

**THE ROLES OF DISPOSITIONAL MINDFULNESS AND FREE TIME
ACTIVITIES IN RECOVERY FROM STRESS**

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Coping with work stress is one of the major challenges in working life. A lot of research has focused on the topic but a lot remains unknown. New interventions for stress reduction are constantly developed, and their effectiveness needs to be examined. The aim of this thesis was to gain better understanding on how dispositional mindfulness and engaging in different types of free time activities relate to recovering from stress. Furthermore, it was examined whether dispositional mindfulness has a moderating effect on the relationship between engaging in free time activities and experiencing recovery. Additionally, a newly constructed mindfulness questionnaire was validated as a part of this study.

The participants of the study were 814 employees from eleven companies, working in knowledge-intensive occupations. The data were gathered at two time points in 2013 and 2014, using online questionnaires. It was hypothesized that dispositional mindfulness would be positively connected to experiencing recovery from stress as well as to the time spent on certain types of free time activities. The relationships between six different types of free time activities and recovery from stress were also expected to be mainly positive, and the possibility of dispositional mindfulness moderating those relationships was investigated.

The mindfulness questionnaire used in this study turned out to be valid and reliable. Furthermore, the results showed that higher levels of dispositional mindfulness were positively related to experiencing recovery. Time spent engaging in most of the free time activities also related positively to recovery from stress, and mindfulness moderated a few of those relationships. There appeared to be no connections between people's levels of dispositional mindfulness and the time spent on different free time activities. The results were relatively consistent at both time points. To conclude, the findings of this thesis suggest that recovery from stress might be enhanced by leading a more active life (i.e., engaging in various types of free time activities, such as physical, social, cultural or creative activities), and by engaging in practices that increase mindfulness.

Key words: free time activities, dispositional mindfulness, recovery experiences, restoration

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Työstressi on yksi työelämän suurimmista haasteista. Sitä on tutkittu paljon, mutta paljon on vielä selvittämättä. Stressinhallintaan kehitetään jatkuvasti uusia menetelmiä ja niiden tehokkuuden varmistaminen vaatii tutkimusta. Tämän pro gradu -tutkielman tavoitteena oli selvittää piirteenaisten tietoisuustaitojen ja erityyppisten vapaa-ajan aktiviteettien yhteyksiä stressistä palautumiseen. Lisäksi tarkasteltiin sitä, onko tietoisuustaitojen tasolla vaikutusta vapaa-ajan aktiviteettien ja stressistä palautumisen välisiin yhteyksiin. Aluksi kuitenkin tutkittiin, onko tätä tutkimusta varten kehitetty tietoisuustaitokysely pätevä ja luotettava.

Tutkimukseen osallistui yhdestätoista yrityksestä 814 työntekijää, jotka työskentelivät tietointensiivisillä aloilla. Tutkimusaineisto kerättiin verkkokyselyitä käyttäen kahtena ajankohtana vuosina 2013 ja 2014. Hypoteesina oli, että piirteenaisten tietoisuustaidot olisivat positiivisesti yhteydessä sekä stressistä palautumiseen että erilaisiin vapaa-ajan aktiviteetteihin käytettyyn aikaan. Lisäksi tutkimuksessa mukana oleviin vapaa-ajan aktiviteetteihin käytetyn ajan oletettiin olevan positiivisesti yhteydessä stressistä palautumiseen. Tietoisuustaitojen oletettiin myös muokkaavan vapaa-ajan aktiviteettien ja stressistä palautumisen välistä suhdetta positiiviseen suuntaan.

Tutkimuksessa käytetty tietoisuustaitokysely osoittautui päteväksi ja luotettavaksi. Tulokset osoittivat lisäksi, että ihmiset, joilla on paremmat tietoisuustaidot, palautuivat paremmin stressistä. Useimpiin tutkimuksessa mukana olleisiin vapaa-ajan aktiviteetteihin käytetty aika oli myös positiivisesti yhteydessä stressistä palautumiseen. Tietoisuustaidot vaikuttivat muutamien vapaa-ajan aktiviteettien ja palautumiskokemusten suhteeseen odotetulla tavalla. Tulokset olivat melko johdonmukaisia molempina ajankohtina. Tiivistettynä tulokset viittaavat siihen, että aktiivinen elämäntapa (esimerkiksi fyysisiin, sosiaalisiin, kulttuurillisiin ja luoviin aktiviteetteihin osallistuminen vapaa-ajalla) ja tietoisuustaitojen kehittäminen voivat edistää stressistä palautumista.

Avainsanat: piirteenaisten tietoisuustaidot, stressistä palautuminen, vapaa-ajan aktiviteetit

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1. INTRODUCTION

Having free time is a basic human right (United Nations, 1948), and its importance has also been recognized in the field of psychology (e.g., Blasche, Arlinghaus, & Dorner, 2014; Sonnentag, 2001). In work and organizational psychology, free time is seen as a precondition for recovery from work stress and well-being (Iwasaki & Schneider, 2003; Tucker, Dahlgren, Akerstedt, & Waterhouse, 2008; Winwood, Bakker, & Winefield, 2007). Some research on the relationship between free time and recovering from stress has been conducted, but the results have not always been consistent. The idea of this study is to examine whether mindfulness could help us better understand the relationship between free time activities and recovery from stress.

Mindfulness is a practice with its roots in Buddhist traditions that has found its way into psychological treatment. Mindfulness can be defined as being aware of one's surroundings and inner states while sustaining an accepting attitude towards the observations made and the thoughts they raise (e.g., Bishop et al., 2004; Kabat-Zinn, 2005). In a nutshell, it can be described as accepting awareness.

This idea of mindfulness forms the foundation for many interventions in which practicing mindfulness skills is seen as the operating ingredient. Such interventions have been found to be beneficial for both physical and psychological well-being (e.g., ACT; Hayes, Strosahl, & Wilson, 1999; MBSR; Kabat-Zinn, 1982; MBCT; Segal, Williams, & Teasdale, 2002). Recently, researchers have also started to investigate individual differences in mindfulness as a trait (Bishop et al., 2004; Brown & Ryan, 2003; Brown, Ryan, & Creswell, 2007). When mindfulness is seen in this way, it is possible to measure it in the general population. For example, it has been found that dispositional mindfulness is related to lower stress reactivity (Bullis, Bøe, Asnaani, & Hofmann, 2014), physical health benefits (Murphy, Mermelstein, Edwards, & Gidycz, 2012; Whitaker et al., 2014), and psychological well-being (Keng, Smoski, & Robins, 2011).

In recent research, connections have been found between dispositional mindfulness and recovery experiences, as well as between mindfulness and engaging in different free time activities or features related to them. In this thesis, I will study these relationships in more detail, and also test whether dispositional mindfulness influences the relationship between one's free time activities and experiences of recovery and restoration. This will add to our knowledge about enhancing well-being during free time, recovering from work stress, and the role of dispositional mindfulness in this context. This knowledge can be used, for example, in occupational healthcare in designing new campaigns and interventions to support well-being. In this thesis, I will also validate the mindfulness questionnaire constructed for and used in this study.

1.1. Conceptualizing mindfulness

Recent decades have witnessed a growing interest in Eastern traditions and their connections to well-being. Already in the 1960's, Alan Watts (1961) wrote about the similarities between Eastern beliefs and Western psychotherapy, but not before the 21st century have practices like yoga, tai chi, and meditation become a normal part of people's lives in the West, too¹. Mindfulness is one of these new popular concepts that have found their way into the field of psychology as well.

The idea of mindfulness originates from Buddhist tradition where it is one of the practices of the Noble Eightfold Path. It constitutes the heart of Buddhist meditation (Hanh, 1999). Grossman and Van Dam (2011) have described five cardinal features of Buddhist mindfulness practice. These are 1) deliberate and open-hearted awareness of moment-to-moment perceptible experience, 2) qualities such as kindness, tolerance, patience, and courage that are prerequisites for developing an accepting stance, 3) nondiscursive and non-analytical investigation of ongoing experience, 4) awareness that is markedly different from everyday modes of attention, and 5) systematic practice of these skills.

However, in contemporary Western psychology, the religious and ideological background has been intentionally faded out to make mindfulness more approachable for everyone (Baer, 2011). In a medical framework, mindfulness has been described as “a form of mental training to reduce cognitive vulnerability to reactive modes of mind that might otherwise perpetuate psychopathology” (Bishop et al., 2004, p. 231). This description differs somewhat from the Buddhist ideas, and it has been argued that cultural differences might affect the understanding of the value of subjective experience and thus the understanding of mindfulness (Grossman & Dam, 2011). Despite the cultural differences, the ideas of awareness and acceptance being beneficial are not new in the West either. The same kind of concepts have been presented by philosophers in ancient Greece, phenomenologists, existentialists, transcendentalists, and humanists throughout Western history (for a more comprehensive description, see Brown et al., 2007; Felder, Aten, Neudeck, Shiomi-Chen, & Robbins, 2014). Some analogical concepts can also be found in the field of psychology from the last hundred years (Bishop et al., 2004; Brown & Ryan, 2003).

One of the biggest differences between Eastern and Western mindfulness might be that in Buddhist traditions, mindfulness is better understood as a developmental and contextual process (Grossman & Van Dam, 2011), while in Western psychology it can be seen both as a practice for increasing and facilitating one's mindful states and as a measurable trait that is inherent to all

¹ By “the East”, I mainly refer to Buddhist religion and culture. As I do not think that religious or ideological practices can be separated from the cultures of their originating countries, I am referring to the countries where Buddhism is practiced and where it has influenced the culture as “the East”. I understand that this is a huge simplification. However, “the East” is an expression commonly used in the psychological literature that I am referring to. When I am talking about “the West”, I refer to the currently secularized cultures of Europe and North America where psychology, as I have learned to understand it, has developed.

human beings (Shapiro & Carlson, 2009). Although the majority of studies in the field of mindfulness have concentrated on the outcomes of mindfulness-based interventions, some researchers have found natural differences in people's levels of mindfulness that also affect their well-being (e.g., Brown & Ryan, 2004).

