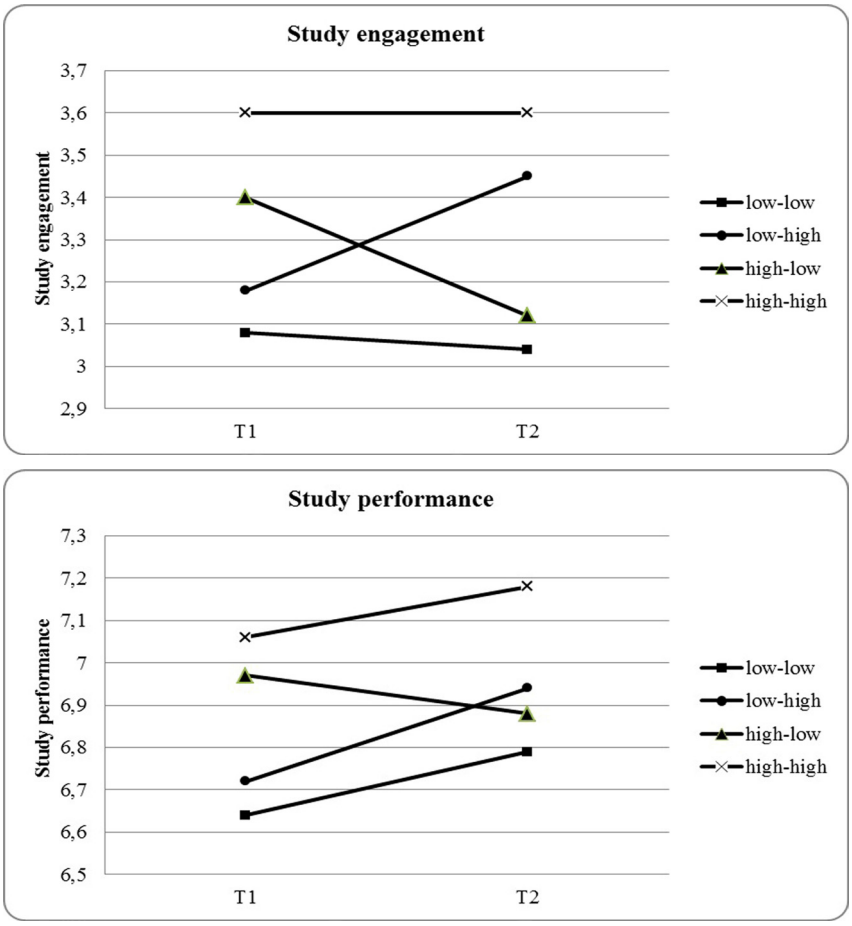

Figure 1. The effect of time and group (change in self-efficacy scores) on study engagement and study performance

Since the main group effects were significant for study engagement and study performance we conducted post-hoc tests by means of independent samples t-tests. In other words, we compared the group means within the two time points. As Table 2 shows, all differences in mean levels are in the expected direction; in all cases, the group means in the 'low' categories are actually lower than the group means of the 'high' categories and vice versa, both at T1 and T2. Although not all independent samples *t*-tests showed the expected significance levels, 19 of the 24 conducted t-tests (79.2%) were in line with our expectations. For reasons of economy, we will not describe the results of these t-tests in detail. Upon request, the results can be obtained from the first author. Finally, Levene's tests indicated no unequal variances for the different groups of change in self-efficacy scores.

5.3.4. Discussion

The results show that changes in self-efficacy scores align with similar changes in study engagement, but not with changes in study performance. We conclude that self-efficacy in an academic setting seems to relate to subjective measures like study engagement, but not to objective measures like GPA. A theoretical explanation is that it has to do with proximity: self-efficacy is firstly related to study engagement, after which it will have an impact on the change in performance. Since we found no relationship between changes in self-efficacy and changes in study performance, it could imply that the two measurements were too close together in time to uncover a similar trend of self-efficacy and study performance. Another explanation is methodological in nature and suggests that the relationship between self-efficacy and study engagement is partly explained by common method variance because of the use of self-reports for both constructs (Podsakoff, MacKenzie, Lee & Podsakoff, 2003). Practically speaking, as can be seen in Figure 1, the overall trend is that GPA scores increase toward the end of the semester. External factors could have positively influenced the grades (e.g., summer holidays getting closer), thereby undoing the possible effect of self-efficacy.

Although part of the results was unexpected, the findings suggest that something interesting is happening: a change in self-efficacy levels is related to how the level of engagement of students varies across time. However, causality cannot be determined based on the results of Study 1. Therefore, we conducted a study on self-efficacy, engagement, and performance using an experimental design. The advantage of this study is that the study takes place in a controlled setting, excluding external factors that could possibly interfere with the performance scores, like in Study 1.

5.4. Study 2: experimental setting

5.4.1. Overview and hypotheses

In the experiment, we assigned the participants to one of three self-efficacy conditions; through positive performance feedback (positive condition), we attempted to increase the level of self-efficacy, through negative performance feedback (negative condition) we attempted to decrease the level of self-efficacy, and finally, in the control condition we gave no feedback at all. *Hypothesis 1* predicts that there is an interaction effect of time and group in that the positive condition enhances task engagement, whereas the negative condition reduces task engagement, and the control condition is stable as far as task engagement is concerned. In addition, *Hypothesis 2* states that there is an interaction effect of time and group in that the positive condition enhances task performance, whereas the negative condition reduces task performance, and the control condition remains stable in task performance across the two measurements.

5.4.2. Method

Participants, design, and procedure

Participants. We recruited different participants for the second study and did so via posters and flyers at a university. The university students, who participated voluntarily, received course credits or a small payment in exchange. In the experiment, 91 university students participated (43% men). Their mean age was 20 years (*SD* = 3.80). Most of the participating students were in one of their first three years of college (82%).

Design. We randomly assigned the participants to one of the three conditions: (a) positive feedback group; (b) a negative feedback group, or; (c) a no feedback (control) group.

Procedure. The participants were seated in small cubicles and were verbally instructed by the researcher in that they would only need to follow the instructions on the computer screen. The first instruction page showed the cover story to the participants, which was that the study was on potential differences in IQ between the sexes. The experiment consisted of two similar IQ tasks (one existing IQ-test split at random in two; http://iq-test-online.co.uk). The tasks consisted of 15 multiple choice questions, the first of which was used as example question. The questions represented spatial aptitude issues, using twodimensional geometric symbols. After both IQ tasks, the level of task engagement was measured (T1 and T2). In between the two IQ tasks, we performed the self-efficacy manipulation. We used the method of providing bogus feedback in order to manipulate the level of self-efficacy. This method was proven to be successful in manipulating levels of self-efficacy in previous studies (e.g., Bouffard-Bouchard, 1990; McAuley, Talbot & Martinez, 1999). In the positive condition, the participants received bogus positive performance feedback ("Congratulations! Your IQ score belongs to the best 10% of the participants so far!"). In the negative condition, the participants received bogus negative performance feedback ("Unfortunately, your IQ score belongs to the worst 10% of the participants so far"). Finally, in the control condition, the participants did not receive any performance feedback. Following the manipulation, the participants had to fill in a Sudoku puzzle, as a filler task to distract them from the manipulation. They were given three minutes to get as far as they could get. The experiment finished with the second IQ task and the second measurement. All participants received bogus positive performance feedback on the second task in order to avoid that the students felt depressed after the experiment. On average, the experiment took the participants 20 to 30 minutes. The participants could leave their email address to be informed on the results of the experiment.

Measures

Task-related self-efficacy. The scale consisted of two items which we developed for the specific context of this study. We based the items on those used by Bouffard-Bouchard (1990) and formulated them as follows: "I believe I will perform well on the next IQ-task"

and “I have confidence in my abilities to do well on the next IQ-task”. Participants responded using a nine-point scale anchored by 1 (not at all applicable) to 9 (very much applicable). The inter-item correlation of the two self-efficacy items was .71.

Task engagement. An adjusted version of UWES-S (Schaufeli, Salanova, González-Romá & Bakker, 2002b; 9-item student version) was used to assess task engagement. The adjustments were twofold: the items were formulated in the passed tense and at a task level instead of academic level. An example of an item is ”I felt energetic when I carried out the task”. The task engagement scale had a good reliability at both time points (α_{T1} = .83 and α_{T2} = .86).

Task performance. Task performance was assessed as the sum of the correct answers on the IQ tasks. The scores on task performance could range from 0 to 14.

Data analyses

Controlling for demographics and T1 variables. In order to establish that participants of the three conditions did not differ with regard to the outcome variables before the experiment started, ANOVA’s were conducted on task engagement and task performance. Also, to check for the possible effects of age and year of study, we conducted ANOVA’s, whereas we used a χ^2 test to check for possible gender differences between the three conditions.

Variance analyses and t-tests. To test the hypotheses, a 2 (time: T1 and T2) x 3 (group: positive, negative, and control) RM-MANOVA was carried out with time as a within-subject factor, group as a between-subject factor, and task engagement and task performance as dependent variables. In addition, we performed univariate RM-ANOVA’s to test the effects on task engagement and task performance separately. Finally, we conducted post-hoc paired-samples *t*-tests in any case to see whether the separate condition means differed significantly across time. The reason for this is that these tests contain information with regard to changes over time per condition, which is relevant in acquiring more insight in the data of this study. Finally, in case of a main effect of condition, we conducted post-hoc independent samples *t*-tests to see whether the separate condition means significantly differed within time points.

5.4.3. Results

Preliminary analyses

Controlling for demographics and T1 variables. ANOVA’s on the T1 variables revealed that participants in the three conditions did not significantly differ as regards the mean levels of task engagement, $F(2, 90) = 1.01$, $p = .37$, and task performance, $F(2, 90) = 0.29$, $p = .75$. Further, it appeared that participants in the three conditions did not differ with regard to age, $F(2, 83) = 0.98$, $p = .38$, year of study, $F(2, 82) = 0.58$, $p = .56$, and gender, $\chi^2(2) = 2.69$, $p = 26$. So, demographics were excluded from further analyses.

Manipulation check. The manipulation was effective; that is, the participants in the positive

condition scored higher on self-efficacy (M = 6.31, SD = 1.07) than the participants of the negative condition (M = 4.89, SD = 1.32) and the control condition (M = 5.47, SD = 1.22), $F(2,90) = 10.84$, $p < .001$ after the manipulation. Further, Tukey's post hoc tests confirmed that participants in the positive condition scored significantly higher on self-efficacy than those in the negative condition ($p < .001$) and those in the control condition ($p < .05$). However, participants' self-efficacy scores in the negative condition did not significantly differ from those in the control condition ($p = .16$).

Testing hypotheses

Analyses of variance and t-tests. We analyzed the data using a RM-MANOVA with time (T1 and T2) as a within-subject factor and group (positive, negative, and control) as a between-subject factor. The analyses with task engagement and task performance as dependent variables, revealed a significant main effect of time, *Wilks' Lambda* = .86, $F(2, 87) = 6.86$, $p < .01$, $\eta^2 = .14$, but no significant main effect of group (i.e., self-efficacy condition), *Wilks' Lambda* = .93, $F(4, 174) = 1.60$, $p = .18$. Finally, we observed a significant interaction effect of time and group, *Wilks' Lambda* = .83, $F(4, 174) = 4.21$, $p < .01$, $\eta^2 = .09$.

In addition, univariate RM-ANOVA's revealed a significant main effect of time on task engagement, $F(1, 88) = 13.60$, $p < .001$, $\eta^2 = .13$. However, we did not observe a main time effect on task performance, $F(1, 88) = 0.59$, $p = .44$. Finally, we found significant interaction effects of time and group on both task engagement, $F(2, 88) = 4.70$, $p < .05$, $\eta^2 = .10$, and task performance, $F(2, 88) = 3.60$, $p < .05$, $\eta^2 = 08$. Since the interaction effects were both in the assumed direction (see Table 3 and Figure 2), *Hypotheses 1* and *2* are confirmed.

Table 3. Means, standard errors (in brackets), and t-values of the outcome variables as a function of time and group

	Self-efficacy conditions per time point											
	Positive (N = 31)			Negative (N = 31)			Control (N = 29)			Time	Group	Time x Group
	T1	T2	*t*	T1	T2	*t*	T1	T2	*t*	RM-(M)ANOVA *F*-values		
Variables										$F(2,87)=$ 6.86** $\eta^2=.14$	$F(4,174)$ = 1.60^{ns}	$F(4,174)$ = 4.21** $\eta^2=.09$
Task engagement	4.47 (.16)	4.51 (.17)	-0.35^{ns}	4.33 (.16)	3.96 (.17)	3.38**	4.64 (.16)	4.27 (.17)	3.54***	$F(1,88)=$ 3.60*** $\eta^2=.13$		$F(2,88)$ = 4.70* $\eta^2=.10$
Task performance	9.32 (.41)	10.19 (.40)	-3.10**	8.90 (.41)	8.39 (.40)	3.54***	9.24 (.43)	9.38 (.41)	-0.31^{ns}	$F(1,88)$ = 0.59^{ns}		$F(2,88)$ = 3.60* $\eta^2=.08$

Note. * $p < .05$, ** $p < .01$, *** $p < .001$, ns = not significant, N = total of participant

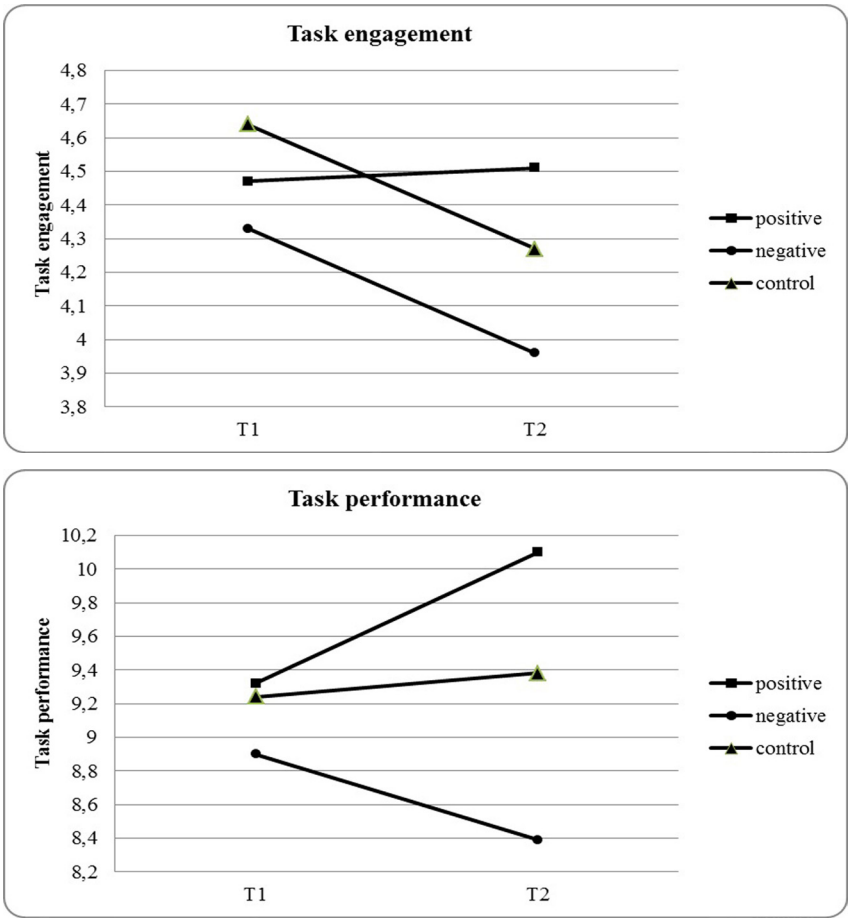

Figure 2. The effect of time and group (self-efficacy condition) on task engagement and task performance

Post-hoc paired-samples t-tests indicated that, in the positive condition, scores were significantly higher at T2 than at T1 for performance ($t(30) = -3.10$, $p < .01$), but not for task engagement. In the negative condition, the scores on task engagement ($t(30) = 3.38$, $p < .01$) decreased significantly, whereas the performance scores did not. Finally, in the control condition, the scores on performance were stable across time, whereas the scores on task engagement decreased ($t(28) = 3.54$, $p < .001$) over time. See Table 3 for all *t*-values, means, and standard errors of the outcome variables of the separate conditions.

5.4.4. Discussion

Based on the experiment in Study 2 we conclude that, indeed, manipulated changes in levels of self-efficacy have a significant influence on changes in scores on task engagement and task performance. Students who received positive performance feedback with the

aim of boosting their self-efficacy also showed an increase in actual task performance. In a similar vein, task performance decreased when students received negative feedback and it remained stable in the control condition. These findings support the practical explanation that was given in the Discussion section of Study 1: we found no relationship between changes in self-efficacy and study performance, which is likely to do with the fact that external factors influenced the performance of students. This is because the relationship between self-efficacy and performance appeared to do exist within a controlled setting (Study 2), in which external factors were excluded.

The effects of changes in self-efficacy on task engagement were slightly different. Although the interaction effect of time and group on task engagement was significant, the level of task engagement was not significantly enhanced following the positive self-efficacy manipulation. Most likely this is caused by the fact that the overall trend indicated that students were getting bored of the task at the end of the experiment (T2). Both the negative and control conditions decreased significantly in engagement at T2 as compared to T1. These trends in task engagement were previously found in a controlled setting (Vera et al., 2011). Indeed, personal communication with the participants revealed that most participants were getting bored of the task at the end of the experiment. The positive self-efficacy manipulation possibly buffered this effect so that in the positive condition the level of engagement was stable across time.

5.5. General discussion

5.5.1. Main findings

The aim of our two studies was to explore to what extent stability and change in levels of self-efficacy over time correspond with similar changes in levels of engagement and performance, in a field setting as well as in a controlled setting. Results showed that our expectations were partly confirmed; changes in self-efficacy corresponded with similar changes in the outcome variables, except for performance in Study 1. So, we cross-validated the effects of changes in self-efficacy on changes in engagement across a field and an experimental setting. However, we found effects of changes in self-efficacy on performance changes in an experimental setting only. We presented a possible explanation for this unexpected null-finding in the Discussion of Study 1. As in a controlled setting the relationship between self-efficacy and performance did exist, it is likely to assume that in Study 1 external factors 'overruled' the effects of changes in self-efficacy on the changes in study performance over time; at least more so than on changes in subjective outcomes such as study engagement. Another theoretical explanation of the inconsistent results with regard to performance could have to do with the fact that the assessment of self-efficacy in Study 1 was not specific enough to be related to the students' grades. Although the measure was specific for the academic domain, it was not geared to the specific courses. In Study 2 we used a more

specific measure of self-efficacy and we indeed found it to be of influence on changes in task performance. Bandura (1997) stated that the more specific the assessment of self-efficacy, the more likely it is to be related to outcomes such as motivation and performance.

All in all, we found that students with increased self-efficacy also increased in engagement and performance over time, either at academic level (Study 1) or task level (Study 2). On the other hand, students who decreased in self-efficacy are potentially at risk in that they are more likely to feel less engaged and perform poorer over time. These results are in line with SCT, in that they confirm that self-efficacy has a significant impact on human cognition and motivation (engagement), and behavior (performance).

Although three out of four interaction effects were significant, not all subgroup differences within time (Study 1) and not all changes over time per condition (Study 2) in the outcome variables were as expected. In Study 2, task engagement was stable over time in the positive condition and decreased significantly in the control condition. An explanation was given in the Discussion of Study 2, namely the overall trend was that students were getting bored of the task at the end of the experiment (see also Vera et al., 2011). Nevertheless, our results by and large confirm what was stated in the Introduction, namely, that it is not only important what students can do, but also what they *believe* they can do. Although an extensive body of research confirmed this general notion (see for overviews Brown et al., 2008; Multon et al., 1991), our studies using a person-centered approach specifically showed that groups of students, who are classified based on different types of changes in self-efficacy scores over time, exhibit changes in engagement (in both studies) and performance (in Study 2) parallel to the changes in self-efficacy.

Our study method compared groups of students based on the change in their self-efficacy beliefs. So far, most studies on the effects of self-efficacy were correlational and thus variable-centered (e.g., Llorens et al., 2007; Ouweneel et al., 2011). Comparing changes in self-efficacy scores across groups has been done mainly in experimental settings (e.g., McAuley et al., 1999; Salanova et al., 2011). To our knowledge, our study is the first in which groups of students were compared in a natural setting, and were classified based on their natural changes in self-efficacy scores (i.e., a natural experiment). As we stated in the Introduction section, the most prominent advantage of this person-centered design is that it does not make the assumption that students are similar in self-efficacy changes over time (Lerner et al., 2001). Since self-efficacy depends on the domain (e.g., exam or task) it is unlikely to assume that self-efficacy is stable throughout the semester, at least not for all students. A person-centered approach as the one we adopted, acknowledges these differences in self-efficacy changes over time. Moreover, these groups are identifiable in practice, which provides a starting point for intervening on certain groups of students.

5.5.2. Strengths and limitations

In our studies, we compared theoretically distinct groups of students with each other. This has rarely been done before in a natural setting. Besides that, our studies have several other strengths. First of all, we made use of actual performance measures, which enabled us to link subjective self-efficacy to objective outcome measures. Second, both studies had longitudinal designs, so that we were able to look at changes over time. Finally, we combined a field study with an experimental study in order to cross-validate findings from the field in a controlled setting.

However, despite these strong points, there is still room for improvement and need for further studies. Firstly, environmental factors such as study resources (e.g., social support) and demands (e.g., time pressure) (Salanova et al., 2010) were not incorporated into our field study. By not including these environmental factors, the origin of the self-efficacy levels in Study 1 is unclear. Also, these factors potentially could have had an influence on the relationships between self-efficacy and the outcome variables. The studies reported here only give insight into the score changes in self-efficacy across time and the extent to which these score changes correspond with the score changes of the other study variables. Future field studies should include environmental variables to have a more detailed look at psychological processes within the academic context.

In Study 1, we measured self-efficacy with respect to the academic domain. However, it would be advisable in future studies to further tailor its measurement by focusing on specific courses. Since self-efficacy applies to the level of specific courses or exams, this would lead to even more valuable insights on task-specific self-efficacy in academic settings. Also with regard to Study 1, the two time points were within one academic semester. A longer time lag could have resulted in stronger changes in the research variables and therefore in even more convincing results. Also, Taris and Kompier (2003) state that, strictly speaking, two observations are not adequate for studying intra-individual processes. This information is usually insufficient for a thorough understanding of the process responsible for changes over time. However, clearly, two observations do provide information about change over time (Taris & Kompier, 2003). Nonetheless, future studies should contain three measurements or more, and preferably with longer time lags, to conduct for example growth curve modeling (see Niemivirta, 2004).

5.5.3. Implications

Both researchers and practitioners are interested in optimizing positive change in human beings (Lerner et al., 2001). In that sense, our person-centered approach provides important practical and empirical insights. Our results show that, on the one hand, natural changes of scores in self-efficacy correspond with parallel changes in levels of engagement among students. On top of that, self-efficacy levels can be manipulated in a controlled setting.

Future research could focus on increasing students' self-efficacy levels in the field (see for example Bresó et al., 2011). Training programs can help students to set goals to achieve study-related goals. Increased levels of self-efficacy are likely to follow goal setting (Schunk & Ertmer, 1999). Increases in self-efficacy will then lead to increases in, for example, engagement levels which will keep students motivated to put effort into their studies. Moreover, training programs could cause strong increases in self-efficacy levels, at least stronger than 'natural' increases in self-efficacy. This enhances the likelihood that an increased level of self-efficacy has a positive impact on performance.

The results of Study 2 showed that providing positive performance feedback is a suitable method to achieve increases in self-efficacy levels among students. University teachers and supervisors can play an important role in changing the self-efficacy beliefs of students in a positive way, e.g., by paying full attention to providing students with positive feedback. Our results showed that bogus feedback works, even without further information. However, others have stated that, in practice, feedback should rather be accurate (Linnenbrink & Pintrich, 2003) and instructive (Schunk, 1983) to enhance self-efficacy levels. In other words, feedback should fit the actual situation and must be shared so that a student can in fact improve his or her situation. So, when a student is not performing very well, teachers might be better off by giving true feedback and by setting personal goals with and for the student instead of providing bogus performance feedback. By monitoring the self-efficacy beliefs of students, university teachers and supervisors can act upon decreasing levels of self-efficacy and prevent students from failing their courses or even leaving university. Similar to how we started our article, we conclude that, next to actual capabilities, students' capability beliefs are crucial for academic success. Since self-efficacy beliefs are prone to faulty assessments (Bandura, 1997), making positive changes in these beliefs among students seems to be a worthwhile endeavor.

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Chapter 6.
On being grateful and kind: Results of two randomized controlled trials on study-related emotions and study engagement

Based on:

Ouweneel, E., Le Blanc, P.M., & Schaufeli, W.B. (submitted). On being grateful and kind: Results of two randomized controlled trials on study-related emotions and study engagement.

6.1. Introduction

The recent rise of positive psychology has laid out the theoretical foundation for positive states such as study engagement. Study engagement is described as a positive and inspiring state of mind that is characterized by vigor, dedication and absorption (Schaufeli & Bakker, 2004; Schaufeli, Martinez, Marques Pinto, Salanova & Bakker, 2002). University students are vigorous when they experience high levels of energy and mental resilience, willingness to invest effort, and persistence in the face of difficulties. Dedicated students feel a sense of significance, enthusiasm, inspiration, pride, and challenge with regard to their studies. Finally, students are absorbed when they are fully focused on their study tasks and feel that time is flying (Bresó, Schaufeli & Salanova, 2011). The concept of study engagement has become more and more relevant due to the increasing pressure on students to perform and successfully complete their studies. Previous studies have found that study engagement, or academic engagement, is associated with higher levels of self-efficacy, hope and optimism among students (Ouweneel, Le Blanc & Schaufeli, 2011a) as well as with superior study performance (Salanova, Schaufeli, Martinez & Bresó, 2010).

