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Area of Study
PSYCHOLOGY

Proposed Title

DECONSTRUCTING MINDFULNESS: A DUAL-PROCESS PERSPECTIVE

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Abstract

The aim of this research is to deeper examine the relationship between state and dispositional mindfulness and quality of life (QoL) by assessing the effects of a variety of potential mediating and moderating variables. Specifically, two studies will explore (1) moderation effects of dispositional mindfulness, demographics (age, gender, level of education) and situational factors (stressors) on the relationship between state mindfulness and QoL, and (2) mediation of the relationship between state mindfulness and QoL by elements of dual processing (impulsive and reflective cognition, and working memory capacity). Data for the first and second studies will be collected using a longitudinal design with multiple assessments, administered to participants who go through a Mindfulness-Based Stress Reduction training. In the third study, a cross-sectional investigation will be conducted to investigate the association of dispositional mindfulness and working memory in participants from a community sample, that will not go through an MBSR training. Finally, a fourth study will be conducted for which the research question and design will be determined at a later moment, based on the outcome of the longitudinal studies.

We will test the following predictions: (a) dispositional mindfulness and working memory capacity (WMC) are positively associated (cross-sectional study); (b) dispositional factors such as age, gender, and level of education will moderate the association of dispositional mindfulness with WMC (cross-sectional study); (c) the association of state mindfulness and QoL over the course of MBSR training is mediated by the elements of dual processing (longitudinal study); (d) dispositional mindfulness moderates the effect of MBSR training (state mindfulness) on QoL (longitudinal study); and (e) stressors (as subjectively perceived situational factors in responses to coping with workplace stress, interpersonal conflicts, challenges in daily living, etc.) will moderate the effect of MBSR training on QoL (longitudinal study).

KEYWORDS: quality of life (QoL), state mindfulness, Mindfulness-Based Stress Reduction (MBSR) training, dispositional mindfulness, working memory capacity (WMC), impulsive dual processing, reflective dual processing, dispositional factors, stressors.

I. CONTEXTUALIZING THE RESEARCH PROBLEM

I.A. Mindfulness

A growing body of scientific literature in the recent years has been populated with studies that correlate a specific state of mind – termed as mindfulness – with numerous psychological and physiological benefits to one's wellbeing (Germer, Siegel & Fulton, 2005; Shapiro, et al., 2010; Davis & Hayes, 2011; Murphy, et al., 2012; Bergen-Cico & Cheon, 2013; Kong, Wang & Zhao, 2014; Klein, et al., 2015). Mindfulness has a potential to "reduce states of anxiety or stress by invoking a state of related alertness from which a conscious skillful response can be made" (Shapiro, Wang, & Peltason, 2015, pg. 25). The scholars generally describe the concept of mindfulness as a state of awareness in which one is connected with his or her thoughts, feelings, sensory and other internal and external experiences that are occurring at the moment, without giving any meanings, associations, or judgments to what they are experiencing at that particular moment (Kabat-Zinn, 1994).

Much of the recent research on mindfulness involves investigating practical applications of mindfulness and its benefits for psychological and physiological wellbeing, which takes form of a meditation practice (Langer, 2000; Grossman, et al., 2004; Hülsheger, et al., 2013; Berkel, et al., 2014). The pioneering program that has gained popularity over the recent years in the Western terms of trying to attain balance between demands and stressors of personal and work life is called Mindfulness-Based Stress Reduction (MBSR). Established by Jon Kabat-Zinn (1994), this program is a well-coordinated eight to ten-week long training offered to the group of individuals wanting to 'retrain' their mind from mechanical thinking and doing, to being fully engaged in the present thought, feeling or action (Grossman, et al., 2004). This process is achieved by implementing three mechanisms of mindfulness: "(a) the intention and understanding of why one is engaging in the practice of mindfulness (e.g. self-regulation, stress reduction), (b) attention to one's moment-to-moment observations and experiences without judgment or analysis, and (c) an attitude of acceptance, kindness, compassion, openness, patience, non-striving, equanimity, curiosity, and non-evaluation (as cited in Bergen-Cico & Cheon, 2013, para. 3). In this sense, being mindful does not only entail being aware of cognitive

processing of internal and external information in the present moment without judgment, but it is also an attitude that needs to be cultivated, as for instance compassion and kindness towards oneself and others.

Despite the success of the MBSR and similar practical mindfulness programs in terms of benefits to the wellbeing, sustaining implementation of its mechanisms in the daily challenges of life could be of a limited value if they are based solely on a meditation practice (Bodian, 2013). The stream of scholars believes that there is additional dimension of cognitive present-moment awareness which is displayed as a "characterological trait" (Davis & Hayes, 2011, pg. 198), and hence called the trait or dispositional mindfulness. Brown and Ryan (2003) go a step further in defining dispositional mindfulness as a "naturally existing characteristic in which individuals differ in their willingness to be aware and in ability to maintain attention to the present, ranging between heightened states of clarity to automatic, mindless, blunted thought or action" (as cited in Pidgeon & Appleby, 2014, pg. 98). In other words, dispositional mindfulness is characterized by the individual cognitive capacity to be aware of the present-moment internal and external experiences, without assigning judgments, while managing everyday life events and activities.

Although state and dispositional mindfulness make two separate dimensions of present-moment awareness without judgment, these two dimensions are on a co-existing continuum in which they influence the strength of each other. For instance, in the randomized controlled experiment by Shapiro et al. (2011), participants with relatively high levels of pre-treatment trait mindfulness displayed more empathy, as well as lower perception of stress over a period of one year than the control group of participants with low pre-treatment levels of mindfulness after exposure to an eight week MBSR training. On a similar note, an investigation into the relationship between state and dispositional mindfulness by Brown and Ryan (2003), concluded that the mindful meditation practices may eventually increase dispositional mindfulness in everyday life application, hence, giving an important role to the interrelatedness of both dimensions of mindfulness in one's psychological wellbeing. In other words, although

dispositional mindfulness is described as a naturally existing characteristic, it can still be reinforced by the manifestation of state mindfulness.

I.B. Quality of Life

The recent decades of increased globalization, technological development and consumerism have taken a toll on meeting the demands of living standard in the Western world. The conditions of long working hours, competition, pressure, workplace stress, job uncertainty and tedious routines - as some examples - have produced a "situation where the person feels overworked, underappreciated, confused about expectations and priorities, concerned about the job security, overcommitted with responsibilities, and resentful about duties that are not commensurate with pay" (as cited in Bickford, 2005, pg. 14). Since work plays a big role in the lives of most individuals, these conditions of physical and psychological state of being often trespass into the matters of personal life, creating an inability to balance demands of work and personal life, and hence negatively affecting overall quality of life (Sinha, 2012). It is inevitable that individuals who are faced with a pressure to meet the challenges of work and private domains of their lives may experience psychological distress such as feeling emotionally and mentally overwhelmed and exhausted to carry on with daily tasks at work and home. It is clear that such stressful conditions take a heavy toll on wellbeing and healthy functioning on both personal and professional levels.

As mentioned before, mindfulness has positive effects on one's well-being, which extends to the benefits of applying mindfulness and mindful practices in the work setting. In an extensive narrative review, Sutcliffe and colleagues (2016) examined the effects of mindfulness benefits in terms of the degree to which organization's members are individually mindful and/or through collectively organized mindfulness programs. Their meta-analysis illustrates that both state and trait mindfulness are positively associated with worker's well-being, reduced emotional exhaustion, increased job satisfaction, better work/life balance, and in turn - more effective organizational task performance, and creation of the organizational environment that encourages positive social practices.

Furthermore, metaregression results from two hundred seventy independent studies focusing on trait mindfulness in the workplace suggest there is a positive correlation between trait mindfulness and work-related outcomes, including reduced work-related stress and burnout, increased work effort, job performance and satisfaction, as well as improved organizational and interpersonal relations (Mesmer-Magnus, et al., 2017). In addition, the results of these positive effects of trait mindfulness in the organizational settings support the promotion of mindfulness-based training programs (state mindfulness) in the workplace.

In another study related to mindfulness and work performance, Glomb and colleagues (2011), examined different factors such as a) self-regulation of thoughts, emotions, and behaviors, b) social relationships, c) resilience and, d) task improvement, and then linked them to the performance and overall employee well-being. The results showed that the application of mindfulness and mindfulness-based practice programs (such as MBSR) had positive effects on being focused on task, building pleasant social relationships with colleagues, having more awareness of emotional and behavioral expression, and more energy and enthusiasm to face the work challenges. However, there are "only a handful of studies that have investigated linkages between work-family variables and mindfulness" (as cited in Reb & Atkins, 2015, pg. 218). One specific study on the topic of work-family balance and mindfulness was done by Allen and Kiburz (2012) in which they showed that working parents who experience greater trait mindfulness display more positive feelings, thoughts and behaviors in their daily roles both at work and home, compared to those with low trait mindfulness. In addition, it was found that mindfulness positively related to sleep quality and vitality, which in turn related to greater work-family balance.

From the business and organizational aspect, the concept of work-family balance has been defined through: (a) objective indicators that refer to the access and utilization of economic resources (generally measured though gross domestic product –GDP), and (b) subjective indicators that are perceived as individual assessment of an individual's satisfaction in domains of health, work, family, and work-family balance (Wallace, et al., 2007, Drobnič, et al., 2010).

Many researchers nowadays agree that both indicators are necessary in achieving what Allardt (1993) initially defined as the QoL – having material resources, loving social relationships with others, and being integrated into society as an individual with needs and feelings who is balancing different domains in life.