Some research on connections between dispositional mindfulness and other constructs already exists. For example, dispositional mindfulness has been found to be positively related to vitality (Brown & Ryan, 2003; Ghorbani, Cunningham, & Watson, 2010) and happiness (Hollis-Walker & Colosimo, 2011). Rumination is by definition the opposite of mindfulness, and a negative relationship between the two constructs has also been established empirically (Borders, Earleywine, & Jajodia, 2010). It has also been found that dispositional mindfulness prevents emotional exhaustion at work (Hülshager, Alberts, Feinholdt, & Lang, 2013).

Conceptualizations of mindfulness vary from the unifactorial to the multifactorial. As an example of a unifactorial definition, Brown and Ryan (2003, 2004) emphasize the meaning of awareness and claim that acceptance should not be considered as a separate construct in measuring mindfulness. However, they do consider openness and receptivity to be essential characteristics of mindful awareness. On the other hand, Shapiro, Carlson, Astin, and Freedman (2006) have stressed that the attitudinal component should be considered to be just as important as the attentional component is. There are also frequently used models that include additional factors such as nonreactivity, observing, and describing (Baer, Smith, Hopkins, Krietemeyer, & Toney, 2006; Baer et al., 2008). However, the two-factor model of accepting awareness is most widely used and accepted. Thus, this is the conceptualization used in the current study. I will now describe these two constructs in more detail.

1.1.1. Acting with awareness

In the context of defining mindfulness, acting with awareness means engaging fully in what one is experiencing (Baer, Smith, & Allen, 2004). This is the opposite of working on autopilot or letting our mind wander into the future or the past (Hanh, 1999; Kang, Gruber, & Gray, 2013). For example, one might take a walk in the forest and think about things one has forgotten to do and not really notice the beauty of the nature. Or one might cook something special on a day off and be so immersed in the newspaper while eating that one does not even taste the food. Attention is seen as an important ingredient of functioning and healing in psychology. The capacity to attend to information, the ability to shift focus and the ability to inhibit information when needed are abilities

that are relevant in mindfulness, and lacking these abilities can even be related to psychopathology (e.g., Shapiro et al., 2006).

The attentional features of mindfulness have been of particular interest for researchers in the fields of cognitive psychology and neuropsychology. It has been found that mindfulness training improves attention skills as measured by cognitive tests (for a review, see Chiesa, Calati, & Serretti, 2011). There are also studies indicating that mindfulness training leads to increases in activity and white matter integrity in the anterior cingulate cortex, which is the brain area related to the attention control system (Jankowski & Holas, 2014). Similar differences in brain structure have been found in those scoring high on dispositional mindfulness (Lu et al., 2014). Furthermore, smaller amygdala volumes and lower HPA axis activity have been found in adults with higher levels of dispositional mindfulness (Daubenmier, Hayden, Chang, & Epel, 2014; Taren, Creswell, & Gianaros, 2013). These findings suggest lower reactivity in stressful and anxiety provoking situations and thus lower levels of stress for mindful people.

1.1.2. Acceptance

An accepting attitude means not evaluating and labeling one's experiences, and thus needing neither to avoid nor change those experiences (Baer et al., 2004). In mindfulness literature, a variety of positive attitudes on attending to one's experience have been encouraged, such as kindness, openness, curiosity, non-attachment, and patience (Shapiro & Carlson, 2009). According to Bishop and others (2004), release from elaborative thinking could save more resources for processing the current experience as it is. Therefore, it might help one see the situation more clearly and from a wider perspective. Avoiding negative emotions, thoughts, or physical sensations can be understood as the opposite of acceptance, and may even lead to psychiatric disorders (Hayes, Wilson, Gifford, Follette, & Strosahl, 1996). Crucial for the acceptance process are the abilities to recognize one's experiences and understand their meaning. Without them, acceptance does not have its healing effect (Hanh, 1999).

1.2. Earlier findings

1.2.1. Mindfulness, recovery experiences, and restoration

Recovery experiences and restoration are important for well-being. The two concepts are closely related and even overlapping. The concept of recovery experiences stems from the field of work and organizational psychology, and restoration from the field of environmental psychology (Korpela & Kinnunen, 2011). Recovery experiences refer to psychological detachment from work, relaxation, mastery, and control (Sonnetag & Fritz, 2007). *Psychological detachment* means being away from the workplace physically and mentally during free time. For instance, taking care of work-related duties and worrying about work-related matters hinder recovery from work stress. *Relaxation* refers to a low activation level and increased positive affect. Prolonged physical and psychological activation has been found to lead to illnesses (Brosschot, Pieper, & Thayer, 2005), and relaxation has been found to reduce stress complaints (Van der Klink, Blonk, Schene, & Van Dijk, 2001). *Mastery experiences* derive from engaging in challenging free time activities and succeeding in them. Even though these kinds of activities may be tiring, they can also provide a sense of achievement and can add to one's skills and competencies (Sonnetag & Fritz, 2007). Finally, *control* refers to the feeling of being able to choose what one does and experiencing autonomy during one's free time. Control has been found to be important for subjective well-being in general (April, Dharani, & Peters, 2012), and it can be considered a basic human need (Ryan & Deci, 2000).

It has been found in earlier studies that mindfulness is beneficial for stress reduction (e.g., Bullis et al., 2014; Kabat-Zinn, 1982), but its relationship with recovery experiences has been looked into in only a few studies. In a study about the relationship between dispositional mindfulness and recovery experiences, mindfulness was found to be positively connected to sense of control but not to relaxation or mastery (Marzug & Drach-Zahavy, 2012). In the same study, more mindful people experienced less exhaustion after a short respite than less mindful people. Furthermore, dispositional mindfulness has been found to be positively related to psychological detachment from work at bedtime (Hülsheger et al., 2014). In another study, dispositional mindfulness has been connected to relaxation (Moody et al., 2013).

Restoration has been defined as 1) decrease of stress, 2) lack of negative affectivity, and 3) lack of physical symptoms related to stress (Korpela, Ylén, Tyrväinen, & Silvennoinen, 2010). Especially natural settings are believed to be restorative due to facilitating the shift of attention and physical distance from work and daily chores (Roe & Aspinall, 2011). There are no published studies about the relationship between restoration and mindfulness, but some presumptions can be

made based on related research. Decline of stress is a part of the definition of restoration, and there are numerous studies proving that practicing mindfulness reduces stress (e.g., Chiesa & Serretti, 2009; Shapiro, Brown, Thoresen, & Plante, 2011). In addition, dispositional mindfulness has been found to be related to lower levels of negative affectivity (Brown & Ryan, 2003), which is also considered an aspect of restoration. The third component of restoration, physical symptoms, has also been found to be inversely related to dispositional mindfulness (Murphy et al., 2012). Furthermore, some specific items of the Restoration Outcome Scale (Korpela, Ylén, Tyrväinen, & Silvennoinen, 2008) such as calmness, concentration, and relaxation have been connected to dispositional mindfulness in earlier studies (Huffziger et al., 2013; Moody et al., 2013). Thus, a positive relationship between mindfulness and restoration can be assumed to exist.

Based on these findings, it can be hypothesized that people with higher levels of dispositional mindfulness experience higher levels of 1a) recovery experiences and 1b) restoration.

1.2.2. Mindfulness and free time activities

Recovery experiences and restoration usually take place during one's free time, and having free time is important for well-being in general (e.g., Blanche et al., 2014; Sonnentag, 2001). The effects of free time on well-being have been explained, for example, through reduction of stress (Iwasaki & Schneider, 2003) or through adding positive affect (Pressman et al., 2009). These experiences are also connected to mindfulness (Brown & Ryan, 2003; Chiesa & Serretti, 2009). Furthermore, it has been shown that well-being can depend on the activities one engages in (Iso-Ahola & Mannell, 2004). The idea behind the current study is that mindful people may choose their free time activities in a more mindful way and have more intensive and positive experiences during their free time, which, in turn, would lead to experiencing more recovery and restoration.

There is some evidence that mindful people are more likely to engage in particular types of activities compared to less mindful people, but, to the author's best knowledge, no broader study about the relationship between mindfulness and free time activities has been conducted. In this study, the focus will be on the relationship between mindfulness and moderate physical activities, intensive physical activities, physical activities in nature, social activities, cultural activities, and creative activities.

In previous studies, dispositional mindfulness was positively associated with engaging in physical activities and getting enjoyment from them (Kangasniemi, Lappalainen, Kankaanpää, & Tammelin, 2014; Roberts & Danoff-Burg, 2010). Dispositional mindfulness has also been associated with connectedness to nature (Howell, Dopko, Paasmore, & Buro, 2011) which might

also lead to engaging in more physical activities in nature. Mindful awareness has also been thought to be a possible source of creativity (Kohler, 2011), and because of being curious, open and accepting, mindful people might be more inclined to partake in creative activities like making art. According to the same logic, and also considering that mindful people might be more able to engage in the moment, a mindful mindset could encourage people to engage in cultural activities. Social skills and interpersonal insight have also been connected to dispositional mindfulness (Van Doesum, Van Lange, & Van Lange, 2013), but on the other hand, mindfulness can be seen as a way of learning to be alone and unattached to one's environment. Thus, it cannot be unambiguously determined if mindfulness is more strongly connected with seeking company or with seeking solitude during one's free time.

Based on these findings, I hypothesize that individuals with higher levels of dispositional mindfulness spend more time on 2a) moderate physical activities, 2b) intensive physical activities, 2c) physical activities in nature, 2d) creative activities, and 2e) cultural activities. I will also study the relationship between mindfulness and the time spent on social activities.

1.2.3. Free time activities, restoration, and recovery experiences

According to Sonnentag and Zijlstra (2006), both job characteristics and off-job activities have an impact on a person's need for recovery. Low-effort activities, physical activities, physical activities in nature, social activities, cultural activities, and creative activities have all been found to lead to recovery experiences (e.g., Demerouti, Bakker, Geurts, & Taris, 2009; Korpela & Kinnunen, 2011; Sonnentag, 2001; Winwood et al., 2007). Some contradictory results have been found regarding the recovery effects of social and low-effort activities (Rook & Zijlstra, 2006).