Despite the large amount of research attention on engagement as well as positive psychology in a general context, there has been little attempt to increase student well-being by means of positive psychological interventions. Hence, the time has come to combine our knowledge on positive psychology and study engagement, and apply this knowledge and evaluate positive psychological interventions within an academic setting. Following the basic idea of positive psychology, study-related interventions should not focus exclusively on stressed students, but also on those who seem to be functioning well, but not to the best of their abilities. Recently, Ouweneel, Schaufeli, and Le Blanc (2009) coined the term '*amplition*' – stemming from the Latin '*amplio*', meaning to enlarge, increase, or magnify – to refer to interventions that focus on improvement, instead of treatment or prevention. So, in contrast with treating students who are stressed (curation) or avert such negative states (prevention), positive psychological interventions are about boosting positive states (amplition), like engagement.

The main objective of this paper is to demonstrate that existing empirical knowledge on positive, context-free happiness interventions, and their favorable effects on subjective well-being, can be used to design specific study-related amplitive interventions. We took on two existing happiness interventions that are general in nature, and tailored these onto a study-related context. More specifically, by means of two separate interventions, namely 'thoughts of gratitude' and 'acts of kindness', we attempted to enhance study-related positive emotions as well as study engagement, and reduce study-related negative emotions among university students.

6.1.1. Positive psychological interventions

Study engagement is conceptually comparable to subjective student well-being. Like study engagement, *subjective well-being* (or *happiness*) is defined as a positive affective-cognitive state of mind (Diener, Suh, Lucas & Smith, 1999). According to Ryan and Deci (2001, p. 144) subjective well-being: "… consists of three components: life satisfaction, the presence of positive mood, and the absence of negative mood, together often summarized as happiness". In short, happiness is defined as a positive affective-cognitive state that consists of both feeling good (i.e., affect) and thinking positively of your life (i.e., cognition). The same applies to study engagement; it entails both feeling good when studying and evaluating your studies positively. Whereas subjective well-being relates to life in general, engagement is considered a positive affective-cognitive state with regard to specific life-domains, such as one's study. For that reason, we propose study engagement as a domain-specific form of happiness.

Subjective student well-being has three main determinants: genetics, circumstances and intentional activities (Lyubomirsky, Sheldon & Schkade, 2005a). It is claimed that half of the variance in well-being is determined by genetics (Lykken & Tellegen, 1996), and circumstances would account for only 10% of the variance (Diener et al., 1999). Finally, 40% of the variance in well-being would originate from intentional activities. These activities include all things people choose to do and think in their daily lives (Lyubomirsky et al., 2005a). Three types of intentional activities have been found to be positively related to measures of well-being: cognitive activities, such as expressing gratitude towards others was found to be positively related to positive emotions and physical health (e.g., Emmons & McCullough, 2003), behavioral activities, such as being kind to others, had a positive effect on happiness experiences (e.g., Otake, Shimai, Tanaka-Matsumi, Otsui & Fredrickson, 2006), and motivational activities, like setting and planning towards personal and meaningful goals, was positive related to well-being (e.g., MacLeod, Coates & Hetherton, 2008). In this paper, we investigate the effects of an intervention based on a cognitive activity and another intervention based on a behavioral activity. We chose to investigate the effects of thoughts of gratitude as a cognitive activity and acts of kindness as a behavioral activity, respectively, since these interventions have been found to enhance general well-being in previous research (e.g., Otake et al., 2006; Sheldon & Lyubomirsky, 2006). In addition, these two types of interventions can be implemented within a relatively short time frame, and can attain instant effects. In contrast, for motivational activities, more time and energy is needed to affect well-being, since making progress towards attaining personal goals is needed to have positive experiences (MacLeod et al., 2008).

We assume that cognitive (i.e., thoughts of gratitude) and behavioral (i.e., acts of kindness) activities generate positive experiences and thus are likely to increase positive emotions and decrease negative emotions instantly. Furthermore, we presume that

increased levels of positive emotions are to result in increased levels of engagement because positive emotions facilitate approach behavior, which prompts students to set goals and to be engaged in attaining these goals (Cacioppo, Gardner & Berntson, 1999). As such, we expect that intentional cognitive and behavioral activities would not only cause higher levels of positive emotions (and lower levels of negative emotions), but also higher levels of study engagement.

6.1.2. Thoughts of gratitude

Gratitude can be directed towards life experiences or directed towards people. Expressing or feeling gratitude can lead to positive emotions and well-being because it promotes the savoring of positive experiences, so that people can optimize feelings of enjoyment from their circumstances (Sheldon & Lyubomirsky, 2006). It prevents people from taking anything or anyone for granted. Finally, gratitude is incompatible with feeling bad, so it is likely that stimulating gratitude inhibits negative emotions (McCullough, Emmons & Tsang, 2002). Emmons and McCullough (2003) conducted three studies on the effects of counting one's blessings, (i.e., feeling gratitude towards life experiences): a weekly and a daily gratitude intervention among 'healthy' participants and a gratitude intervention in a clinical sample. They concluded that keeping daily gratitude notes for 13 days had a stronger instant effect on positive emotions than a weekly intervention. However, keeping weekly gratitude notes for ten weeks was needed to affect physical health in a positive way. Finally, as opposed to the first two studies, in the third study using a clinical sample, daily gratitude notes resulted in a decrease of negative emotions. Positive effects on positive emotions and well-being were also found in a two-week daily gratitude intervention among early adolescents (Froh, Sefick & Emmons, 2008), in a gratitude intervention among students consisting of three sessions in four weeks (Sheldon & Lyubomirsky, 2006), in a gratitude contemplation intervention of eight days in four weeks (Rash, Matsuba & Prkachin, 2011), and finally, in a six-week intervention among students (see Lyubomirsky et al., 2005b).

Seligman, Steen, Park, and Peterson (2005) conducted randomized controlled trials of five separate positive psychology interventions. Results showed that the gratitude activity (i.e., writing and delivering a gratitude letter to someone) caused the most pronounced positive changes in happiness among participants. The positive effect on well-being lasted up to a month. The participants in the gratitude condition were given one week to write a gratitude letter to someone who they are grateful to but never properly thanked, and bring this letter to the person in question. Watkins, Woodward, Stone, and Kolts (2003) compared the effectiveness of cognitive and behavioral gratitude interventions. They found that a cognitive intervention, such as grateful thinking, had a stronger effect on positive emotions than a behavioral intervention, i.e., writing a gratitude essay or a gratitude letter, probably because writing an essay or letter was too demanding. All in all, general, context-free

gratitude interventions appeared to be effective in enhancing well-being, and cognitive gratitude interventions seem to have stronger effects than behavioral gratitude interventions. Therefore, we designed our gratitude intervention as a cognitive intervention, rather than a behavioral intervention.

6.1.3. Acts of kindness

The effects of acts of kindness have received less research attention. Whereas gratitude can be a result of receiving kindness from people, kindness entails enacting kind behaviors towards people (Otake et al., 2006). Conducting acts of kindness, such as helping someone with his or her homework, or holding a door for someone, is assumed to have a favorable effect on positive emotions and well-being. Research showed that when people perform behaviors that are courteous or altruistic, they report higher levels of happiness (Lyubomirsky, King & Diener, 2005b). On the one hand, performing acts of kindness makes people feel good about themselves and their ability to help other people. On the other hand, kind acts generate positive reactions of others like gratitude and affection (Lyubomirsky et al., 2005a). Simply counting one's acts of kindness for one week appeared to affect the level of subjective well-being significantly (Otake et al., 2006). As far as we know, the effects of acts of kindness on negative emotions have not been investigated yet.

6.1.4. The present studies

Study 1 and Study 2 both comprise of randomized controlled trials in which the participating students were assigned to an experimental group, either 'thoughts of gratitude' (Study 1) or 'acts of kindness' (Study 2), or to one of the two non-intervention control groups. *Hypothesis 1* states that students who perform thoughts of gratitude/acts of kindness, experience significantly more positive emotions over time (during and after the intervention) than do students of the control groups. In other words, we expect an interaction effect of time and group on positive emotions. We expected opposite effects of these interventions on negative emotions. *Hypothesis 2* states therefore, that students who perform thoughts of gratitude/acts of kindness, experience significantly less negative emotions over time (during and after the intervention) than do students of the control groups. In other words, we expect an interaction effect of time and group on negative emotions. Finally, Hypothesis 3 assumes that students who perform thoughts of gratitude/acts of kindness experience significantly more study engagement over time (after the intervention) than do students of the control groups. In other words, we expect an interaction effect of time and group on study engagement in both studies.

6.2. Method

6.2.1. Participants

In Study 1, 50 students participated, 25 in the experimental condition, and 25 in the control condition. Their mean age was 21.26 years (*SD* = 1.93). Of the participants, 72% was female. Most of the participants were in the second or third year of their studies (79.6%). In Study 2, 49 students participated, 25 in the experimental condition, and 24 in the control condition. Their mean age was 20.88 (*SD* = 1.94) and most of the participants were female (84%). As in Study 1, most of the participants (81.7%) were in the second or third year of their studies.

6.2.2. Recruitment and general procedure

The participants of both studies were recruited via posters and flyers. Following Seligman et al. (2005), we conducted all further communication via the Internet. Students were asked to send an email to the researchers in case they wanted to participate. The university students, who participated voluntary, received course credits in return. Note however, these course credits were not awarded until their participation was fully completed. The participants were then randomly assigned to the experimental and control conditions. After registration, the participants received an email in which the procedures were stipulated. The research started in a weekend with an online survey, in which positive and negative emotions and study engagement were assessed (T1 – week 0). After completing the survey, the participants received specific instructions for the intervention week via email, depending on the condition that they were assigned to. During the intervention week, from Monday until Friday, every morning the participants received an email on the activities for that specific day. Along with these emails, a short questionnaire was sent every day, to assess positive and negative emotions (day 1 – day 5). The participants were requested to fill in the questionnaire and write down a short report on the intervention activities of that day, both in the experimental and control condition. All participants were asked to use at least 50 words in the reports on their activities and thoughts. They were required to send this report and questionnaire back per email every evening. To optimize participation, the participants received two reminders per day via email. After the intervention week, the post measurement of positive and negative emotions and study engagement took place by means of a second online survey (T2 – week 1). Finally, four weeks later, the follow-up measurement on positive and negative emotions and study engagement was completed (T3 – week 5).

6.2.3. Procedure Study 1: Thoughts of gratitude

The participants in experimental gratitude condition were asked to think of people or experiences that they were grateful for. The participants were instructed to focus their gratitude each day on a different domain. On Monday, we asked them to think back on their

years at Primary School. “Take your time to think of a person you were close to and of whom you are grateful with reference to a specific event. For example, a friend or family member who helped you with your homework. Write down a short note on what you are thinking: To whom do you want to express your gratitude and why?” On Tuesday, the instructions were similar, but with regard to the years at High School. The instruction on Wednesday had to do with the academic study the participant is currently enrolled in. On Thursday, the participants were asked to think of their High School period once more, but specifically of a teacher. Finally, on Friday, the students had to think again of a teacher they were grateful of, but with regard to their current studies. Following Sheldon and Lyubomirsky (2006), we asked the participants in the control condition every day, from Monday until Friday, to write down the details of their day. The specific instruction was: “Think of the people you met and experiences you had today. Describe in short what your day looked like”.

6.2.4. Procedure Study 2: Acts of kindness

The participants of the kindness condition did not receive daily instructions like in Study 1; rather they received the complete instruction for the intervention week beforehand. Every day, from Monday until Friday, the assignments were similar. “We would like to ask you to pay close attention to your behavior towards the people around you at your university. During the coming week, please perform at least five acts of kindness per day and report on them in the evening, including the responses of others that you received. Examples of acts of kindness are: holding a door for someone at university, greeting strangers in the hallway, helping other students in preparing for an exam, etcetera. It does not matter whether you address your acts of kindness to people you know or not”. However, it is important that the acts that you perform are study-related somehow. The participants in the control condition had similar instructions to those in Study 1. “Think of the people you met and experiences you had today. Describe in short what your day looked like”.

6.2.5. Measures

Study-related positive and negative emotions. We used a shortened 12-item Dutch version (Schaufeli & Van Rhenen, 2006) of the Job-related Affective Well-being Scale (JAWS; Van Katwyk, Fox, Spector & Kelloway, 2000) to assess positive and negative emotions (both six items). For the present study, the scale instruction was adjusted to students by substituting ‘work’ by ‘studies’. Further, the items were modified to fit the time line of our studies. Example items of the five daily measures of emotions are (day 1 – day 5): “Today, I felt inspired”, and “Today, I felt discouraged”. The pre-, post-, and follow-up measurements (T1 – week 0, T2 – week 1, T3 – week 5) were formulated as follows: “My study makes me feel inspired”, and “My study makes me feel discouraged”. All items were scored on a five-point Likert scale (1 = (almost) never, 5 = (almost) always). The scale of positive emotions had a

mean reliability of α_M = .71 across the eight time points in Study 1 (range of .60 - .81) and of α_M = .79 in Study 2 (range of .70 - .87). The scale of negative emotions had a mean reliability of α_M = .68 across the eight time points in Study 1 (range of .54 - .78) and of α_M = .75 in Study 2 (range of .69 - .84).

Study engagement. Study engagement was assessed by means of the Utrecht Work Engagement Scale – Student survey (UWES-S; Schaufeli et al. 2002) that consists of 17 items. Study engagement was assessed only at the pre-, post-, and follow-up measurements (T1 – week 0, T2 – week 1, T3 – week 5). A sample item is "When I'm doing my work as a student, I feel bursting with energy". All items were scored on a seven-point Likert scale (0 = never, 6 = always). The scale had a good reliability across the three time points in both Study 1 (α_{T1} = .94, α_{T2} = .94, and α_{T3} = .92) and Study 2 (α_{T1} = .91, α_{T2} = .90, and α_{T3} = .93).

6.3. Results

6.3.1. Preliminary analyses Study 1 and Study 2

For Study 1, independent samples t-tests on the T1 variables revealed that participants in the two conditions did not significantly differ as regards the mean levels of study-related positive emotions, $t(48) = 1.16$, $p = .25$, study-related negative emotions, $t(48) = -0.29$, $p = .77$, and study engagement, $t(48) = 1.26$, $p = .22$. The means and standard errors of all outcome variables of Study 1 are depicted in Table 1. Further, it appeared that participants in the two conditions did not differ with regard to age, $t(48) = -0.22$, $p = .83$, year of study, $t(48) = -0.71$, $p = .48$, or gender, $\chi^2(1) = 0.40$, $p = .53$.

Table 1. Means and standard errors, per condition and per time point of positive emotions, negative emotions, and study engagement of Study 1 (thoughts of gratitude)

	Positive emotions				Negative emotions				Study engagement			
	Experimental		Control		Experimental		Control		Experimental		Control	
Time point	*M*	*SE*	*M*	*SE*	*M*	*SE*	*M*	*SE*	*M*	*SE*	*M*	*SE*
T1 (week 0)	3.83	0.10	3.66	0.10	1.93	0.10	1.97	0.10	3.49	0.19	3.16	0.19
Day 1	3.71	0.10	3.54	0.10	1.91	0.12	1.97	0.12				
Day 2	3.77	0.10	3.48	0.10	1.78	0.11	1.97	0.11				
Day 3	3.76	0.08	3.53	0.08	1.79	0.09	1.92	0.09				
Day 4	3.84	0.10	3.38	0.10	1.80	0.10	1.93	0.10				
Day 5	3.95	0.11	3.38	0.11	1.69	0.09	1.88	0.09				
T2 (week 1)	3.87	0.11	3.74	0.11	1.84	0.08	1.72	0.08	3.46	0.19	3.17	0.19
T3 (week 5)	3.72	0.11	3.64	0.11	1.86	0.10	1.88	0.10	3.51	0.16	3.00	0.16

Note. *M* = mean; *SE* = standard error

For Study 2, similar results were found. Independent samples t-tests on the T1 variables revealed that participants in the two conditions did not significantly differ as regards to mean levels of positive emotions, $t(47) = 0.50$, $p = .62$, negative emotions, $t(47) = -0.34$, $p = .57$, and study engagement, $t(47) = 0.32$, $p = .75$. The means and standard errors of all outcome variables of Study 2 are depicted in Table 2. Further, participants in the two conditions did not differ with regard to age, $t(47) = -0.58$, $p = .57$, year of study, $t(47) = 0.89$, $p = .38$, or gender, $\chi^2(1) = 1.36$, $p = .24$. So, we excluded demographic variables from further analyses.

Table 2. Means and standard errors, per condition and per time point of positive emotions, negative emotions, and study engagement of Study 2 (acts of kindness)

	Positive emotions				Negative emotions				Study engagement			
	Experimental		Control		Experimental		Control		Experimental		Control	
Time point	*M*	*SE*	*M*	*SE*	*M*	*SE*	*M*	*SE*	*M*	*SE*	*M*	*SE*
T1 (week 0)	3.54	0.13	3.45	0.13	2.01	0.12	2.07	0.12	3.08	0.15	3.01	0.16
Day 1	3.47	0.11	3.18	0.11	1.89	0.11	1.99	0.11				
Day 2	3.53	0.11	3.03	0.11	1.92	0.11	2.03	0.12				
Day 3	3.61	0.10	3.13	0.10	1.91	0.11	2.00	0.11				
Day 4	3.63	0.10	3.13	0.10	1.90	0.10	2.04	0.11				
Day 5	3.81	0.10	3.04	0.10	1.79	0.12	2.10	0.12				
T2 (week 1)	3.57	0.14	3.31	0.14	1.97	0.15	2.19	0.15	3.39	0.14	3.02	0.14
T3 (week 5)	3.67	0.14	3.47	0.15	2.02	0.13	1.95	0.13	3.02	0.17	3.07	0.18

Note. *M* = mean; *SE* = standard error

6.3.2. Results Study 1: Thoughts of gratitude

Study-related positive emotions. To test the hypotheses, we carried out 8 (time: T1, day 1 – day 5, T2, and T3) x 2 (condition: experimental and control condition) repeated measures analyses of variances (RM-ANOVA's), with time as a within-subject factor, and condition as a between-subject factor to investigate the effects on positive (and negative) emotions. Results showed no main effect of time on positive emotions, $F(7, 42) = 0.94$, $p = .49$, but a main effect of condition, $F(1, 48) = 7.29$, $p < .01$, $\eta^2 = .13$, and a marginally significant interaction effect of time and condition on positive emotions, $F(7, 42) = 1.92$, $p = .09$, $\eta^2 = .24$. Since the interaction effects were both in the assumed direction, *Hypothesis 1*, which stated that the experimental condition would develop higher levels of positive emotions over time than the control condition, was confirmed.

Following the significant interaction effect of time and condition on positive emotions, within-subject contrast analyses (see Table 3) showed that only an interaction between time and condition was observed when T1 (week 0) was compared to day 5

(i.e., last intervention day). In other words, the increase in positive emotions was significantly stronger in the experimental condition than in the control condition, but not until *at the end* of the intervention week. Finally, because the main effect of condition was significant, Bonferroni post hoc tests were performed. The results confirmed the findings of the RM-ANOVA's and are shown in Table 3. For Study 1 – thoughts of gratitude –, the scores of the participants in the experimental and control condition only differed significantly on the last two intervention days (i.e., day 4 and day 5).

Table 3. Results of within-subject contrast analyses, showing interaction effects per time point on positive emotions, with T1 as reference and the Bonferroni post-hoc tests for the mean differences in positive emotions across the two conditions per time point for Study 1 (thoughts of gratitude)

	Within-subject contrast analyses			Bonferroni post-hoc tests		
Time point	*F*(1, 48)	*p*	η^2	Mean difference	*SE*	*p*
T1 (week 0) Versus:				0.17	0.14	.25
Day 1	0.00	.97	.00	0.17	0.14	.21
Day 2	0.55	.46	.01	0.29	0.13	.05
Day 3	0.21	.65	.00	0.23	0.12	.05
Day 4	3.34	.07	.07	0.46	0.13	.00
Day 5	6.64	.02	.12	0.57	0.13	.00
T2 (week 1)	0.05	.82	.00	0.13	0.16	.39
T3 (week 5)	0.39	.54	.01	0.00	0.11	.60

Note. *SE* = standard error

Study-related negative emotions. Mauchly's tests revealed that the assumption of sphericity is violated. Therefore, we report on the Greenhouse-Geisser corrected F-values for the main effect of time and the interaction effect (Field, 2005). Results showed no main effect of time on negative emotions, $F(5.59, 268.28) = 1.29$, $p = .27$, no main effect of condition, $F(1, 48) = 0.70$, $p = .41$, and no interaction effect of time and condition on negative emotions, $F(5.59, 268.28) = 0.93$, $p = .47$. Hence, *Hypothesis 2* is rejected; we found no interaction effect of time and condition on negative emotions.

Study engagement. We carried out 3 (time: T1, T2, and T3) x 2 (condition: experimental and control condition) RM-ANOVA's, with time as a within-subject factor, and condition as a between-subject factor to investigate the effects on study engagement. Mauchly's test revealed significant estimates of sphericity of study engagement. So again, we report on the Greenhouse-Geisser corrected *F*-values for the main effect of time and the interaction effect. Results showed no main effect of time on study engagement, $F(1.77, 84.73) = 0.85$, $p = .42$, no main effect of condition, $F(1, 48) = 2.44$, $p = .13$, and no interaction effect of time and condition on study engagement, $F(1.77, 84.73) = 2.03$, $p = .14$. The interaction effect of

time and condition on study engagement was not significant. So, *Hypothesis 3*, which stated that the experimental condition would develop more study engagement over time than the control condition, was rejected. Figure 1 shows the mean scores in Study 1 on positive emotions, negative emotions, and study engagement on all time points of the experimental and control conditions.

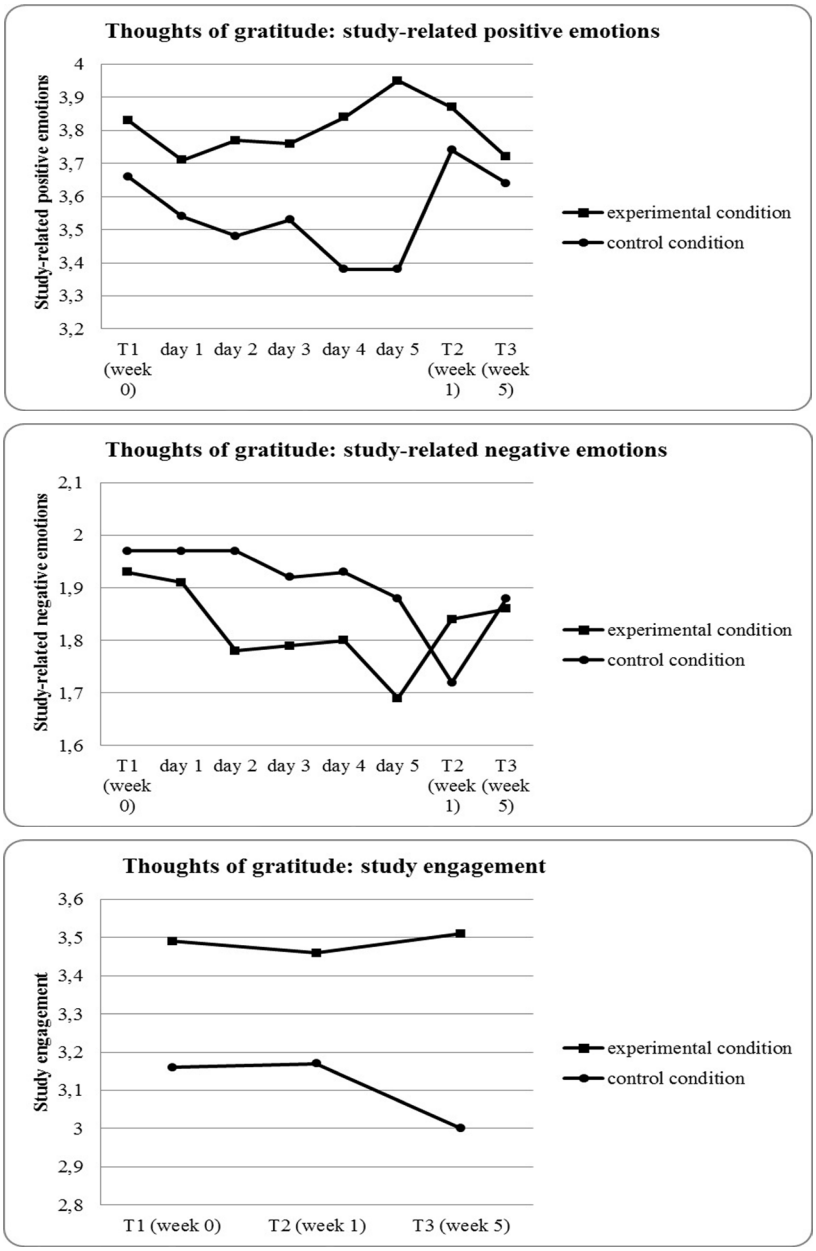


Figure 1. Mean scores on positive emotions, negative emotions, and study engagement of the experimental condition and control condition of Study 1 (thoughts of gratitude)

6.3.3. Results Study 2: Acts of kindness

Study-related positive emotions. In Study 2, similar analyses were conducted to test our hypotheses. For positive emotions, results showed no main effect of time, $F(7, 41) = 1.82$, $p = .11$, but a main effect of condition, $F(1, 47) = 11.21$, $p < .01$, $\eta^2 = .19$, and an interaction effect of time and condition on positive emotions, $F(7, 41) = 3.31$, $p < .01$, $\eta^2 = .36$. Since the interaction effect was in the assumed direction, Hypothesis 1, which stated that the experimental condition would develop higher levels of positive emotions over time than the control condition, was confirmed.

