

“How can Entrepreneurs lead Themselves?”

**Empirically-Based Development and Testing of Interventions for
Healthy and Effective Self-Regulation in the Context of
Entrepreneurship to Trigger Positive Individual and Collective Effects**

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ABSTRACT

Various studies identify self-regulation as being particularly challenging for entrepreneurs, who often have to lead themselves independently. If they use dysfunctional self-regulatory processes, they are exposed and rather unprotected to the high working demands of new venture creation. Not only does it imply negative consequences on the individual level, but also on the collective level, as entrepreneurs are recognized as engines for economic growth and ecologically sustainable development. Despite their need for guidance on healthy and effective self-regulation, relevant research is sparse and fragmented.

This dissertation is intended to address the need for guidance on healthy and effective self-regulation for entrepreneurs. In the first two studies, a causal model of healthy and effective self-regulation that can be applied in the context of entrepreneurship has been empirically developed and tested. The work is based on a meta-theory of human motivation, called self-determination theory (SDT), which focuses on self-regulation. Structural equation modeling has been applied based on cross-sectional quantitative data ($N=1,024$). The results indicate that mindfulness, clarity about personal values, intrinsic values orientation, and autonomy of goals are potential psychological constructs to foster, in case healthy and effective self-regulation of individuals is intended. In the second study, a causal model as a knowledge base has been applied to empirically develop and test two interventions that foster the four psychological constructs in aspiring and practicing entrepreneurs. Both interventions are conducted as non-controlled field experiments with post-measurement in the form of two iterations ($N_1 = 55$; $N_2 = 13$) of the design science research approach. The first intervention is a self-assessment and action plan, called the Values Finder. The second intervention is a four-hour workshop block on personality development called Core Values Workshop. It is empirically validated that both interventions can be described as functional, efficient, and usable in the scope of the ISO evaluation standard 9126. Thus, they can be used as cutting-edge interventions to leverage entrepreneurs' self-regulation, triggering positive individual and collective effects.

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1. INTRODUCTION

1. INTRODUCTION

The first chapter addresses the questions of **why** the research was conducted (Research Motivation), **what** specific research problems were tackled (Problem Statements and Research Goals), and **how** they were tackled (Research Methodology). Furthermore, an overview of how the overall work is structured (Research Structure) complements the section.

1.1. Research Motivation

In a personal conversation, Prof. Dr. Orestis Terzidis (personal conversation, 20 January 2020) once attempted to quote the Greek philosopher Odysee Elytis by saying:

“Freedom requires the strength to bear it.”

Albeit we later noticed that the original quote did not mention “freedom” rather “peace” (Elytis, 2004, p. 125), we would like to share these words as an opening thought. They represent a core problem we consistently see and tackle through our work with entrepreneurs. Entrepreneurs are enterprising individuals who discover and/or create market opportunities through creative destruction (see chapter 2.1.). Thus, they are seen as facilitators of economic growth (see chapter 2.2.) and engines for the development of an ecologically and socially sustainable economy (see chapter 2.3.). However, as big as the potential of entrepreneurs for the planet may be, entrepreneurs face a personal challenge that may be particularly demanding for individuals in the context of business creation. As the nature of entrepreneurial activities is highly self-directed, **entrepreneurs often have to lead themselves** and are rarely led by others. For this reason, research in the scope of motivation and self-regulation indicates that more than any other type of individuals in the business context, entrepreneurs are challenged to develop and use processes of self-regulation that are effective and healthy. Possible approaches include discovering and pursuing personal values or creating a business mission and vision based on them. If entrepreneurs use dysfunctional self-regulatory processes, they are exposed and

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unprotected to the high working demands of new venture creation, leading to psychological stress and entrepreneurial burnout (see chapter 2.4.).