As a concept from the field of environmental psychology, restoration has been strongly linked with nature-related activities (Korpela et al., 2008), but the relationship between restoration and other free time activities has not yet been studied. However, as restoration is conceptually similar to recovery experiences, the connections can be assumed to be comparable. Thus, I hypothesize that more time spent on 3a) moderate physical activities, 3b) intensive physical activities, 3c) physical activities in nature, 3d) social activities, 3e) cultural activities, and 3f) creative activities is connected to higher levels of recovery experiences and restoration.

1.2.4. Mindfulness as a moderator

Based on what is discussed above concerning the relationships between free time activities, mindfulness, restoration, and recovery experiences, it is plausible that mindfulness may affect the choice of free time activities and intensify one's experiences during those activities, leading to higher levels of recovery experiences and restoration. Put together, attending to free time activities with awareness and an accepting attitude can be assumed to lead to higher levels of restoration and recovery experiences than pursuing them without awareness and acceptance. Hence, I hypothesize that 4) people with higher levels of dispositional mindfulness experience more recovery and restoration when they attend to modest physical activities, intensive physical activities, physical activities in nature, social activities, creative activities, and cultural activities.

2. METHODS

2.1. Participants and procedure

The data used in this study were collected for a larger study about well-being through work in Finnish companies, financed by the Academy of Finland (grant no.: 257682). The participants were employees of eleven companies in the fields of media, IT, engineering, healthcare, education, and financial services. The uniting factor for all the employees was working in knowledge-intensive and emotionally demanding jobs. The data were collected during spring 2013 (T1) and spring 2014 (T2).

All the employees of the participating companies received advance information about the goals of the study, and a link to an online questionnaire. The employees were also reminded up to two times if they had not answered in ten or twenty days. Of the 2,824 employees who received the questionnaire, 1,334 responded to the inquiry at T1, resulting in a response rate of 48%. At T2, inquiries were sent to the people who responded at T1, and 919 responses were received at this time point, resulting in a response rate of 69%. After excluding respondents who failed to provide data necessary for the study at T1 and T2, the sample size for the validation study was 807, and the sample size for studying the relationships between mindfulness, free time activities, recovery experiences, and restoration was 814. There were no significant differences between the included and excluded cases as regards gender, age, education, emotional exhaustion, or workload.

Of the sample, 65% had a Bachelor's or higher degree, and the majority (58%) defined themselves as upper level white collar workers. The majority of the sample were women (59%), and the mean age was 47 years. The average weekly working time was 39 hours, and 89% had a permanent work contract.

2.2. Measures

Mindfulness was measured with a newly constructed short questionnaire with 6 items. The questionnaire has been created by combining items from two rather long, valid mindfulness questionnaires: the Kentucky Inventory of Mindfulness Skills (KIMS, 39 items; Baer et al., 2004) and the Mindful Attention Awareness Scale (MAAS, 15 items; Brown & Ryan, 2003). The items related to acceptance were chosen from KIMS based on the highest factor loadings reported by Baer and others (2004, 2006). The items related to acting with awareness were chosen from MAAS based on highest factor loadings in American (Brown & Ryan, 2003), Chinese (Black, Sussman, Johnson, & Milam, 2012), and Swedish samples (Hansen, Lundh, Homman, & Wångby-Lundh, 2009), and based on results from an item response theory (IRT) analysis, as reported in a study by Van Dam, Earleywine, and Borders (2010). There were three items measuring awareness, such as "I rush through activities without being really attentive to them", and three measuring acceptance, such as "I tell myself I shouldn't be feeling the way I'm feeling". All items were reverse-scored as they were formulated in the negative form (i.e., in the absence of mindfulness). The items were rated on a 5-point scale ranging from 1 (very seldom or never) to 5 (very often or always). Cronbach's alpha for the whole mindfulness scale was 0.77 at both T1 and T2. For the awareness scale, alpha was 0.66 at T1 and 0.65 at T2. For the acceptance scale, alpha was 0.76 at T1 and 0.78 at T2.

Rumination was measured with a shortened version of the Work-Related Rumination Questionnaire (Querstreet & Copley, 2012). There were altogether six items. Three of them related to affective rumination and the other three to problem-solving pondering. For example, "I become tense when I think about work related issues in my free time" measured affective rumination, and "I find solutions to work-related problems in my free time" measured problem-solving pondering. The items were rated using a 5-point scale ranging from 1 (very seldom or never) to 5 (very often or always). Measures were only taken at T1. Cronbach's alpha for the whole scale was 0.73. For the affective rumination scale, alpha was 0.88. For the problem-solving pondering scale, it was 0.70.

Emotional exhaustion was measured with five items from the Maslach Burnout Inventory (Maslach, Jackson, & Leiter, 1996). A sample item is “I feel emotionally drained from my work”. The items were rated on a 7-point scale ranging from 0 (never) to 6 (always/every day). Cronbach’s alpha for this scale was 0.93 at T1.

Happiness was measured with a single question: “How happy do you feel in general?” (Abdel-Khalek, 2006). This question was rated on a 10-point scale ranging from 1 (very unhappy) to 10 (very happy).

Vitality was measured with four items from the Subjective Vitality Scale (Ryan & Frederick, 1997) where one is asked to estimate one’s experience of vitality over the previous month. The statement “I don’t feel very energetic” used in the original questionnaire was changed to a positive form as “I had energy and spirit”. Negative items were reverse-scored. The items were rated on a 5-point scale ranging from 1 (very seldom or never) to 5 (very often or always). Cronbach’s alpha for this scale was 0.88 at T1.

Recovery experiences were measured with a shortened version of the Recovery Experience Questionnaire (Sonnentag & Fritz, 2007). There were three items each about detachment, for example, “During time after work, I forget about work”, relaxation, for example, “During time after work, I do relaxing things”, mastery, for example, “During time after work, I do things that challenge me”, and control, for example, “During time after work, I decide my own schedule”. The items were rated on a 5-point scale ranging from 1 (strongly disagree) to 5 (strongly agree). Cronbach’s alpha for the detachment scale was 0.86 at both T1 and T2. For the relaxation scale, alpha was 0.79 at T1 and 0.76 at T2. For the mastery scale, alpha was 0.76 at T1 and 0.77 at T2. For the control scale, it was 0.83 at T1 and 0.85 at T2.

Restoration was measured with an adapted and extended version of the Restoration Outcome Scale (Korpela et al., 2008). The respondents were asked to evaluate the effectiveness of their free time activities by indicating their agreement with six statements, such as “My free time activities make me feel calm”. The items were rated on a 7-point scale ranging from 1 (not at all) to 7 (completely). Cronbach’s alpha for this scale was 0.93 at T1 and 0.92 at T2.

Free time activities were assessed by asking the respondents to evaluate how much time they usually spend on moderate physical activities (e.g., walking, cycling, home chores), intensive physical activities (“exercising at least for 20 minutes getting at least slightly out of breath and sweaty”), physical activities in nature (e.g., swimming, running, cycling), social activities (e.g.,

meeting friends or family in person or online, talking on the phone), cultural activities (e.g., visiting a museum, attending a concert, going to the theater), and creative activities (e.g., playing music, painting, handicrafts). The answers were given using a 6-point scale ranging from 1 (almost never or a few times per year) to 6 (almost every day).

Gender and *education* were asked about in the general information section². When asking about education, seven answering options were given ranging from 1) comprehensive school to 7) doctoral or licentiate's degree. The respondent was instructed to choose the highest level completed.

2.3. Data analyses

Statistical analyses were carried out using IBM SPSS Statistics 21, except for the confirmatory factor analysis that was conducted using a demo version of Mplus 7.3. To validate the mindfulness questionnaire, I used five different analytical strategies. The analyses were conducted using the whole mindfulness questionnaire and the awareness and acceptance scales separately. First, I evaluated the internal consistency of the items by calculating Cronbach's alphas. Second, I computed the test-retest reliability from T1 to T2 using dependent t-tests. The third step was to conduct an exploratory factor analysis to compare the factor structure of the awareness scale and the acceptance scale to examine whether they are distinguishable constructs. Fourth, I conducted a confirmatory factor analysis to further evaluate factorial validity of the two-factor model. Fifth, I investigated the convergent and divergent validity by assessing relationships between dispositional mindfulness and the variables chosen based on earlier research findings specified in the introduction. Where both independent and dependent variables were measured on a Likert scale, I used Pearson's product-moment correlation for the analysis. Where the independent variables were categorical, I performed one-way analyses of variance (ANOVA). The variables used to examine convergent validity were rumination, emotional exhaustion, happiness, and vitality, as they have been linked with dispositional mindfulness in earlier studies. The variables used to examine divergent validity were gender and education which, to the best knowledge of the author, have not

² Please note that the only options offered for gender were "female" and "male". This binary understanding of gender may exclude people who do not feel comfortable defining themselves either as a man or a woman. This is a marginal group of people but in a sample as big as the one used in this study, it is possible that gender non-conforming people are included.

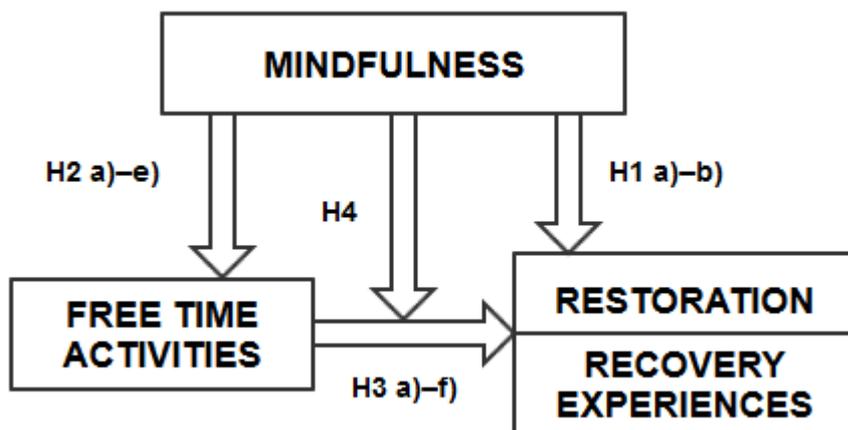
been found to be related to mindfulness. The constructs used for validation were assessed at T1, except for the test-retest data for mindfulness that was collected at T1 and T2.