We found significant interaction effects between time and condition when we compared the pre measurement (T1 – week 0) to the last four days of the intervention week (day 2-5). So, the experimental condition showed a significantly stronger increase in positive emotions than the control condition during the most part of the intervention week. Figure 2 shows the mean scores on positive emotions over time of the experimental and control conditions. Bonferroni post-hoc tests confirmed the findings of the RM-ANOVA's and are shown in Table 4. For Study 2 – acts of kindness –, the participants of the experimental condition scored significantly higher on positive emotions than the participants of the control condition at the final four intervention days (day 2-5).

Table 4. Results of within-subject contrast analyses, showing interaction effects per time point on positive emotions, with T1 as reference and the Bonferroni post-hoc tests for the mean differences in positive emotions across the two conditions per time point for Study 2 (acts of kindness)

	Within-subject contrast analyses			Bonferroni post-hoc tests		
Time point	$F(1, 47)$	p	η^2	Mean difference	*SE*	p
T1 (week 0) Versus:				0.09	0.18	.62
Day 1	1.95	.17	.04	0.29	0.15	.06
Day 2	5.59	.02	.11	0.50	0.16	.00
Day 3	4.70	.04	.09	0.48	0.14	.00
Day 4	5.10	.03	.10	0.50	0.14	.00
Day 5	19.91	.00	.30	0.77	0.14	.00
T2 (week 1)	0.87	.36	.02	0.26	0.20	.19
T3 (week 5)	0.35	.56	.01	0.19	0.21	.35

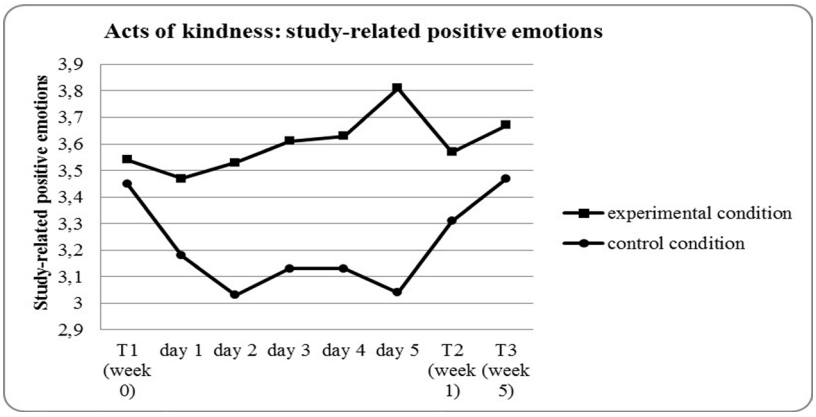
Note. *M* = mean; *SE* = standard error

Study-related negative emotions. Mauchly's test revealed significant estimates of sphericity with regard to negative emotions. Therefore, we report on the Greenhouse-Geisser corrected *F*-values for the main effect of time and the interaction effect. Results showed no main effect of time, $F(5.60, 263.33) = 0.56$, $p = .75$, no main effect of condition, $F(1, 47) = 1.11$, $p = .30$, and no interaction effect of time and condition on positive emotions, $F(5.60,$

263.33) = 0.72, p = .63. Hence, *Hypothesis 2* is rejected; we found no interaction effect of time and condition on negative emotions.

Study engagement. Results showed a main effect of time on study engagement, F(2, 46) = 3.81, $p < .05$, $\eta^2 = .14$, no main effect of condition, $F(1, 47) = 0.42$, $p = .52$, and an interaction effect of time and condition on study engagement, $F(2, 46) = 5.37$, $p < .01$, $\eta^2 = .19$. The interaction effect of time and condition on study engagement was not significant in Study 1, but in Study 2 the interaction effect was significant and in the expected direction. So, *Hypothesis 3*, which stated that the experimental condition would develop more study engagement over time than the control condition, was confirmed in Study 2.

In addition, within-subject contrast analyses showed that the increase in study engagement in the experimental condition was *marginally* significant in comparison to the control condition from T1 (week 0) until T2 (week 1), $F(1, 47) = 3.53$, $p = .07$, $\eta^2 = .07$. After that, compared to the control condition, the experimental condition decreased significantly in study engagement from T2 (week 1) until T3 (week 5), $F(1, 47) = 10.27$, $p < .001$, $\eta^2 = .18$. Finally, Bonferroni post-hoc tests showed that the experimental condition scored significantly higher ($p < .05$) on the post measurement of study engagement (T2 – week 1) in comparison to the pre measurement (T1 – week 0). Moreover, the follow-up measurement (T3 – week 5) showed significantly lower ($p < .001$) scores on study engagement for the experimental condition compared to the post measurement (T2 – week 1). Figure 2 shows the mean scores in Study 2 on positive emotions, negative emotions, and study engagement on all time points of the experimental and control conditions.



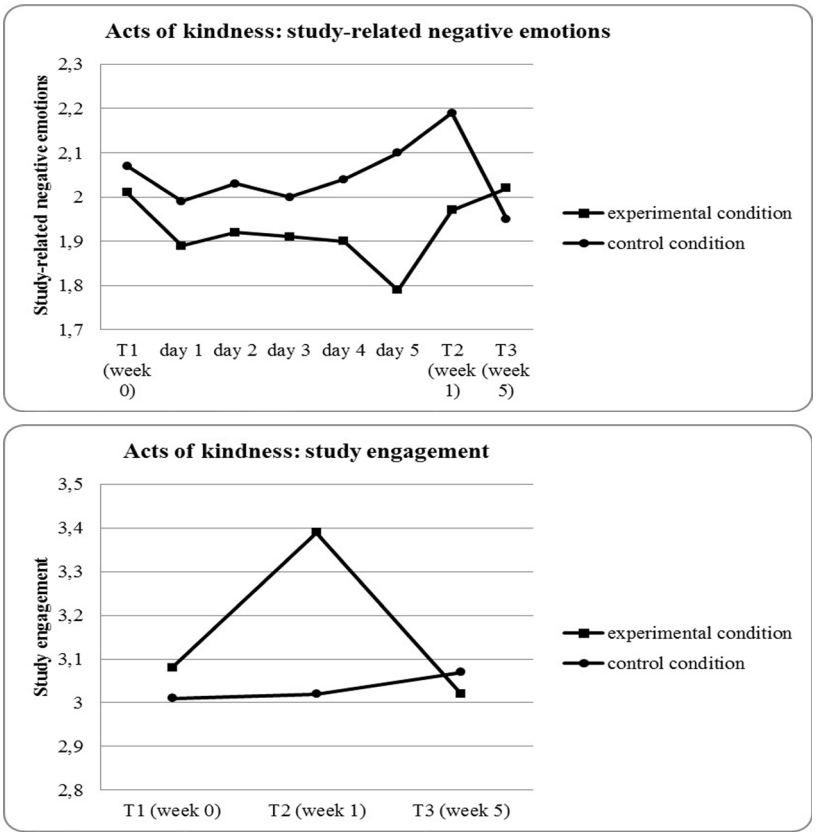


Figure 2. Mean scores on positive emotions, negative emotions, and study engagement of the experimental condition and control condition of Study 2 (acts of kindness)

6.4. Discussion

6.4.1. Conclusions

Our objective was to increase daily and study-related positive emotions and study engagement, and decrease daily and study-related negative emotions by means of positive psychological interventions. We took on two interventions, namely 'thoughts of gratitude' and 'acts of kindness', and adapted these for use in an study context. Thoughts of gratitude (Study 1) had a positive effect on positive emotions compared to the control condition, but no effect on study engagement or negative emotions. Acts of kindness (Study 2) showed stronger effects. Not only the interaction effects on positive emotions were quite strong, we also found a significant effect on study engagement compared to the control condition directly after the intervention week (T2 – week 1). Note however, the control groups slightly decreased in positive emotions (see Figures 1 and 2) over time, so the interaction effects on positive emotions could have partly been caused by that. Probably, the positive interventions

have a buffering effect on the decrease in positive emotions over time. Finally, we found no significant effects of acts of kindness on negative emotions.

Thoughts of gratitude increased positive emotions only at the end of the intervention week. This suggests that gratitude thoughts may have a cumulative effect on positive emotions. It seems that it takes a while before increases in positive emotions as a consequence of gratitude thoughts become significant in comparison to the control condition. Additionally, the effects on study engagement were non-significant. This is in line with Emmons and McCullough (2003) and Watkins et al. (2003), who found that daily gratitude thoughts led to increases in positive emotions, but only weekly gratitude thoughts led to longer-term states of (physical) well-being. However, Seligman et al. (2005) did find a significant positive long-term effect of writing a gratitude letter during only one week. Important is, though, that this intervention was behavioral in nature instead of cognitive like ours. That is, the participants had not only to write a gratitude letter but also actually deliver and read the letter to the person they were grateful of. It is likely that by doing so positive feedback from the recipient was provoked, which might have boosted positive emotions among the participants. All in all, our results show that keeping gratitude notes on a daily basis during one week resulted in higher levels of positive emotions for a few days – as long as the intervention lasted –, but it neither increased positive emotions in the longer run, nor did it make the participants more engaged in their studies. Most likely this is due to the fact that our intervention was cognitive instead of behavioral in nature.

The effects of the acts of kindness intervention on positive emotions and study engagement were much stronger than the effects of thoughts of gratitude. At already the second day of the intervention week, the level of positive emotions in the experimental group was significantly higher compared to that of the control group. This may be because, contrary to gratitude thoughts, acts of kindness often evoke immediate positive feedback. Positive reactions of people towards the participants are likely to strengthen the effects of the acts of kindness. Besides feeling better about yourself because you did something kind, positive consequences of the participants' actions are immediately visible and may therefore be reciprocated (Trivers, 1971). Participants could have got favors in return, a thank you, or just a smile. This kind of positive feedback could – by its very nature – not occur as a result of our thoughts of gratitude intervention. For this reason, we conclude that positive behavioral interventions work better and/or faster than cognitive interventions. Of course, gratitude interventions can be designed as behavioral interventions so that participants express gratitude towards persons which enables them to receive feedback, for example by reading a gratitude letter to someone (Seligman et al., 2005; Watkins et al., 2003). However, Watkins et al. (2003) showed that thoughts of gratitude generate stronger effects on positive emotions than writing gratitude letters or essays. According to the authors, positive emotions could be inhibited because it is quite a big assignment that took a lot of time.

Moreover, the prospect to have to read the letter out loud to someone could have caused anxiety among the participants (Watkins et al., 2003). Another explanation could have something to do with the fact that the participants were told that their letter would be send to the person in question, but this was not done actually. Hence, the participants did not receive any positive feedback, which might have been the most effective part of the intervention as designed by Seligman et al. (2005). So, the participants could have felt anxious up front with the idea that they had to read the letter out loud, but did not have the actual positive experience by having done this and received a positive reaction.

Acts of kindness resulted in higher levels of study-related positive emotions and enhanced study engagement after the intervention week. So, it could be that daily positive emotions 'result' in an increase of study engagement. That is, positive emotions are likely to have an effect on engagement because they facilitate approach behavior, which prompts individuals to set goals and to be engaged in attaining these goals (Cacioppo et al., 1999). That way, it might be that thoughts of gratitude and acts of kindness initiate upwards spirals: feeling grateful and being kind causes participants to experience more positive emotions, and in the case of acts of kindness it even causes a short-term elevated level of engagement in their studies. Thus, being kind is not only a way to feel good at particular times, but it also increases the likelihood that students function better and feel good in the future. Frequent experiences of positive emotions at university may lead to a more persistent, positive affective state, namely study engagement. Indeed, Ouweneel, Le Blanc, and Schaufeli (2011b) and Salanova, Llorens, and Schaufeli (2011) already showed that work and task engagement were predicted by positive emotions such as enthusiasm and comfort.

Furthermore, although we did find some significant increases of positive emotions, our results showed that neither of our interventions significantly decreased negative emotions. Most likely, this is because our samples were non-clinical in nature. In clinical samples positive interventions are likely to affect negative states, though in non-clinical samples this is probably not the case (see Sin & Lyubomirsky, 2009, for a review). Although some positive interventions appeared to have a decreasing effect on negative states in non-clinical samples (e.g., Seligman et al., 2005; Sheldon & Lyubomirsky, 2006), other intervention studies only showed effects on positive states (e.g., Emmons & McCullough, 2003; Cohn, Fredrickson, Brown, Mikels & Conway, 2009).

In our acts of kindness study, we found a discrepancy in the effects on negative emotions and study engagement; although no effects were found on negative emotions, the level of study engagement was elevated after the intervention week. Although we did not expect the non-effects on negative emotions, it is plausible to assume that negative emotions are not (negatively) related to study engagement per se. A previous study among students showed that, in contrast to positive emotions, negative emotions are not negatively related to states of engagement (Ouweneel et al., 2011a).

Furthermore, in a cross-sectional study among managers (Schaufeli & Van Rhenen, 2006) positive emotions were related to engagement and negative emotions were related to burn-out and health complaints. We found no relationships between negative emotions and engagement, and between positive emotions and unwell-being. So, negative emotions do not necessarily have a 'demolishing effect' on well-being. Unless negative emotions become pathological or chronic, they are not assumed to have a strong effect on positive states such as engagement (Cohn et al., 2009). All in all, our results show that positive emotions are more likely to be associated with engagement over time, whereas negative emotions do not. Growth in engagement is predicted specifically by the increase of feeling good, not by the reduction of feeling bad (Cohn et al., 2009).

6.4.2. Limitations and further research

Investigating the effects of general happiness interventions on domain-specific (e.g., study-related context) well-being outcomes seems promising. In our studies, we established that the interventions related to thoughts of gratitude and acts of kindness had a positive impact on the level of positive emotions and, in one of the two cases, also on the level of study engagement. Even though our studies are relatively new in the field of student well-being and particularly acts of kindness proved to be an important research subject, our studies have some limitations that are important to mention. First of all, some effects were marginally significant, namely, the interaction effect of time and group on positive emotions in Study 1 and the interaction effect of time and group on study engagement in Study 2 (contrast of T1-T2). However, as both studies had small sample sizes, we found these results noteworthy nonetheless considering the effect sizes of these specific effects (η^2 = .24 and .07, respectively). That being said, the number of participants in the two intervention studies was limited. Using a larger sample would have resulted in more statistical power and probably would have strengthened the results. Moreover, it can be questioned whether the time period of implementing the interventions was long enough, because the effects of the intervention did not continue in the long run. Because gratitude thoughts and kind acts affected positive emotions not until the second half of the intervention week, a second intervention week could have caused the upward trend to continue. Unfortunately, the literature is not quite clear about what type of interventions yields the most positive effects: daily interventions over a short period of time (massed practice), or weekly interventions over a longer period of time (spaced practice). Emmons and McCullough (2003) found that writing daily gratitude notes had a stronger effective on positive emotions, whereas a similar long-term intervention had a significant impact on physical health. Sheldon and Lyubormirsky (2006) stated that it would be better to implement interventions at a lower frequency and over a longer period of time than to intervene on a daily basis for a short period of time to find long-term effects on well-being.

In contrast, a one-week intervention of writing a gratitude letter showed health benefits up to a month later (Seligman et al., 2005). All things considered, our results show that daily intervention activities can be effective, though one intervention week may have been too short.

Further, it remains somewhat unclear whether the increases of positive emotions caused increased levels of study engagement in Study 2 or whether the intervention itself had a direct effect on study engagement. As argued above, theoretically speaking, it is likely that positive emotions cause an increase in study engagement (Fredrickson, 2001; Ouweneel et al., 2011a). It would be interesting, though, to elaborate on our study and investigate the distinct effects of actual kind acts versus the positive feedback these acts generate. Finally, we did not investigate individual moderators to differentiate in the effects because of our small sample sizes. A way of extending our knowledge on the effects of domain-specific positive psychological interventions would be to include moderators such as motivation to participate in the intervention (Frederick, Morrison & Manning, 1996), self-concordance (Sheldon & Lyubomirsky, 2006), and regulatory focus (Van Dijk & Kluger, 2004). We would expect stronger results when participants are willing to engage in the intervention activities, i.e., are motivated to participate in the intervention, when the activities are in line with the wishes and values of the participants, i.e., the activities are self-concordant, and when the participants are inclined to invest in themselves and their environment in a positive way, i.e., are promotion focused.

6.4.3. Implications and further research

Sin and Lyubomirsky (2009) suggest that researchers and practitioners dealing with positive psychology interventions could combine different types of interventions into a larger scale program to strengthen the effects of positive interventions. Although it is difficult to establish the unique effects of the separate parts of a comprehensive program, it would increase the likelihood of detecting positive effects on well-being, also in the long run. These types of larger scale programs are referred to as interventions based on a 'shotgun approach' (Sin & Lyubomirsky, 2009). Our studies are a first step in developing domain-specific happiness interventions which seem to be effective in increasing study-related positive emotions and study engagement. In practice, the activities such as showing gratitude and committing acts of kindness should be conducted over a longer period of time. Since it takes a while for these cognitions and behaviors to be internalized, long-term intervention follow-ups could cause a longer-term effect on well-being. These activities are simple and easy enough to implement in the classroom, or by university supervisors. Note however, that positive interventions are not effective for everyone. 'Normal functioning' students are likely to experience positive effects of these types of interventions on positive emotions and engagement, but students

with mental problems or students who have to cope with many stressful situations – such as student nurses – would probably benefit more from preventive interventions such as stress management programs (see Galbraith & Brown, 2011, for a review among student nurses). As stated before, in clinical samples, negative emotions are more dominant and can have negative effects on well-being. Therefore, in such cases, attempting to decrease negative feelings instead of increase positive feelings may be more effective. All in all, interventions focused on amplition appeared to have promising effects on enhancing academic or study-related well-being. More studies in this domain are needed, however, to extend our knowledge on the effects of these types of positive interventions. Nonetheless, our studies show that, on balance, being grateful and kind to others pays off in terms of positive emotions and study engagement.

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Chapter 7.
Do-it-yourself: An online positive psychology intervention to promote positive emotions, self-efficacy, and engagement at work

Based on:

Ouweneel, E., Le Blanc, P.M., & Schaufeli, W.B. (submitted). Do-it-yourself: An individual positive psychology intervention to promote positive emotions, self-efficacy, and engagement at work.

7.1. Introduction

The emergence of positive organizational behavior (Bakker & Schaufeli, 2008; Luthans, 2002) has paved the way for individual interventions that are aimed at enhancing well-being at work. The question is, however, how exactly can this be accomplished? Simple as this question might seem at first glance, the answer is far from self-evident. Traditionally speaking, individual interventions are based on the medical disease model. This means that interventions are carried out when something is wrong or malfunctioning, and with the sole objective of fixing it. However, soon the importance of prevention was discovered in order to reduce the risk of developing occupational disease: after all, preventing disease from occurring is more efficient than curing it (Seligman, Schulman, DeRubeis & Hollon, 1999). Currently, it seems that after the shift in focus from curation to prevention, we are entering into a second paradigm shift. Namely, from prevention to '*amplition*', after the Latin '*amplio*' meaning to enlarge, increase, or magnify (Ouweneel, Schaufeli & Le Blanc, 2009). In contrast to curing and prevention, amplition is *not* based on the medical disease model – fix what is broken or what is about to break – but on the principle of improvement. Amplition is about promoting and improving employee well-being. In a way, this is a logical next step to widen the scope of interventions because curing or treatment is – by definition – restricted to employees who *suffer* from an identified disease, whereas prevention is restricted to those who *potentially* may suffer from it. Amplition goes one step beyond to include the *entire workforce*, because it is based on the belief that improving employee health and well-being is relevant for all. Indeed, positive psychology interventions have been shown to have a positive effect on well-being in non-clinical samples (see for a meta-analysis Sin & Lyubomirsky, 2009). In the current article, we describe and evaluate the effect of a positive psychology intervention that is focused on amplition, i.e., that is focused on enhancing individual well-being at work.

7.1.1. Individual well-being at work

We propose work engagement as a suitable well-being construct in testing the effects of a work-related intervention, since it is both affective and cognitive in nature similarly to general well-being (Diener, Suh, Lucas & Smith, 1999). Work engagement is particularly interesting in that it is an active measure of well-being instead of a passive measure, like job satisfaction, that is characterized by satiation (Warr, 2007). Hence, Bakker and Demerouti (2008) argue that engaged employees are activated towards behaving positively and performing better in the workplace. Work engagement is defined as "a positive, fulfilling, and work-related state of mind that is characterized by vigor, dedication and absorption" (Schaufeli & Bakker, 2004, p. 295). Vigorous employees experience high levels of energy at work and motivation to invest effort into work. They are dedicated by being strongly involved into work and experience feelings of pride and enthusiasm about their work. Finally, absorbed employees

are immersed in and concentrated on work, and they feel that time is flying at work.

Though ample research has established the role of work characteristics as main initiators of the process that leads to work engagement (Bakker & Demerouti, 2007), it has also been suggested that positive individual characteristics are crucial antecedents of employee well-being (Judge, Bono, Erez & Locke, 2005; Judge, Van Vianen & De Pater, 2004). Indeed, longitudinal research found that individual characteristics, like optimism and self-efficacy, are strong predictors of engagement too (e.g., Avey, Luthans, Smith & Palmer, 2010; Ouweneel, Le Blanc & Schaufeli, 2011; Xanthopoulou, Bakker, Demerouti & Schaufeli, 2009). Especially self-efficacy has been found to be strongly related to engagement (Salanova, Llorens & Schaufeli, 2011; Vera, Le Blanc, Salanova & Taris, 2012). Bandura's Social Cognitive Theory (SCT) defines self-efficacy as the '…belief in one's capabilities to organize and execute the course of action required to produce given attainments' (Bandura, 1997, p. 3). Self-efficacious employees are likely to be engaged at work because self-efficacy leads to a greater willingness to spend additional energy and effort on completing a task and hence to more task involvement and absorption (Schaufeli & Salanova, 2007). Efficacious individuals are more likely to regulate their motivation by setting challenging goals for themselves (Diseth, 2011), and are therefore more likely to be engaged. Obviously, goal setting and planning may contribute to engagement through goal attainment. Attainment, though, is not a necessary precondition linking goal setting and planning to engagement. Progress towards goals rather than attainment seems to be the key to engagement. People feel good when they think about achieving desirable future outcomes. For example, some studies demonstrated that having meaningful goals and plans to pursue those goals is likely to result in higher levels of engagement in study tasks (MacLeod, Coates & Hetherton, 2008; Sansone & Thoman, 2006).

Next to self-efficacy, we expect the experience of positive emotions to be an important predictor of work engagement. Work-related positive emotions are described as relatively intense, short-lived affective experiences that are focused on specific objects or situations at work (Gray & Watson, 2002). Whereas positive emotions are immediate responses to the work environment, work engagement is relatively more enduring in nature (Schaufeli, Salanova, González-Romá & Bakker, 2002). Therefore, it is plausible to assume that short-term positive emotions precede work engagement (Schaufeli & Van Rhenen, 2006). Furthermore, positive emotions are likely to have an effect on work engagement because they facilitate approach behavior, which prompts individuals to set goals and to be engaged in attaining these goals and work-related activities (Cacioppo, Gardner & Berntson, 1999).

Fredrickson (1998) posits that positive emotions signal the presence of optimal well-being. Yet, she also states that positive emotions not only make people feel good at a particular point in time, they may also produce future well-being. According to *Broaden-and-Build*

(B&B) theory (Fredrickson, 1998), positive emotions broaden thought-action repertoires by fostering exploratory behaviors that create learning opportunities and goal achievement, and help to build enduring resources. Thus, by experiencing positive emotions and engaging in concomitant exploratory behaviors, people enhance their resources, for example self-efficacy. As a result, people experience a more enduring positive state of well-being such as work engagement. Although we do not test the relationships between positive emotions, self-efficacy, and work engagement – we cannot confirm these relationships with our current study design –, we theorize that intervening on positive emotions and self-efficacy could also enhance the level of work engagement. In sum, we investigate the effects of our intervention not only on work engagement, but also on positive emotions and self-efficacy as a personal resource.

To date, positive interventions were mostly conducted in student samples (e.g., Macleod et al., 2008). In contrast, we know of only a few positive work-related interventions that generated promising results. For example, Demerouti, Van Eeuwijk, Snelder, and Wild (2011) found that a positive intervention focusing on enhancing personal effectiveness had a positive effect on several personal resources, such as self-efficacy. A Finnish study showed that employees benefitted from a career management intervention as regards their level of work engagement (Vuori, Toppinen-Tanner & Mutanen, 2012). Finally, an online intervention in which participants were guided to set and achieve personal work-related goals, resulted in enhanced levels of personal resources (e.g., hope and self-efficacy) among employees (Luthans, Avey & Patera, 2008). The present paper reports on the effects of a work-related positive psychology intervention that was designed according to the principles advocated in the general literature on positive psychology (see for a review Lyubomirsky , Sheldon & Schkade, 2005).