Although the concept of work-family balance is often used in the literature, there is still an absence of conceptual and empirical clarity about defining its meaning. For instance, some researchers define this concept as the absence of work-family conflict – specifically, the interconnection between the role pressures from work and family domains that create the form of interrole conflict (Greenhaus & Beutell, 1985; Grzywacz & Carlson, 2007). While there is a general agreement of the key concept - conflict - that plays a role in the relationship between work and family domains, other researchers believe that once the demands of work and family domains are met through individual's self-appraisal of effectiveness and satisfaction, an individual may experience less conflict, and consequently achieve (subjectively perceived) satisfactory work-family balance (Frone, 2003; Voydanoff, 2005; Valcour, 2007).

Thus far, the most widely used psychometrical measure in assessing work-family balance is one developed and validated by Netemeyer and colleagues (1996). This particular psychometrical measure consists of two short self-report scales that are based on the concept of interrole conflict that emerges in two distinct but related forms: work-family conflict (WFC), and family-work conflict (FWC). In other words, pressure from the role responsibilities at work are believed to be in conflict with pressures from the role responsibilities at home – while in turn, affecting an individual's QoL as a whole. Specifically, the study showed strong correlations of WFC and FWC with job dissatisfaction, burnout and turnover, psychological distress, general QoL and marital dissatisfaction.

I.C. Elements of dual processing

Since both state and dispositional mindfulness are dimensions of cognitive present-moment awareness, to elucidate the working mechanism of their beneficial effects on QoL, it seems

important to address the elements of cognitive processing and how they play a role in the present-moment awareness and QoL. For this purpose, a dual-process perspective is pursued (Frankish & Evans, 2009), that encompassed recent insights from cognitive theory.

A number of cognitive psychologists have contributed to the legacy of cognitive examination of dual processing since the 1970s, which thus far has produced a field of knowledge defining two-system cognitive processes as System 1 and System 2 - one being unconscious, automatic, fast, associative, impulsive, and requiring a low cognitive processing capacity versus the other as conscious, controlled, slow, rule-based, reflective, and requiring a high cognitive capacity. Taking dual-process theory a step further, Strack and Deutsch (2004) describe a 2-system model of cognitive processing, the *reflective-impulsive model*, based on which judgments and decision making may explain behavioral responses and their modulation by contextual factors. "The reflective system generates behavioral decisions that are based on knowledge about facts and values, whereas the impulsive system elicits behaviors through associative links and motivational orientations" (ibid., pg. 220). Furthermore, in case of emotional responses or stereotype tendencies, initial cognitive processing is generally triggered automatically (by the impulsive system) based on the existing cognitive associations, which then "modulate[s] how the automatic reaction is expressed in thoughts, feelings and behaviors" (Devine, 1989; Macrea, Milne & Bodenhausen, 1994, as cited in Levesque, Copeland, & Sutcliffe, 2008, pg. 218). In that sense, it is believed that the two systems operate in parallel. The impulsive system will be activated first, but in some situations depending on intensity, a stimulus might immediately activate the reflective system, which then makes impulsive and reflective system operate in a parallel episode (Strack & Deutsch, 2004).

Besides the elements of impulsive and reflective systems, an important role in relation to the functioning of dual cognitive processing is, thus, played by working memory capacity (WMC). Baddeley and Hitch (1974) proposed a model that defines the WMC as "a brain system that provides temporary storage and manipulation of the information necessary for such complex cognitive tasks as language comprehension, learning and reasoning" (Baddeley, 1992, pg. 556).

Specifically, this working model expands on previous ideas of a unitary short-term memory system by bringing into play three important components for performance of cognitive tasks, namely: a) central executive that has a supervisory role in which it controls attention, distributes and combines information to and from its two short-term storage centers, the slave systems – b) phonological loop, in charge of speech and language tasks, and c) visuospatial sketch pad, in charge of visual and spatial processing. In a later study, Baddeley (2000) upgraded the model with the fourth component of WMC - the episodic buffer, which serves as a temporary storage that links the components of WMC and long-term memory into episodic cognitive representations.

In the reflective-impulsive model of Strack and Deutsch, WMC plays a crucial role in constraining the effects of reflective cognizing. Under conditions of high-level WMC, reflective cognitions are capable of overriding or interrupting the omnipresent, ongoing impulsive cognizing, but this possibility is decreased when WMC is low. To substantiate this claim, Hofmann and colleagues (2009) investigated how different levels of WM capacity affected the functioning of impulsive and reflective cognitive processing in three separate domains: a) sexuality, b) eating behavior, and c) anger expression. Their results showed that the behavioral outcomes, dispositions, and attitudes of the participants with a low level of WM capacity tended to be dominated by the automatic (impulsive) cognitive processing – hence, displaying inability to override quick, irrational behavioral responses (for instance, not being able to refrain from eating sweets). Contrary to this, participants with a high level of WM capacity displayed attitudes and goals that were dominated by the reflective cognitive processing (for instance, the goal to control one's anger guided their behavioral outcome).

II. THEORETICAL FRAMEWORK

The following section introduces research background on specific relationships between QoL, state and dispositional mindfulness, and elements of dual-processing, and then how each of these mediating and moderating relationships apply specifically to this research. It is important to note that this research conducts studies in an order of their design, specifically - Study 1 as

the cross-sectional study, followed by Study 2 and Study 3 as the longitudinal studies. However, for the purpose of explaining specific relationships between all the variables, the order of presenting the studies in this chapter will alter.

II.A. Moderating effects of dispositional mindfulness, demographic and situational factors on QoL

In chapter I.C., we presented a brief research background of the elements of dual processing, where we specifically mentioned the study done by Hofmann and colleagues (2009). Based on the findings of the study, they developed a framework in which behavioral outcome is manifested though the interplay of reflective and impulsive precursors, and situational or dispositional boundaries that act as moderators of those precursors.

We have adapted that framework to our research in order to examine moderating effects on variables in this study and to investigate the interplay between different processes and moderators.

As shown in Figure 1, QoL may be predicted by reflective processing (during application of state mindfulness training) or by impulsive processing (during application of state mindfulness training) depending on stable characteristics such as: age, gender, educational level (presented in Study 1), and WMC, dispositional mindfulness and stressors (presented in Study 3). Stressors are characterized as subjectively perceived situational factors in responses to coping with – to name a few – workplace stress, interpersonal conflicts, and other challenges in daily living. The importance of investigating these relationships lies in understanding how dual cognitive processing affects behavioral outcomes, dispositions and attitudes, which play a significant role in QoL.

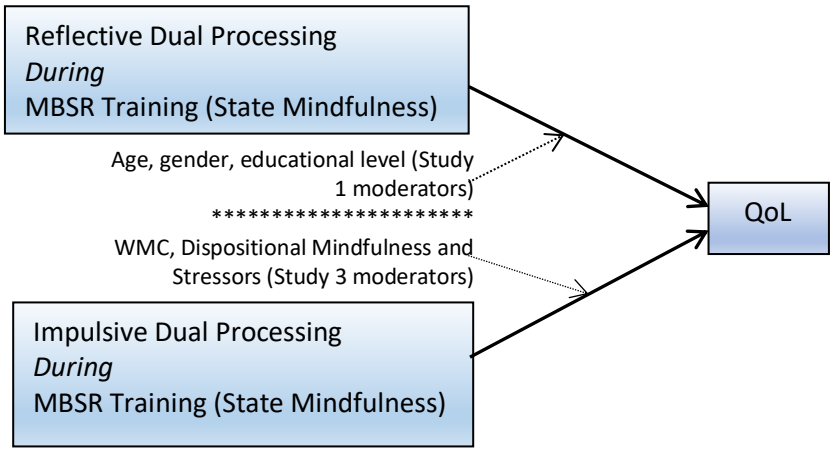

Figure 1: A suggested framework for the prediction of QoL (adaptation from the original model of Hofmann, et al., 2009)

Because mindfulness interventions are aimed to increase the person's state level of mindful awareness, it can be envisaged that the individual's starting level of dispositional mindfulness will co-determine the outcome of the intervention. Therefore, in Study 3, dispositional mindfulness will be investigated as a moderator in the association between MBSR training (state mindfulness) and QoL. Similar to the role of dispositional mindfulness as a moderator, starting level of perceived stress can also be envisaged to co-determine the outcome of the intervention, in terms of reducing anxiety or stress (Shapiro, Wang, & Peltason, 2015).

As represented in Figure 2 (line B), in this study dispositional mindfulness is investigated as a moderator in the association between MBSR training (as the state mindfulness) as an independent variable or predictor, and QoL as the dependent variable or outcome, by altering the strength of their interaction (line A). Further, the relationship between the MBSR training and QoL will be moderated by the level of contributing stress factors, specifically how these external stressors are experienced by the individuals.