In the second part of this study, I scrutinized the relationships between dispositional mindfulness, free time activities, recovery experiences, and restoration. The hypotheses and their relationships are displayed in Figure 1. First, I computed bivariate correlations between all the constructs using Pearson's product-moment correlation analyses. Correlation coefficients were interpreted to be high if the correlation coefficient was 0.5 or higher, moderate if it was 0.3–0.5, and low if it was smaller than 0.3 (Miles & Shevlin, 2001). I also conducted hierarchical regression analyses to gain further information about the relationships when the other variables were controlled for, and to test the hypothesis of mindfulness moderating the relationships between the time spent on free time activities, restoration, and recovery experiences at T1 and T2.

I conducted altogether ten regression analyses, one for every dependent variable at T1 (cross-sectional) and T2 (longitudinal). The dependent variables were restoration, detachment, relaxation, control, and mastery, measured at both T1 and T2. The independent variables were the six types of free time activities, mindfulness, and interaction terms created by multiplying mindfulness with each of the six free time activities. Independent constructs were measured only at T1, as they can be considered quite stable constructs. The independent variables were mean centered and standardized to reduce multicollinearity (Dawson, 2014). Education and age at T1 were used as control variables in both the cross-sectional study and the longitudinal study. In addition, the levels of the dependent variables at T1 were controlled for in the longitudinal analyses.

In the cross-sectional regression analyses, where values for dependent variables were measured at T1, four steps were conducted: the first step included the control variables, the second step added the free time activities, the third step added mindfulness, and the fourth step added the interaction terms into the model. In the longitudinal regression analysis, with dependent variables measured at T2, the first four steps were the same as in the cross-sectional analyses but the level of the dependent variable at T1 was controlled for as the fifth step (following the example of Kirves, Kinnunen, & De Cuyper, 2014). By adding the baseline measure as the last step, it was possible to compare the results from the cross-sectional (T1) and the longitudinal (T2) analyses. Furthermore, simple slope analyses were conducted for the interaction terms that significantly predicted the outcomes.

Figure 1. Research plan and hypotheses.



3. RESULTS

3.1. Validation analyses

In the validation study, there were five sources of evidence for validity. Firstly, Cronbach's alphas were calculated. For the whole mindfulness scale, it was 0.77 at both T1 and T2, representing good internal consistency. For the awareness scale, it was 0.66 at T1 and 0.65 at T2, representing acceptable internal consistency. For the acceptance scale, it was 0.76 at T1 and 0.78 at T2, suggesting good internal consistency. If the third item of the acceptance scale ("I make judgments about whether my thoughts are good or bad") were removed, Cronbach's alpha for the acceptance scale would rise to 0.87 at T1 and 0.88 at T2. At the same time, alpha would stay the same for the whole mindfulness scale. As the item adds incremental validity for the scale by measuring also acceptance of one's thoughts instead of just measuring acceptance of one's emotions, all the items were preserved.

Secondly, the test-retest reliability was computed for mindfulness, awareness, and acceptance. The self-reported levels of mindfulness, awareness, and acceptance rose significantly between T1 and T2 (the value of t varied between -4.20 and -2.92 with $p < .01$). The scores on different scales increased by 0.08–0.1 points. The correlation between awareness and acceptance was 0.49 at T1 and 0.46 at T2.

Thirdly, an exploratory factor analysis was conducted using principal axis factoring with varimax rotation to clarify the factor structure. Two factors with eigenvalues over 1.0 were

generated. All items had loadings of 0.40 or greater on the factor for which they were intended (see Table 1).

The two-factor model was also tested using confirmatory factor analysis. The chi-square value to test the model fit was significant ($\chi^2 = 26.61$, $p < .001$), suggesting less than optimal model fit. However, it has been noted that this value becomes significant very easily when the sample size is bigger than 600 (Stommel, Wang, Given, & Given, 1992). For this reason, supplementary analyses were executed. The Comparative Fit Index (CFI) was 0.98 and the Tucker Lewis Index (TLI) was 0.96, indicating good model fit. The Root Mean Square Error of Approximation was 0.06 and the Standardized Root Mean-Square Residual was 0.03, also suggesting good model fit. Put together, the results suggest that the two-factor model fits this mindfulness scale well.

Table 1. Factor structure for the mindfulness scale at T1.

Item number and content	Factor loadings	
	1	2
<u>Awareness items</u>		
1. It seems I am “running on automatic”, without much awareness of what I am doing.	0.17	0.57
4. I get so focused on the goal I want to achieve that I lose touch with what I am doing right now to get there	0.27	0.56
5. I rush through activities without being really attentive to them	0.22	0.64
<u>Acceptance items</u>		
2. I tell myself I should not be feeling the way I am feeling.	0.78	0.34
3. I think some of my emotions are bad or inappropriate and I should not feel them.	0.90	0.21
6. I make judgments about whether my thoughts are good or bad.	0.41	0.23

Note. The items were not reverse-scored for the factor analysis.

Finally, the relationships between the mindfulness scales and constructs related to dispositional mindfulness in earlier studies were examined to assess convergent validity (see Table 2). All correlation coefficients were significant. Dispositional mindfulness had negative relationships with emotional exhaustion, affective rumination, and problem-solving pondering, and positive relationships with vitality and happiness.

For divergent validity, the differences in mindfulness between women and men, as well as between people with different educational backgrounds at T1 were tested using one-way ANOVAs. No significant differences between the groups were found. In the analyses for differences between the genders in mindfulness, awareness, and acceptance, the F-values varied from 0.01 to 1.73 ($p > .19$). Between different education groups, the F-values varied from 0.29 to 1.00 ($p > .43$).

Table 2. Bivariate correlations between mindfulness and other constructs at T1.

Scale	Mindfulness	Awareness	Acceptance
Awareness	.85**	–	–
Acceptance	.88**	.49**	–
Emotional exhaustion	-.32**	-.27**	-.28**
Affective rumination	-.40**	-.34**	-.35**
Problem-solving pondering	-.11**	-.12**	-.08*
Vitality	.36**	.29**	.33**
Happiness	.32**	.21**	.33**

Note: **p < .01. *p < .05.

3.2. Free time activities, mindfulness, restoration, and recovery experiences

3.2.1. Correlations between the constructs

The first hypotheses were that people with higher levels of dispositional mindfulness experience higher levels of 1a) recovery experiences and 1b) restoration. From Table 3, it can be seen that all correlations between mindfulness, restoration, and recovery experiences on both time points were statistically significant, although relatively low. The whole mindfulness scale had the highest correlation with relaxation at both T1 ($r = .26$, $p < .01$) and T2 ($r = .29$, $p < .01$) and the lowest correlation with mastery at T1 ($r = .12$, $p < .01$) and T2 ($r = .18$, $p < .01$). Similarly, acceptance had the lowest correlation with mastery at T1 ($r = .08$, $p < .05$) and T2 ($r = .14$, $p < .01$), and the highest correlation with relaxation at both T1 ($r = .21$, $p < .01$) and T2 ($r = .24$, $p < .01$). In line with the whole mindfulness scale and the acceptance scale, awareness had the strongest correlation with relaxation at T1 ($r = .24$, $p < .01$) and T2 ($r = .27$, $p < .01$), but the lowest correlation was with detachment at both T1 ($r = .13$, $p < .01$) and T2 ($r = .16$, $p < .01$). It is noteworthy that all the correlations between the mindfulness scales and the recovery experiences were stronger at T2 than at T1.

The second set of hypotheses was that individuals with higher levels of dispositional mindfulness spend more time on 2a) moderate physical activities, 2b) intensive physical activities, 2c) physical activities in nature, 2d) creative activities, and 2e) cultural activities. Furthermore, the relationship between mindfulness and social activities was examined, as theoretically the relationship might be either positive or negative. In the current study, mindfulness, awareness, and

Table 3. Bivariate correlations between the variables used in the study.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Mean	3.65	3.57	3.73	5.10	4.53	4.31	4.44	2.24	2.30	5.07	5.08	2.95	3.02	3.82	3.83	3.94	3.96	3.42	3.27
SD	0.68	0.74	0.84	1.07	1.24	1.30	1.19	1.10	1.59	0.95	0.88	0.99	0.97	0.73	0.71	0.78	0.78	0.77	0.78
Range	1-5	1-5	1-5	1-6	1-6	1-6	1-6	1-6	1-6	1-7	1-7	1-5	1-5	1-5	1-5	1-5	1-5	1-5	1-5
1. Mindfulness ^a	-																		
2. Awareness ^a	.85**	-																	
3. Acceptance ^a	.88**	.49**	-																
4. Mod. phys. act. ^a	.07	.05	.07	-															
5. Int. phys. act. ^a	.03	.04	.01	.56**	-														
6. Nature act. ^a	.03	.03	.02	.60**	.58**	-													
7. Social act. ^a	.07	.05	.07	.27**	.20**	.20**	-												
8. Cultural act. ^a	-.02	-.01	-.02	.10**	.10**	.11**	.34**	-											
9. Creative act. ^a	-.01	.01	-.03	.03	.02	.03	.15**	.27**	-										
10. Restoration ^a	.22**	.19**	.19**	.22**	.28**	.26**	.27**	.22**	.14**	-									
11. Restoration ^b	.25**	.21**	.22**	.22**	.20**	.22**	.24**	.17**	.09**	.61**	-								
12. Detachment ^a	.17**	.13**	.16**	.09**	.09*	.05	.14**	.09*	.10**	.31**	.25**	-							
13. Detachment ^b	.19**	.16**	.16**	.07	-.00	-.01	.16**	.11**	.09*	.19**	.28**	.61**	-						
14. Relaxation ^a	.26**	.24**	.21**	.19**	.18**	.16**	.24**	.20**	.12**	.52**	.43**	.60**	.42**	-					
15. Relaxation ^b	.29**	.27**	.24**	.17**	.16**	.12**	.23**	.12**	.10**	.39**	.53**	.42**	.56**	.58**	-				
16. Control ^a	.22**	.20**	.18**	.13**	.11**	.12**	.24**	.21**	.07	.38**	.34**	.40**	.26**	.58**	.39**	-			
17. Control ^b	.25**	.22**	.22**	.06	.08*	.03	.17**	.10**	.03	.30**	.40**	.27**	.32**	.40**	.55**	.57**	-		
18. Mastery ^a	.12**	.14**	.08*	.05	.10**	.07*	.11**	.24**	.28**	.41**	.31**	.16**	.06	.30**	.21**	.23**	.16**	-	
19. Mastery ^b	.18**	.18**	.14**	-.00	.06	.03	.11*	.20**	.26**	.34**	.33**	.08*	.13**	.20**	.29**	.18**	.27**	.66**	-

Notes. SD = Standard deviation. Mod. phys. act. = moderate physical activity. Int. phys. act. = Intensive physical activity. Nature act. = Physical activity in nature. Social act. = social activity. Cultural act. = cultural activity. Creative act. = creative activity.