7.1.2. Effective individual positive interventions

In our intervention, we focus on what the individual employee can do in order to flourish and thrive at work. This does not mean we do not acknowledge the role of the organization in providing an appropriate and challenging work environment for employees in order to enhance their well-being. Our individual focus is in line with the concept of *empowerment*, a principle by which employees are intrinsically motivated to take initiative and make decisions to solve problems at work and improve their performance (Spreitzer, 1995). Empowerment is based on the idea that providing employees with resources and opportunities for development, as well holding them responsible and accountable for outcomes of their own actions, leads them to adopt an active orientation toward their work and contribute to their own resources and engagement (Spreitzer, 1995).

In line with this, research has shown that individuals are able to change their well-being levels by means of intentional activities. Despite the fact that employee's well-being

is partly determined by genetic and situational influences, employees may improve their well-being by volitional actions (Lyubomirsky et al., 2005). For employees to improve their own work-related well-being by means of an intervention program; (1) they should have selected themselves in engaging in certain activities (i.e., motivated cognition); (2) the activities should have been validated regarding their effectiveness, and; (3) the employee should actively participate in the entire intervention program (Lyubomirsky, Dickerhoof, Boehm & Sheldon, 2011).

(1) When employees choose for a certain intervention program, it implies that they are motivated to engage in this program. They deliberately choose to participate and are aware of the objective of the program, namely to enhance their level of well-being (Lyubomirsky et al., 2011). Self-selection (e.g., Fordyce, 1977; Seligman, Steen, Park & Peterson, 2005) has been shown to be far more effective than random assignment of participants to either the intervention- or control condition (e.g., Sheldon & Lyubomirsky, 2006). A meta-analysis of the effectiveness of positive psychology interventions indeed confirmed that self-selected participants showed a stronger increase in their well-being than non-self-selected participants (Sin & Lyubomirsky, 2009). This is probably the case because you need to be extra motivated to benefit from positive interventions when there is no problem at hand; nothing is broken and is in need to be fixed.

(2) A second important point is that the intervention should contain validated content (Lyubomirsky et al., 2011), i.e., evidence-based methods (Seligman et al., 2005). Although this point may seem evident, quite some self-help interventions are not designed based upon theory and/or empirical evidence. Obviously, instead of only believing the intervention will help you in feeling better at work, the program also should consist of activities that have been proven to be effective in enhancing well-being. As Lyubomirsky et al. (2011) state: "...people need both a 'will' and a 'way' to gain maximum benefits from a happiness intervention" (p. 393). Whereas the 'way' refers to the content of the program, the 'will' refers to the motivation to participate in the intervention and the effort the participants put into participating.

(3) Finally, it is essential that participants *actively* participate in an intervention program. Choosing to engage in an intervention is a good starting point, but not the whole story. The more the participants exert sustained effort throughout the intervention, the higher the probability that they will enhance their well-being in the end (Lyubomirsky et al., 2011). Sustained effort in intervention activities (i.e., assignments) is more likely when activities and the related work-goals are congruent with the internal values and hopes of the participants, in other words, when the activities and goals are self-concordant (Sheldon & Elliot, 1999). A self-concordant activity entails that it contains personal meaning for the participants. Personal meaning is of extra importance to ensure participants to invest effort into the intervention since there is no pressing problem to guarantee this. And of course,

this is more likely to be the case when employees voluntarily decided to participate in the intervention program (i.e., self-selection).

7.1.3. Content of the intervention

To enhance participants' levels of positive emotions, self-efficacy, and work engagement, we designed an intervention program according to the three principles mentioned above. Studies have shown that online instruction during an intervention program may be as effective as face-to-face classroom instruction (Luthans et al., 2008). Especially, when it comes to learning and individual development, the web-based approach is more effective (Sitzmann, Kraiger, Stewart & Wisher, 2006). This is mainly because participants can keep their own pace compared to face-to-face group training. Also, web-based interventions are more cost-efficient and are flexible in nature as assignments can be conducted anywhere and everywhere (Tate & Zabinsky, 2004). So, we designed an online program consisting of three types of assignments:

- *Happiness assignments*: for example, participants were asked to act kindly at work and to report on the positive reactions this evoked, to keep a positive diary (Seligman et al., 2005), and to recapitulate happy memories from work (Bryant, Smart & King, 2005). This way, participants focused on a positive past and on a positive here and now at work. Based on previous studies, we expect that these positive experiences will result in higher levels of positive emotions;
- *Goal setting assignments*: participants were asked to set personal work-related goals based on individual feedback of an online survey (see Method section). For example, when supervisory support was low and this mattered to the participant, a goal could be to ask one's supervisor for performance feedback. By means of online guidelines, an e-coach and tips from other participants, the participant was supported in formulating steps toward the goal and trying out several of these steps in the actual work environment. Progress was monitored and successes were celebrated by congratulating and complementing the participants. By making progress, i.e., experiencing mastery (Bandura, 1997), and celebrating this, we expected to increase participants' self-efficacy and positive emotions (see also Brunstein, 1993);
- *Resource building assignments*: these assignments were designed to cope with future stressful events at work. For example, obstacles in reaching your personal goals and ways to overcome them were addressed. The online program also taught participants skills to ask for help and social support. In addition, possible setbacks at work were toned down and strategies were discussed on how to handle them. We expected that these assignments would make participants more confident in their capabilities (i.e., self-efficacy) to handle any future adversities at work (see also Schunk, 1990; Vuori et al., 2012).

As is previously theorized, positive emotions and self-efficacy are likely to be

related to work engagement over time. Therefore, we expect that a program made up of these three types of assignments not only enhances the level of positive emotions and self-efficacy, but also has the potential to increase participants' levels of work engagement. In addition, Van Berkel, Proper, Boot, Bongers, and Van der Beek (2011) state that goal setting activities and happiness assignments are presumed to relate to work engagement directly.

7.1.4. Overview and hypotheses

The participants of the online positive psychology intervention (i.e., self-enhancement group) were compared to a group of participants who did not participate in the intervention but only received a feedback report on their work-related well-being (i.e., self-monitoring group). *Hypothesis 1* states that participants in the self-enhancement group show a significantly stronger increase in positive emotions compared to employees participating in the self-monitoring group. *Hypothesis 2* states that participants in the self-enhancement group show a significantly stronger increase in self-efficacy levels compared to participants in the self-monitoring group. Finally, *Hypothesis 3* says that employees who participated in the self-enhancement intervention show a significantly stronger increase in work engagement compared to employees who participated in the self-monitoring group.

7.2. Method

7.2.1. Participants and procedure

Participants of the self-enhancement and self-monitoring group were both recruited via an interactive website of a Dutch national newspaper. In the self-enhancement group, participants were asked to fill in an online questionnaire (pre measurement: Time 1 (T1)) and they received an automatically generated feedback report on their results in return. This report was then used as input for the online intervention program. At the end of the questionnaire, participants were asked for their e-mail address in case they were willing to fill in the questionnaire again at a later occasion. Participants were given two assignments per week, at predetermined time points. The assignments focused either on increasing positive experiences at work, on goal setting or resource building at work. The assignments could be watching a movie clip, describing something on paper (e.g., keeping a positive diary), or actually conducting particular behavior in the workplace. Next to the individual assignments, participants could log on to a digital forum on which they could share experiences with other participants and an e-coach. After the intervention, participants were invited via e-mail to fill in a follow-up questionnaire (post measurement: Time 2 (T2)). In the self-monitoring group, participants were invited to fill in a similar questionnaire and received a feedback report – similar to the self-enhancement group – in return (pre control measurement: T1). At the end of the questionnaire, participants were asked for their e-mail address in case they were willing to fill in the questionnaire again at a later occasion. These

e-mail addresses were then used to send the participants a follow up online questionnaire two months later (post control measurement: T2).

At the pre measurement, 878 participants of the self-enhancement group filled in the questionnaire, at the post measurement 158 participants filled in the questionnaire (T1-T2 dropout of 82%). Of these 158 participants, 86 participants completed the intervention (intervention dropout of 46%). Of the self-monitoring group 1,330 participants filled in the questionnaire at the pre measurement, and 225 filled in the same questionnaire at the post control measurement (T1-T2 dropout of 83%). See Figure 1 for the flow of participants.

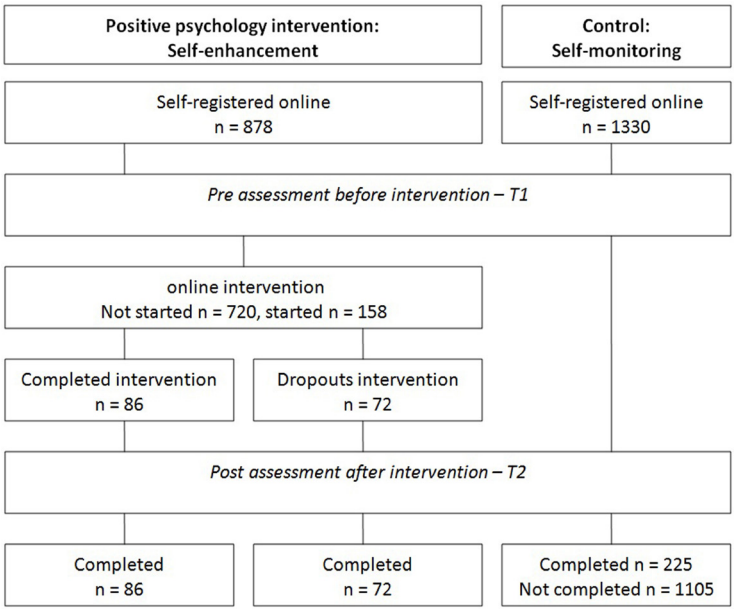

Figure 1. Flow of participants in the intervention (self-enhancement) group and control (self-monitoring) group

With regard to the self-enhancement group and their T1-T2 dropout, independent samples t-test revealed that the dropout group did *not* differ significantly from the panel group with regard to age. [3] In addition, χ^2-tests revealed that the dropout and panel group did *not* differ as regards level of education, or gender. Independent samples t-tests further revealed that the dropout group and the panel group differed significantly as regards the T1 measurement of the outcome variables, namely positive emotions (M = 3.17 versus M = 3.35; $t(876)$ = -2.77, p = .006), self-efficacy (M = 3.50 versus M = 3.64; $t(876)$ = -2.75, p = .006), and work engagement (M = 2.82 versus M = 3.19; $t(217.82)$ = -3.41, p = .001).

[3] Results of all t-tests and χ^2-tests as regards demographical differences can be obtained from the first author upon request.

The panel group scored significantly higher than the dropout group on all T1 measurements of the research variables.

Moreover, it is important to note that the intervention dropout of the self-enhancement group was selective with regard to the outcome variables as well. Independent samples t-tests revealed that dropouts scored lower on positive emotions (M = 3.23 versus M = 3.45), self-efficacy (M = 3.54 versus M = 3.74), and work engagement (M = 2.98 versus M = 3.36). Although only the difference in self-efficacy ($t(156) = 2.38$, $p = .019$) between the dropouts and the participants who completed the intervention was significant, the difference in positive emotions ($t(156) = 1.83$, $p = .069$) and work engagement ($t(156) = 1.88$, $p = .062$) also nearly reached significance. Possible selection effects are important in this type of research, so we will elaborate on this in the discussion section. Moreover, with regard to demographics, the dropouts significantly differed from the final intervention group in age, gender, and educational level. Dropouts were younger, more often female, and lower educated relatively to those who finished the intervention. Dropouts of the self-enhancement intervention were not incorporated in the analyses since this group was too diverse; participants who dropped out could either have stopped during the first assignment or after having performed for example half of the assignments. For this reason, the scores of the drop-out group are difficult to interpret. Moreover, the drop-out group was too small (n = 72) to split the group out in specific subgroups.

With regard to the self-monitoring group, independent samples t-test revealed that the T1-T2 dropout group differed significantly from the panel group with regard to age. In addition, χ^2-tests revealed that the dropout and panel group also differed as regards levels of education. Younger and lower educated participants were more likely to drop out. However, the difference in gender was not significant. Independent samples t-tests further revealed that the dropout group and the panel group did not differ as regards the T1 measurement of the outcome variables, namely positive emotions (M = 3.51 versus M = 3.42; $t(1328) = 1.78$, $p = .075$), self-efficacy (M = 3.68 versus M = 3.66; $t(1328) = 0.30$, $p = .761$), and work engagement (M = 3.12 versus M = 3.20; $t(1328) = 0.94$, $p = .345$).

The final self-enhancement and self-monitoring panel groups appeared to be rather similar with regard to demographics. The mean age of the participants of the self-enhancement group was 46.8 years (SD = 10.0) versus 46.0 years (SD = 10.2) of the self-monitoring group. Of the self-enhancement group, 58.1 % was male versus 52.4% of the self-monitoring group. Only with reference to educational level it was obvious that the self-monitoring group is more highly educated than the self-enhancement group. Of the self-enhancement group, only 29.1% had at least a university degree, whereas in the self-monitoring group 43.6% had at least a university degree (for difference tests, see Preliminary analyses). Tests to see whether the self-enhancement and self-monitoring group differed significantly with regard to demographics are described in the Preliminary results section.

7.2.2. Measures

Positive emotions were assessed using the positive items of the Job-related Affective Well-being Scale (JAWS; Van Katwyk, Fox, Spector & Kelloway, 2000; shortened to six items by Schaufeli & Van Rhenen, 2006). A sample item is "The last couple of weeks, my work made me feel inspired". The participants answered using a five-point Likert scale (1 = (almost) never, 5 = (almost) always). The reliability was good (α_{T1}: .78, α_{T2}: .79).

Self-efficacy was assessed with a five-item scale that was self-constructed following Bandura's recommendations (http://www.des.emory.edu/mfp/self-efficacy.html), in that we applied the scale to an occupational setting. An example item is: "I can always manage to solve difficult problems at work if I try hard enough". The items were scored on a six-point Likert scale (1 = strongly disagree, 6 = strongly agree). The reliability of the scale was good (α_{T1}: .85, α_{T2}: .86).

Work engagement was assessed with the nine-item version of the Utrecht Work Engagement Scale (UWES; Schaufeli, Bakker & Salanova, 2006) to measure work engagement. A sample item is "I am proud of the work that I do". All items were scored on a seven-point Likert scale (0 = never, 6 = always). The reliability was very good (α_{T1}: .93, α_{T2}: .94).

7.2.3. Data analyses

By means of independent samples *t*-tests, we checked whether participants differed with regard to the outcome variables prior to the interventions. We also conducted an independent samples *t*-test to check for the possible differences in age. We performed χ^2-tests to check for possible gender and education level differences between the groups. To test our hypotheses, we carried out 2 (time: pre (T1) and post (T2) measurement) x 2 (group: self-enhancement and self-monitoring) repeated measures (multivariate) analyses of variances (RM-(M)ANOVA's), with time as a within-subject factor, and group as a between-subject factor. Subsequently, we conducted paired samples *t*-tests in case of main effects of time to check the differences within groups. In case of a main effect of group, we conducted independent samples *t*-tests to see whether the separate group means significantly differed within time points on the outcome variables.

7.3. Results

7.3.1. Preliminary analyses

Independent samples *t*-test revealed that the self-enhancement group and self-monitoring group did *not* differ with regard to age ($t(309) = 0.59$, $p = .56$). In addition, χ^2-tests revealed that the two groups did *not* differ as regards gender ($\chi^2(1) = 0.81$, $p = .37$), whereas, the difference in level of education between the two groups was significant ($\chi^2(5) = 17.01$, $p = 004$). However, regression analyses revealed that educational level did *not* have a significant effect on T1 positive emotions ($F(1, 309) = 1.45$, $p = .23$), self-efficacy ($F(1, 309)$

= 3.01, p = .08), and work engagement (F(1, 309) = 0.14, p = .71). Therefore, demographics were excluded from further analyses. In addition, independent samples t-tests on the T1 measurement of the outcome variables revealed that the self-enhancement group and the self-monitoring group did *not* differ as regards positive emotions (M = 3.45 versus M = 3.42; t(309) = 0.35, p = .73), self-efficacy (M = 3.74 versus M = 3.66; t(309) = 1.15, p = .25), and work engagement (M = 3.36 versus M = 3.12; t(309) = 1.57, p = .12). Finally, Levene's tests of equality of variances revealed that the self-enhancement group and the self-monitoring group had equal variances with regard to positive emotions, self-efficacy, and work engagement at both time points.

7.3.2. Testing hypotheses

The RM-MANOVA with positive emotions, self-efficacy, and work engagement as dependent variables revealed a main effect of time, *Wilks' Lambda* = .89, F(3, 307) = 12.44, p = .000, η^2 = .11, but *no* effect of group, *Wilks' Lambda* = .98, F(9, 307) = 2.41, p = .067. Finally, the interaction effect of time and group was significant, *Wilks' Lambda* = .96, F(9, 307) = 4.18, p = .006, η^2 = .04.

For positive emotions, we found a main effect of time (*Wilks' Lambda* = .94, F(1, 309) = 21.59, p = .000, η^2 = .07), but again *no* main effect of group (F(1, 309) = 1.62, p = .204). The interaction effect of time and group on positive emotions was significant (*Wilks' Lambda* = .99, F(1, 309) = 4.78, p = .029, η^2 = .02). The interaction effect was in the expected direction; the self-enhancement group showed a stronger increase in positive emotions than the self-monitoring group (see Figure 2). Hence, Hypothesis 1 was confirmed.

Further, paired samples t-tests showed that both the self-enhancement group (t(85) = -3.41, p = .001) and the self-monitoring group (t(224) = -3.19, p = .002) increased significantly in positive emotions. The effects size of the self-enhancement group was moderate to high (Cohen's d = -.53), whereas the effects size of the self-monitoring group was small (Cohen's d = -.30).

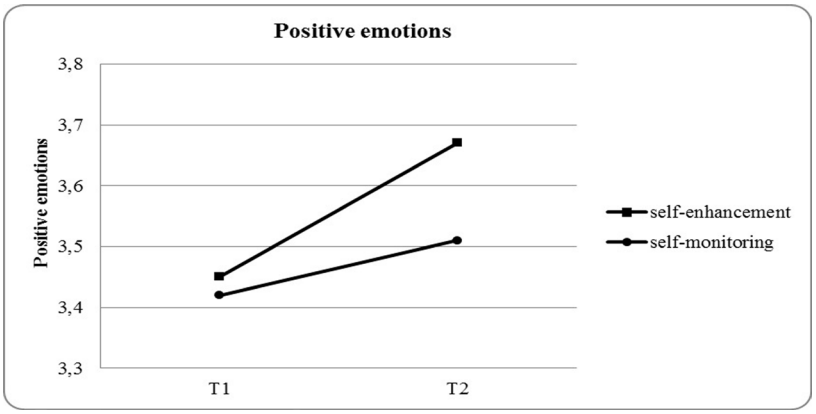

Figure 2. The effects of time (T1 and T2) and group (self-enhancement and self-monitoring) on positive emotions

For self-efficacy, *no* main effect of time was found (*Wilks' Lambda* = .99, $F(1, 309) = 3.15$, $p = .077$). However, we did find a main effect of group ($F(1, 309) = 6.79$, $p = .010$, $\eta^2 = .02$), and a significant interaction effect of time and group (*Wilks' Lambda* = .98, $F(1, 309) = 6.48$, $p = .011$, $\eta^2 = .02$) on self-efficacy. Again, the interaction effect was in the expected direction; the self-enhancement group showed a stronger increase in self-efficacy than the self-monitoring group (see Figure 3). So, Hypothesis 2 was confirmed as well.

Further, independent samples *t*-tests showed that the self-enhancement and self-monitoring group did *not* differ significantly in self-efficacy at T1 ($t(309) = 1.15$, $p = .25$), but the self-enhancement group scored significantly higher in self-efficacy at T2 compared to the self-monitoring group ($t(309) = 3.57$, $p = .000$) The effect was moderate to high (Cohen's $d = .46$).

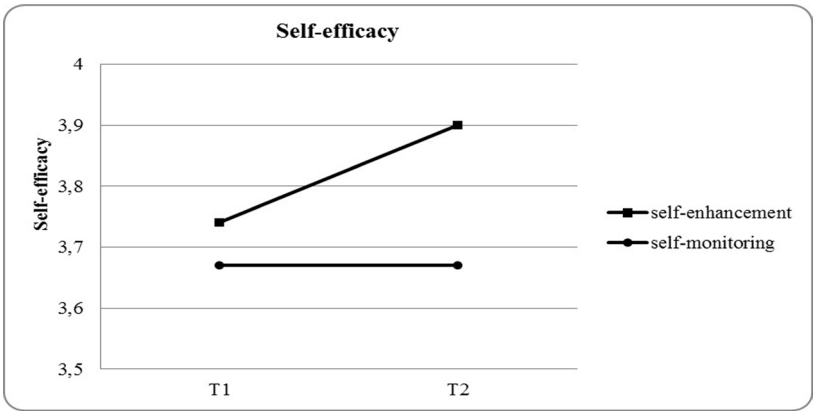

Figure 3. The effects of time (T1 and T2) and group (self-enhancement and self-monitoring) on self-efficacy

For work engagement, we found *no* main effect of time (*Wilks' Lambda* = .99, $F(1, 309) = 0.35$, $p = .555$), *no* main effect of group ($F(1, 309) = 2.42$, $p = .121$), and *no* interaction effect (*Wilks' Lambda* = .99, $F(1, 309) = 0.06$, $p = .805$). The self-enhancement and self-monitoring group were both stable over time as far as work engagement is concerned (see Figure 4). So, Hypothesis 3 was rejected: the self-enhancement group did *not* increase more strongly in work engagement compared to the self-monitoring group.

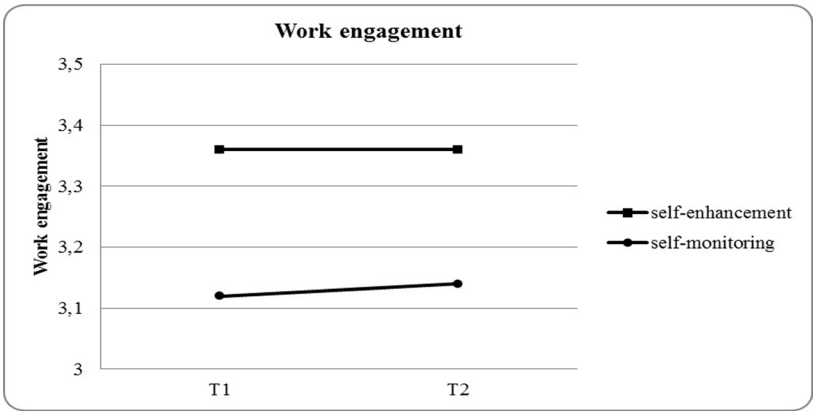

Figure 4. The effects of time (T1 and T2) and group (self-enhancement and self-monitoring) on work engagement

Table 1. Means and standard errors (in brackets) of the outcome variables as a function of time (T1 and T2) and group (self-enhancement and self-monitoring)

	Self-enhancement ($N = 86$)		Self-monitoring ($N = 225$)		Time	Group	Time x Group
Variables					$F(3,307) = 12.44^{***}$ $\eta^2 = .11$	$F(9,307) = 2.41^{ns}$	$F(9,307) = 4.18^{**}$ $\eta^2 = .04$
	T1	T2	T1	T2			
Positive emotions	3.45 (0.07)	3.67 (0.07)	3.42 (0.04)	3.51 (0.04)	$F(1,309) = 21.59^{***}$ $\eta^2 = .07$	$F(1,309) = 1.62^{ns}$	$F(1,309) = 4.78^{*}$ $\eta^2 = .02$
Self-efficacy	3.74 (0.06)	3.90 (0.05)	3.67 (0.04)	3.67 (0.03)	$F(1,309) = 3.15^{ns}$	$F(1,309) = 6.79^{**}$ $\eta^2 = .02$	$F(1,309) = 6.48^{*}$ $\eta^2 = .02$
Work engagement	3.36 (0.13)	3.36 (0.13)	3.12 (0.08)	3.14 (0.08)	$F(1,309) = 0.35^{ns}$	$F(1,309) = 2.42^{ns}$	$F(1,309) = 0.06^{ns}$

Note. * $p < .05$, ** $p < .01$, *** $p < .001$, ns = not significant, N = total of participants

7.3.3. Additional analyses

Since we did not find consistent effects with regard to the effects of the self-enhancement intervention – only Hypotheses 1 and 2 were confirmed, Hypothesis 3 was rejected –, we looked at the moderating effects of T1 levels of the research variables. Due to the selection effects within the self-enhancement group described in the Method section, we

hypothesized that differential effects of the intervention could have occurred within the self-enhancement group. The assumption is that participants of the self-enhancement intervention, who are *low* in positive emotions, self-efficacy or work engagement prior to the intervention at T1, are more likely to experience an increase in positive emotions, self-efficacy or work engagement compared to participants of the self-monitoring group. Alternatively, participants of the self-enhancement intervention who are medium or high in initial positive emotions, self-efficacy or work engagement at T1, are *not* expected to show a significant increase compared to the self-monitoring participants who are medium or high in initial positive emotions, self-efficacy or work engagement at T1 because they are assumed to benefit less from the self-enhancement intervention. So, we expect that the effect of the self-enhancement intervention is more pronounced for participants who start off scoring low on positive emotions, self-efficacy or work engagement than for participants who initially are scoring medium or high. To test this additional hypothesis, we checked for interaction effects of time and group for every T1 category (low, medium, and high) separately by means of RM-ANOVA's. Also, by means of independent *t*-tests, we checked within the T1 categories whether the self-enhancement and self-monitoring group differed significantly at T2.