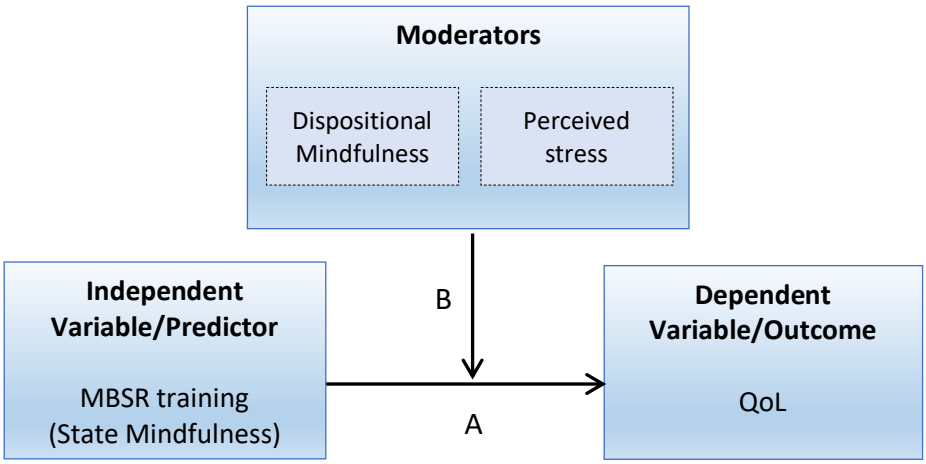

Figure 2: Moderation of the association of state mindfulness and QoL by dispositional mindfulness and perceived stress (own source)

II.B. Mediating role of elements of dual processing in the effect of mindfulness on QoL

In relation to mindfulness, the complexity of the elements of dual cognitive processing may play a crucial role in the emotional and behavioral outcomes, and – hence – in the overall functioning and psychological well-being. This can be seen in the study of Stone (2012) which illustrates the interrelatedness between mindfulness and dual cognitive processing, and how this relationship influences behavioral and emotional responses, specifically in terms of managing one's finances. The results showed that nurturing mindfulness may decrease feelings of consumer wants that are associated with the impulsive system. On a similar note, while investigating the effects of dispositional mindfulness on work safety behaviors in nuclear power plants, Zhang and Wu (2013) used dual-process theory to confirm the positive relationship between mindfulness and impulsive and reflective cognitive processing. The researchers observed that mindfulness improved the application of safety behaviors by the employees in the sense that it reduced the harm of automatic, impulsive thinking, while it promoted being more aware of workers' experiences and intuitions (reflective cognitive processing) (Zhang & Wu, 2013). Both studies shed a significant light on the relationship between mindfulness and dual-process theory, especially the latter study that was conducted in the workplace.

Further to the effect of impulsive and reflective cognitions, the role of WMC is also significant in managing cognitive demands. Cognitive functioning may be negatively affected in some situations under intense pressure of demands in the sense of disengaged, mindless or mind-wandering processing of tasks in a work or non-work domain (Glomb, et al., 2011). Since lacking attention or having the inability to focus on a task is closely related to the operations of WMC, implementing mindfulness – thus improving conscious and deliberate attention – in some studies (for instance, Lutz, et al., 2008, as cited in van Vugt & Jha, 2011) has shown a positive relationship between mindfulness and WMC. In this particular study by van Vugt and Jha (2011), participants were exposed to a mindfulness training (MT) with attention to breathing skills and practices of compassion and loving kindness, in order to investigate how MT plays a role in delayed-recognition task performance before and after a month-long exposure to the program. The results confirmed the initial hypothesis that implementing mindfulness has a positive effect on the WMC in terms of increased memory performance.

The presently proposed study focuses on investigating whether the relationship between increased state mindfulness, as a result of MBSR training, and enhanced QoL is mediated by elements of dual processing – namely, impulsive and reflective processing, and WMC.

Figure 3 represents the mediation model of this study. The model hypothesizes that the manipulation of state mindfulness by the MBSR training (independent variable or predictor) causes changes in the operations of the elements of cognitive processing (line A); in turn, the elements of dual cognitive processing help to account for the outcomes related to QoL – a dependent variable (line B). In addition, there may be a direct causal effect of MBSR training on QoL (line C). In case of full mediation, the relationship C will be absent, and the effects of MBSR training on QOL will run fully through the effect of the training on the elements of dual processing (relationship A), and the effects of the elements of dual processing and QOL (relationship B). In case of partial mediation, the explained variance in QoL will be divided between the mediated pathway (A plus B) and the direct pathway (line C). It is important to investigate these relationships to show that mindfulness as it improves attention

and focus, it affects the functioning of the elements of dual processing which in turn affect QoL.

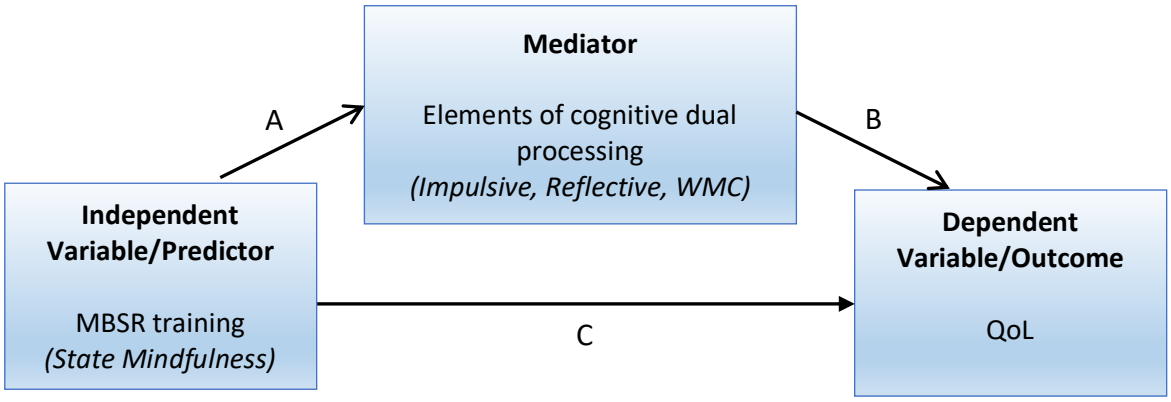

Figure 3: Mediation of the association of state mindfulness and QoL by elements of dual processing - applied to the first group of participants (own source)

III. PURPOSE AND OBJECTIVES OF THE STUDY

So far, we have noted various examples of studies that have focused on physical and psychological benefits of dispositional and state mindfulness, including in the context of organizations and work-family balance. Furthermore, the research literature suggests an important effect of the elements of dual processing, particularly the role of impulsive and reflective processing, and WMC, on the cognitive, behavioral and emotional functioning, measuring the positive impacts on individual well-being. While those existing studies provide a helpful foundation of knowledge of these concepts and how they related to each other, our literature review observes that they lack the following:

1. they do not sufficiently examine the cause-effect relationship between dispositional and state mindfulness and QoL because of their cross-sectional study design; and
2. they do not sufficiently examine the cause-effect relationship between mindfulness, elements of dual processing, and QoL, specifically in the context of work-family balance.

Hence, our study would cover both shortages by, first, moving forward from the starting point of existing studies by adopting a cross-sectional investigation which will administer dispositional

mindfulness instruments and working memory tests to participants that will not go through an MBSR training (Study 1). Furthermore, a longitudinal study with multiple assessments will be conducted in order to investigate mediating effects of the elements of dual processing on the association of state mindfulness and QoL, before and after MBSR training (Study 2). Finally, another longitudinal study will be conducted to investigate moderating effects on the association of MBSR training and QoL (Study 3), depending on the outcome of the first longitudinal study.

More specifically, the following objectives will help to achieve that goal:

1. to determine the association between dispositional mindfulness on WMC (this particular objective will be the focus of Study 1)
2. to explore the mediating effect of impulsive and reflective dual processing, and WMC on the effect of MBSR training (state mindfulness) on QoL (this particular objective will be focus of study 2); and
3. to determine the moderating effect of dispositional mindfulness and stressors on the relationship between state mindfulness and QoL, during MBSR training (this particular objective will be the focus of Study 3).

As to the expected scientific output of this research project, the currently planned studies will result in a minimum of three research papers that will be submitted for publication in international peer-reviewed scientific journals. After completion of these three studies at least one more study will be conducted building upon and integrating their results, which will result in the fourth article (see page 27). The abovementioned publications will be compiled into a PhD dissertation that will also contain an introductory chapter and a concluding chapter.

IV. DESIGN AND METHODOLOGY

As mentioned, this research consists of three studies that will assess the effects of a variety of potential mediating and moderating variables in order to investigate their effect on the relationship between the state and dispositional mindfulness and QoL. This will be done by the

conducting a study with a longitudinal design with multiple assessments of participants who undergo a MBSR training. The forth study will be a compilation of three studies building upon and integrating their results (see page 27).

MBSR training

The training consists of eight weekly sessions of 2.5 hours per session taught by certified trainers. Between sessions six and seven, there is a one-day retreat which consists of a six-hour mindfulness practice spent in silence and self-reflection. The participants who undergo the training also have homework to practice mindfulness at home (45 minutes daily) by using the CDs and a workbook which may be provided during the training. The sessions start with the body scan, which is a formal technique that entails quietly laying on one's back and focusing attention on various parts of the body, starting with toes and moving up slowly to the top of the head. Other two formal techniques include mindfulness meditation, some simple yoga postures, and the breathing exercises. The participants are also exposed to learning about MBSR principles such as non-judging, non-striving, acceptance, letting go, patience, trust, and non-centering. They are asked to incorporate these principles with mindfulness practice into their daily routines.

IV. A. Study 1: The association of dispositional mindfulness variability and WMC

Purpose/Aim

Study 1 will investigate the direct relationship of dispositional mindfulness and WMC. Furthermore, it will also measure the role of moderating variables (dispositional factors: age, gender, level of education) on the relationship between dispositional mindfulness and the elements of dual processing (specifically WMC).

Participants and power analysis

In Study 1, participants will consist of individuals recruited by undergraduate students at the Open University Heerlen – The Netherlands – in the course of their enrollment in the bachelor

thesis program. They will be chosen from their personal circles of acquaintances. Inclusion criteria consisted of age >18, written and spoken Dutch language comprehension, belonging to a family unit (committed romantic relationship, either with or without children living with the participant), and being employed. Since the study is testing the participant's level of dispositional mindfulness, the exclusion criteria include ongoing formal meditation practice or prior enrollment in an MBSR program. Using G* power calculation, no less than 111 participants are needed to obtain 95% power to detect a regression effect slope = 0.09 (based on a correlation coefficient Rho = .30, and residual SD = .30). Recruitment will continue until the required sample size is reached.