^a = measured at T1. ^b = measured at T2. **p < .01. *p < .05.

acceptance did not correlate with the time spent engaging in any of the six types of free time activities at T1.

Thirdly, it was hypothesized that more time spent on 3a) moderate physical activities, 3b) intensive physical activities, 3c) physical activities in nature, 3d) social activities, 3e) cultural activities, and 3f) creative activities would be connected to higher levels of recovery experiences and restoration. In general, the correlations were higher at T1 than at T2, and restoration and relaxation had the strongest correlations with engaging in free time activities.

Regarding restoration, correlations with engaging in free time activities were significant at both time points and with all activities. At T1, the strongest correlation was with engaging in intensive physical activity ($r = .28, p < .01$) and the weakest correlation was with engaging in creative activity ($r = .14, p < .01$). At T2, restoration had the highest correlation with engaging in social activity ($r = .24, p < .01$) and the lowest correlation with engaging in creative activity ($r = .09, p < .01$).

Regarding detachment at T1, the strongest correlation was with engaging in social activity ($r = .14, p < .01$) and the weakest correlations that were still significant were with engaging in intensive physical activity and cultural activity ($r = .09, p < .05$). There was no significant correlation between detachment at T1 and engaging in physical activity in nature. At T2, detachment had again the strongest correlation with social activity ($r = .16, p < .01$) and the lowest, though still significant, correlation with engaging in creative activity ($r = .09, p < .05$). Detachment at T2 was not significantly correlated with engaging in any of the physical activities.

Relaxation had significant correlations with engaging in all free time activities at both time points. At T1, relaxation had the strongest correlation with engaging in social activity ($r = .24, p < .01$) and the weakest correlation with engaging in creative activity ($r = .12, p < .01$). Similarly, at T2, the strongest correlation was with engaging in social activity ($r = .23, p < .01$) and the weakest with engaging in creative activity ($r = .10, p < .01$).

Regarding control at T1, the highest correlation was with engaging in social activity ($r = .24, p < .01$) and the lowest still significant correlation with engaging in intensive physical activity ($r = .11, p < .01$). No significant correlation was found between control at T1 and taking part in creative activity. At T2, control had again the highest correlation with engaging in social activity ($r = .17, p < .01$) and the lowest still significant correlation with engaging in intensive physical activity ($r = .08, p < .05$). At this time point, experiencing control was not significantly correlated with engaging in moderate physical activity, physical activity in nature, or creative activity.

Mastery at T1 had the highest correlation with engaging in creative activity ($r = .28, p < .01$) and the lowest still significant correlation with engaging in physical activity in nature ($r = .07, p < .05$). There was no significant correlation between mastery at T1 and engaging in moderate physical activity. At T2, mastery had the strongest correlation again with engaging in creative activity ($r =$

.26, $p < .01$) and the weakest still significant correlation with engaging in social activity ($r = .11$, $p < .05$). Mastery at T2 was not significantly correlated with any of the physical activities.

3.2.2. Mindfulness and free time activities predicting restoration and recovery experiences

To further elaborate on hypotheses 1a)–b) and 3a)–f) and to test the contributions of free time activities and mindfulness when the other variables are controlled for, the results of the regression analyses are scrutinized (see Table 4 for the cross-sectional analyses at T1 and Table 5 for longitudinal analyses at T2). At T1, the regression models explained 10–21 per cent of the variance in restoration, detachment, relaxation, control, and mastery scores ($F(15,789)$ varied between 5.52 and 13.65, with $p < .001$). Regarding hypotheses 1a) and 1b), mindfulness explained 1–6 per cent of the variance in the scores for recovery experiences at T1, with the highest explanation rate observed for relaxation ($F(9,795) = 18.93$, $p < .001$) and the lowest one for mastery ($F(9,795) = 15.06$, $p < .001$). For restoration, mindfulness explained 4 per cent of the variance in the scores ($F(9,795) = 22.37$, $p < .001$).

Regarding hypotheses 3a) to 3f), free time activities explained 3–11 per cent of the variance in the scores of recovery experiences at T1, with the highest explanation rate for mastery ($F(8,796) = 15.33$, $p < .001$) and the lowest explanation rate for detachment ($F(8,796) = 6.47$, $p < .001$). Free time activities explained 16 per cent of the restoration scores ($F(8,796) = 22.37$, $p < .001$). When considering the standardized regression coefficients for different free time activities, it was found that engaging more in five types of free time activities, but not in moderate physical activity, was positively related to restoration and recovery experiences at T1.

Intensive physical activity was the strongest predictor of restoration ($\beta = .18$, $p < .001$) and it was also positively related to experiencing relaxation and mastery ($\beta = .09$, $p < .05$). Engaging more in physical activities in nature was connected to a higher level of restoration ($\beta = .12$, $p < .01$) but did not significantly relate to recovery experiences. The people who engaged more in social activities experienced more restoration, control, and relaxation (for restoration $\beta = .16$, $p < .001$, for control, $\beta = .15$, $p < .001$, and for relaxation, $\beta = .12$, $p < .01$). Spending more time in cultural activities was related to higher relaxation, control, and mastery (β varied between .14 and .16 with $p < .001$), as well as to higher restoration ($\beta = .12$, $p < .01$). Finally, engaging more in creative activities was positively related to mastery experiences ($\beta = .23$, $p < .001$) and to experiencing restoration ($\beta = .08$, $p < .05$).

In the longitudinal analyses, where the dependent variables were measured at T2, the results were not notably different from T1. Mindfulness explained 3–8 per cent of the variance in the

Table 4. Hierarchical regression analyses for free time activities, mindfulness and their interactions predicting restoration and recovery experiences at T1.

Variables	Restoration			Recovery experiences								
	β	ΔR^2	Detachment	β	ΔR^2	Relaxation	β	ΔR^2	Control	β	ΔR^2	Mastery
Step 1: Control variables		.00			.03***			.02**		.02**		.02***
Age	.04		-.12**									.13***
Education	-.01		-.16***									.05
Step 2: Free time activities		.16***			.03**			.10***		.08***		.11***
Moderate physical	-.03		.03					.05		.02		-.04
Intensive physical	.18***		.07					.09*		.04		.09*
Physical in nature	.12**		-.03					.04		.04		.00
Social	.16***		.06					.12**		.15***		.03
Cultural	.12**		.06					.14***		.16***		.16***
Creative	.08*		.06					.05		-.00		.23***
Step 3: Mindfulness		.20***	.18***	.04***	.03***	.26***	.21***	.06***	.04***	.11**	.01**	.01**
Step 4: Interaction		.00		.00	.00			.00		.01*		.01
mind*physical	-.01		-.03					-.03		-.06		-.02
mind*intensive physical	-.01		-.02					-.01		-.01		.03
mind*physical in nature	.04		.00					.02		.05		-.04
mind*social	.02		-.00					-.02		-.04		.09*
mind*culture	.05		.01					.07		.11**		.01
mind*creative	-.03		.04					-.00		.00		.05
Total R ²		.21***	.10***	.18***	.16***							

Notes. Interaction terms are interactions of mindfulness and free time activities. β = standardized regression coefficient. ΔR^2 = change of R². *** = p < .001. ** = p < .01. * = p < .05.

Table 5. Hierarchical regression analyses for free time activities, mindfulness and their interactions predicting restoration and recovery experiences at T2.

Variables	Restoration			Recovery experiences		
	β	ΔR^2	ΔR^2	β	ΔR^2	ΔR^2
Step 1: Control variables		.00	.03***		.01*	.02***
Age	-.01		-.00	.03		.05
Education	-.02		-.07*	-.04		-.01
Step 2: Free time activities		.10***	.03***		.07***	.09***
Moderate physical	.05		.07	-.04		-.06
Intensive physical	-.03		-.07	.07		.02
Physical in nature	.03		-.06	-.06		-.01
Social	.07*		.06	.06		.04
Cultural	.03		.04	-.03		.02
Creative	-.01		.01	.00		.08**
Step 3: Mindfulness	.11***	.05***	.08**	.13***	.06***	.10***
Step 4: Interaction		.02*	.00		.02**	.00
mind*physical	-.07		.02	-.02		.00
mind*intensive physical	.01		-.01	-.01		-.01
mind*physical in nature	-.04		.00	.03		-.00
mind*social	.06		.03	-.01		-.02
mind*culture	.06		.03	.04		-.00
mind*creative	.01		-.02	-.00		-.01
Step 5: T1	.55***	.24***	.58***	.52***	.23***	.61***
Total R ²	.42***		.41***	.38***		.46***

Notes. Interaction terms are interactions of mindfulness and free time activities. T1 = the level of the dependent variable at T1. ΔR^2 = change of R². *** = p < .001. ** = p < .01. * = p < .05.

scores for recovery experiences, with the smallest contributions to detachment and mastery (respectively, $F(15,789) = 9.28$ and $F(15,789) = 14.54$, $p < .001$) and the strongest contribution again to relaxation ($F(15,789) = 16.46$, $p < .001$). Of the restoration scores, mindfulness explained 5 per cent ($F(15,789) = 16.26$, $p < .001$).