First, we categorized T1 positive emotions, self-efficacy, and work engagement in low, medium, and high, using a procedure based on the corresponding cut points of tertiles, resulting in three subgroups for every research variable. Thus, we used T1 levels of positive emotions, self-efficacy, and work engagement as a categorical variable to predict the changes in scores (T1-T2) over time. We carried out 2 (time: pre (T1) and post (T2) measurement) x 2 (group: self-enhancement and self-monitoring) RM-ANOVA's, with time as a within-subject factor and group as a between-subject factor. By means of independent *t*-tests, we performed additional post-hoc tests to assess the significance of the differences between the self-enhancement and self-monitoring group within each T1 group (low, medium, or high). All main and interaction effects and *t*-test results are shown in Table 2.

Positive emotions. Within the low T1 positive emotions group, we found a significant interaction effect of time and group (*Wilks' Lambda* = .93, $F(1, 124) = 9.25$, $p = .003$, $\eta^2 = .07$). Within the medium T1 positive emotions group, we found *no* interaction effect of time and group (*Wilks' Lambda* = .98, $F(1, 73) = 1.21$, $p = .274$). Within the high T1 positive emotions group, we also found *no* interaction effect of time and group (*Wilks' Lambda* = 1.00, $F(1, 108) = 0.39$, $p = .532$). In line with our expectations, additional independent *t*-tests confirmed the results of the RM-ANOVA's and showed that the only significant difference between the self-enhancement group and the self-monitoring group was found within the low category of T1 positive emotions at the post-intervention measurement ($M = 3.29$ versus $M = 3.03$; $t(124) = 2.68$, $p = .008$).

Figure 5 shows the results of the additional analyses for positive emotions.

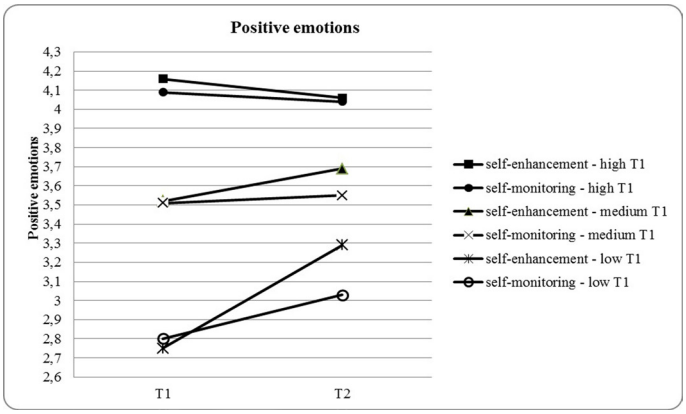

Figure 5. Results of RM-ANOVA's per group (self-enhancement and self-monitoring) and per T1 positive emotions category (low, medium, and high)

Self-efficacy. Within the low T1 self-efficacy group, we found a significant interaction effect of time and group (*Wilks' Lambda* = .97, $F(1, 144) = 4.18$, $p = .043$, $\eta^2 = .03$). Within the medium T1 self-efficacy group, we also found a significant interaction effect of time and group (*Wilks' Lambda* = .97, $F(1, 121) = 4.00$, $p = .048$, $\eta^2 = .03$). Within the high T1 self-efficacy group, we found *no* interaction effect of time and group (*Wilks' Lambda* = .95, $F(1, 40) = 1.91$, $p = .174$). Additional independent *t*-tests showed, however, that the only significant difference between the self-enhancement group and the self-monitoring group was within the low category of T1 self-efficacy at the post-intervention measurement ($M = 3.66$ versus $M = 3.41$; $t(144) = 2.80$, $p = .006$). Figure 6 shows the results of the additional analyses for self-efficacy.

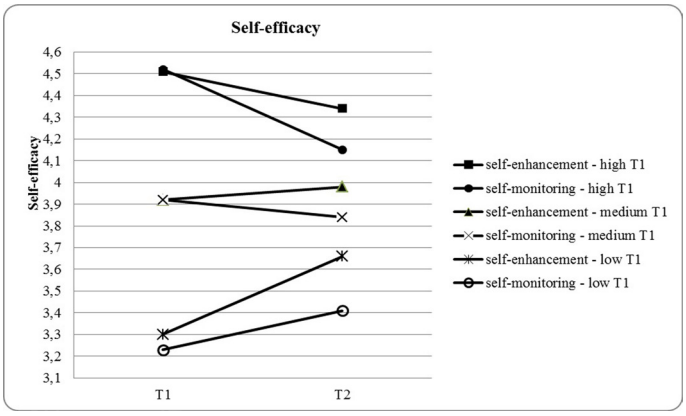

Figure 6. Results of RM-ANOVA's per group (self-enhancement and self-monitoring) and per T1 self-efficacy category (low, medium, and high)

Work engagement. Within the low T1 work engagement group, we found a significant interaction effect of time and group (*Wilks' Lambda* = .94, $F(1, 90) = 5.94$, $p = .017$, $\eta^2 = .06$). Within the medium T1 work engagement group, we found *no* interaction effect of time and group (*Wilks' Lambda* = .94, $F(1, 116) = 1.61$, $p = .208$). Within the high T1 work engagement group, we found no interaction effect of time and group (*Wilks' Lambda* = 1.00, $F(1, 99) = 0.18$, $p = .669$). In line with our expectations, additional independent *t*-tests confirmed the RM-ANOVA's and showed that the only difference between the self-enhancement group and the self-monitoring group was within the low category of T1 work engagement at the post measurement ($M = 2.26$ versus $M = 1.88$; $t(90) = 2.62$, $p = .010$). Figure 7 shows the results of the additional analyses for work engagement.

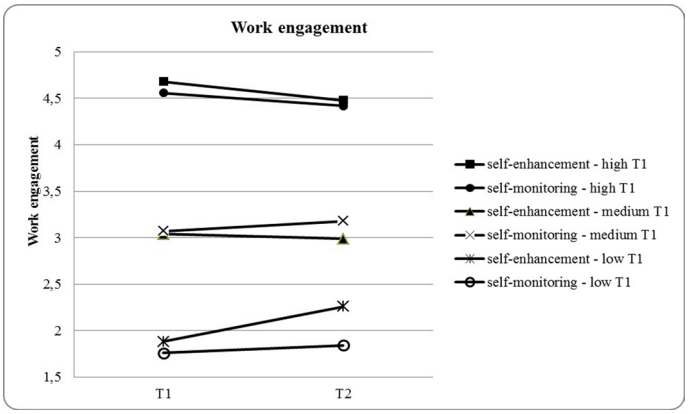

Figure 7. Results of RM-ANOVA's per group (self-enhancement and self-monitoring) and per T1 work engagement category (low, medium, and high)

In conclusion, the additional analyses showed that participants of the self-enhancement intervention who scored low in positive emotions, self-efficacy, and work engagement prior to the intervention, benefitted significantly more than participants who scored medium or high in positive emotions, self-efficacy, and work engagement at T1.

Table 2. Means and standard errors (in brackets) of the outcome variables as a function of time (T1 and T2) and group (self-enhancement and self-monitoring) per T1 category on the research variables (low, medium, and high)

	Self-enhancement (N = 86)		Self-monitoring (N = 225)		Time	Group	Time x Group
T1 category	T1	T2	T1	T2			
Positive emotions							
low	2.75 (0.07) N = 35	3.29 (0.08)	2.80 (0.04) N = 91	3.03 (0.05)	$F(1,124)$= 56.84*** η^2 = .31	$F(1,124)$= 2.05 ns	$F(1,124)$= 9.25** η^2 = .07
medium	3.52 (0.03) N = 18	3.69 (0.10)	3.51 (0.02) N = 57	3.55 (0.06)	$F(1,73)$= 3.85 ns	$F(1,73)$= 1.81 ns	$F(1,73)$= 1.21 ns
high	4.16 (0.05) N = 33	4.06 (0.07)	4.09 (0.03) N = 77	4.04 (0.05)	$F(1,108)$= 3.91 ns	$F(1,108)$= 0.49 ns	$F(1,108)$= 0.39 ns
Self-efficacy							
low	3.30 (0.06) N = 38	3.66 (0.08)	3.23 (0.04) N = 108	3.41 (0.05)	$F(1,144)$= 36.99*** η^2 = .07	$F(1,144)$= 1.62 ns	$F(1,144)$= 4.78* η^2 = .02
medium	3.92 (0.02) N = 34	3.98 (0.06)	3.92 (0.01) N = 89	3.84 (0.06)	$F(1,121)$= 0.08 ns	$F(1,121)$= 3.27 ns	$F(1,121)$= 4.00* η^2 = .03
high	4.51 (0.05) N = 14	4.34 (0.07)	4.52 (0.03) N = 28	4.15 (0.05)	$F(1,40)$= 14.10*** η^2 = .26	$F(1,40)$= 0.74 ns	$F(1,40)$= 1.91 ns
Work engagement							
low	1.88 (0.10) N = 23	2.26 (0.14)	1.76 (0.06) N = 69	1.84 (0.08)	$F(1,90)$= 14.16*** η^2 = .14	$F(1,90)$= 4.82* η^2 = .05	$F(1,90)$= 5.94* η^2 = .06
medium	3.04 (0.08) N = 30	2.99 (0.13)	3.07 (0.04) N = 88	3.18 (0.07)	$F(1,116)$= 0.22 ns	$F(1,116)$= 1.35 ns	$F(1,116)$= 1.61 ns
high	4.68 (0.09) N = 33	4.48 (0.13)	4.56 (0.06) N = 68	4.42 (0.09)	$F(1,99)$= 7.16** η^2 = .07	$F(1,99)$= 0.61 ns	$F(1,99)$= 0.18 ns

Note. * p < .05, ** p < .01, *** p < .001, ns = not significant, N = total of participants

Table 3. Results of post-hoc independent *t*-tests testing mean differences between the self-enhancement and self-monitoring group per T1 category on the research variables (low, medium, and high)

	t-test results self-enhancement versus self-monitoring	
T1 category	T1	T2
Positive emotions		
low	$t(124) = -0.70^{ns}$	$t(124) = 2.68^{**}$
medium	$t(73) = 0.33^{ns}$	$t(73) = 1.15^{ns}$
high	$t(45.75^{\#}) = 1.14^{ns}$	$t(43.27^{\#}) = 0.21^{ns}$
Self-efficacy		
low	$t(144) = 1.04^{ns}$	$t(144) = 2.80^{**}$
medium	$t(121) = -0.19^{ns}$	$t(121) = 1.97^{ns}$
high	$t(20.46^{\#}) = -0.06^{ns}$	$t(40) = 1.28^{ns}$
Work engagement		
low	$t(90) = 1.11^{ns}$	$t(90) = 2.62^{**}$
medium	$t(116) = -0.40^{ns}$	$t(116) = -1.37^{ns}$
high	$t(99) = 1.12^{ns}$	$t(99) = 0.41^{ns}$

Note. ** $p < .01$, ns = not significant, # Levene's test of equality of variances was violated, so adjusted degrees of freedom and *t*-values were reported

7.4. Discussion

7.4.1. Conclusions

The objective of our study was to investigate whether an intervention based on principles of positive psychology could be applied to a work-related setting in order to enhance positive emotions, self-efficacy, and work engagement. The online self-enhancement intervention that was designed containing happiness activities, goal setting at work, and resource building assignments, appeared to have a significant positive effect on what we believe to be antecedents of engagement, namely positive emotions and self-efficacy. This is in line with results of previous studies on positive psychology interventions. Interventions consisting of a single happiness activity showed positive effects on general well-being, e.g., using signature strength, expressing gratitude (e.g., Lyubomirsky et al., 2011; Mitchell, Stanimirovic, Klein & Vella-Brodrick, 2009; Seligman et al., 2005), using a goal setting method (Macload et al., 2008), and using resource building interventions (e.g., Luthans et al., 2008). Only Vuori et al. (2012) reports on a positive psychology intervention, namely a combination of goal setting and resource building, which had a positive effect on the level of work-related well-being (i.e., work engagement) instead of general well-being.

The intervention had a positive effect on both positive emotions and self-efficacy, positive emotions being an affective and self-efficacy being a cognitive antecedent of

work engagement. In that sense, we showed that a positive psychology intervention can actually initiate the building process towards engagement. The fact that we found effects on antecedents of work engagement but not on engagement itself could have to do with proximity. According to B&B theory (Fredrickson, 1998), well-being *follows* positive emotions and resources, so a follow-up assessment measuring the long term effect of the intervention, would probably have resulted in an increase in work engagement as well.

Our self-enhancement intervention had no significant short term effect on work engagement, at least, not at first glance. Additional analyses showed, however, that effects on engagement were found when taking participants' initial levels of work engagement prior to the intervention into account. Splitting up the self-enhancement (intervention) and self-monitoring (control) groups in low, medium and high on initial work engagement scores, showed that participants in the intervention group with low initial scores on work engagement scores did increase significantly in work engagement, and that the corresponding subgroup in the self-monitoring group did not. This finding confirms that the positive activities that were initiated by the online intervention were more beneficial for those who were expected to gain from it most (Lyubomirsky et al., 2011). The validity of this finding is supported by the fact that similar results were found for positive emotions and self-efficacy (see Table 2 and 3). This has to do with *behavioral plasticity*: the extent to which an employee is affected by external factors, such as the opportunities for development. Brockner (1988) hypothesized that there are differences in the degree to which individuals attend and react to external cues, such as online assignments. So, as a consequence, those online assignments affect their attitudes and behaviors differently. Those employees, who are more in need (i.e., low in positive emotions, self-efficacy, and work engagement), benefit more because they have more to gain with regard to their well-being. Moreover, Vuori et al. (2012) found a similar pattern in their intervention study. Their study showed that especially employees that were highly exhausted at baseline, benefitted from a career management intervention as regards their level of work engagement. Similar results were found in intervention studies on self-efficacy (Eden & Aviram, 1993; Gibson, 2001).

7.4.2. A critical reflection

The attrition rate of our study was relatively high (82-83%). Internet interventions tend to have higher attrition rates compared to other types of interventions, because human interaction (e.g., face-to-face contact, telephone) reduces attrition (Mitchell et al., 2009). As stated in the Results section, we conducted additional analyses because of the selective attrition of participants with regard to positive emotions, self-efficacy, and work engagement. Looking at the selective attrition in the self-enhancement group regarding pre- and post-measurement and the selective dropout during the online self-enhancement intervention, we conclude that especially participants who started off the intervention with relatively

high initial levels of positive emotions, self-efficacy, and work engagement are more likely to engage in (and complete) the online intervention. Based on this, we expected to find differential effects of the intervention for participants who differed with regard to pre-intervention level of positive emotions, self-efficacy, and work engagement. At first glance, the results of our additional analyses may be caused by the statistical artifact 'regression to the mean'. However, Yudkin and Stratton (1996) state that regression to the mean cannot account for results when the scores of a group of participants were significantly affected by the intervention whereas the scores of those belonging to a control group were not. That is, a general development over time (difference between T1 and T2) can be explained by regression to the mean, but a significant difference between the intervention and control group at the post measurement (T2) – in case there is no significant difference at T1 – cannot. Accordingly, the finding is more robust and it is likely that the intervention actually had an effect on positive emotions, self-efficacy, and work engagement. Namely, our results showed that there were no differences in positive emotions, self-efficacy, and work engagement at the pre measurement (T1), but that the participants who participated in the online intervention program, and were low on positive emotions, self-efficacy, and work engagement, scored significantly higher at T2 on the three outcome variables compared to the participants in the control group (see Table 3). Therefore, we can be pretty sure that our results cannot be explained by regression to the mean.

Sin and Lyubomirsky (2009) recommend using what they call a 'shotgun approach' to enhance well-being. This type of approach is likely to be effective, since multiple positive activities are conducted by the participants instead of only one (Sin & Lyubomirsky, 2009). Our intervention had a similar approach and was indeed effective in enhancing positive emotions, self-efficacy, and – for part of the participants – also work engagement. However, we do not really know what elements of the intervention were most effective: the happiness activities, goal setting, resource building activities or any combination of these. Nevertheless, we could also argue that all elements are needed to make the intervention program effective enough to enhance participants' level of well-being.

7.4.3. Implications and recommendations

In the Method section, we described that participants of the self-enhancement intervention who both intended to start the intervention as well as completed the intervention, are those participants who experience relatively high levels of positive emotions, self-efficacy, and work engagement. However, this gives rise to a paradox, which we would like to dub *Selection Benefit Paradox*. As previously stated in the Discussion section, the intervention in particular has positive effects on those participants who experience initially low levels of positive emotions, self-efficacy, and work engagement. In other words, the participants who potentially benefit the most from the self-enhancement intervention are those who are the

most likely to drop out of the intervention or not even to start with it. This paradox has serious implications for future research as well as practice. On the one hand, we recommend focusing on employees who experience little positivity in the workplace. Recruitment of these employees for positive psychology interventions seems to be an important endeavor because they can be expected to have the most significant gain with regard to their levels of positive emotions, self-efficacy, and work engagement. That is, these employees have the most unused potential. However, these employees are likely to be less intrinsically motivated to participate in this type of activities. Supervisors have a key role within organizations to make especially these types of employees enthusiastic to participate. In a sense, supervisors should function as ambassadors of the positive intervention within the organization. Because of our design – using participants nationwide instead of within one organization – we could not use supervisors that way. The opposite also applies: employees who experience high levels of positive emotions, self-efficacy and work engagement are enthusiastic and motivated to participate in a self-enhancement intervention. However, they are less likely to gain anything from it as regards their level of work-related well-being: they had less to gain from the intervention to start with. Although from a methodological perspective, a randomized controlled trial (RCT) is a stronger design than using a self-selection design, we would not have recovered this important insight using an RCT. Moreover, in order to find positive effects of self-enhancement interventions, voluntary participation seems to be of the utmost importance.

Our study was conducted via a semi-public website. That means that the participants of the intervention were all working in different organizations throughout the country. As stated, they did not have the advantage of having the support of their supervisors and colleagues who are participating in a similar intervention. So, the fact that no effects were found on work engagement for the *total* sample could also have been caused by the fact that the working context of the participants was not integrated into the content of the intervention. Namely, previous research showed that the social working environment is important in predicting the level of engagement among employees (e.g., Bakker, Hakanen, Demerouti & Xanthopoulou, 2007). Therefore, we advise to implement this online intervention within an organizational context. This way, it is possible to create a learning environment in which colleagues and supervisors are actively participating as well. Furthermore, it is important to put a lot of energy in promoting the intervention within the organization beforehand, and in explaining what individual employees could gain by participating in the intervention. So, motivating them to participate by making clear what is in it for them. This in reference to what was previously stated, that it is hard to intrinsically motivate every employee in participating in a self-enhancement intervention. Why would this be? Probably, the strength of interventions focused on amplition, namely that everyone can potentially benefit from it, is also its pitfall. Because there is no specific problem,

complaint or disease, employees sometimes do not understand the need for (participating in) this type of intervention. So, practitioners have to explain to potential participants why they would want to be more engaged in their work. Namely, that employees could have a more positive perception on the current work environment but can also have an actual influence on their work environment, and as such, they can be more happy and confident at work.

Needless to say positive psychology interventions that are focused on amplition cannot replace interventions that are based on the medical model. Just as prevention does not replace curing, amplition does neither replace treatment nor prevention. Of course, sick employees need to be cured and occupational hazards need to be prevented. So instead of replacing each other, the three perspectives *supplement* each other by widening the scope, from diseases via potential diseases to enhancing employee health and well-being.

7.4.4. Conclusion

In conclusion, positive psychology interventions have major potential in enhancing well-being at work, but it will only work when employees want it to. That is, especially employees who already are engaged and experiencing positive emotions and self-efficacy at work are likely to be motivated in enhancing their own well-being even further. It is up to supervisors, HR managers, trainers, and coaches to make sure that also those who experience lower levels of well-being get motivated to attend positive interventions. In other words, they have to convince these employees that they can benefit from positive interventions. Researchers should support this by providing more research on what types of activities have the potential to work.

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Chapter 8.
Conclusions and discussion

8.1. Results, conclusions, and theoretical implications

The two main objectives of this dissertation were to increase our theoretical understanding of engagement by expanding Broaden-and-Build (B&B) theory (Fredrickson, 2001), and – based on this – to design and evaluate individual interventions that enhance engagement. Following these objectives, four research questions were formulated. In this final Chapter (section 8.1), we will discuss the answers to these questions based on the results obtained in our studies. Moreover, we formulate our main conclusions and discuss the most important theoretical implications of our findings. In the following sections, three topical issues that arose from our results are discussed, also in relation to the limitations of our studies and suggestions for further studies and practical recommendations. These issues are related to the research designs that we used (section 8.2), to the concept of engagement (section 8.3), and to the (lack of) motivation in participating in positive interventions (section 8.4). This Chapter is concluded with a final note (section 8.5).

8.1.1. What is the role of positive emotions in enhancing engagement? (Question 1)

We expected an important role of positive emotions because they facilitate approach behavior, which prompts individuals to set goals and to be engaged in attaining these goals (Cacioppo, Gardner & Berntson, 1999). In Chapters 2-4, we tested the hypothesis that the experience of positive emotions predicts future engagement. Further, following the 'build' hypothesis of B&B theory, we specified this relationship by adding personal resources as a mediator between positive emotions and engagement. In Chapters 2 and 3, we used a two-wave full panel design to unravel the causal relationships between positive emotions, personal resources (i.e., hope, optimism, and self-efficacy), and either study (Chapter 2) or work (Chapter 3) engagement over time. Because of the two-wave design, we were unable to test whether an indirect relationship exists between positive emotions and engagement *via* personal resources (i.e., a mediating effect). Nevertheless, in both studies, we found that positive emotions did not have a direct effect on engagement over time, though positive emotions appeared to be directly related to personal resources. These results confirm that those employees or students who experience positive emotions at a certain point in time are more likely to report personal resources at a later point in time. In other words, whilst people experience positive emotions, they are prone to have more positive work-related beliefs. So, both in Chapter 2 and 3, results confirm the 'build' hypothesis derived from B&B theory that positive emotions initiate the building of resources.

Chapter 4 reported on a study in which employees filled in a diary questionnaire for five consecutive working days, twice a day (i.e., before and after the working day). We reported in this Chapter that positive emotions build hope, which, in turn, leads to engagement. More specifically, we found that positive emotions felt after a working day predicted how hopeful the participating employees were regarding their work at the start of

the next working day. In addition, the level of hope at the beginning of the next working day appeared to have an effect on the level of engagement that the participants reported after that same working day. In conclusion, on a daily level, the experience of positive emotions had an indirect effect on work engagement through hope. Hence, the results of Chapter 4 substantiate what was found in Chapters 2 and 3, but on a daily basis. Importantly, although positive emotions and engagement might be substantially correlated over time, they are not directly related when personal resources are taken into account. So, positive emotions have the potential to build personal resources over time and, as a result, have an indirect effect on engagement over time.

8.1.2. What is the role of personal resources (PsyCap) in enhancing engagement? (Question 2)

As stated, B&B theory assumes that resources lead to engagement over time. We operationalized these resources using *Psychological Capital* (PsyCap: Luthans & Youssef, 2007). In Chapters 2 and 3, we expected a longitudinal relationship between personal resources, i.e., PsyCap and engagement. The results supported the assumption of B&B theory that the availability of personal resources leads to engagement, across a period of one month among university students (Chapter 2) and across a period of six months among employees (Chapter 3), respectively. Thus, the current studies demonstrated that personal resources are indeed important in predicting future engagement. Furthermore, in Chapter 4, one element of PsyCap, namely hope – measured before the working day –, appeared to have an effect on the level of engagement that employees reported after that same working day.

Chapter 5 reported on a field study and an experimental study among university students, to answer the question whether changes in students' self-efficacy levels co-vary with similar changes in engagement and performance. In doing so, we uncovered the relationship between self-efficacy, being the most important element of PsyCap (Luthans, Avolio, Avey & Norman, 2007), and study engagement. As opposed to Chapters 2-4, where we used a variable-centered approach, in Chapter 5 we adopted a person-centered approach. That is, instead of looking at the sample as a whole, we created 'natural' (Study 1) and manipulated (Study 2) subgroups based upon their change in self-efficacy levels over time, and then examined whether these subgroups showed corresponding changes over time in levels of engagement and performance. Results partly confirmed our expectations; changes in self-efficacy corresponded with similar changes in study engagement (Study 1), task engagement, and task performance (Study 2). So, we confirmed the positive 'effects' of changes in self-efficacy on increases in engagement (though not on performance) in a field as well as an experimental setting. In section 8.2, the interpretation of the results of variable- versus person-centered approaches is discussed in more detail. In conclusion,

Chapters 2-5 all confirmed that personal resources (i.e., hope, optimism, and self-efficacy) have a positive impact on engagement over time.

In the current thesis, we investigated the role of positive emotions and personal resources in enhancing engagement in the context of B&B theory. We combined the notion of PsyCap with B&B theory resulting in a more comprehensive approach, with the aim of applying this framework on two specific (i.e., academic and work-related) contexts. Whereas B&B theory is a context-free framework, PsyCap is designed to be used within a work-related context. Both are popular in positive (organizational) psychology and integrating them by using the elements of PsyCap as operationalization of personal resources, as stipulated by B&B theory, seems to work well. However, we excluded one component of PsyCap – resilience – from our studies. The reason for this is twofold. First, in our initial analyses resilience was poorly correlated to the other elements of PsyCap, i.e., hope, optimism, and self-efficacy, as well as to our other main constructs, i.e., positive emotions and engagement. Second, also a conceptual motive was involved, albeit in hindsight. As we have discussed in Chapter 1, resilience is the capacity of an individual to bounce back from negative stressful circumstances. Conceptually speaking, in contrast to resilience, hope, optimism, and self-efficacy do not assume that a trigger event (adversity) has taken place. That means that resilience is *reactive* in that it draws upon mechanisms that enable to move past an adverse event (Luthans, Vogelgesang & Lester, 2006). Resilience is what enables people to keep trying, and to restore their (other) personal resources even after they have been challenged by set-backs. In contrast, hope, optimism, and self-efficacy are prospective and consist of positive beliefs and expectations regarding the future. The more hopeful, optimistic, and efficacious people are in task accomplishment, the more likely they have a pathway to resilience in which they frame a possible negative event or failure in the future as a learning experience (Luthans et al., 2006).