Instruments and assessment plan

Instruments:

- Mindful Attention Awareness Scale (MAAS) and Freiburg Mindfulness Inventory (FMI14) – to measure dispositional mindfulness
- Tower of Hanoi (ToH), and the automated version of the Operational Span Task (AOSPAN) – to measure WMC

Investigating the direct relationship of dispositional mindfulness and WMC will be measured by distributing four instruments to the participants. For the level of **dispositional mindfulness**, participants will be given the MAAS by Brown and Ryan, (2003). This is a 15-item single-dimension scale of trait mindfulness ranging from 1 (almost always) to 6 (almost never) on a Likert-type scale, for example "I rush through activities without being really attentive to them", and "I find it difficult to stay focused on what's happening in the present". The MAAS has demonstrated high test-retest reliability, discriminant and convergent validity, known-groups validity, and criterion validity. Correlational, quasi-experimental, and experimental studies have shown that the trait MAAS taps a unique quality of consciousness that is related to, and predictive of, a variety of emotion regulation, behavior regulation, interpersonal, and well-being phenomena (Brown, n.d.). This measure takes 10 minutes or less to complete.

In addition, the short version of the FMI will be used to assess what the MAAS is lacking, in particular "some other aspects of mindfulness, like the non-judgmental, accepting attitude, dis-

identification, insightful understanding, or an attitude of having no specific goals" (Walach, et al., 2006, pg. 1545). This is a 14-item scale of dispositional mindfulness used in a generalized context of characterizing moment to moment experiences in thoughts and feelings, ranging from 1 (rarely) to 4 (almost always). For example, "When I notice an absence of mind, I gently return to the experience of the here and now", and "I watch my feelings without getting lost in them". Further, it was demonstrated that the instrument is a valid and reliable measurement of mindfulness showing medium to low range of correlation (alpha=.86). FMI14 will generally take less than 10 minutes to complete.

Finally, to measure the level of **WMC**, two instruments will be used: ToH, and AOSPAN. Each instrument measures different aspects of WMC; AOSPAN is considered to assess all components of WMC, whereas the ToH more specifically indexes the visuospatial sketchpad. Hence, using both instruments will give us a two-fold depth of WMC.

More specifically, ToH consists of problem-solving tasks requiring "the transformation of a start state of disks on three vertical pegs into a goal configuration of these objects in the fewest number of moves" (Welsh & Huizinga, 2001, pg. 168). The 22-item revised version of TOH (TOH-R) was developed by Welsh and Huizinga (2001) to increase the reliability and validity of the initial TOH, and was found to have satisfactory internal consistency reliability with Cronbach's α =.77.

AOSPAN examines the level of WMC of the participants by asking them to solve math problems while simultaneously attempting to remember a set of words for later, lasting approximately 1 hour. In the study by Unsworth and colleagues (2005), the results showed that "AOSPAN is a reliable and valid indicator of WMC that can be applied to a wide array of research domains, [with] both good internal consistency (α =.78) and rest-retest reliability (.83)" (pg. 498). According to wide research studies (Black, Semple, Pokhrel, & Grenard, 2011; Jha, Stanely, Kiyonaga, Wong, & Gelfand, 2010; Stanley, Schalddach, Kiyonaga, & Jha, 2011, Vines, 2014), OSPAN tasks have been previously used in recent research concerning mindfulness and WMC.

Individual responses will be analyzed in relation to the aspects of mindfulness represented in the MAAS and the FMI.

Research questions and hypotheses

RESEARCH QUESTION 1.1: *What are the bidirectional relationships between the WMC and dispositional mindfulness?*

HYPOTHESIS 1.1: Dispositional mindfulness and working memory capacity are positively associated.

RESEARCH QUESTION 1.2: *What factors moderate the association between dispositional mindfulness and WMC?*

HYPOTHESIS 1.2: Factors such as age, gender and/or level of education will moderate the association of WMC and dispositional mindfulness (see Figure 4). Moderation by gender is exploratively investigated.

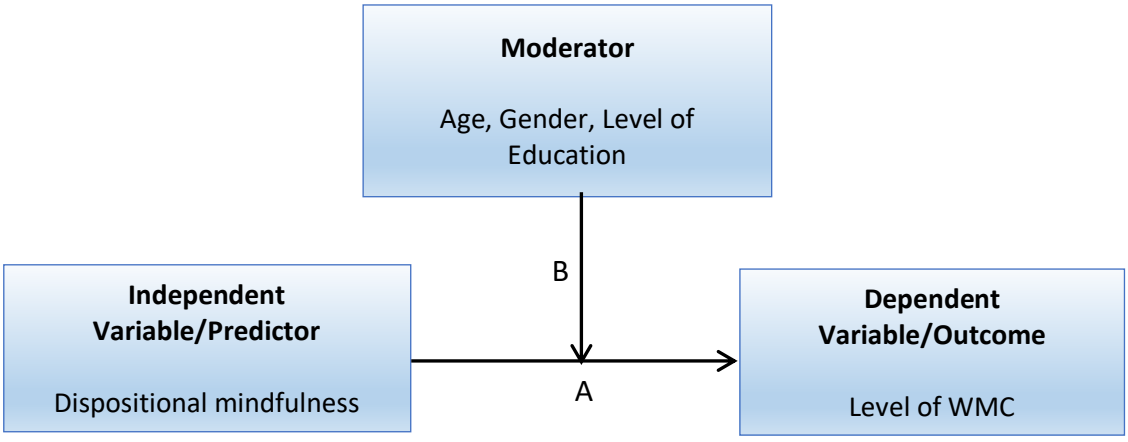

Figure 4: Moderation effects of age, gender and level of education on the association between dispositional mindfulness and the level of WMC (own source)

Procedure

A group of bachelor level students has created an online questionnaire platform that includes the following instruments: MAAS, FMI14, ToH, and AOSPAN. They will explain the study to the participants, and that they may cease participation at any time. Prior to filling out the online questionnaire, the students will obtain an informed consent from the participants. The students will then ask the participants to read online directions carefully and fill out each assessment to the best of their ability. Finally, the participants will be asked if they have any questions, and students will thank the participants.

IV.B. Study 2: Mediation of the association of state mindfulness and QoL by elements of dual processing

Purpose/Aim

Study 2 focuses on investigating whether the relationship between increased state mindfulness, as a result of MBSR training, and enhanced QoL is mediated by elements of dual processing – namely, impulsive and reflective processing, and WMC.

Participants and power analysis

In Study 2, the participants for the MBSR training will be recruited by networking with the mindfulness trainers who are members of the Dutch society for mindfulness (www.verenigingvoormindfulness.nl). The participants will be randomly selected from across the field of different professions and places of employment. Hence, there will be no need to gain cooperation of the specific organizations to recruit the participants.

To ensure that the standard practice will be investigated only among psychologically healthy participants, participants who engage in the MBSR training will be given the Depression, Anxiety and Stress Scale - 21 Items (DASS-21), which is a set of three self-report scales designed to measure the emotional states of depression, anxiety and stress. During the scoring, the DASS-21 scores are multiplied by two, which enables comparisons between the three scales and also giving the percentile rankings. High scores on DASS indicate high level of distress, while low levels

would indicate low levels of distress (see Table 1). It is important to note that DASS alone should not be an indicator of presence or absence of depression or anxiety, and should be accompanied by comprehensive clinical interviews; however, for the purpose of this study, the results of DASS will be used only to screen the MBSR trainees for eligibility for study participation.

Depression, Anxiety and Stress Scale - 21 Items (DASS-21) Scoring			
	Depression	**Anxiety**	**Stress**
Normal	0-9	0-7	0-14
Mild	10-13	8-9	15-18
Moderate	14-20	10-14	19-25
Severe	21-27	15-19	26-33
Extremely Severe	28+	20+	34+

Table 1: Scoring of the Depression, Anxiety and Stress Scale - 21 items (DASS-21), source Lovibond, S.H., & Lovibond, P. F. (1995)

Hence, inclusion criteria for study 2 are: age >18, written and spoken Dutch and English language comprehension, belonging to a family unit (committed romantic relationship, either with or without children living with the participant), and being employed. Exclusion criteria are: scoring on DASS-21 for depression >9, anxiety >7, and stress >14. Exclusion criteria also include ongoing formal meditation practice or prior enrollment in an MBSR program. Using the Percentile bootstrap procedure as described by Efron and Tibshirani (1993), no less than 162 participants are needed to obtain 95% power for the participation in the MBSR training. Recruitment will continue until the required sample size is reached.