Regarding free time activities, they explained 3–9 per cent of the scores for recovery experiences, with the highest explanation rate again for mastery ($F(8,796) = 12.88$, $p < .001$) and the lowest explanation rate for detachment ($F(8,796) = 6.55$, $p < .001$). For restoration, free time activities explained 10 per cent of the variance in the scores ($F(8,796) = 11.67$, $p < .001$). Then again, when the standardized regression coefficients were considered for the free time activities separately when the level of the dependent variable was controlled for, there were just a few significant predictors of restoration or recovery experiences. Attending more to social activities was related to higher levels of restoration and relaxation (respectively, $\beta = .07$, $p < .05$ and $\beta = .09$, $p < .01$), and engaging more in creative activities was related to a higher level of mastery ($\beta = .08$, $p < .01$).

Put together, it appears that free time activities explain a smaller percentage of the variance in the scores for restoration, relaxation, control, and mastery at T2 than at T1. In contrast, mindfulness appears to have greater explanation rates at T2 than at T1. These findings are in line with the changes in correlations between the two time points (see Table 3). Even though the trends of the changes are parallel, the overall changes are not remarkable. However, controlling the levels of the dependent variables at T1 had a great impact on the standardized regression coefficients of all the independent variables in the longitudinal analyses. Summing up, in predicting recovery experiences and restoration at T2, recovery experiences and restoration at T1 explained most of the variance. However, mindfulness and free time activities contributed about equally to predicting the outcomes.

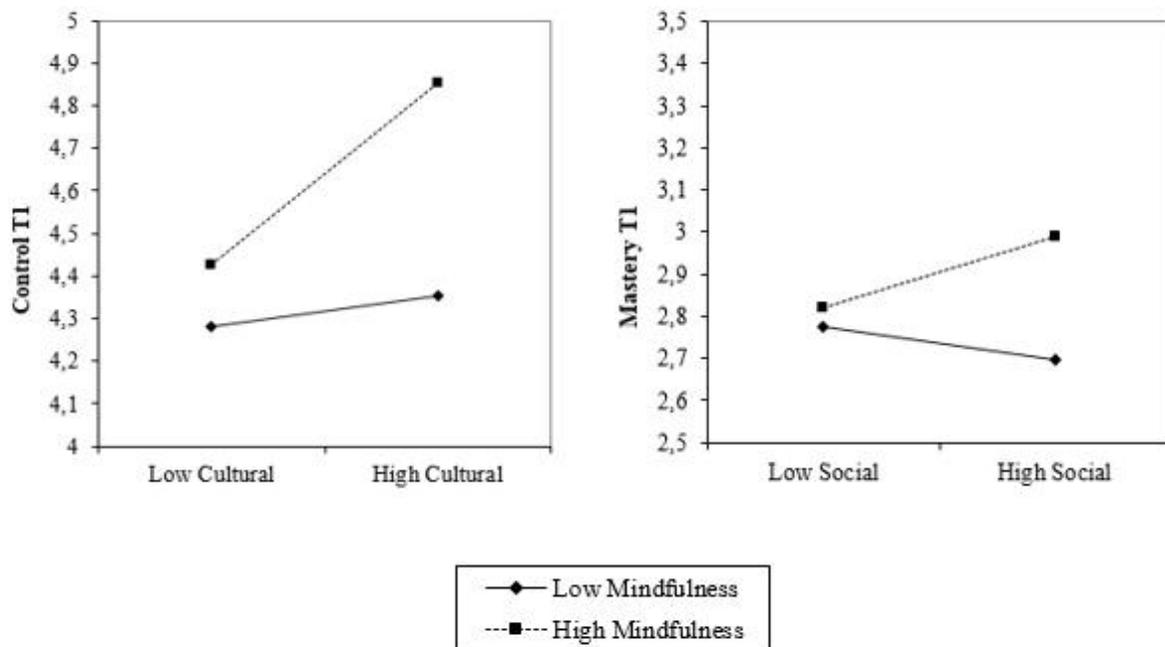
3.2.3. Mindfulness moderating the relationship between free time activities, restoration, and recovery experiences

The fourth hypothesis was that people with higher levels of dispositional mindfulness experience more restoration and recovery when they engage more in moderate physical activity, intensive physical activity, physical activity in nature, social activity, creative activity, and cultural activity. In general, the interaction terms did not explain much of the variance in the outcomes at T1 or T2. At

T1, there were two significant interaction terms (see Table 4 for the regression models and Figure 2 for the simple slopes³).

Firstly, the people with higher levels of mindfulness who attended more to cultural activities experienced more control ($\beta = .11, p < .01$). Attending to cultural activity related more strongly to control for people with high levels of mindfulness ($\beta = .18, p < .001$) than for those with low levels of mindfulness ($\beta = .03, p > .05$). Secondly, the people with higher levels of mindfulness who engaged more in social activity experienced more mastery ($\beta = .09, p < .05$). The relationship between engaging in social activity and mastery was stronger when a person had a high level of mindfulness ($\beta = .17, p < .01$), as compared to having a low level of mindfulness ($\beta = .04, p > .05$).

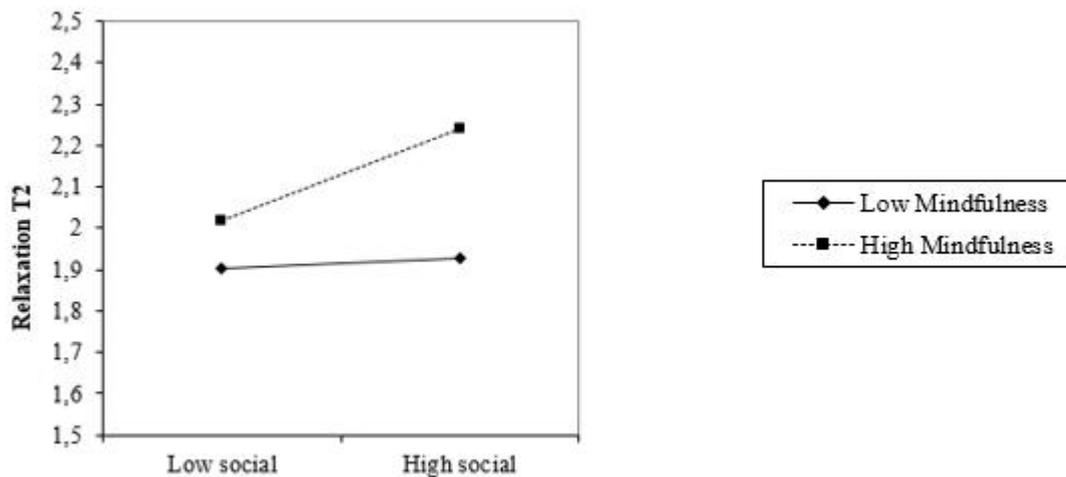
Figure 2. Simple slopes for the interactions between engaging in cultural activity and control at T1, and between engaging in social activity and mastery at T1, moderated by mindfulness.



³ Please note that all the other variables are controlled for in the values used to draw the figures for the simple slopes, whereas in conducting the simple slope analyses, only the interaction terms and the outcome variables can be included. Consequently, the simple slope analyses depict slightly different situations, providing more information about the impact of the other variables.

At T2, there was one significant interaction term (see Table 5 for the regression model and Figure 3 for the simple slopes). People with higher levels of mindfulness who engaged more in social activity experienced more relaxation at T2 ($\beta = .07, p < .05$). Once again, the effect was clearer for those with high levels of mindfulness ($\beta = .29, p < .001$), as compared to those with low levels of mindfulness ($\beta = .14, p < .01$). All in all, the interaction terms did not add much explanatory value. But the few interaction terms that did become significant all acted in the expected direction: being mindful while engaging in certain free time activity was related to some positive recovery experiences.

Figure 3. Simple slopes for the interaction between engaging in social activity and relaxation at T2, moderated by mindfulness.



4. DISCUSSION

This thesis had two objectives. First, the mindfulness questionnaire that was constructed for and used in this study was validated. Second, the relationships between engaging in different types of free time activities, dispositional mindfulness, and experiencing recovery and restoration were examined. For the latter part of the study, the relationships between all constructs were scrutinized separately, and the moderation effect of mindfulness on the relationship between engaging in different free time activities and experiencing recovery and restoration was examined.

4.1. Validity of the mindfulness scale

When all the results from the validation analyses are taken into consideration, the mindfulness questionnaire used in this study appears to be relatively valid and reliable. This was expected, as the questionnaire was constructed using items from scales that have been found to be valid and reliable in earlier studies (e.g., Baer et al., 2004; Brown & Ryan, 2003). Internal consistency of the mindfulness scales varied between acceptable and good in this sample. For the acceptance scale, internal consistency would have been higher if the item referring to accepting one's thoughts would have been removed. However, all the items were retained as they are relevant for measuring mindfulness. If the item would have been removed, the scale would only have measured acceptance of one's feelings, which is not a sufficient measure of mindful acceptance (Bishop et al., 2004).

When the test-retest reliability between T1 and T2 was examined, the results showed that people's levels of mindfulness rose significantly when measured with a one-year interval. However, the actual differences in the scores were only 0.08–0.10 points on average. On a scale from one to five, these do not appear to be a meaningful differences when the inaccuracy of self-assessment on a Likert scale is kept in mind. With a sample size as big as the one used in this study, even small changes in scores can easily turn out to be significant. The two-factor model appeared to be fitting for mindfulness on the basis of both explanatory and confirmatory factor analyses.

Moreover, some earlier findings on the relationships between mindfulness and various other constructs were replicated in this study, suggesting that the same underlying phenomenon is measured by this questionnaire as by the scales used in previous studies. This study strengthened the existing knowledge about mindfulness being positively related to happiness and vitality, and negatively related to emotional exhaustion and rumination. No differences in levels of mindfulness were found between women and men or between people with different levels of education, as was expected. To conclude, the questionnaire constructed for this study appears to measure mindfulness rather well. Its brevity is beneficial as the questionnaire is quick and easy to fill, and thus practical for use even in long inquiries. Using this short mindfulness questionnaire can also benefit future research.