In conclusion, resilience basically comes into play only after a negative event has occurred (i.e., the trigger). As such, resilience has an important buffer function in preventing burnout (Sweetman & Luthans, 2010), more so than having a positive role in enhancing engagement. As stated in Chapter 1, resilience resources may produce a buffering effect, whereby work engagement could be maintained despite burnout-inducing job demands (Bakker, Demerouti & Euwema, 2005). This buffering may reduce the likelihood that activities are experienced as stressful and even reduce the health-damaging consequences of such activities (Masten & Reed, 2002). Thus, resilience is more likely to reduce the negative (e.g., burnout) than to enhance the positive (e.g., engagement). Although the one option does not rule out the other, based on our empirical findings as well as on the conceptual reasoning above, we propose that the framework of PsyCap is 'better off' without the concept of resilience. It seems that resilience is not fitting to the criteria of positive psychology and the

principles of amplition (see Chapter 1), i.e., optimizing the positive.

In Chapter 3, we investigated the role of *job* resources next to *personal* resources in the 'building process' towards engagement. Interestingly, we did not find relationships between job resources and any of the other variables, i.e., positive emotions, personal resources, and engagement. The reason for this could be that job resources are more dependent on environmental factors than personal resources which are actually personal attributes. In other words, job resources are more distal in relation to individual employees, whereas personal resources are more proximal. So, although job resources have been found to predict work engagement (e.g., Xanthopoulou, Bakker, Demerouti & Schaufeli, 2009), Chapter 3 showed that the effects of job resources on work engagement are 'overruled' by the effects of individual factors (i.e., positive emotions and personal resources). Despite these results we refrain from stating that the work environment is unimportant in predicting employees' work engagement; however, we do believe that it is essential to take individual factors into account as well.

8.1.3. Gain cycles: reciprocal relationships

Important to note is that, besides testing the assumption that positive emotions lead to engagement via personal resources, we also investigated whether these variables relate to each other in a way akin a *gain cycle*. That means that variables are reciprocally (i.e., normal and reversed causation) related to each other over time (Salanova, Schaufeli, Xanthopoulou & Bakker, 2010). In other words, they mutually influence each other. In Chapters 2 and 3, next to testing the build hypothesis, we studied the reciprocal relationships between positive emotions, personal resources, and engagement. In Chapter 2, we found reciprocal relationships between positive emotions and personal resources, as well as between personal resources and study engagement. Additionally, Chapter 3 reported on a reciprocal relationship between positive emotions and personal resources as well as a reversed causal effect of work engagement on positive emotions.

To summarize, our results showed that positive emotions, personal resources, and engagement are related to each other in a way that resembles a gain cycle. These results imply that none of the constructs included in our research model can be considered as a single, isolated cause or consequence, as reciprocal causation seems to occur. So, the psychological processes seem to be dynamic in nature. Accordingly, our results supported the notion that it is too simplistic to assume a specific, one-directional causal order when it comes to the relationships between psychological constructs that are involved in the building of engagement (Llorens, Schaufeli, Bakker & Salanova, 2007). So, based on the results of our studies we conclude that the assumed sequence of the building hypothesis of B&B theory is not the 'whole truth': positive emotions, personal resources, and engagement are dynamically related to each other. The robustness of this interpretation is supported

by similar reciprocal relationships that were found in previous studies (see Salanova et al., 2010, for an overview).

The existence of gain cycles of positive emotions, personal resources, and engagement raises the question what would stand at the beginning of the building process. Fredrickson and Joiner (2002) advocate that reciprocal relations among positive emotions and personal resources over time suggest that the effects of positive emotions should accumulate and compound: positive emotions may facilitate personal resources, and these, in turn, may predict future positive emotions. As this cycle continues, people build towards more personal resources and simultaneously enhance their well-being. Alternatively, some researchers have proposed that engagement – in this thesis considered as an outcome of the building process – sparks the building process (e.g., Salanova et al., 2010; Xanthopoulou et al., 2009). However, our studies are not conclusive on either assumption; namely, although Chapters 2 and 3 showed that the relationships between positive emotions, personal resources, and engagement are best interpreted when all effects are taken into account simultaneously, not all (reciprocal) effects appeared to be significant. We discuss this in more detail in section 8.1.5 when we compare the results on work and study engagement. Moreover, the studies that are described in Chapter 4 had – in contrast to Chapters 2, 3, and 5 – more than two measurements and showed that positive emotions, hope, and work engagement are related in ways as assumed by the build hypothesis of B&B theory. Therefore, we believe that work engagement is more likely to act as an outcome measure in the building process. Consequently, as we argued in Chapter 1, our studies confirm that engagement can be used as a domain-specific measure of subjective well-being or happiness.

8.1.4. Are happiness interventions, i.e., intentional activities, useful in enhancing engagement? (Question 3)

Chapters 6 and 7 both entailed evaluations of the effects of different types of happiness activities. More specifically, Chapter 6 tested the potential of a cognitive (i.e., thoughts of gratitude) and a behavioral (i.e., acts of kindness) intervention to enhance study-related positive emotions and study engagement, as well as to reduce study-related negative emotions. In doing so, we modified two existing positive psychology interventions – that were originally aimed at increasing context-free happiness – for use in an academic context. We monitored the participants at a daily basis during the one-week intervention, and we carried out additional pre-, post-, and follow-up assessments. The first study showed that by stimulating thoughts of gratitude (i.e., a cognitive intervention), university students experienced more positive emotions compared to university students in the control condition. However, thoughts of gratitude did neither result in higher levels of study engagement nor in lower levels of negative emotions. Performing acts of kindness (i.e., a

behavioural intervention) showed stronger effects. Not only did performing acts of kindness yield higher levels of positive emotions, there was also a positive effect on study engagement compared to the control condition. Therefore, we conclude that happiness activities such as thoughts of gratitude and acts of kindness can be useful for enhancing positive study-related states, but as it seems, not for decreasing study-related negative emotions.

So, the current thesis suggests that adopting an individual perspective on enhancing study engagement through positive interventions is useful. The results of Chapter 6 indicated that positive behavioral interventions in an academic context (i.e., acts of kindness) work better and/or faster than cognitive interventions (i.e., thoughts of gratitude) in enhancing engagement. Thoughts of gratitude increased positive emotions only at the end of the intervention week. It took a while before increases in positive emotions became significant in comparison to the control condition. Additionally, the effects on study engagement were non-significant. These results are in line with those of Emmons and McCullough (2003) and Watkins, Woodward, Stone, and Kolts (2003) who found that daily gratitude thoughts led to increases in positive emotions, but only less frequent gratitude thoughts over longer periods of time led to longer-term states of (physical) well-being.

The effects of the acts of kindness intervention on positive emotions and study engagement were much stronger, as the level of positive emotions in the experimental group was significantly elevated compared to that of the control group, already at the second day of the intervention week. This may be because, contrary to gratitude thoughts, acts of kindness often evoke immediate positive feedback. Positive reactions of other people towards the participants are likely to have strengthened the effects of the acts of kindness intervention. That is, their acts of kindness caused the participants to feel better about themselves, but also generated positive consequences that were immediately visible and could be reciprocated (Trivers, 1971). For example, participants could have gotten favors, a thank you, or just a smile in return. These kinds of positive feedback cannot – by its very nature – result from our thoughts of gratitude intervention. In conclusion, we found positive effects on positive emotions and engagement, though the effects were short-lived. So, we were unable to prevent the effects of the hedonic treadmill. All in all, we did not completely confirm what was stated in Chapter 1, that by means of intentional activities the levels of positive emotions and engagement may be affected for a longer term.

The objective of the study discussed in Chapter 7 was to investigate whether an intervention based on principles of increasing happiness-levels could be applied to employees in a work-related setting in order to enhance positive emotions, self-efficacy, and work engagement. The intervention covered behavioral, cognitive, and motivational activities and consisted of three types of online self-initiated activities: happiness activities to stimulate positive emotions, goal setting activities, and resource building activities. This study thus examined whether happiness interventions are also effective in a work-related

context. In comparison with the (self-monitoring) control group and as expected, the (self-enhancement) intervention group showed a significant increase in both positive emotions and self-efficacy. The intervention had no significant short-term effect on work engagement, at least, not at first glance. However, additional analyses showed that significant effects on engagement were found when taking employees' initial levels of work engagement prior to the intervention into account. We split up the intervention group and control group in low, medium, and high on initial work engagement scores, thereby showing that employees in the intervention group with low initial scores on work engagement significantly increased in work engagement, whereas the corresponding subgroup in the control group did not. All in all, we showed that context-free positive psychology interventions can be tailored for application in a work setting in order to enhance individual antecedents of work engagement (i.e., positive emotions and self-efficacy) and – at least for some of the participants – their levels of work engagement as well.

The intervention described in Chapter 7 had a significant positive effect on positive emotions and self-efficacy. For work engagement, however, we only found a significant positive effect for those who scored low on baseline work engagement. This finding underlines that the positive activities that were initiated by the online intervention were more beneficial for those who were expected to gain from it the most (Lyubomirsky, Dickerhoof, Boehm & Sheldon, 2011). To the best of our knowledge, the only other positive psychology intervention that was aimed at enhancing work engagement is that of Vuori, Toppinen-Tanner, and Mutanen (2012). Their intervention – a one-week workshop in a group setting – combined goal setting and resource building and they found a small positive effect on the levels of work engagement. Besides the fact that they found an effect on work engagement in the total sample – probably because their intervention was face-to-face and quite intensive –, they also found that those who benefited most from the intervention were employees with elevated levels of depression or exhaustion, implying additional benefits of a more targeted use of the intervention. So, similar to our intervention study, they found that employees low in well-being benefited most from the intervention. In conclusion, interventions targeted at enhancing engagement are likely to be more effective when directed towards specific groups of employees instead of to all employees, as is indicated by the principles of amplition.

8.1.5. Can students build towards engagement in the same way as employees do? (Question 4)

We expected that university students would be a suited pilot sample for investigating relationships between work-related constructs. Namely, as stated in Chapter 1, like employees, students are involved in structured activities (e.g., doing assignments, attending class) that are directed toward a specific goal (e.g., passing exams, acquiring a degree),

have social contacts with fellow students as well as teachers, get social status from being a student, and remain active throughout the study (Jahoda, 1981). In other words, from a psychological point of view, the daily, study-related activities of students can be considered equivalent to 'work' (Salanova, Schaufeli, Martínez & Bresó, 2009). As such, students can feel engaged in their studies, and possibly, 'build' towards engagement in a similar way. In this thesis, Chapters 2 and 5 looked into the role of positive emotions (Chapter 2) and personal resources (Chapters 2 and 5) in enhancing engagement among university students, whereas Chapters 3 and 4 investigated similar relationships among employees. By comparing the results of these Chapters we can relate the building process towards engagement of university students to the building process towards engagement of employees. However, because we did not adopt exactly the same research designs – time lags as well as measurement scales were not identical – we cannot be completely conclusive on this matter. Nevertheless, we can get an indication about the extent to which relationships between positive emotions, personal resources, and engagement generalize among university students and employees. With regard to the role of positive emotions in enhancing either work or study engagement, we found indirect relationships via the build of personal resources (Chapters 2-4). Corresponding to this, among university students (Chapters 2 and 5) and employees (Chapters 3 and 4) we found that positive emotions are related to personal resources, and personal resources, in turn, are related to engagement over time. In other words, the building process described by B&B theory is successfully demonstrated within an academic and a work-related context. So, the first five Chapters seem to indicate that university students and employees build towards engagement in similar ways. It follows that, indeed, university students are a suitable pilot sample to test hypothesized relationships between constructs that were designed for use in the workplace.

In addition, as stated in section 8.1.3, our results showed that positive emotions, personal resources, and engagement are related to each other in a way that resembles a gain cycle. More specifically, our results indicated that next to causal relationships as proposed by the 'build' hypothesis, also reversed causal relationships exist. For example, Chapter 2 showed that *study* engagement is related to personal resources over time. So, among university students, both positive emotions and study engagement seem to build personal resources over time. However, in Chapters 3 and 4 we saw that *no* reversed relationship exists between work engagement and personal resources over time. Apparently, where *study* engagement relates to personal resources among university students, *work* engagement has limited 'building capacities' despite its positive affective component.

Also, the question about the ecological validity of interventions is important because student samples are often adopted for performing pilot studies that are to be conducted in work-related contexts. Chapters 6 and 7 reported on interventions, whereby Chapter 6 used a student sample and Chapter 7 used a sample of employees. Although the

contents of the interventions were not entirely similar, we were able to explore whether activities designed to increase context-free happiness could also be applied to enhance engagement and its individual antecedents in academic and work-related settings, respectively. Both Chapters reported on interventions that used 'online' communication with participants, and thus they relied on the assumption that participants adhered to the instructions on how to conduct the intervention. So, although the contents were not identical, the procedures for both interventions were similar. Both Chapters 6 and 7 showed that the activities performed by the participants had a positive effect on their levels of positive emotions and – though more modestly –, on their levels of engagement. So, it seems that adapted versions of context-free happiness interventions may yield comparable positive outcomes in both academic and work-related contexts.

Below, three main issues on a more general level are discussed that arose from the current thesis. First, we discuss a *methodological issue*, being the two types of designs we used to analyze our data and the implications of those designs for both theory and practice. Second, we elaborate on a *conceptual issue* grounded in the fact that we investigated the effects of positive emotions and personal resources on different *types* of engagement, namely work engagement, study engagement, day-level engagement and task engagement, using different time lags. Finally, we discuss a *pragmatic issue* based on the most important lessons we learnt on conducting intervention studies, thereby trying to answer the question how to engage the un-engaged. For each of these three issues, the limitations of the studies in this thesis as well as recommendations for further research and/or practical interventions are discussed.

8.2. How to interpret the results of variable-centered and person-centered approaches?

8.2.1. The issue

In the current thesis, we used two different ways to analyze our data: a variable-centered and a person-centered approach. Chapters 2 and 3 reported on structural equation models which assess longitudinal relationships between positive emotions, resources, and engagement. Chapter 4 investigated relationships over time among similar variables, though using a hierarchical linear modeling approach. These studies all employed a variable-centered approach in which the focus is on relationships among variables with the aim of supporting a theory. The goal of this type of approach is to predict outcomes by relating independent and dependent variables using (structural) equation models (Muthén & Muthén, 2000). That way, we specified the relationships between positive emotions, personal resources, and engagement and tested hypotheses that were derived from B&B theory in an academic and in a work-related context.

In Chapters 5-7 we took on a person-centered approach. A person-centered

approach takes heterogeneity into account and thus focuses on relationships among individuals instead of variables. The goal of this approach is to group individuals into categories – either 'natural' (Chapter 5; Study 1) or manipulated (Chapter 5; Study 2, Chapters 6 and 7) –, each of which contains individuals who are similar to each other and different from individuals in other categories (Muthén & Muthén, 2000). The studies in this thesis using a person-centered approach, investigated whether (differences in) mean levels of positive emotions, personal resources, and engagement coincided over time (Chapter 5; Study 1), but also whether these mean levels could be positively influenced over time (Chapter 5; Study 2, Chapters 6 and 7). Looking at specific subgroups and their mean score differences on self-efficacy over time, we yielded relevant knowledge for (the design of) interventions to increase engagement and its individual antecedents. For example, in Chapter 5 we showed that a decrease in self-efficacy corresponded with a similar decrease in study engagement, suggesting that it is rewarding to invest in students' self-efficacy in order to enhance their levels of engagement. In Chapter 6, we showed that a raise in positive emotions was followed by an increase in engagement in the intervention study in which participants were to commit acts of kindness (Study 2). Similarly, we showed in Chapter 7 that changes in positive emotions and self-efficacy coincided, and 'resulted' in an increase in engagement for part of the participating employees.

Although both approaches are designed to answer different questions and thus did not yield the same type of results, the results of our studies were not contradictory. The two approaches answer either the question (1) do constructs relate over time (variable-centered), or (2) are the mean differences in scores on these constructs similar over time for different (sub)groups (person-centered)? These questions are closely related to the two prerequisites for *gain spirals*. Namely, gain spirals are defined as amplifying loops in which cyclic relationships among constructs build on each other positively over time (Lindsley, Brass & Thomas, 1995). Thus, for a gain spiral of positive emotions, personal resources, and engagement to exist, two conditions should be met: (1) the variables should be related to each other in a gain cycle (variable-centered); and (2) there should be an increase in mean levels over time (person-centered). Statistically speaking, both conditions are independent (Salanova et al., 2010). In this thesis, we investigated both conditions of gain spirals, though in separate studies using different approaches.

In conclusion, using variable-centered approaches we found gain cycles, referring to positive emotions, personal resources, and engagement being dynamically related to each other over time. Further, we used person-centered approaches to confirm that mean differences of positive emotions, personal resources, and engagement run parallel (Chapters 5 and 7) or follow each other (Chapter 6) over time.

8.2.2. Limitations and recommendations

We investigated the effect of positive emotions *at a specific time-point* on personal resources and engagement. However, higher levels of personal resources and engagement are more likely to occur when a person experiences *an increase* in positive emotions. Hence, B&B theory states that an accumulation of positive emotions is likely to result in more personal resources and engagement (Cohn, Fredrickson, Brown, Mikels & Conway, 2009). That way, positive emotions initiate a gain spiral towards engagement via personal resources. Based on Chapter 6 (Study 2), we suggest that an accumulation of positive emotions is likely to result in enhanced engagement because acts of kindness led to higher levels of study-related positive emotions and, sequentially, enhanced study engagement. However, based on the design of this study we cannot be conclusive about this. Only when combining variable- and person-oriented approaches, the hypothesis that an increased level of positive emotions leads to more personal resources and higher levels of engagement over time can be tested. In future research more than two waves of data – with larger sample sizes – should be used, so that more advanced statistical techniques can be used such as growth mixture modeling. Growth mixture modeling both estimates a mean growth curve for each subgroup within a sample and captures individual variation around these growth curves by the estimation of growth factor variances for each group (Mäkikangas, Bakker, Aunola & Demerouti, 2010; Muthén & Muthén, 2000).

8.3. How to assess engagement: different types or different dimensions?

8.3.1. The issue

We assumed engagement to be a suitable construct to assess domain-specific (i.e., academic and work-related) well-being. For that reason, we used engagement as an outcome measure in the building process, as conceptualized by B&B theory. After Kahn (1990) being one of the first to dub the term engagement, ample research has been carried out on this concept. In the current dissertation, we investigated different types of engagement. In Chapters 3, 4, and 7 we examined work engagement and in Chapters 2, 5, and 6 we investigated study engagement, which is similar to work engagement but refers to a different domain. In addition, we looked at day-level engagement in Chapter 4 and investigated task engagement in Chapter 5. As described previously, it appeared that different types of engagement yield similar empirical results. So, the types of engagement that are investigated do not only differ with regard to their domain object (study versus work), but also use different time frames (day versus longer-term), and adopt different foci (general versus task specific).

As stated, the types of engagement differ with regard to the time lags between the measurements of engagement (i.e., time frame). In the current thesis, we assessed work (and study) engagement over a course of one to six months, using survey designs. Day-level engagement was assessed across days using a diary study, and task engagement was

measured across an even shorter period of time in the context of an experimental design. Furthermore, the questionnaires that we used to measure the types of engagement were adjusted according to their object, time frame, and focus. That is, different versions of the same questionnaire (Utrecht Work Engagement Scale; UWES) were used to measure different types of engagement (i.e., study-, work-, day-level-, and task engagement). That raises the question whether these different types of engagement as operationalized by different versions of the UWES reflect 'real' differences in conceptualizations of engagement. In other words, are work-, day-level-, and task engagement conceptually similar or different?

To answer this question the distinction made by Schaufeli and Salanova (2011) between four different types of engagement, which all have different objects, time frames, and/or foci, is helpful: employee engagement, work engagement, day-level engagement, and task engagement. *Personal* or *employee engagement* is defined as "… the harnessing of organization members' selves to their work roles; in engagement, people employ and express themselves physically, cognitively, and emotionally during role performances" (Kahn, 1990, p. 694). So, employee engagement is a quite wide-ranging concept that is determined by the *professional* or *occupational role* and the relationship with the organization (Schaufeli & Salanova, 2011). Employee engagement was not included in this thesis; however, it is seen as an important precondition for work, day-level, and task engagement to occur, as it is an important indicator of the commitment of employees to the organization (Schaufeli & Salanova, 2011).

In contrast, *work* (or *study*) *engagement* is mainly determined by the *content of work* (or studies). Work engagement refers to an affective-cognitive state that is habitual in nature and relatively stable across time but is nevertheless influenced by job resources (e.g., supervisory support and autonomy), as well as individual characteristics such as positive emotions and personal resources. These determinants of work engagement are of a more temporary nature than organizational determinants of employee engagement (e.g., organizational climate and job security). Therefore, work engagement is more likely to fluctuate over shorter periods of time, whereas employee engagement is likely to be more stable over time.

Even more so, engagement is likely to fluctuate across days (day-level engagement) or even within days (task engagement). That is to say, engagement could be considered a short-term experiential state (Sonnentag, Dormann & Demerouti, 2010). Employees are probably not equally engaged across days. On some days, employees may feel more engaged than on other days (Bakker, Albrecht & Leiter, 2011). Investigating *day-level engagement* thus allows for gaining a better understanding of how engagement is related to its antecedents and consequences in one's *daily job* (Sonnentag et al., 2010).

In addition to habitual work engagement and day-level engagement – which both focus on work but from a different time perspective –, *task engagement* is the most

specifically focused type of engagement. Jobs (or studies) consist of several tasks, and employees (or students) might feel more engaged while performing some tasks rather than other tasks. Hence, examining task engagement allows for a more detailed evaluation of the *specific tasks* that constitute jobs (Schaufeli & Salanova, 2011). In the current thesis, we found that self-efficacy had a positive influence on task engagement in an experimental setting (Chapter 5). In field research, experience sampling methods are suitable to assess task engagement within an academic or a work-related context as well (e.g., Rodríguez, Schaufeli, Salanova, Cifre & Sonnenschein, 2011).

In summary, the focus of engagement may be the organization and work role (employee engagement), the content of work (work engagement), a particular working day (day-level engagement), or the task at hand (task engagement). In this thesis, we investigated the effects of either positive emotions and/or personal resources on the latter three types of engagement. As stated, these studies yielded similar results and are assessed by different versions of the same questionnaire, suggesting these types of engagement are actually conceptually similar dimensions of one and the same construct. However, based on the elaboration above that every type of engagement has its own object, time frame, and/or focus, we would assume that we have to label the different types of engagement as conceptually different.

8.3.2. Limitations and recommendations

The question remains whether we found similar results using different types of engagement, or that these types of engagement are actually different aspects of the same construct. Our studies do not shed light on this matter; rather we used different types of engagement as outcome measures in separate studies (except for Chapter 4 in which we combined work and day-level engagement). Future studies should integrate these different types of engagement within one study to establish empirically whether or not these different types of engagement are actually different constructs. In other words, future research should focus on examining the connections between relatively static levels of people's engagement (employee engagement) and the fluctuations of work, day-level, and task engagement. Regarding this, we assume – besides the different types of engagement being highly correlated – that the more engagement is studied at a micro level, the less stable its (mean) level is over time. Thus, day-level and task engagement should be studied within short time lags to uncover changed variance and mean levels over time.

8.4. How to engage the un-engaged?

8.4.1. The issue

In this thesis, we developed and evaluated interventions that are based on the principles of amplition. In contrast to curation and prevention, amplition is *not* based on the medical

disease model – fix what is broken or what is about to break – but on the principle of improvement of well-being, i.e., engagement. It originates in the belief that improving employee health and well-being is relevant for all and at all times, and not just for those employees who actually suffer from an identified disease, or are at risk to develop that disease. Being in line with positive psychology, amplition seems a logical next step following curation and prevention. However, a potential pitfall of interventions based on amplition surfaced in Chapters 6 and 7. Namely, it seems that the effectiveness of these types of interventions is limited due to the fact that there is no real, identified problem at hand to be tackled, as is the case for instance with burnout (Le Blanc & Schaufeli, 2008) or workaholism (Van Wijhe, Schaufeli & Peeters, 2010). In other words, for employees (or students) the urgency of these types of interventions is not (immediately) obvious, which lowers their motivation to participate in and/or finalize a positive psychology intervention.

For example, in Chapter 6 we showed that happiness activities (i.e., thoughts of gratitude and acts of kindness) only had short-term effects on positive emotions and study engagement. That is, the effects disappeared almost directly after the intervention week. Furthermore, in Chapter 7 we described the evaluation of a work-related positive psychology intervention, in which we found selection biases among the participating employees. That is to say, those employees who were already relatively high in positive emotions, self-efficacy, and work engagement were more likely to start with and complete the intervention. So, people who feel already quite positive about their work and about themselves are more inclined towards participating in an intervention that sets out to enhance this positivity even more. In contrast, our results show that those low in positive emotions, self-efficacy, and work engagement are the ones that benefit the most from the intervention. We dubbed this phenomenon the *Selection Benefit Paradox*: those who are less in need of a positive psychological intervention are more likely to participate and complete the intervention program, whereas those who need the intervention most are less likely to start and more likely to drop out from the intervention.