Instruments and assessment plan

Instruments:

- Toronto Mindfulness Scale (TMS) – to measure state mindfulness (multiple measurements during MBSR training)
- Implicit Association Task (IAT) – to measure impulsive elements of dual processing
- Utrecht Work Engagement Scale (UWES-9), and Family Satisfaction Scale (FSS-10) – to measure reflective elements of dual processing
- AOSPAN – to measure WMC
- Family-Work Conflict (WFC) and Work-Family Conflict (FWC) Scales – to measure QoL

Increased **state mindfulness** will be induced by introducing the MBSR training sessions in duration of 8 weeks by the certified mindfulness trainers. Changes in the state mindfulness will be measured by administering the TMS to the participants. Lau and colleagues (2006) have developed this presently unique state mindfulness assessment tool to specifically target mindful experiences where attention is maintained by intentional self-regulation of thoughts, feelings and sensations in a subjective nonjudgmental experience occurring during or following mindfulness-based treatments (i.e. MBSR training). It is a 13-item scale measuring state mindfulness by two subscales: (1) Curiosity, which is characterized as person's ability to reflect on his or her immediate experiences of a mindfulness moment), and (2) Decentering – a unique aspect of TMS, not found in other mindfulness measurements, characterized as subjective awareness of the mindful experience with a certain distance from feelings and thoughts. It uses a 5 point Likert-type scale from not at all (0) to very much (4). For example, "I experienced myself as separate from my changing thoughts and feelings", and "I was curious about my reactions to things". According to Park and colleagues (2013), "Cronbach's α are reported to range from 0.86 to 0.91 for Curiosity and 0.85 to 0.87 for Decentering (as cited in Klein, et al., 2015, pg. 137). It takes approximately 15 minutes to complete the TMS.

The **impulsive elements of dual processing** will be operationalized by assessing implicit cognitions using the Implicit Association Task (IAT), as well online. The IAT is a useful instrument in measuring automatic actions, judgments or attitudes without necessitating one's awareness of this cognitive process. The IAT procedure consists of measuring associations of two target concepts with two attribute concepts. For example, in a study by Greenwald and colleagues (1998), "the two concepts appear in a 2-choice task (e.g., flower vs. insect names), and the attribute in a 2nd task (e.g., pleasant vs. unpleasant words for an evaluation attribute)" (pg. 1464). The procedure starts with introduction of the concept-targets, then follows: Block 1 (attribute pairs such as positive versus negative are trained), Block 2 (attribute and target pairs are trained in the first combination, such as flower = positive, insect = negative), Block 3 (attribute and target pairs are again presented in the first combination, Block 4 (attribute and target pairs are trained in the second combination, such as insect + positive, flower + negative), and finally Block 3 (attribute and target pairs are again presented in the second combination).

The participants have to strike a keyboard key, one on the left-hand side of the keyboard (e.g., z), and one on the right-hand side (e.g. m).

While the IAT has been widely used in social research, its validity and reliability is still questionable, measuring moderate validity and a low reliability particularly for the first-time test users (Rezaei, 2011). However, it is useful for its high flexibility in assessing implicit associations between very different construct categories. In this study, the IAT will assess the association between a target-concept pair – family versus work - and an attribute pair - pleasant versus unpleasant words (i.e. pleasant words: happy, love, peace, health, freedom, etc.; and i.e. unpleasant words: sad, war, disaster, evil, sickness, etc.). The first step is introduction of target-concept discrimination, specifically distinguishing concepts that are recognizable as family (i.e. home, parents, children, family, marriage, wedding, relatives) from ones recognizable as career (i.e. management, professional, corporation, salary, office, business). The second step is introduction of the attribute dimension represented by the task of categorizing words as pleasant versus unpleasant. The third step will present the stimuli for target and attribute discriminations on alternate trials, which will follow in reverse in the next (fourth) step. Finally – the fifth step – will combine the attribute discrimination with this reversed target discrimination.

The **reflective elements of dual processing** will be measured by assessing attitudes of work and family by using two scales: Utrecht Work Engagement Scale (UWES-9) for work assessment, and Family Satisfaction Scale (FSS-10) for family assessment. UWES-9 is a short version of the UWES-17 scale, a seven-point Likert scale with 0 indicating never and 7 indicating always, and assessing the work engagement in terms of a) vigor ("refers to high levels of energy and resilience, the willingness to invest effort, not being easily fatigued, and persistence in the face of difficulties"), b) dedication ("refers to a sense of significance from one's work, feeling enthusiastic and proud about one's job, and feeling inspired and challenged by it"), and c) absorption ("refers to being totally and happily immersed in one's work and having difficulties detaching oneself from it so that time passes quickly and one forgets everything else that is around") (Schaufeli & Bakker, 2004, pg. 295). According to the study done by Seppala and

colleagues (2008), UWES-9 had a good internal consistency displaying "Cronbach's alpha varying from 0.81 to 0.85 for vigor, from 0.83 to 0.87 for dedication, and from 0.75 to 0.83 for absorption" (pg.467).

To assess the attitudes towards the family life in observation of reflective cognitive processing, FSS-10 will be applied. The 10 item FSS is based on the original version of FSS that consists of 14 items, in the format of a 5-point Likert scale-scoring (1 = dissatisfied, 2 = some- what dissatisfied, 3 = generally satisfied, 4 = very satisfied, 5 = extremely satisfied). For example, "how satisfied are you with the degree of closeness between the family members" or, "how satisfied are you with the way problems are discussed?" The scale was created by Olson and Wilson (1982) to assess individual satisfaction with the various levels of family functioning, including communication, closeness, and flexibility. Based on the study of 2,456 family members (participants included university students, married couples and adolescents), the reported Cronbach's Alpha for the 10-item scale has α of .92 and test re-test of .85 (as cited in Olson, n.d.). It will take 5-10 minutes to complete.

WMC will be assessed by performing an AOSPAN task. As already explained in detail in chapter IV.B. Study 1 (see pg. 16-17), AOSPAN examines the level of WMC of the participants by asking them to solve math problems while simultaneously attempting to remember a set of letters for later, lasting approximately 20 minutes.

QoL will be assessed as individually perceived degree of accomplishment of the role responsibilities at work, and the role responsibilities at home (family), which demonstrates work-family balance. Netemeyer's scales of work-family conflict (WFC) and family-work conflict (FWC) will be used. Initially, both scales consisted of 110 items in total, however after some modification, correlated measurement error, and elimination of redundant wording, Netemeyer and colleagues (1996) generated a 5-item WFC scale, and a 5-item scale to be best providing optimal operationalization of this instrument (as cited in Boyar, et al., 2006). These scales have been exposed to rigorous scale development, showing a strong internal consistency across three samples (1. high school teachers, 2. small business owners, and 3. real estate

agents). Specifically, coefficient alpha levels in the three samples ranged from 0.83 to 0.89 for both scales. Each scale consists of five statements (ten in total) using a 7-point Likert scale, with 1 meaning strongly disagree and 7 meaning strongly agree. For instance, "The amount of time my job takes up makes it difficult to fulfill family responsibilities" (WFC), and "I have to put off doing things at work because of demands on my time at home" (FWC). It takes approximately 5-10 minutes to complete both scales.

Research question and hypothesis

RESEARCH QUESTION 2: *Do elements of cognitive dual processing mediate the association between MBSR training (state mindfulness) and QoL?*

HYPOTHESIS 2: The association of state mindfulness and QoL is mediated by the elements of cognitive dual processing.

Procedure

The following steps will be taken:

1. Contact the MBSR trainers who are in the database for the Dutch society for mindfulness (www.verenigingvoormindfulness.nl). Explain the study to them and ask if they would be willing to assist with selecting participants that are currently enrolled in their MBSR programs. The request for assistance from the trainers would be on a volunteer basis.
2. Explain the study purpose and objectives to the randomly selected participants who volunteer to participate in the study. These participants will be starting or already enrolled in MBSR program. Have them sign the informed consent.
3. Distribute DASS-21 questionnaire to the randomly selected participants to assure that those who will be in the study are screened to be psychologically healthy individuals.
4. During their MBSR program, have the randomly selected participants fill out the questionnaires package online: MAAS[1], TMS, IAT, AOSPAN, FSS-10, UWES-9, PSS[2],

[1] Study 2 and Study 3 both use data of a single sample from the MBSR training. Although MAAS is not an assessment instrument for Study, it will be included in the questionnaire package to be used for Study 3.
[2] Study 2 and Study 3 both use data of a single sample from the MBSR training Perceived Stress Scale (PSS) is an assessment instrument to be used for Study 3 data analysis.

WFC/FWC. Ask the participants to please read online instructions carefully and to fill out each assessment to the best of their ability. Mention that they may cease participation at any time.

5. Thank the participants for their participation in the study, and give contact information if they wish to read the study once it is completed.
6. Anticipated duration: MBSR training 8 weeks, additional 2-3 weeks after the MBSR training to allow extra time for the participants to complete the questionnaire package.

IV.C. Study 3: Moderation of association of state mindfulness and QoL by dispositional mindfulness and stressors

Purpose/Aim

In this study, dispositional mindfulness and perceived stressors will be investigated as moderators in the association between state mindfulness (MBSR training) and QoL.

Participants and power analysis

Participants are identical to those in Study 2 (re-analysis of data from the same sample); hence recruited from the mindfulness database. Participants who engage in the MBSR training will be given the Depression, Anxiety and Stress Scale - 21 Items (DASS-21). Inclusion criteria consists of age >18, written and spoken Dutch and English language comprehension, belonging to a family unit (committed romantic relationship, either with or without children living with the participant), being employed, and scoring on DASS-21 for depression >9, anxiety >7, and stress >14 (see table 5). Exclusion criteria include ongoing formal meditation practice or prior enrollment in an MBSR program. Using the Percentile bootstrap procedure as described by Efron and Tibshirani (1993), no less than 162 participants are needed to obtain 95% power for the participation in the MBSR training. Recruitment will continue until the required sample size is reached.