4.2. Major findings

4.2.1. Mindfulness, restoration, and recovery experiences

In this study, people's levels of dispositional mindfulness significantly predicted their experiences of restoration and recovery, as was hypothesized. It appears that mindfulness has a stronger relationship with restoration, relaxation, and control in this sample than with detachment or mastery. Still, earlier findings regarding the positive relationship between mindfulness and control and between mindfulness and detachment were also replicated (Hülshager et al., 2014; Marzug & Drach-Zahavy, 2012). On the other hand, Marzug's and Drach-Zahavy's study (2012) did not indicate that mindfulness would be related to relaxation or mastery, like the current study did. The participants of that study were 200 Israeli nurses, so the differences in the results may be explained by differences in sample size, cultural backgrounds, and occupations. Nursing has been found to be a particularly stressful profession, and in Israel, nurses have seen the lack of staff and resources as especially problematic, not to mention the stress caused by the ongoing state of war (Glazer & Gyurak, 2008; Jennings, 2008). Thus, the job characteristics of nursing may lead to experiencing less mastery and relaxation, as compared to Finnish workers in knowledge-intensive jobs. In addition to the studies mentioned, dispositional mindfulness has been related to relaxation in another study (Moody et al., 2013).

No earlier studies about the relationship between mindfulness and restoration as such have been published but some connections between mindfulness and different components of restoration have been found (e.g., Brown & Ryan, 2003; Chiesa & Serretti, 2009; Huffziger et al., 2013; Moody et al., 2013). Thus, the current results are coherent with earlier findings, and further add to our current knowledge about the relationship between mindfulness and restoration. All in all, it seems that being more aware of and accepting towards one's experiences is beneficial for restoring one's energy and recovering from stress. There might be a direct link between mindfulness and recovery experiences, but mindfulness could also affect recovery from stress indirectly, for example through enhancing positive affect, quality of sleep, or health-related behaviors (e.g., Brown & Ryan, 2003; Hülshager et al., 2014; Roberts & Danoff-Burg, 2010).

It is curious that people's levels of mindfulness appeared to rise between the two times they filled the questionnaire, and mindfulness had stronger relationships with restoration and the recovery experiences at the second measurement point. Answering based on "gut feeling" is possible when the options are somewhat ambiguous like on a Likert scale, leading to some variation

in the answers (Hartley & Betts, 2010). However, the change seems to be systematic and thus may not be completely explained by random changes in the evaluation process.

It is possible that asking questions about mindfulness in an inquiry about well-being through work indicates that it is important for well-being, and therefore, the respondents start to pay more attention to being aware and accepting. On the other hand, as mentioned in the introduction, mindfulness and other forms of meditation have become very popular in Finland, and it is even possible that mindfulness training has been arranged at the work places. Thus, we cannot be certain if it is dispositional mindfulness that is measured here or if some people have practiced mindfulness.

As it has been found that mindfulness skills can be enhanced (Baer, 2003; Kabat-Zinn, 2005), these findings support the use of mindfulness-based practices to enhance recovery from stress. However, it has to be remembered that the explanatory rates of dispositional mindfulness for restoration and recovery experiences were rather small and thus it may not be the most effective method in enhancing recovery from stress. Nonetheless, practicing mindfulness should be a considerable option for occupational healthcare, as it is cost-effective and easy to learn (Kabat-Zinn, 2005; Van Gordon, Shonin, Zangeneh, & Griffiths, 2014). In addition, campaigns of practicing awareness and acceptance at workplaces could be a noteworthy way to support employees' well-being before they end up needing occupational healthcare services (Aikens et al., 2014).

4.2.2. Mindfulness and free time activities

Contrary to expectations, no relationships were found between being mindful and engaging in any of the free time activities included in the study. Only the relationship between mindfulness and engaging in physical activity had been directly studied before and found to be positive (Kangasniemi et al., 2014; Roberts and Danoff-Burg, 2010). One of the explanations for the different results could be the different methods used to measure physical activity in these three studies. In the study by Kangasniemi and others (2014), physical activity was measured objectively, using an accelerometer. On the other hand, in the study by Roberts and Danoff-Burg (2010), respondents were asked to describe their "daily lifestyle activity (i.e., how active you are)" on a Likert scale from 1 to 10 (Wadden & Foster, 2006, p. 111). This question about lifestyle activity may be understood to refer to other kinds of activities than just physical activity. In the current study, the respondents were asked to evaluate how often they generally engage in six different activities on a Likert scale ranging from 1 to 6. One possible disadvantage in our way of surveying

the time spent on physical activities was that in the questionnaire, there were three different types of physical activities (moderate/intensive/in nature), which may have caused confusion. To conclude, physical activity was examined in all three studies, but it was measured in rather distinct ways and thus the results are not entirely comparable.

Other hypotheses regarding the relationship between mindfulness and free time activities were more based on theoretical ideas and research findings on connections between mindfulness and constructs relating to the six free time activities. No robust hypotheses could be made based on these findings, but theoretically it is curious that no relationships were found in this study. It could be expected that people would engage more in different free time activities if they could more intensively enjoy them, but, apparently, mindfulness is not a strong indicator of attending more to any of the activities in the current study.

It might be that mindful people find joy also from more everyday activities and do not need to have so much to do to pass their time. It also needs to be remembered that people can have various motivators behind their choices of free time activities (Dillard & Bates, 2011) and that demographic characteristics (e.g., gender, education, and socioeconomic status) have been noticed to affect these choices, too (Janke, Davey, & Kleiber, 2006). Thus, the level of mindfulness may not be the best predictor of the choices of free time activities as mindful people probably have as varying interests as people in general. However, it would have been interesting to add measures of people's engagement in activities like meditation or yoga to see if more mindful people practice in order to be more mindful or if these really are naturally occurring differences.

4.2.3. Free time activities, restoration, and recovery experiences

In general, the results of this study support the hypotheses that engaging more in different types of free time activities is positively related to higher levels of restoration and recovery experiences. Only moderate physical activities did not have any relationship with restoration and recovery experiences in the current study, when the other activities were controlled for. This may be due to the nature of activities that can be considered moderately physical, such as walking home from work or doing household chores. Especially household chores can feel like duties as they may activate the same systems that are at use already at work, and they may not enhance the enjoyment of free time, thus not being ideal in order to enhance detachment, relaxation, control, or mastery even though being moderately physical (Demerouti et al., 2009; Tucker et al., 2008). In addition, it can be argued that only physical activity that is intensive enough can lead to recovery experiences by having greater physical and psychological effects (Shephard, 1997). Otherwise, the current

results are consistent with earlier research findings on the relationships between free time activities and recovery from stress (Demerouti et al., 2009; Korpela & Kinnunen, 2011; Korpela et al., 2008; Sonnentag, 2001; Winwood et al., 2007). The results also indicate that restoration can be a useful concept outside the context of environmental research and engaging in activities in nature, as it relates to engaging in other kinds of free time activities, too.

Restoration was significantly related to engaging in five different types of free time activities, but not in moderate physical activity. Engaging in intensive physical activities and social activities had the strongest relationships with restoration. Earlier findings about the relationship between restoration and activities in nature were also replicated (Korpela et al., 2008). The relationships between attending to free time activities and restoration are perhaps stronger than those between attending to free time activities and recovery experiences, partly because the questions about restoration were more closely related to free time, whereas the questions about recovery experiences were more closely related to work. This is perhaps the main difference between the concepts of restoration and recovery experiences in this study, and this might have guided the respondents to think about different experiences when answering the two questionnaires. The restoration questionnaire is also more holistic, as it does not segregate different kinds of restorative experiences, and for that reason the overall scores might be higher.

Relaxation had the strongest relationship with engaging more in cultural activities, social activities, and intensive physical activities. Cultural activities and social activities demand relatively little effort and thus do not use a lot of the resources that are used at work (Sonnentag, 2001), but on the other hand, offer enough activity to avoid boredom (Demerouti et al., 2009). Cultural and social activities can also be empowering as has been found in studies about some more artistic therapy forms such as music therapy or literature therapy (e.g., Nordström, 2014; Rolvsjord, 2004), and in studies about the significance of peer support (for a review, see Davidson et al., 1999). Experiencing empowerment can be assumed to help in relaxing, as one feels more self-confident and in control of one's life. When it comes to engaging in intensive physical activity, it consumes energy and decreases tension, thus facilitating physical relaxation (Shephard, 1997).

For the feeling of control, the activities with the strongest relationships were the social and cultural ones. The empowering effect of social and cultural activities mentioned in the previous paragraph is likely to apply to experiences of control as well. By definition, empowerment has very much to do with the feeling of being in control of one's own life. Getting social support can also be meaningful in order to feel more in control of one's life (Demerouti et al., 2009).

Overall, free time activities were most strongly related to experiencing mastery. This was expected as mastery by definition results from excelling in something. Of the free time activities, mastery was related to engaging in creative activities, cultural activities, and intensive physical

activities. Creative and physical activities have been connected to experiencing mastery, as they can offer experiences of succeeding when one's goals are achieved or when one exceeds oneself (e.g., Demerouti et al., 2009). The positive relationship between mastery and engaging in cultural activities can again be explained through the empowering effect of different cultural activities that has been found in studies about different forms of cultural therapies (e.g., Nordström, 2014; Rolvsjord, 2004).

Finally, detachment was not connected to engaging in any of the six free time activities in the regression models, although all the free time activities together had low but significant predictive power for detachment. In addition, some rather low but significant correlations appeared with engaging in different free time activities. However, it seems that the choice of free time activities does not have a great effect on people's levels of detachment. Detachment is perhaps more related to personality traits than to the choice of activities. For example, lower levels of detachment from work have been found in people prone to neuroticism (Sonnentag & Fritz, 2007).

In general, it seems that engaging more in almost all the free time activities currently studied can be beneficial in order to recover from stress, and that the choice of activity is not as relevant as being active. However, the connections were generally lower at the second time point. It is possible that the results would have been slightly different if the time spent on free time activities were also measured at the second time point, as the levels of engagement may change for some activities (Stanley & Freysinger, 1995). Here it was assumed that people are likely to continue engaging in similar activities throughout the years (Friedman et al., 2008).