The fact that we observed merely short-term effects of engagement (Chapter 6) and only effects among a specific subgroup of participants (Chapter 7) indicates that our participants were not very intrinsically motivated to participate and/or benefit from the interventions. In our intervention studies, participation occurred solely upon people's own initiative, knowing (or assuming – Chapter 6) that they would participate in an intervention that was designed to enhance their levels of engagement. Based on this and following the notion of empowerment (Spreitzer, 1995) as well as the assumed effectiveness of self-initiated activities (Lyubomirsky, Sheldon & Schkade, 2005), our interventions were based on the assumption that the participants were actually intrinsically motivated. After granting their participation, participants were fully responsible for actually participating.[4] However, as it appears, self-selection is not a guarantee for commitment in participation and/or

benefiting from a positive psychology intervention.

In conclusion, interventions based on amplition have the potential to enhance engagement, though the effectiveness of the interventions we studied was limited. This was probably so because university students and employees were not optimally motivated to get more engaged in their studies or work. An explanation for this could be that the discrepancy between the ideal self (i.e., being highly engaged) and the actual self (i.e., having the current level of engagement) is not experienced to be large enough to motivate participants towards finalizing and thus benefitting from positive psychological interventions (see Petrocelli & Smith, 2005). Below, we discuss how engagement interventions can be optimized to improve their effectiveness, i.e., to undo the hedonic treadmill, and which study designs are suitable for evaluating the effectiveness of such interventions.

8.4.2. Limitations and recommendations

It seems that self-selection of participants is unavoidable in case of interventions based on amplition, especially because there is no specific problem, complaint or disease that drives people to participate in such interventions. A basic level of intrinsic motivation already has to be there to be able to reach higher levels of engagement. We could argue that not using a randomized controlled trial (RCT) with regard to the evaluation of our work-related positive intervention (Chapter 7) is a limitation of our approach. However, the question is whether this type of design is actually the most suited one for evaluating the effects of positive interventions. Our studies have indicated that intrinsic motivation is needed to engage in such interventions. So, we recommend that future evaluation studies on positive psychological interventions should be based on self-selection instead of randomized selection. RCT's seem pointless in case of these types of interventions, which – by definition – are effective only when someone is truly motivated to participate and exert sustained effort during participation. Instead, for this type of research it seems more feasible to allow for self-selection of participants rather than selecting them at random from a given population. Voluntary participation is important because someone has to be engaged to become engaged. Namely, amplition means strengthening what is already there; so, some engagement is needed to enhance engagement even further.

The studies of this dissertation showed that self-selection for positive psychology interventions is not a warranty for intrinsically motivated participants and thus significant positive (long-term) effects on engagement. Possibly, participants are in need of a stimulating environment to be motivated to invest in their own well-being. In the current dissertation, we adopted an individual perspective on engagement, assuming that – besides aspects of the work environment – individual characteristics predict engagement as well. However, individual interventions should preferably not be conducted by individuals in isolation, as was the case in our studies. Future research should perform and evaluate similar interventions

within the context of teams, departments, or organizations in order to create a 'climate for engagement' (Bakker et al., 2011). In this climate, colleague support stimulates employees in getting forward and achieving their personal goals. More importantly, by using organizations as context for positive interventions, their management teams have the opportunity to be closely involved in the design and implementation of interventions. Organizations should invest in their employees when they expect them to show initiatives toward self-development. They should do so not only because of moral obligation, but also to stimulate employees' motivation for engaging in these types of interventions. So, organizations should take on a facilitating role by which individual building processes towards engagement can take place. By integrating positive interventions in their daily practices, organizations create not only a 'climate for engagement', but also the possibility of face-to-face contact with a trainer or coach. Although web-based interventions seem rather effective, their results are likely to be stronger in combination with face-to-face contacts. Moreover, these are found to prevent high attrition rates as well (Mitchell, Stanimirovic, Klein & Vella-Brodrick, 2009).

8.5. Final note

The individual perspective on the prediction and enhancement of engagement that was adopted in this thesis seems promising. Moreover, it is in line with the current trend of empowerment which holds every individual responsible for his or her own growth, (mental) health, and performance. Nevertheless, organizations (including universities) carry great responsibility for the well-being of their employees (and students). Namely, the full potential of an engaged workforce can only be expressed in a positive organizational climate, with the availability of job resources and a facilitating management team. This context is, in our opinion, the prerequisite to enable individual employees to build towards higher levels of work-, day-level-, and task engagement. Only then, individually building towards engagement is possible and likely to take place.

[4] Note however, that in the interventions described in Chapter 6, the participating university students were also quite generously rewarded with course credit after the follow-up measurement. So, the participants could also have been extrinsically motivated to finalize the intervention.

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Summary.

Building towards engagement: An individual perspective

Introduction

Organizations are struggling to survive, and more than ever before, they are dependent on the productiveness and well-being of their employees. Nowadays, work engagement – the focal construct of this thesis – is one of the most established constructs within positive organizational psychology. Work engagement is defined as "a positive, fulfilling, and work-related state of mind that is characterized by vigor, dedication and absorption". In this thesis, we state that work engagement is conceptually comparable to happiness. Whereas happiness is defined as a positive affective-cognitive state that comprises of feeling good (affect) as well as thinking positively of your life (cognition), work engagement entails both feeling good at work and evaluating your work positively. More insight into individual antecedents of work engagement and ways to enhance engagement by means of individual-level interventions is badly needed. Though, based on *Broaden-and-Build (B&B) theory*, we do have quite some empirical knowledge on the way that individual antecedents such as positive emotions and personal resources relate to general well-being. In this thesis, we embrace this knowledge in order to develop theory on an individual perspective on engagement and related individual interventions to increase work (and study) engagement.

What is the role of positive emotions in enhancing engagement? (Question 1)

We assumed that positive emotions precede engagement because positive emotions are momentary and intensive, whereas engagement is a longer-term mood. B&B theory specifies the relationship between positive emotions and work engagement by stating that positive emotions 'build' personal resources, which in turn lead to a state of well-being, like engagement. The theory consists of two main hypotheses: the *broaden hypothesis* and the *build hypothesis*. That is, positive emotions momentarily *broaden* people's attention and thinking which helps people to discover and *build* consequential personal resources. So, positive emotions may predict future well-being either directly or indirectly via resources. In this thesis, we investigated whether this is also the case in specific settings such as academia and the workplace, by investigating the role of positive emotions in enhancing engagement.

In Chapters 2-4, we tested the hypothesis that the experience of positive emotions predicts future engagement. Further, following the build hypothesis of B&B theory, we specified this relationship by adding personal resources as a mediator between positive emotions and engagement. In Chapters 2 and 3, we found that positive emotions did not have a direct effect on engagement over time, though positive emotions appeared to be directly related to personal resources. Chapter 4 reported on a daily diary study in which we found that positive emotions build hope, which, in turn, leads to engagement. So, our results confirmed the build hypothesis derived from B&B theory that positive emotions initiate the building of resources. Moreover, positive emotions have an indirect effect on engagement over time via the building of personal resources.

What is the role of personal resources (PsyCap) in enhancing engagement? (Question 2)

Personal resources are functional in achieving goals, and stimulate personal growth and development. Recently, the concept of *Psychological Capital* (*PsyCap*) – a work-related set of personal resources that refers to a positive psychological state characterized by having confidence in the work-related future (*hope* and *optimism*), making a positive contribution to organizational successes by persevering towards work-related goals (*self-efficacy*) and bouncing back from setbacks at work (*resilience*). Based on the assumption of B&B theory that personal resources lead to engagement over time, we expected that the synergistic potential of hope, optimism, efficacy, and resilience would be a powerful predictor of work engagement.

Chapters 2 and 3 supported the assumption of B&B theory that the availability of personal resources leads to engagement among university students (Chapter 2) and among employees (Chapter 3), respectively. Furthermore, in Chapter 4, hope – measured before the working day –, appeared to have an effect on the level of engagement that employees reported after that same working day. Chapter 5 showed by means of a field study and an experimental study, that changes in students' self-efficacy levels co-vary with similar changes in engagement. Thus, we uncovered that changes in self-efficacy 'resulted' in similar changes in task- and study engagement over time. In conclusion, Chapters 2-5 all confirmed that personal resources have a positive impact on engagement over time.

Gain cycles: reciprocal relationships

Besides testing the assumption that positive emotions lead to engagement via personal resources, we also investigated whether these variables relate to each other in a way akin a *gain cycle* (i.e., positively and reciprocally related). Our results (Chapters 2 and 3) confirmed this notion. So, based on the results of our studies we conclude that the assumed sequence of the building hypothesis of B&B theory is not the 'whole truth': positive emotions, personal resources, and engagement are dynamically related to each other. Nevertheless, based on the results of Chapters 2-4 we argue that work engagement is more likely to act as an outcome measure in the building process. Consequently, as we stated in Chapter 1, our studies confirmed that engagement can be used as a domain-specific measure of subjective well-being or happiness.

Are happiness interventions, i.e., intentional activities, useful in enhancing engagement? (Question 3)

It is hypothesized that the variance in happiness (i.e., engagement) that we can influence by means of *intentional* or *self-initiated activities* is about forty per cent. Our happiness interventions consisted of self-initiated activities in order to prevent that (positive) changes in engagement are short-lived. In the current thesis, we tested three types of individual

interventions, i.e., behavioral, cognitive, and motivational, to promote engagement. These types of interventions have already been investigated with regard to their effects on happiness, but rarely in relation to specific contexts such as academia and the workplace.

Chapters 6 and 7 both entailed evaluations of the effects of happiness activities that were modified for use in an academic and work-related context. Chapter 6 tested the potential of a cognitive (i.e., thoughts of gratitude) and a behavioral (i.e., acts of kindness) intervention to enhance study-related positive emotions and study engagement, as well as to reduce study-related negative emotions. We found that by stimulating thoughts of gratitude, university students experienced more positive emotions compared to the control condition. However, thoughts of gratitude did neither result in higher levels of study engagement nor in lower levels of negative emotions. Performing acts of kindness showed stronger effects. Not only did performing acts of kindness yield higher levels of positive emotions, there was also a positive effect on study engagement compared to the control condition. These results indicate that in an academic context, positive behavioral interventions (i.e., acts of kindness) work better and/or faster than cognitive interventions (i.e., thoughts of gratitude) in enhancing engagement. This may be because, contrary to gratitude thoughts, acts of kindness often evoke immediate positive feedback. Positive reactions of other people towards the participants are likely to have strengthened the effects of the acts of kindness intervention. All in all, we conclude that happiness activities such as thoughts of gratitude and acts of kindness can be useful for enhancing positive academic states, but as it seems, not for decreasing study-related negative emotions.

The objective of the study discussed in Chapter 7 was to investigate whether an intervention based on principles of increasing happiness-levels could be applied to employees in a work-related setting in order to enhance positive emotions, self-efficacy, and work engagement. The intervention covered behavioral, cognitive, and motivational activities and consisted of three types of online self-initiated activities: happiness activities to stimulate positive emotions, goal setting activities, and resource building activities. The intervention had a significant positive effect on positive emotions and self-efficacy. For work engagement, however, we only found a significant positive effect for those who scored low on baseline work engagement. This finding underlines that the positive activities that were initiated by the online intervention were more beneficial for those who were expected to gain from it the most.

Can students build towards engagement in the same way as employees do? (Question 4)

The current thesis uses both student and employee samples. In our view, student samples are useful and appropriate for conducting preliminary studies as regard work-related constructs. Namely, from a psychological point of view, students' core activities can be considered as 'work'. Like employees, students are involved in structured activities (e.g.,

doing assignments, attending class) that are directed toward a specific goal (e.g., passing exams, acquiring a degree). Hence, students could also experience engagement regarding their studies.

With regard to the role of positive emotions in enhancing either work or study engagement, we found indirect relationships via the build of personal resources (Chapters 2, 3, and 5). Corresponding to this, among university students (Chapters 2 and 5) and employees (Chapters 3 and 4) we found that positive emotions are related to personal resources, and personal resources, in turn, are related to engagement over time. So, the building process described by B&B theory is successfully demonstrated within an academic and a work-related context. That is, the first five Chapters seem to indicate that university students and employees build towards engagement in similar ways. It follows that, indeed, university students are a suitable pilot sample to test hypothesized relationships between constructs that were designed for use in the workplace. In addition, Chapter 2 showed that *study* engagement is related to personal resources over time. So, among university students, both positive emotions and study engagement seem to build personal resources over time. However, in Chapters 3 and 4 we saw that no reversed relationship exists between *work* engagement and personal resources over time. Apparently, where *study* engagement relates to personal resources among university students, *work* engagement has limited 'building capacities'.

Chapters 6 and 7 reported on positive psychology interventions, whereby Chapter 6 used a student sample and Chapter 7 used a sample of employees. Although the contents of the interventions were not entirely similar, the online procedures for the interventions were comparable. That way, we could get an indication of the usefulness of happiness interventions in academic and work-related contexts. Both Chapters 6 and 7 showed that the activities performed by the participants had a positive effect on their levels of positive emotions and – though more modestly –, on their levels of engagement. So, it seems that adapted versions of context-free happiness interventions may yield comparable positive outcomes in both academic and work-related settings.

How to interpret the results of variable-centered and person-centered approaches?

In the current thesis, we used two different ways to analyze our data: a variable-centered and a person-centered approach. The studies in Chapters 2-4 all employed a variable-centered design in which the focus is on relationships among variables with the aim of supporting a theory. That way, we specified the relationships between positive emotions, personal resources, and engagement and tested hypotheses that were derived from B&B theory in an academic and in a work-related context. In Chapters 5-7 we took on a person-centered approach. A person-centered approach takes heterogeneity into account and thus focuses on relationships between (groups of) individuals instead of variables. The goal of

this approach is to group individuals into categories – either 'natural' (Chapter 5; Study 1) or manipulated (Chapter 5; Study 2, Chapters 6 and 7) –, each of which contains individuals who are similar to each other and different from individuals in other categories. The studies in this thesis, using a person-centered approach, investigated whether (differences in) mean levels of positive emotions, personal resources, and engagement coincided over time (Chapter 5; Study 1), and also whether these mean levels could be positively influenced over time (Chapter 5; Study 2, Chapters 6 and 7). The two approaches test for the two preconditions for *gain spirals*: namely, cyclic relationships as well as increased levels over time. In this thesis, we investigated both conditions of gain spirals, though in separate studies using different approaches. Using variable-centered approaches we found gain cycles, referring to positive emotions, personal resources, and engagement being dynamically related to each other over time. Further, we used person-centered approaches to confirm that mean differences of positive emotions, personal resources, and engagement run parallel (Chapters 5 and 7) or follow each other (Chapter 6) over time. We investigated the effect of positive emotions *at a specific time-point* on personal resources and engagement. However, higher levels of personal resources and engagement are more likely to occur when a person experiences *an increase* in positive emotions. Only when combining variable- and person-oriented approaches, the hypothesis that an increased level of positive emotions leads to more personal resources and higher levels of engagement over time can be tested. Future research should encompass at least three waves of data, so that more advanced statistical techniques can be used such as growth mixture modeling.

How to assess engagement: different types or different dimensions?

In the current dissertation, we investigated different types of engagement. In Chapters 3, 4, and 7 we examined work engagement and in Chapters 2, 5, and 6 we investigated study engagement. In Chapter 4, we looked at day-level engagement and in Chapter 5 we investigated task engagement. As described previously, it appeared that the different types of engagement that are studied in the current thesis yield similar empirical results. However, the types of engagement differ conceptually with regard to object (study versus work), time frame (day versus longer-term), and focus (general versus task specific). The types of engagement differ with regard to the time lags between the measurements of engagement (i.e., time frame). Additionally, the questionnaires that we used to measure the types of engagement were adjusted according to their object, time frame, and focus. That is, different versions of conceptually the same questionnaire (Utrecht Work Engagement Scale; UWES) were used to measure different types of engagement. That raises the question whether the different types of engagement as operationalized by different versions of the UWES reflect 'real' differences in conceptualizations of engagement. The object and focus of engagement may be the organization and work role (employee engagement), the

content of work (work engagement), a particular working day (day-level engagement), or the task at hand (task engagement). In this thesis, we investigated the effects of either positive emotions and/or personal resources on the latter three types of engagement. As stated, these studies yielded similar results, suggesting these types of engagement are actually conceptually similar dimensions of one and the same construct. However, based on the fact that every type of engagement has its own object, time frame, and/or focus, we would assume that we have to label the different types of engagement as conceptually different. As we used different types of engagement as outcome measures in separate studies (except for Chapter 4 in which we combined work and day-level engagement), our findings do not (yet) shed light on this issue. Future studies should integrate these different types of engagement within one study to establish empirically whether or not these different types of engagement are conceptually different indeed.

How to engage the un-engaged?

In this thesis, we developed and evaluated interventions that are based on the principles of amplition. The basic tenet of amplition is that improving employee health and well-being is relevant for all and at all times. In line with positive psychology, amplition seems a logical next step following curation and prevention. However, a potential pitfall of interventions based on amplition surfaced in Chapters 6 and 7. Namely, for employees (or students) the urgency (i.e., an identified problem) of these types of interventions is not at hand, which lowers their motivation to participate in and/or finalize a positive psychology intervention. We observed merely short-term effects on engagement (Chapter 6) and only among a specific subgroup of participants, namely among those who are relatively low in work engagement (Chapter 7). In contrast, Chapter 7 showed that those relatively *high* in work engagement were more likely to start with and/or finalize the intervention (i.e., *Selection Benefit Paradox*). This indicates that a selective group of participants is motivated to participate in the interventions. In conclusion, interventions based on amplition have the potential to enhance engagement, though the effectiveness of the interventions we studied was limited. For this type of research it seems more feasible to allow for self-selection of participants rather than selecting them at random from a given population. Voluntary participation is important because someone has to be engaged to become engaged. As amplition means strengthening what is already there, some basic level of engagement is needed to enhance engagement even further. Moreover, future research should perform and evaluate similar interventions within the context of organizations in order to create a 'climate for engagement'. In this type of climate, colleague support stimulates employees in achieving their personal goals. More importantly, by using organizations as context for positive interventions, management teams have the opportunity be closely involved in their development and implementation. Only when organizations take on a facilitating role, their employees are likely to individually build towards engagement.

Samenvatting.

Bouwen aan bevlogenheid: Een individueel perspectief

Introductie

Veel organisaties worstelen om te overleven, en hiervoor zijn ze meer dan ooit tevoren afhankelijk van de productiviteit en het welzijn van hun werknemers. Tegenwoordig is bevlogenheid – het centrale construct van dit proefschrift – een van de meest gevestigde begrippen binnen de positieve organisatiepsychologie. Bevlogenheid wordt gedefinieerd als "een positieve en werkgerelateerde gemoedstoestand die wordt gekenmerkt door vitaliteit, toewijding en absorptie". In dit proefschrift stellen we dat bevlogenheid conceptueel vergelijkbaar is met geluk. Geluk kan worden gedefinieerd als een positieve affectief-cognitieve toestand die bestaat uit zowel een goed gevoel hebben (affect) als het positief evalueren van je leven (cognitie). Hetzelfde geldt voor bevlogenheid; het leidt tot een goed gevoel op het werk en bevlogen werknemers evalueren hun werk positief. Er is nog maar weinig kennis beschikbaar over individuele antecedenten van bevlogenheid en over hoe individuele interventies bevlogenheid zou kunnen stimuleren. Echter, op basis van de *Broaden-and-Build (B&B) theorie* hebben we een behoorlijke hoeveelheid empirische kennis over de manier waarop individugebonden factoren (bijvoorbeeld positieve emoties en persoonlijke hulpbronnen) samenhangen met contextvrij welzijn. In dit proefschrift gebruiken we deze kennis vanuit de B&B theorie om het individuele perspectief op bevlogenheid theoretisch uit te diepen en tevens voor de ontwikkeling en evaluatie van individugerichte interventies die als doel hebben om (werk- en studie) bevlogenheid te stimuleren.

Wat is de rol van positieve emoties bij het stimuleren van bevlogenheid? (Vraag 1)

Onze hypothese was dat positieve emoties voorafgaan aan bevlogenheid. Dit omdat positieve emoties momentaan en intensief zijn, terwijl bevlogenheid een positieve lange termijn gemoedstoestand is. De B&B theorie geeft aan dat er een relatie bestaat tussen positieve emoties en bevlogenheid omdat positieve emoties persoonlijke hulpbronnen 'bouwen', die op hun beurt weer leiden tot bevlogenheid. De B&B theorie bestaat uit twee belangrijke hypothesen: de *'broaden' hypothese* en de *'build' hypothese*. Deze hypothesen stellen dat positieve emoties de aandacht van mensen tijdelijk verbreden en zo mensen helpen om persoonlijke hulpbronnen te ontdekken en op te bouwen. Zo kunnen positieve emoties leiden tot bevlogenheid, hetzij direct dan wel indirect via persoonlijke hulpbronnen. In dit proefschrift hebben we onderzocht of dit ook het geval is in een specifieke context zoals werk en (universitaire) studie.

In de Hoofdstukken 2-4 hebben we de hypothese getoetst dat de ervaring van positieve emoties bevlogenheid voorspelt. In navolging van de 'build' hypothese van de B&B theorie hebben we persoonlijke hulpbronnen toegevoegd als mediator in de relatie tussen positieve emoties en bevlogenheid. In de Hoofdstukken 2 en 3 vonden we dat positieve emoties geen direct effect hebben op bevlogenheid, echter, positieve emoties bleken

wel direct verband te houden met persoonlijke hulpbronnen. In Hoofdstuk 4 worden de resultaten van een dagboekstudie gerapporteerd, waarin we hebben gevonden dat positieve emoties aan het eind van een werkdag leiden tot een hoger niveau van 'werkgerelateerde hoop' (als persoonlijke hulpbron) de volgende dag. Daarmee bevestigden deze resultaten de 'build' hypothese dat positieve emoties de bouw van persoonlijke hulpbronnen initiëren. Positieve emoties hebben dus het potentieel om persoonlijke hulpbronnen op te bouwen over tijd en, als gevolg daarvan, een effect te hebben op bevlogenheid over tijd.

Wat is de rol van persoonlijke hulpbronnen (PsyCap) bij het stimuleren van bevlogenheid? (Vraag 2)

Persoonlijke hulpbronnen zijn belangrijk in het bereiken van doelen en het stimuleren van persoonlijke groei en ontwikkeling. *Psychologisch kapitaal (Psychological Capital; PsyCap)* is een werkgerelateerde set van persoonlijke hulpbronnen en verwijst naar een positieve psychologische toestand die gekenmerkt wordt door het hebben van vertrouwen in de werkgerelateerde toekomst en positieve gebeurtenissen (*hoop* en *optimisme*), het leveren van een positieve bijdrage aan organisatiesuccessen door te volharden in het behalen van werkgerelateerde doelen (*self-efficacy*) en weerbaar zijn voor tegenslagen op het werk (*weerbaarheid*). Op basis van de aanname van de B&B theorie dat persoonlijke hulpbronnen tot bevlogenheid over tijd leiden, verwachtten we dat de synergetische kracht van hoop, optimisme, self-efficacy en weerbaarheid een krachtige voorspeller is van bevlogenheid.

Hoofdstukken 2 en 3 ondersteunden de aanname van de B&B theorie dat de beschikbaarheid van persoonlijke hulpbronnen leidt tot bevlogenheid onder studenten (Hoofdstuk 2) en onder de werknemers (Hoofdstuk 3). Verder is in Hoofdstuk 4 gebleken dat hoop – gemeten vóór aanvang van de werkdag – een effect heeft op de mate van bevlogenheid die werknemers na diezelfde werkdag rapporteren. Hoofdstuk 5 toonde door middel van een veldstudie en een experimentele studie aan dat veranderingen in self-efficacy niveaus onder studenten samengaan met vergelijkbare veranderingen over tijd in hun mate van bevlogenheid. Veranderingen in self-efficacy 'resulteerden' dus in soortgelijke veranderingen in taak- en studiebevlogenheid over tijd. Concluderend, Hoofdstukken 2-5 bevestigden allemaal dat persoonlijke hulpbronnen een positieve invloed op bevlogenheid over tijd hebben.

Gain cycles: wederzijdse relaties

Naast het toetsen van de veronderstelling dat positieve emoties tot bevlogenheid leiden via persoonlijke hulpbronnen, hebben we ook onderzocht of deze constructen zich tot elkaar verhouden in een gain cycle (positieve reciproke relaties). Onze resultaten (Hoofdstukken 2 en 3) lieten inderdaad 'gain cycles' van positieve emoties, persoonlijke hulpbronnen en bevlogenheid zien. Wij concluderen daarom op basis van de resultaten van ons onderzoek

dat de veronderstelde volgorde van de 'build' hypothese van de B&B theorie niet 'het hele verhaal' is: positieve emoties, persoonlijke hulpbronnen en bevlogenheid zijn dynamisch aan elkaar gerelateerd over tijd. Desalniettemin betogen we op basis van de resultaten van Hoofdstukken 2-4 dat het plausibel is om te veronderstellen dat bevlogenheid een *uitkomst* is van het bouwproces. Onze studies bevestigden daarmee wat we beweerd hebben in Hoofdstuk 1: bevlogenheid kan worden gezien als een domeinspecifieke maat van subjectief welzijn of geluk.