Instruments and assessment plan

Instruments:

- MAAS – to measure dispositional mindfulness

- TMS – to measure state mindfulness (multiple measurements during MBSR training)
- Perceived Stress Scale (PSS) – to measure perceived stressors
- Family-Work Conflict (WFC) and Work-Family Conflict (FWC) Scales – to measure QoL

Stressors are characterized as subjectively perceived situational factors in responses to coping with – to name a few – workplace stress, interpersonal conflicts, and other challenges in daily living. Perceived stress will be measured using the Perceived Stress Scale (PSS) developed by Cohen and colleagues (1983). The PSS is a 10-item self-report scale measuring a degree to which situations of one's life are appraised as stressful, in the past month of their life. For example, "in the last month, how often have you been upset because of something that happened unexpectedly?" It runs as a highly reliable instrument, with Cronbach's α between .84-.86 for the PSS. In addition, test-retest reliability for the PSS was .85. In terms of validity, correlation of the PSS to other measures of similar symptoms ranges between .52-.76 (Cohen et al., 1983). It takes on average 5-10 minutes to complete.

QoL will be assessed as individually perceived degree of accomplishment of the role responsibilities at work, and the role responsibilities at home (family), which demonstrates work-family balance. Netemeyer's scales of work-family conflict (WFC) and family-work conflict (FWC) will be used. Dispositional mindfulness will be assessed by administering the MAAS. State mindfulness will be measured by administering TMS.

Research question and hypotheses

RESEARCH QUESTION 3: *What contextual factors moderate the association between MBSR mindfulness training (state mindfulness) and QoL?*

HYPOTHESIS 3.1: Dispositional mindfulness will moderate the effect of MBSR training (state mindfulness) on QoL. More specifically, participants with higher level of dispositional mindfulness will have more (positive) benefits of MBSR training for QoL. State mindfulness will be measured to check the appropriateness of the MBSR training that is aimed to enhance state mindfulness.

HYPOTHESIS 3.2: Stressors will moderate the effect of MBSR training on QoL. Participants with the lower level of stressors will have more (positive) benefits of MBSR for QoL.

Procedure

Since the sample size for Study 3 is the same as for Study 2, the procedure will be completed in Study 2 (see pg. 23-24).

IV.D. Study 4: Compilation of three studies

A fourth study will be conducted for which the research question and design will be determined at a later moment, based on the outcome of the longitudinal studies. The following model represents the gathering of three studies for the purpose of integrating the results (Figure 5).

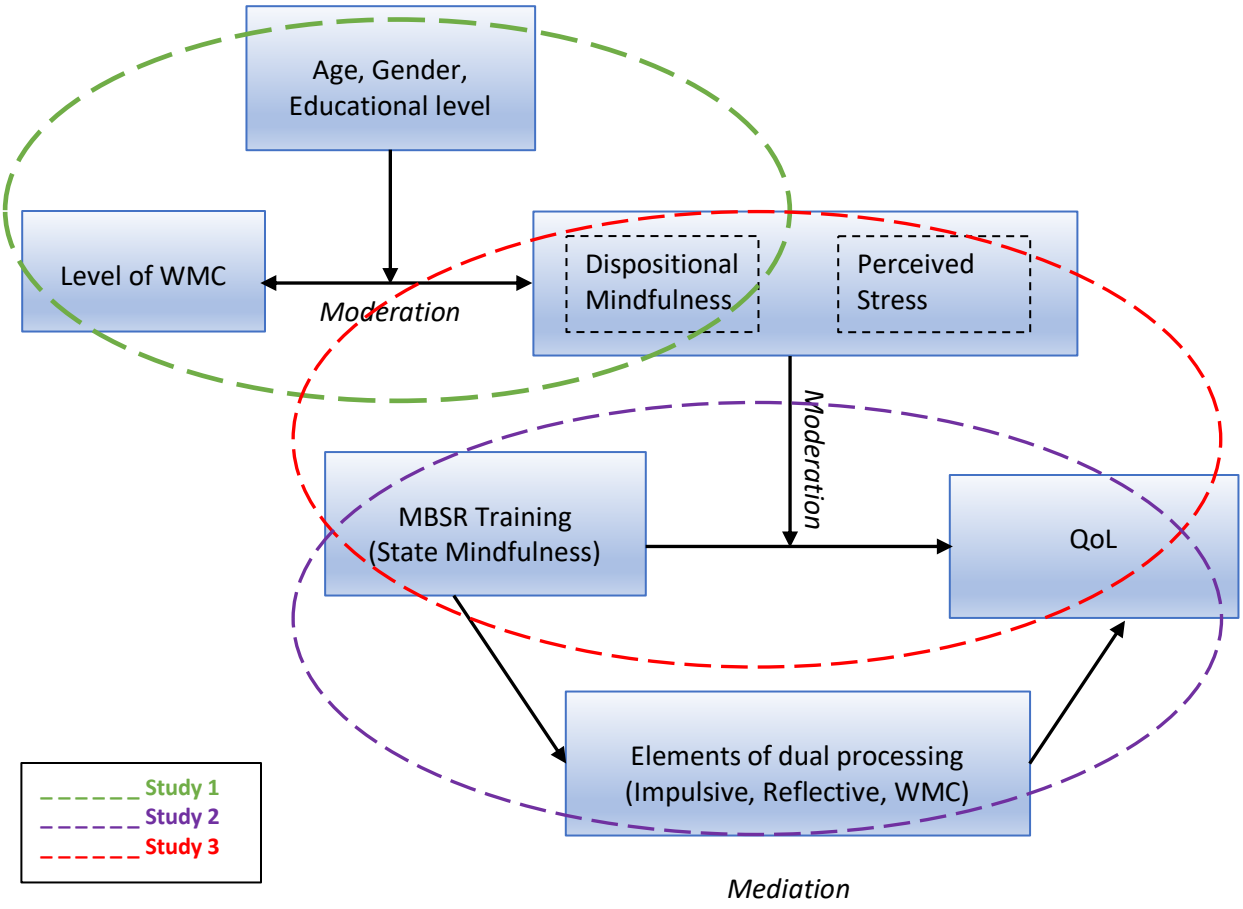

Figure 5: Integration of the results from three studies

V. ETHICAL ASPECTS OF THE STUDIES

Study 1 will be conducted in the Open University in Heerlen. The request was submitted and approved by the Ethical Review Board (cETO) of the Open University.

Study 2 and Study 3 will be conducted in assigned training places for mindfulness, based on networking from the Dutch Society for Mindfulness. In Study 2 and Study 3 there is a direct involvement of the participants as part of MBSR training. It will be emphasized that the results will be anonymous and confidential and only the final report of the study will be shared with the organization, if requested.

Participation in the studies requires, beyond standard practice in the MBSR training, (only) the completion of an online questionnaire package at two occasions (baseline and post training), and completing the online questionnaire package plus two online computer tasks (AOSPAN, IAT) at mid training. It is not invasive, and involves a moderate effort of the participants. Additionally, prior to engaging in the MBSR training, the participants will complete the DASS-21 to ensure that the sample consists of psychologically healthy individuals. Ethical clearance will be evaluated by the cETO. If required, further evaluation will be asked from an METC.

VI. RESEARCH TEAM

During undergraduate and graduate studies, Maja Majdanac was engaged in conducting various psychological studies, but she also gained a hands-on experience in counseling as a psychosocial rehabilitation specialist to children and teens. Her Master degree research was published in November 2010, under title “Privileged in Inequality: Barriers in achieving the right to education of the Roma children in Croatia” at the University of xxx. She has just received her diploma in Counseling and Coaching in July 2017.

Dr. Ellin Simon (co-promotor) is experienced in performing studies on the efficacy of interventions in community samples and has expertise on mindfulness, dual-processing, and quality of life.

Prof. dr. Jacques van Lankveld (promotor) has extensive expertise in conducting randomized controlled trials of efficacy for various types in interventions in different groups of mental health care patients. He also has expertise in research based on dual-process models, using both explicit and implicit cognitions and WMC measurement.

VII. COST AND BENEFITS OF THE STUDIES

In terms of financial cost, Study 1 will not require any financial compensation. As described already in design and methodology section, a group of undergraduate students working on their bachelor degree thesis will recruit the participants, who will then fill out the questionnaires online. Study 2 and Study 3 will require a mindfulness training (MBSR) intervention. A written request (via e-mail) will be sent to the network for Dutch Society of Mindfulness to inquire for a volunteered participation of MBSR trainers. Once we have a selection of MBSR trainers willing to provide space for intervention, a group of Master level students will be assigned to specific MBSR trainers who will then present the studies to the ongoing MBSR participants. The students will follow up with each MBSR group to guide them through the completion of the online questionnaires. Therefore, no major financial compensation is envisaged, other than some minor expenses as explained in Table 2.

Description of anticipated expenses	**Estimated costs (per year)**
Ink and paper for printing, drafting, taking notes	$500; covered from personal finances
Computer software (i.e. SPSS, excel, word)	$1000; University provided SPSS; personal assets already in possession
Books, notebooks, other reading material	$500; covered from personal finances
Journal subscriptions	$200; covered from personal finances
Internet and mobile data usage	$1200 for Internet/mobile; covered from personal finances
Traveling expenses (if needed)	Personal finances (if needed)
Seminars, workshops, lectures	$1000; covered from personal finances and ad honorem
Tutoring	$500; covered from personal savings
Editing, proof reading	$200; covered from personal savings
MBSR trainings and materials provided during training	Volunteered for the study (participants will not incur additional fees for the training or

	materials to participate in the study, besides what might have already been charged by the trainer for the course. This research will not influence the cost of the training sessions.)
MBSR trainers	Volunteered
Questionnaires	Volunteered (link will be provided online from the Open Universiteit platform, participants will access the link from their own Internet access)
Any other expenses as they occur	Covered from personal finances

Table 2: A break-down of anticipated expenses and costs

In terms of gains, the research, from the start of developing this proposal, has been an invaluable growing experience on both, personal and professional levels. Being given the opportunity to have a theoretical and experimental perspective about mindfulness and dual process cognition together with highly knowledgeable professors of Open Universiteit will complement the practical side of my understanding of mindfulness. This will help to substantiate the benefits of mindfulness practice when relating with clients in my profession, as well as with other professionals in the field. Moreover, the knowledge gained will be shared with those who are interested in the benefits of mindfulness in terms of cognition, and QoL. Finally, it will give an added value to the personal dealings when raising a family that has to adapt to relocations that bring changes in living standards, different cultures, traditions, and ways of living.