Another problem in measuring the free time activities was that we do not know what the activities that people considered to be of a specific type actually were. It would have helped in drawing conclusions if there had been a free space for reporting the activities engaged in. Of course, this would have added to the workload substantially. In the current study, it is also possible that people included the same activities in several different categories, which makes interpreting the results a bit problematic. Furthermore, it has been found that the enjoyment brought on by the activity might be more meaningful for recovery from stress than the activity *per se* (Tucker et al., 2008), and enjoyment of the activities was not measured in the current study. It might be that the people who have found the right activity for themselves and have the possibility to engage in it might be the ones experiencing more recovery and restoration. In the future, it would be interesting to conduct an experimental research following in the footsteps of Tucker and others (2008), where the same activities would be assessed but the activities would be chosen for the participants. That way, people's own preferences would not affect the results and the effect of a specific activity *per se* would become more visible.

4.2.4. Mindfulness as a moderator between free time activities, restoration, and recovery experiences

A moderating effect of dispositional mindfulness on the relationship between engaging in different free time activities and experiencing recovery and restoration was found only in a few of the cases, and even in those cases, it was rather small compared to the predictive power of mindfulness and/or the free time activity as such. Still, these moderation effects rose to be significant even when mindfulness and different free time activities were controlled for, so they appear to be adding something to the explanatory models.

Firstly, people who are more mindful experienced more control when engaging more in cultural activity. This may be due to the fact that mindful people are more capable of living in the current moment and ruminating less about things that are not relevant for the situation, as well as more able to just observe their feelings and thoughts aroused by the cultural activity instead of automatically reacting to them (Bishop et al., 2004; Kabat-Zinn, 2005). Thus, they might enjoy themselves more when engaging in cultural activities and feel that they are in control of the situation and themselves. Secondly, people with higher levels of mindfulness experienced more mastery and relaxation when engaging more in social activity. Mindful people have been found to experience less social anxiety (Brown & Ryan, 2003), as they tend to worry and ruminate less (Desrosiers, Vine, Klemanski, & Nolen-Hoeksema, 2013). These factors are likely to make social events more enjoyable, rewarding, and relaxing.

In general, the interaction effects found were rather small and thus robust conclusions cannot be drawn about the moderating effect of mindfulness on the relationships between engaging in different free time activities and experiencing more recovery and restoration. However, as both mindfulness and engaging in most of the free time activities were positively related to experiencing recovery and restoration, it may still be assumed that attending to activities more mindfully might be more beneficial than just attending to an activity without being aware and accepting. Overall, it can be concluded that various activities may provide experiences of recovery and restoration, but generally it can be beneficial to be active, aware, and accepting during one's free time.

4.3. Limitations, strengths, and ideas for future research

This study had some noteworthy limitations concerning the sample and the research methods that should be considered. First of all, several respondents did not finish the inquiry or failed to give data at the second time point. Based on feedback, this was most probably due to the total length of

the inquiry. This was problematic for the current study as the questions about mindfulness were among the last questions, and thus more often left unanswered. It is possible that the quality of the answers at the end of the inquiry have suffered as well if the respondents got tired. There could have been more answers to the questionnaires used in this study if multiple versions of the inquiries with the questionnaires in a different order (i.e., that mindfulness would have been one of the first questionnaires in some versions) had been sent to the respondents. This arrangement could have increased the sample size and improved the quality of the answers now given to the last questionnaires. However, due to the size of the whole sample, the sample used for the study remained sufficiently large. On the other hand, big sample sizes can lead more easily to statistically significant results that have little meaning in practice. I have tried to point out this possibility wherever it is presumable.

It is a strength of this study to compare multiple free time activities but in future research, the ways of asking about attending to these activities should be more thoroughly considered. In the current study, very different activities could have been considered to belong in to the same group, and on the other hand, similar activities might have easily belonged to various groups (for example, social activity can take place in cultural venues, and cultural activities can be enjoyed in company), which might make the results difficult to interpret. In the future, it might be of use to add a free space where the respondents could specify which activities they mean when the time spent in some type of activity is evaluated.

In addition, the possible changes in the time spent engaging in different free time activities between multiple measuring points should be inspected. The time spent on physical activities has been found to be rather stable throughout the lifespan (Friedman et al., 2008), but there may still be yearly fluctuation, even if the overall level of engagement stays the same for decades. Furthermore, it might be that engaging in some types of activities is less constant than engaging in some others (Stanley & Freysinger, 1995). Finally, it could be measured whether the participants engage in activities such as meditation or yoga that might improve their levels of mindfulness, and also how much they enjoy the activities they participate in.

The mindfulness questionnaire that was created for this study was found to be a valid measure of mindfulness. It can be a very useful tool in future research as it is short and easy to fill. However, it should be further studied if these six items are the ideal ones to capture the essence of mindfulness or if changing or adding a few items could make a difference. The questionnaire mainly concentrated on awareness and acceptance of one's own actions, emotions, and thoughts, leaving out perceptions of the outside world that have also been considered relevant features of mindfulness. However, as long as there is no consensus about what are the most essential features of mindfulness (e.g., Baer, 2011; Brown & Ryan, 2003), no final conclusion can be reached about

“the right way” to measure it. In any case, as this was the first study where the current questionnaire was used, its validity should be established in other studies, too.

There have also been some concerns about measuring mindfulness using self-evaluation questionnaires that are worthwhile to consider when drawing conclusions. As in most self-evaluation studies, it is uncertain how well people can judge their own experiences, especially when these kinds of experiences are not commonly paid attention to in everyday life. Furthermore, the question has been raised as to whether mindfulness can be measured reliably by only asking about the lack of it, as was done in the current study (Grossman & Van Dam, 2011). However, many current mindfulness researchers do not consider these to be restrictions for studying mindfulness but instead something that should be kept in mind whenever self-evaluative questionnaire studies are conducted (Brown, Ryan, Loverich, Biegel, & West, 2011). Moreover, there are no better ways to measure mindfulness at the moment, although some cognitive and neuroimaging methods might be invented in the future, if research about the cognitive and neural features of mindfulness keeps on developing (for current understanding, see e.g., Chiesa et al., 2011; Murakami, 2012).

Furthermore, in this study, it cannot be said with certainty that higher levels of mindfulness lead to better recovery from stress. It can also be speculated that perhaps it is easier to be aware and accepting when one is under less stress. The longitudinal aspect was included in the study to cover this dilemma, and it seems that mindfulness measured in 2013 is still positively related to recovery from stress in 2014, but it cannot be stated with certainty that the person has not always experienced less stress and that is why it is easier for that person to be mindful. In addition, it has been found that both mindfulness and predisposition to stress are related to the same personality traits (Giluk, 2009; Sonnentag & Fritz, 2007), and someone might argue that research should be conducted on personality traits instead of mindfulness when it comes to recovery from stress. However, personality traits are relatively constant whereas mindfulness can be practiced (Baer, 2003; Kabat-Zinn, 2005), and thus concentrating on mindfulness can be justified.

This is one of the first studies conducted about mindfulness in Finland, and, to the author’s best knowledge, the first ever studying mindfulness along with free time activities and recovery from stress. It has been speculated that mindfulness might be a somewhat culture-related phenomenon (Grossman & Van Dam, 2011). Thus studies taking place in Finland have been needed, too, and will be needed in the future. However, the current results are rather consistent with earlier findings. This may be because the majority of the research is done in the Western countries and Finland can be considered one of them. Not that many psychological or clinical studies regarding mindfulness have been conducted in Asia, the fountainhead of Buddhism and thus mindfulness. It would be interesting to find out in the future if the same results apply to different countries, also in the East, or even just to different working cultures in the Western countries.

The results of this study are currently very relevant as prolonging work careers is one of the main topics in Finnish politics. This objective cannot be reached only by changing laws about the retirement age, but also by investing in well-being at work. Of course, it is not enough to help employees bear the work stress, but instead, the working conditions should be improved, too. Based on this study, at least the people working in knowledge-intensive and emotionally demanding jobs in Finland can benefit from being mindful when it comes to recovering from stress. Thus, practicing mindfulness is a promising method for enhancing well-being at work, as it is cost-effective and easy to learn (Kabat-Zinn, 2005; Van Gordon et al., 2014). Furthermore, we have gained information about the positive effects that different free time activities can have on restoration and recovery experiences. This knowledge can also be used in promoting well-being outside the workplace by supporting people to lead more active lives during their free time, in the manner that best suits them.

Based on a plethora of studies conducted on mindfulness, recovery from work stress would not be the only positive outcome of being more mindful. Mindfulness has also been connected to being more vital and happy (Brown & Ryan, 2003; Ghorbani et al., 2010; Hollis-Walker & Colosimo, 2011), as well as less ruminative and emotionally exhausted (Borders et al., 2010; Hülshager et al., 2013). These findings were also replicated in the current study. Overall, being more mindful has been related to better physical and mental health in general (Keng et al., 2011; Murphy et al., 2012; Whitaker et al., 2014). Based on current knowledge, practicing mindfulness appears as a panacea for curing or improving practically anything, but recently some doubts among researchers have started to rise, too. For example, some people involved in Buddhist meditation have started to remember old traumatic incidents more vividly and be haunted by them, or their personalities have started to change, leading to problems in social relations (Booth, 2014). However, little research has been done about these phenomena. In the future, it would be important to critically examine the possibility that practicing mindfulness can also have negative side effects and that some types of people might be more vulnerable to experiencing them.

4.4. Conclusion

To conclude, it seems that people with higher levels of mindfulness experience better recovery from stress. The study thus replicates earlier findings but also offers new knowledge for understanding the interplay between mindfulness, recovery experiences, and restoration. Thus, the findings of this study support the use of mindfulness-based interventions in healthcare, to improve both well-being

through work and quality of life in general. In addition, this is the first study to examine the relationships between engaging in six different types of free time activities and recovering from stress. This adds to our knowledge about the meaning of free time to stress recovery. The findings can be used to support people in spending their free time in a favorable way. Finally, a new, shorter mindfulness questionnaire was constructed for the current study and it was found to be valid and reliable. It can make a practical addition to mindfulness research.

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