Zijn geluksinterventies, ofwel intentionele activiteiten, zinvol om bevlogenheid te stimuleren? (Vraag 3)

Er wordt verondersteld dat ongeveer veertig procent van de variantie in ons geluksniveau (niveau van bevlogenheid) kan worden beïnvloed door middel van *intentionele* of *zelfgeïnitieerde activiteiten*. De geluksinterventies die wij hebben ontwikkeld en geëvalueerd bestonden uit zelfgeïnitieerde activiteiten, omdat die het vermogen hebben om te voorkomen dat (positieve) veranderingen in bevlogenheid van korte duur zijn. In dit proefschrift onderzochten we de capaciteit van drie typen individuele interventies – namelijk gedragsmatige, cognitieve en motivationele activiteiten – om bevlogenheid te bevorderen. Tot op heden is met name gekeken naar de effecten van dit soort interventies op contextvrij welzijn, maar nog maar zelden op contextspecifiek welzijn, zoals werk- of studiebevlogenheid.

Hoofdstukken 6 en 7 beschreven evaluaties van de effecten van geluksactiviteiten die waren aangepast voor gebruik in een academische en werkgerelateerde context. In Hoofdstuk 6 werd onderzocht of een cognitieve ('dankbaarheidgedachten') en een gedragsmatige ('vriendelijke gedragingen') interventie studiegerelateerde positieve emoties en studiebevlogenheid kan stimuleren en studiegerelateerde negatieve emoties kan verminderden. We vonden dat door het stimuleren van dankbaarheidgedachten, studenten meer positieve emoties ervaren in vergelijking met studenten uit de controlegroep. Echter, dankbaarheidgedachten resulteerden niet in een hogere mate van studiebevlogenheid, noch verminderde deze interventie het niveau van negatieve emoties. De gedragsmatige interventie 'vriendelijke gedragingen' toonde sterkere effecten. Deze leverde niet alleen meer positieve emoties op, maar had ook een positief effect op studiebevlogenheid ten opzichte van de controlegroep. Deze resultaten geven aan dat een positieve gedragsinterventie in een academische context beter en/of sneller werkt dan een cognitieve interventie als het gaat om het stimuleren van bevlogenheid. Dit zou veroorzaakt kunnen worden doordat, in tegenstelling tot dankbaarheidgedachten, vriendelijke gedragingen vaak direct positieve feedback genereren. De positieve (tegen)reacties van anderen jegens de deelnemers van de interventie hebben de positieve effecten van het vertonen van vriendelijke gedragingen waarschijnlijk versterkt. Al met al concluderen wij dat geluksactiviteiten zoals

dankbaarheidgedachten en het vertonen van vriendelijke gedragingen zinvol kunnen zijn voor het versterken van positieve studiegerelateerde gemoedstoestanden, maar zoals het er naar uitziet, niet voor het verminderen van studiegerelateerde negatieve emoties.

Het doel van de studie die besproken wordt in Hoofdstuk 7 was om te onderzoeken of een interventie gebaseerd op de beginselen van 'algemene' geluksbevordering ook kon worden toegepast op individuen in een werkgerelateerde context om positieve emoties, self-efficacy en bevlogenheid te stimuleren. De interventie bevatte gedragsmatige, cognitieve en motivationele activiteiten en bestond uit drie soorten online aangeboden, zelfgeïnitieerde activiteiten: geluksactiviteiten om positieve emoties te bevorderen, activiteiten rondom het stellen van doelen en activiteiten rondom het bouwen van hulpbronnen. De interventie had een significant positief effect op het niveau van positieve emoties en self-efficacy van deelnemers in vergelijking met de controlegroep. Echter, met betrekking tot bevlogenheid vonden we enkel een significant positief effect bij diegenen die voorafgaand aan de interventie relatief laag scoorden bevlogenheid. Deze bevinding laat dus zien dat de positieve online interventie meer opleverde voor diegenen die het meeste te winnen hadden met betrekking tot bevlogenheid.

Kunnen studenten op dezelfde manier 'bouwen aan bevlogenheid' als werknemers? (Vraag 4)

De studies waarvan in dit proefschrift verslag wordt gedaan, zijn verricht onder zowel studenten als werknemers. Wij achtten het gerechtvaardigd om pilot-studies naar werkgerelateerde constructen uit te voeren onder studenten. Want, vanuit een psychologisch oogpunt, kunnen de activiteiten van studenten worden beschouwd als 'werk'. Net als werknemers, zijn studenten bezig met gestructureerde activiteiten (bijvoorbeeld opdrachten maken en het bijwonen van colleges), die zijn gericht op een specifiek doel (bijvoorbeeld het halen van tentamens en het verwerven van een diploma). Daarom kunnen ook studenten bevlogenheid ervaren ten aanzien van hun studie.

In Hoofdstukken 2, 3 en 5 hebben wij indirecte relaties gevonden tussen positieve emoties en bevlogenheid via de bouw van persoonlijke hulpbronnen. Onder universitaire studenten (Hoofdstukken 2 en 5) en onder werknemers (Hoofdstukken 3 en 4) vonden we dat positieve emoties gerelateerd zijn aan persoonlijke hulpbronnen, welke op hun beurt samenhangen met bevlogenheid over tijd. Het bouwproces, zoals beschreven door de B&B theorie, is daarmee met succes aangetoond binnen zowel de academische als de werkgerelateerde context. Dat wil zeggen, de eerste vijf Hoofdstukken lijken erop te wijzen dat universitaire studenten en medewerkers procesmatig op dezelfde wijze 'aan bevlogenheid bouwen'. Op basis hiervan kan dus geconcludeerd worden dat universitaire studenten een geschikte steekproef vormen om pilot-studies op te zetten om relaties tussen constructen die zijn ontworpen voor gebruik op de werkplek te toetsen. Daarnaast bleek

in Hoofdstuk 2 dat studiebevlogenheid gerelateerd is aan persoonlijke hulpbronnen over tijd. Onder universitaire studenten lijken zowel positieve emoties en *studie*bevlogenheid dus persoonlijke hulpbronnen op te bouwen over tijd. Echter, in Hoofdstukken 3 en 4 zagen we dat er onder werknemers geen relatie over tijd bestaat tussen *werk*bevlogenheid en persoonlijke hulpbronnen. Blijkbaar is het zo dat studiebevlogenheid over tijd samenhangt met een toename in persoonlijke hulpbronnen, terwijl bevlogenheid onder werknemers slechts beperkte 'bouwcapaciteiten' heeft.

Hoofdstukken 6 en 7 rapporteerden over de effecten van positieve psychologische interventies, waarbij Hoofdstuk 6 gebruik maakte van een studentensteekproef en Hoofdstuk 7 van een steekproef van werknemers. Hoewel de inhoud van de interventies niet geheel vergelijkbaar was, waren de online procedures voor de interventies wel vergelijkbaar. Op die manier krijgen we een indicatie van het nut van geluksinterventies in een academische en werkgerelateerde context. Zowel uit Hoofdstuk 6 als uit Hoofdstuk 7 bleek dat de activiteiten van de deelnemers een positief effect op hun niveau van positieve emoties hadden en – hoewel minder overtuigend – op hun niveau van bevlogenheid. Het lijkt er dus op dat de aangepaste versies van contextvrije geluksinterventies vergelijkbare positieve resultaten kunnen opleveren in een (specifieke) academische en werkgerelateerde context.

Hoe de resultaten van 'variabele-centered' en 'person-centered' benaderingen te interpreteren?

In dit proefschrift gebruiken we twee verschillende benaderingen om onze gegevens te analyseren: een '*variabele-centered*' en een '*person-centered*' benadering. De studies in Hoofdstukken 2-4 hadden allen een 'variabele-centered' design, waarin de nadruk lag op relaties tussen de variabelen met als doel om een theorie te bevestigen. Op die manier hebben we laten zien dat de door B&B theorie gepostuleerde relaties tussen positieve emoties, persoonlijke hulpbronnen en bevlogenheid daadwerkelijk kunnen worden aangetoond in een academische en in een werkgerelateerde context. In Hoofdstukken 5-7 hebben we een 'person-centered' benadering gebruikt. Deze benadering houdt rekening met de heterogeniteit in een steekproef en richt zich op verbanden tussen (groepen van) individuen in plaats van variabelen. Het doel van deze benadering is categorieën te vormen – hetzij natuurlijk (Hoofdstuk 5; Studie 1) dan wel gemanipuleerd (Hoofdstuk 5; Studie 2, Hoofdstukken 6 en 7) – van personen die vergelijkbaar zijn met elkaar en verschillen van personen in andere categorieën. De studies in dit proefschrift die een 'person-centered' benadering hadden onderzochten of (verschillen in) gemiddelde scores op positieve emoties, persoonlijke hulpbronnen en bevlogenheid parallel verlopen over tijd (Hoofdstuk 5; Studie 1), maar ook of deze gemiddelde scores positief konden worden beïnvloed over tijd (Hoofdstuk 5; Studie 2, Hoofdstukken 6 en 7). De twee benaderingen testen de twee voorwaarden voor *gain spirals*: enerzijds dat de variabelen cyclische relaties ('gain cycles')

vertonen over tijd, alsmede dat ze een toename in gemiddelden laten zien over tijd. In dit proefschrift toetsten we beide voorwaarden in afzonderlijke studies met behulp van verschillende benaderingen ('variable-' of 'person-centered'). Met behulp van een 'variabele-centered' benadering vonden we 'gain cycles', die verwijzen naar dynamisch aan elkaar gerelateerde positieve emoties, persoonlijke hulpbronnen en bevlogenheid over tijd. Verder hebben we gebruik gemaakt 'person-centered' benaderingen die lieten zien dat (verschillen in) gemiddelden van positieve emoties, persoonlijke hulpbronnen en bevlogenheid parallel lopen (Hoofdstukken 5 en 7) dan wel elkaar opvolgen (Hoofdstuk 6) over tijd. We onderzochten het effect van positieve emoties *op een bepaald moment* op toekomstige persoonlijke hulpbronnen en bevlogenheid. Echter, er is een grotere kans op een hoger niveau van persoonlijke hulpbronnen en bevlogenheid indien een persoon een *toename* van positieve emoties ervaart. Alleen een combinatie van een 'variabele-' en een 'person-centered' benadering kan dus de hypothese toetsen dat een verhoogd niveau van positieve emoties leidt tot meer persoonlijke hulpbronnen en hogere niveaus van bevlogenheid over tijd. Toekomstig onderzoek zou meer dan drie metingen moeten omvatten, zodat er meer geavanceerde statistische technieken gebruikt kunnen worden om de gegevens te analyseren, zoals 'growth mixture modeling'.

Hoe bevlogenheid te beoordelen: Verschillende typen of verschillende dimensies?

In dit proefschrift onderzochten we verschillende typen bevlogenheid. In Hoofdstukken 3, 4 en 7 onderzochten we *werkbevlogenheid* en in Hoofdstukken 2, 5 en 6 hebben we *studiebevlogenheid* onderzocht. In Hoofdstuk 4 hebben we gekeken naar *dagelijkse bevlogenheid* en in Hoofdstuk 5 hebben we *taakbevlogenheid* onderzocht. Zoals eerder beschreven, bleek dat onze onderzoeken naar de verschillende typen bevlogenheid vergelijkbare empirische resultaten genereerden. Echter, deze typen bevlogenheid verschillen van elkaar met betrekking tot object (bijvoorbeeld studie versus werk), tijdsperiode (bijvoorbeeld dag versus langere termijn) en focus (bijvoorbeeld algemeen versus taak specifiek). De typen bevlogenheid verschillen met betrekking tot de tijd tussen de metingen van bevlogenheid (tijdsperiode). Daarnaast zijn de vragenlijsten die we hebben gebruikt om de typen bevlogenheid te meten aangepast aan het object, de tijdsperiode en focus. Dat wil zeggen, we hebben verschillende versies van conceptueel dezelfde vragenlijst (Utrecht Bevlogenheid Schaal; UBES) gebruikt om de verschillende typen bevlogenheid te kunnen meten. Dat roept de vraag op of de verschillende typen bevlogenheid – zoals geoperationaliseerd door de verschillende versies van de UBES – 'echte' conceptuele verschillen reflecteren. Qua object en focus van bevlogenheid maken we een onderscheid tussen de organisatie en werkrol (werknemer bevlogenheid), de inhoud van het werk (werkbevlogenheid), een bepaalde werkdag (dagelijkse bevlogenheid), of een specifieke taak (taakbevlogenheid). In dit proefschrift hebben we onderzoek gedaan naar de effecten

van zowel positieve emoties en/of persoonlijke bronnen op de laatste drie typen bevlogenheid. Zoals gezegd leverden deze studies vergelijkbare resultaten op wat suggereert dat deze typen bevlogenheid conceptueel vergelijkbare dimensies zijn van een en hetzelfde construct. Echter, gebaseerd op het feit dat elk type bevlogenheid zijn eigen object, tijd en/of focus heeft, zouden we ervan uit kunnen gaan dat we de verschillende typen bevlogenheid toch als conceptueel verschillend dienen te beschouwen. Onze studies geven geen uitsluitsel over deze kwestie omdat we de verschillende typen bevlogenheid als uitkomstmaten gebruikt hebben in afzonderlijke studies (met uitzondering van Hoofdstuk 4, waarin we werkbevlogenheid en dagelijkse bevlogenheid combineerden). Toekomstige studies moeten deze verschillende typen bevlogenheid binnen een en dezelfde studie bestuderen om empirisch vast te kunnen stellen of deze verschillende typen bevlogenheid daadwerkelijk conceptueel verschillen.

Hoe de niet-bevlogenen bevlogen te krijgen?

In dit proefschrift hebben we interventies ontwikkeld en geëvalueerd die zijn gebaseerd op de principes van amplitie. '*Amplitie*' is een perspectief dat is gebaseerd op de overtuiging dat het verbeteren van gezondheid en welzijn relevant is voor iedereen en op elk moment. Omdat dit in overeenstemming is met de grondgedachte van de positieve psychologie, lijkt 'amplitie' een logische volgende stap na curatie en preventie. Echter, in Hoofdstukken 6 en 7 is een potentiële valkuil opgedoken van interventies op basis van 'amplitie'. Namelijk, de urgentie (in termen van een vastgesteld probleem) van dit soort interventies is voor medewerkers (of studenten) niet bij voorbaat duidelijk, hetgeen hun motivatie verlaagt om aan een positieve psychologische interventie deel te gaan nemen en/of deze af te ronden. We hebben enkel korte termijn effecten van dit type interventies op bevlogenheid gevonden (Hoofdstuk 6). Daarbij hebben we enkel significante effecten gevonden voor een specifieke subgroep van deelnemers, namelijk bij diegenen die relatief *laag* scoorden op bevlogenheid voorafgaand aan de interventie (Hoofdstuk 7). Daarentegen liet Hoofdstuk 7 ook zien dat diegenen die relatief *hoog* scoorden op bevlogenheid vaker begonnen met de interventie en deze ook vaker daadwerkelijk afmaakten (*Selection Benefit Paradox*). Dit alles maakt duidelijk dat slechts een selectieve groep personen gemotiveerd was om deel te (blijven) nemen aan de interventie.

Concluderend, interventies gericht op 'amplitie' hebben de capaciteit om bevlogenheid te stimuleren, maar de effectiviteit van dit type interventies is beperkt. Daarom is het aan te raden om deelnemers voor dit type interventies te werven op basis van zelfselectie. Vrijwillige deelname is belangrijk, omdat iemand reeds enigszins bevlogen moet zijn om bevlogen(er) te willen worden. Namelijk, 'amplitie' betekent het stimuleren van wat er al is, dus enige mate van bevlogenheid is nodig om bevlogenheid nog verder te doen toenemen. Bovendien moet toekomstig onderzoek naar soortgelijke interventies

plaatsvinden binnen de context van organisaties, om het mogelijk te maken om een ‘klimaat voor bevlogenheid’ te creëren. In een dergelijk klimaat kunnen collega’s elkaar ondersteunen en stimuleren in het bereiken van hun persoonlijke doelen met betrekking tot het werk. Nog belangrijker is dat door gebruik te maken organisaties als kader voor positieve interventies, management teams de mogelijkheid hebben nauw betrokken te zijn bij de ontwikkeling en implementatie van interventies. Alleen wanneer organisaties een dergelijke faciliterende rol op zich nemen, is het waarschijnlijk dat werknemers actief ‘bouwen’ aan hun eigen bevlogenheid.

Dankwoord.

Dankwoord

Het moment waar ik zo lang naartoe gewerkt heb is daar. Het proefschrift is af en ik hoef alleen nog maar alle mensen te bedanken zonder wie ik dit punt niet had bereikt. En dat zijn er nogal wat.

Ik kan niet anders dan – hoe onconventioneel ook – te beginnen met mijn ouders. Lieve papa en mama, ik heb dit boekje aan jullie opgedragen omdat ik jullie enorm dankbaar ben. Ik realiseer me maar al te goed dat dit alles zonder jullie niet mogelijk was geweest. Mijn hele leven hebben jullie er alles aan gedaan om mij in de gelegenheid te stellen om mijzelf te ontwikkelen. Niet alleen financieel en praktisch, maar ook door constant te laten blijken hoeveel jullie van me houden en hoe trots jullie op me zijn. En als jullie de oplossing niet voorhanden hadden, hebben jullie mij geleerd om het in Gods handen te leggen. Heel veel dank voor alles!

Voordat ik overga op mijn andere familie en vrienden keer ik mij eerst tot mijn begeleiders. Wilmar, het is geen vraag, ik had het niet beter kunnen treffen met jou als promotor. Jij bent de “real deal” in A&O psychologie wereldwijd en je bent toch maar even mijn begeleider geweest voor vier jaar! Daar ben ik erg trots op! Vanaf het begin heb je jouw vertrouwen in mij gesteld als onderzoeker en heb je me mijn gang laten gaan. Hoewel ik wel eens heb aangegeven dat ik heus nog niet zo’n goede onderzoeker ben en liever wat meer gestuurd zou worden (weet je nog?;-)), heb ik nu wel door dat je me echt wel had bijgestuurd als ik de verkeerde kant op was gegaan. Nu realiseer ik me dat jij een mooie balans hanteert tussen vrijlaten en bijsturen waar nodig. Ik heb idioot veel van je geleerd en ik ben erg dankbaar dat ik nog een paar jaar als onderzoeker onder je mag werken. Ik ga nog veel meer van je leren, dat weet ik zeker.

Pascale, jij hebt vanaf dag één niet onder stoelen of banken gestoken dat je trots op me bent. Ik was jouw eerste “AiO-kindje” zoals je me vaak noemde. De eerste drie jaren liep ik geregeld binnen voor vragen en nee, ik stoorde nooit. Ik stuurde je documenten – klein of groot – en je stuurde ze altijd binnen een mum van tijd en verzorgd van feedback weer terug. Zo flexibel als jij je naar me opstelde, zo kom je dat bij begeleiders maar weinig tegen. Het laatste jaar zat je in Eindhoven, maar dit deed niets af aan onze efficiënte samenwerking! Bedankt voor de vier fijne jaren waarin je altijd voor me klaar stond! We’ll keep in touch!

Mijn lieve roomies, Corine en Jos. Corine, ik begin met jou. Je weet het al van me, maar wat een respect heb ik voor jou. Je bent een stuk jonger dan ik maar vaak had ik het idee dat je een jaar of tien ouder was! Zoveel wijsheid die schuilgaat in zo’n jonge vrouw als jij is zeldzaam. Ik ben enorm van je gaan houden door de jaren heen en ik mis je echt enorm. We hebben samen lief en leed gedeeld, van onze relaties en ons geloof tot structural

equation models. Ik zal voor jou altijd een plekje in m'n hart hebben! Jos, tja Jos. Ze hadden denk ik niet twee mensen op een kamer kunnen zetten die meer van elkaar verschillen dan wij! De eerste maanden leken we wel een ruziënd getrouwd stel, maar nu zijn we maatjes! Dat hebben we toch maar mooi voor elkaar gebokst! We hebben heel wat mooie en "echte" momenten beleefd met elkaar die ik nooit meer zal vergeten. Ook al werken we niet meer met en bij elkaar, ik hoop met jullie beiden contact te houden en wens jullie alle goeds van de wereld toe!

Nu weer even terug naar het thuisfront. Mark, Maurits, Stefan, Heleen en Marije, ik zou jullie graag vaker zien dan nu het geval is. Maar het feit dat jullie er voor me zijn als het nodig is en wetende dat jullie zo trots op me zijn is hartverwarmend! Ik vertel met net zoveel trots over jullie en jullie mooie gezinnetjes (Steef, die van jou komt ook, weet ik zeker!). En nog even een apart woordje voor Stefan: heel heel heel erg bedankt voor al je tijd en moeite die je hebt gestoken in de opmaak van dit proefschrift. Zonder jou was het absoluut niet zo'n mooi boekje geworden! Ik kijk uit naar onze dagen in een mooie wereldstad (Boedapest, Praag, Istanbul, St. Petersburg?).

Mijn lieve schoonfamilie: Piet, Barbara en Hendrik. We hebben de afgelopen periode een moeilijke tijd met elkaar doorgemaakt (en nog steeds). Gek genoeg ben ik daardoor nog meer van jullie gaan houden dan ik al deed. We zullen in de toekomst nog vaak verdrietig zijn om Linda en ik hoop dat we elkaar blijven steunen zoals we dat de afgelopen maanden hebben gedaan.

Ik heb een hoop lieve vriendjes en vriendinnetjes (Jan, Paula, Lydia, Mariëtte, en de hele bups van Danny's kant natuurlijk), maar ik pik er een paar uit die "extra special" zijn. Ten eerste, mijn lieve en prachtige paranimfen Pauline en Gaby. Ik ken jullie allebei nog niet eens zo heel erg lang, maar toch nemen jullie een enorm belangrijke plaats in mijn leven in! Pau, jij bent een van de best gelukte exemplaren van God, ook al geloof je dat zelf soms niet! Ik vind het nog steeds bijzonder dat je binnen zo'n korte tijd zoveel van mij bent gaan houden. Ik ben dankbaar voor je liefde en steun, ik zou niet meer weten wat ik zonder je moest. Ik hoop jou hetzelfde te kunnen geven. The best is yet to come lieverd! Geeb, binnen no time was jij verstrengeld in mijn leven, zowel qua werk als privé en daar geniet ik enorm van. Je bent een cadeautje in mijn leven en ik geniet van al onze leuke momenten samen. Er gaan er nog een heleboel volgen, dat kan niet missen! Dank dat je bent wie je bent, love you!

Mijn Apeldoorn-vriendinnetjes Marieke en Manon. Jullie gaan al heel wat langer mee in mijn leven en dat zegt denk ik veel. Mariek, we hebben samen al enorm veel meegemaakt en we weten allebei dat het leven soms niet over rozen gaat, maar gelukkig hebben we juist in die periodes veel voor elkaar kunnen betekenen. Ik stel voor dat we dat blijven doen ;-)! Manon, jij bent als mijn grote zus. We lijken zo lekker veel op elkaar!

We zien elkaar niet zo vaak, maar dat maakt je niet minder belangrijk. Ik vind je een topwijf en ik houd van je! Ik ben heel blij dat onze vriendschap nooit is verwaterd en dat gaan we zo houden!

Terug naar mijn collega's. Ik had er al een paar genoemd, maar er zijn er nog een paar die absoluut een plekje verdienen in dit dankwoord. Toon, je bent je er wellicht niet van bewust maar jij hebt me geïnspireerd om te gaan promoveren. Jouw nuchtere en humoristische houding ten opzichte van de wetenschap tijdens het begeleiden van mijn scriptie maakten de wereld van onderzoek heel aantrekkelijk voor me. Bovendien was jouw connectie met Wilmar de aanleiding van mijn sollicitatie in Utrecht! Maria, het afgelopen jaar hebben we meer de gelegenheid gehad om samen te werken dan daarvoor, en daar heb ik enorm van genoten. Ik vind je een bijzonder mens en bijzondere collega en ik ben heel blij dat we in de nabije toekomst nog veel meer kunnen gaan samenwerken! Ilona (vrijdagmiddagborrels! :-)), Gerdientje (je hoort er toch echt bij! ;-)), Maggie (San Juan, Zürich :-)), Paris (de liefste Griekse jongen die ik ken! ;-)), Elianne (HRM-buddies!): bedankt dat jullie mijn promovendajaren zo veel kleur hebben gegeven!

Een promotieonderzoek komt niet tot stand zonder hulp van buitenaf. In mijn samenwerking met Schouten & Nelissen heb ik het genoegen gehad om met Ulrike Wild een traject uit te voeren en te evalueren. Ulrike, bedankt voor de prettige en vooral ook (voor mij) leerzame samenwerking. Ook al hadden we samen soms wat verplichte nummers af te werken, achteraf gezien was het eigenlijk allemaal heel gezellig! Ook gaat mijn dank uit naar de mensen van 365. Hoewel we er uiteindelijk niet in zijn geslaagd om samen data te verzamelen, heb ik toch enorm genoten van alle contacten en samenwerkingen bij 365. Willem van Rhenen, Catelijne Joling, Theo Visser, Diederik Vermeulen, Heleen Paagman, Guus de Lange, Jan Machek: ik voel me vereerd dat ik met zulke talentvolle mensen heb mogen werken. Ik heb als broekie een heleboel van jullie geleerd!

En dan als allerlaatste: mijn lieve Danny. Je bent in alle rumoerige jaren een baken van rust voor me geweest. Jij bent niet omver te krijgen (in tegenstelling tot ondergetekende), en dat is precies wat ik nodig heb. Ik kijk er naar uit om met jou verder te bouwen aan ons leven samen. Dank je wel dat je van me houdt.

Else