VIII. PROVISIONAL TIME TABLE

Research Activities	Year 1 Months 1-6	Year 1 Months 7-12	Year 2 Months 1-6	Year 2 Months 7-12	Year 3 Months 1-6	Year 3 Months 7-12
Submission for ethical approval						
Contacting the Dutch mindfulness database www.verenigingvoormindfulness.nl						
Working on introduction and organizing information for the literature review						
Setting up the MBSR trainings with MBSR trainers						
Study 1- preparation and collection of data in the university						
Study 2 and 3 - preparation and collection of data of questionnaires, prior to MBSR training						
Study 2 and 3 - MBSR training by the trainer						
Study 1 - Interpretation and analysis of data						
Study 2 and 3 - Interpretation and analysis of data						
Integrating the results of Study 1, 2 and 3 (Paper 4)						
Discussion, recommendations						
Sending the final draft						

IX. REFERENCES

Allardt, E. (1993). Having, loving, being: An alternative to the Swedish model of welfare research. In M. C. Nussbaum & A. Sen (Eds.), *The quality of life* (pp. 88-94). Oford: Clarendon.

Allen, T. D., & Kiburz, K. M. (2012). Trait mindfulness and work-family balance among working parents: The mediating effects of vitality and sleep quality. *Journal of Vocational Behavior, 80*, 372-379. Retrieved from https://www.researchgate.net/publication/232241331_Trait_mindfulness_and_work-family_balance_among_working_parents_The_mediating_effects_of_vitality_and_sleep_quality

Baddeley, A. (1992). Working memory. *Science, New Series, 255*(5044), 556-559. Retrieved from https://www.tamu.edu/faculty/takashi/psyc689/Irrelevant%20speech/Baddeley%20(working%20memory)%201992.pdf

Baddeley, A. (2000). The episodic buffer: a new component of working memory? Trends in Cognitive Sciences, 4(11), 417-423. Retrieved from http://old.nbu.bg/cogs/events/2002/materials/Markus/ep_bufer.pdf

Baddeley, A., & Wilson, B. A. (2002). Prose recall and amnesia: implication for the structure of working memory. *Neuropsychologia*, *40*, 1737-1743. Retrieved from http://www.researchgate.net/publication/11377158_Prose_recall_and_amnesia_Implications_for_the_structure_of_working_memory

Bergen-Cico, D., & Cheon, S. (2013). The mediating effects of mindfulness and self-compassion on trait anxiety. *Mindfulness.* DOI 10.1007/s12671-013-0205-y. Retrieved from http://self-compassion.org/wp-content/uploads/publications/Bergen-Cico.pdf

Black, D. S. (2011). A brief definition of mindfulness. *Mindfulness Research Guide*. Accessed from http://www.mindfulexperience.org

Bodian, S. (2013). Mindfulness: State or trait? Retrieved from http://www.mentalworkout.com/blog/2013/12/05/mindfulness-state-or-trait/

Boyar, S. L., Carson, C. M., Mosley Jr., D.C., Maertz Jr, C.P., Pearson, A. W. (2006). Assessment of the validity of Netemeyer et al.'s (1996) WFC and FWC scales. International Journal of Conflict Management, 17(1), pp.34-44. https://doi.org/10.1108/10444060610734163

Brown, K. W. (n.d.). *Mindful Attention Awareness Scale (MAAS), trait version.* Virginia Commonwealth University, Monroe Campus. Retrieved from http://www.kirkwarrenbrown.vcu.edu/wp-content/scales/MAAS%20trait%20research-ready%20+%20intro.pdf

Brown, K. W., & Ryan, R. M. (2003). The benefits of being present: Mindfulness and its role in psychological well-being. *Journal of Personality and Social Psychology, 84*(4), 822-848. Retrieved from http://selfdeterminationtheory.org/SDT/documents/2003_BrownRyan.pdf

Carlson, D. S., Grzywacz, J. G., & Zivnuska, S. (2009). Is work-family balance more than conflict and enrichment? *Hum Relat., 62*(10), 1459. Retrieved from https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2818261/

Cohen, S., Kamarck, T., & Mermelstein, R. (1983). A global measure of perceived stress. *Journal of Health and Social Behavior, 24*(4), 385-396. Retrieved from http://www.psy.cmu.edu/~scohen/globalmeas83.pdf

Davis, D. M., & Hayes, J. A. (2011). What are the benefits of mindfulness? A practice review of psychotherapy-related research. *Psychotherapy, 48*(2), 198-208. Retrieved from https://www.apa.org/pubs/journals/features/pst-48-2-198.pdf

Drobnič, S., Beham, B., Prağ, P. (2010). Good job? Good life? Working conditions and quality of life in Europe. *Social Indicators Research, 99*, 205-225. doi: 10.1007/s11205-010-9586-7. Retrieved from https://www.rug.nl/research/portal/files/6752690/2010-DrobnicS-GoodJob.pdf

Efron, B., & Tibshirani, R. J. (1993). An introduction. In *An introduction to the bootstrap* (pp. 1-9). Boca Raton, FL: Chapman & Hill/CRC. Retrieved from http://www.hms.harvard.edu/bss/neuro/bornlab/nb204/statistics/bootstrap.pdf

Frankish, K., & Evans, J. St. B. T. (2009). The duality of mind: An historical

perspective. In J. Evans and K. Frankish (Eds.), *In Two Minds: Dual Processes and Beyond,* Oxford University Press, 2009, pp.1-29. Retrieved from http://www.open.ac.uk/Arts/philos/The_duality_of_mind_preprint.pdf

Frone, M. R. (2003). Work-family balance. In Quck, J. C. and Tetrick L. E. (Eds.), *Handbook of occupational health psychology.* Washington, D.C.: American Psychological Association, 2003, pp. 13-162. Retrieved from https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2818261/

Germer, C. K., Siegel, R. D., & Fulton, P. R. (Eds.). (2005). *Mindfulness and Psychotherapy*. New York, NY: The Guilford Press.

Glomb, T. M., Duffy, M. K., Bono, J. E., & Yang, T. (2011). Mindfulness at work. *Research in Personnel and Human Resources Management, 30*, 115-157. Retrieved from http://www.congresenstudiecentrum.nl/media/253156/1.-mindfulnessatwork_glombduffyetal2012.pdf

Greenhaus, J. H., & Beutell, N. J. (1985). Sources of conflict between work and family roles. *Academy Management Review (10),* 76-88. Retrieved from https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2818261/

Greenwald, A. G., McGhee, D. E., & Schwartz, J. L. K. (1998). Measuring individual differences in implicit cognition: The Implicit association test. *Journal of Personality and Social Psychology, 74*(6), 1464-1480. Retrived from http://faculty.washington.edu/agg/pdf/Gwald_McGh_Schw_JPSP_1998.OCR.pdf

Grossman, P., Niemann, L., Schmidt, S., & Walach, H. (2003). Mindfulness-based stress reduction and health benefits: A meta-analysis. *Journal of* Psychosomatic Research 57, 35-43. Retrieved from http://www.openground.com.au/articles/MBSR_MA_JPR_2004.pdf

Grzywacz, J. G., & Carlson, D. S. (2007). Conceptualizing work-family balance: Implications for practice and research. *Advances in Developing Human Resources (9),* 455-471. Retrieved from https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2818261/

Hofmann, W., Friese, M., & Strack, F. (2009). Impulse and self-control from a dual-systems perspective. *Perspectives on Psychological Science, 4*(2), 162-176.

Hülsheger, U. R., Alberts, H. J., Feinholdt, A., & Lang, J. W. (2012). Benefits of mindfulness at work: The role of mindfulness in emotion regulation, emotional exhaustion, and job satisfaction. *Journal of Applied Psychology, 98*(2), 310-325.

James, L. R., & Brett, J. M. (1984). Mediators, moderators, and tests for mediation. *Journal of Applied Psychology, 69*(2), 307-321. Retrieved from http://www.unt.edu/rss/class/mike/Articles/JamesBrett1984.pdf

Kabat-Zinn, J. (1994). *Wherever You Go, There You Are: Mindfulness Meditation in Everyday Life.* New York, NY: Hyperion.

Klein, R., Dubois, S., Gibbons, C., Ozen, L. J., Marshall, S., Cullen, N., Bedard, M. (2015). The Toronto and Philadelphia Mindfulness Scales: Associations with satisfaction with life and health-related symptoms. *International Journal of Psychology and Psychological Therapy, 15*(1), 133-142.

Kong, F., Wang, X., & Zhao, J. (2014). Dispositional mindfulness and life satisfaction: The role of core self-evaluations. *Personality and Individual Differences, 56*, 165-169. Retrieved from http://www.researchgate.net/publication/260908962_Dispositional_mindfulness_and_life_satisfaction_The_role_of_core_self-evaluations

Langer, E. J. (2014). *Mindfulness 25th Anniversary Edition*. Boston, MA: Da Capo Press.

Lau, M. A., Bishop, S. R., Segal, Z. V., Buis, T., Anderson, N. D., Carlson, L., Shapiro, S., & Carmody, J. (2006). The Toronto mindfulness scale: Development and validation. *Journal of Clinical Psychology, 62*(12), 1445-1467. Retrived from http://www.personal.kent.edu/~dfresco/mindfulness/Lau_et_al_TMS.pdf

Levesque, C., Copeland, K. J., & Sutcliffe, R. A. (2008). Conscious and nonconscious processes: Implications for self-determination theory. *Canadian Psychology, 49*(3), 218-224. Retrieved from http://selfdeterminationtheory.org/SDT/documents/2008_LevesueCopelandSutcliffe_CanPsych.pdf

Mesmer-Magnus, J., Manapragada, A., Viswesvaran, C., & Allen, J. W. (2017). Trait mindfulness

at work: A meta-analysis of the personal and professional correlates of train mindfulness. *Human Performance, 30*(2-3), 79-98. DOI 10.1080/08959285.2017.1307842. Retrieved from http://www.tandfonline.com/doi/full/10.1080/08959285.2017.1307842

Murphy, M. J., Mermelstein, L. C., Edwards K. M., & Gidycz C. A. (2012). The benefits of dispositional mindfulness in physical health: A longitudinal study of female college students. *Journal of American College Health, 60(5*), 341-348. Retrieved from http://greatergood.berkeley.edu/images/uploads/Murphy-Dispositional_Mindfulness_on_Physical_Health.pdf

Netermeyer, R. J., Boles, J. S., & McMurrian, R. (1996). Development and validation of Work-Family Conflict and Family-Work Conflict scales. *Journal of Applied Psychology, 81*(4), 400-410. Retrieved from https://pdfs.semanticscholar.org/0bc1/2fa3305c632f931169a30034824ed730144c.pdf

Olson, D. H. (n.d.). *Family satisfaction scale (FSS).* Minneapolis, MN: Life Innovations, Inc. Retrieved from http://www.laviecounseling.org/vfh/vfhasm/FACESIV.FamilySatisfactionScale.pdf

Pidgeon, A. M., & Appleby, L. (2014). Investigation the role of dispositional mindfulness as a protective factor for body image dissatisfaction among women. *Current Research in Psychology, 5*(2), 96-103. Retrieved from http://www.researchgate.net/profile/Aileen_Pidgeon/publication/267752697_INVESTIGATING_THE_ROLE_OF_DISPOSITIONAL_MINDFULNESS_AS_A_PROTECTIVE_FACTOR_FOR_BODY_IMAGE_DISSATISFACTION_AMONG_WOMEN/links/5459b46f0cf2cf516483d978.pdf

Preacher, K. J., Rucker, D. D., & Hayes, A. F. (2007). Addressing moderated mediation hypotheses: Theory, methods and prescription. *Multivariate Behavioral Research, 42*(1), 185-227. Retrieved from http://www.researchgate.net/publictopics.PublicPostFileLoader.html?id=54d731cccf57d7e46d8b45f9&key=b3284663-4b28-4201-b1c6-0ac42241bb2f

Reb, J., & Atkins, P. W. B. (Eds.). (2015). *Mindfulness in organizations: Foundation, research*

and application. Cambridge, UK: Cambridge University Press.

Rezaei, A. R. (2011). Validity and reliability of the IAT: Measuring gender and ethnic stereotypes. Computers in Human Behavior, 27(5), 1937–1941. Retrieved from http://www.sciencedirect.com/science/article/pii/S074756321100094X

Schaufeli, W. B., & Bakker, A. B. (2004). Job demands, job resources, and their relationship with burnout and engagement: a multi-sample study. *Journal of Organizational Behavior, 25,* 293–315. Retrieved from http://www.wilmarschaufeli.nl/publications/Schaufeli/209.pdf

Seppala, P., Mauno, S., Feldt, T., Hakanen, J., Kinnunen, U., Tolvanen, E, & Schaufeli, W. (2009). The Construct Validity of the Utrecht Work Engagement Scale: Multisample and Longitudinal Evidence. *Journal of Happiness Studies, 10*, 459–481. Retrieved from https://www.researchgate.net/publication/226963410

Shapiro, S. L., Brown, K. W., Thoresen, C., & Plante, T. G. (2011). The moderation of mindfulness-based stress reduction effects by trait mindfulness: Results from a randomized controlled trial. *Journal of Clinical Psychology, 67*(3), 267-277. Retrieved from http://self-compassion.org/wp-content/uploads/publications/Shapiro_et_al_JCP_2011.pdf

Shapiro, S. L., Wang, M. C., & Peltason, E. H. (2015). What is mindfulness, and why should organizations care about it? In Reb, J. & Atkins, P. W. B. (Eds.), *Mindfulness in organizations: Foundation, research, and applications.* Cambridge, UK: Cambridge University Press.

Sinha, C. (2012). Factors affecting quality of work life: Empirical evidence from Indian organizations. *Australian Journal of Business and Management Research, 1*(11), 31-40. Retrieved from http://ajbmr.com/articlepdf/AJBMR_20_07_4.pdf

Skevington, S. M., Lofty, M., & O'Connell, K. A. (2003). The World Health Organization's WHOQOL-BREF quality of life assessment: Psychometric properties and the results of the international field trial. *Quality of Life Research, 13*, 299-310. Retrieved from http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.463.2578&rep=rep1&type=pdf

Strack, F., & Deutsch, R. (2004). Reflective and impulsive determinants of social behavior. *Personality and Social Psychology Review, 8*(3), 220-247. Retrieved from https://www.uni-wuerzburg.de/fileadmin/uniwue/_temp_/02strack_und_deutsch.pdf

Stone, D. (2012). Cultivating financial mindfulness: A dual-process theory. In D. J. Lamdin (ed.), Consumer Knowledge and Financial Decisions: Lifespan *Perspectives*, International Series on Consumer Science, DOI 10.1007/978-1-4164-0475-0_2, @Springer Science+Business Media, LLC 2012.

Sutcliffe, K. M., Vogus, T. J., & Dane, E. (2016). Mindfulness in organizations: A cross-level review. *The Annual Review of Organizational Psychology and Organizational Behavior, 3*, 55-81. DOI 10.1146/annurev-orgpsych-041015-062531. Retrieved from https://www.researchgate.net/publication/293009713_Mindfulness_in_Organizations_A_Cross-Level_Review

van Vugt, M. K., & Jha, A. P. (2011). Investigating the impact of mindfulness meditation training on working memory: A mathematical modeling approach. Cognitive, Affective, & behavioral Neuroscience, 10 (2). doi: 10.3758/s13415-011-0048-8. Retrieved from http://www.ai.rug.nl/~mkvanvugt/vanVJha11.pdf

Zhang, J., & Wu, C. (2013). The influence of dispositional mindfulness on safety behaviors: A dual process perspective. *Accident Analysis and Prevention, 70*, 24-32.

Unsowrth, N., Heitz, R. P., Schrock, J. C., & Engle, R. W. (2005). An automated version of the operation span task. *Behavior Research Methods, 37*(3), 498-505. Retrieved from http://link.springer.com/article/10.3758%2FBF03192720#/page-1

Valcour, M. (2007). Work-based resources as moderators of the relationship between hours and satisfaction with work-family balance. *Journal of Applied Psychology, 6,* 1512-1523. Retrieved from https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2818261/

Vines, L. M. (2014). *Dispositional mindfulness and working memory in the context of acute stress*. (Doctoral thesis, University of Louisville, Louisville, Kentucky, USA). Retrieved from http://ir.library.louisville.edu/etd/1493/

Voydanoff, P. (2005). Toward a conceptualization of perceived work-family fit and balance. A demands and resources approach. *Journal of Marriage and Family, 67*, 822-836. Retrieved from https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2818261/

Walach, H., Buchheld, N., Buttenmuller, V., Kleinknecht, N., & Schmidt, S. (2006). Measuring mindfulness—the Freiburg Mindfulness Inventory (FMI). *Personality and Individual Differences, 40*(8), 1543-1555. Retrieved from https://www.researchgate.net/publication/222528212_Measuring_Mindfulness-The_Freiburg_Mindfulness_Inventory_FMI

Wallace, C., Pichler, F., & Hayes, B. C. (2007). *First European quality of life survey: Quality of work and life satisfaction.* European Foundation for the improvement of Living and Working Conditions. Published in Luxembourg: Office for Official Publications of the European Communities, 2007. Retrieved from http://www.lu.lv/materiali/biblioteka/es/pilnieteksti/nodarbinatiba/First%20European%20Quality%20of%20Life%20Survey%20-%20Quality%20of%20work%20and%20life%20satisfaction.pdf

Way, B. M., Creswell, J. D., Eisenberger, N. L., & Lieberman, M. D. (2010). Dispositional mindfulness and depressive symptomatology: Correlations with limbic and self-referential neural activity during rest. *Emotion, 10*, 12-24. Doi: 10.1037/a0018312

Welsh, M. C., & Huizinga, M. (2001). The development and preliminary validation of the Tower of Hanoi-Revised. *Assessment, 8*(2), 167-176. Retrieved from https://www.researchgate.net/publication/11911444_The_Development_and_Preliminary_Validation_of_the_Tower_of_Hanoi-Revised

World Health Organization, Geneva (1996). *WHOQOL-BREF: Introduction, administration, scoring and generic version of the assessment.* Field trial version. Programme on Mental Health. Retrieved from http://www.who.int/mental_health/media/en/76.pdf