Although research studies emphasize the **need for guidance for entrepreneurs on healthy and effective self-regulation**, research in this area is sparse. The existing research on self-regulation in entrepreneurship is rather fragmented than integrated (see chapter 2.5). Therefore, one dives into the compound research field of motivational psychology and presents in detail how the embedding of self-regulation is perceived while providing a more integrated view on self-regulation in general (see chapter 2.6). Building on that integrated view, the focus has been on one motivational theory that is particularly relevant in entrepreneurship given its strong empirical base and emphasis on self-regulation. It is a modern and prominent integrated theory of human motivation, called self-determination theory (SDT). **SDT has been introduced as a frame to develop an integrated model of healthy and effective self-regulation that can be applied in the context of entrepreneurship** (see chapter 2.7). Developing and applying an empirically based, integrated model of healthy and effective self-regulation in the context of entrepreneurship yields the potential to guide the entrepreneurs through their highly self-directed journey. **Based on such an integrated model, interventions could be empirically developed and tested** to foster healthy and effective self-regulation in entrepreneurs. Such interventions would not only contribute to the individual health and efficacy of the entrepreneurs but also to economic growth and to socially and ecologically sustainable development.

1.2. Problem Statements and Research Goals

Diving into self-determination theory (SDT), the body of research is identified that adds to an integrated view on healthy and effective self-regulation and could be applied in the context of entrepreneurship. Although a study by Ryan et al. (2008), as well as a study by Schultz & Ryan (2015), provide a substantial overview of constructs and causations that are related to healthy and effective self-regulation, an empirically

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tested integrated model of healthy and effective self-regulation in the scope of SDT has not been developed yet.

This gap leads to **research goal 1**:

Develop and test an empirical, yet open, causal model for healthy and effective self-regulation in the scope of SDT

Based on the developed causal model, it is decided to attempt to fill the research gap of missing guidance for entrepreneurs in the context of healthy and effective self-regulation, which leads to **research goal 2**:

Develop and test interventions to foster healthy and effective self-regulation in the context of entrepreneurship

1.3. Research Methodology

The following methods are used to tackle **research goal 1**:

To develop and test a causal model of healthy and effective self-regulation in the scope of SDT, **structural equation modeling** is used. The **eight steps** that are proposed by Weiber & Mühlhaus (2014) for causal models based on structural equation modeling (see Figure 1) are applied.

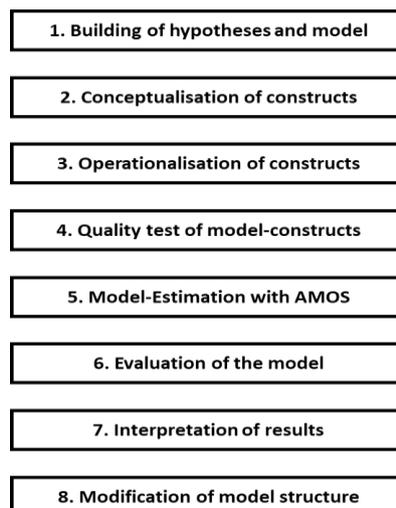


Figure 1: General process of structural equation model by Weiber & Mühlhaus (2014, p. 86)

In the **first step**, the hypothesized causal model based on theoretical as well as empirical studies from the context of SDT is developed (see chapter 3.4). In the **second**

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step, each construct is conceptualized (chapter 3.4). The **third step** operationalizes each construct of the causal model of healthy and effective self-regulation (see chapter 3.5.3) with validated quantitative measurement instruments. As a **fourth step**, Weiber & Mühlhaus (2014) proposes to test for the validity and reliability of each construct's measurement instrument. As instruments that were already tested for their validity and reliability in previous researches are used, the instrument's validity and reliability in this study is not tested. In the **fifth step**, the data is prepared for using SEM. Therefore, data is controlled for true outliers (see chapter 3.5.2) and all constructs are tested for normal distribution (chapter 3.6.1). In the **sixth step**, the model by using the Maximum Likelihood Estimator (MLE) is estimated and tested for global model fit using CFI (Confirmatory Fit Index) and RMSEA (Root Mean Square Error of Approximation) (see chapter 3.6.2.1). The **seventh step** evaluates and adopts the model based on modification indices to achieve a better global model fit (see chapter 3.6.2.1). In the **eighth step**, the model for local model fit is tested (see chapter 3.6.2.2), and final adjustments are made based on the p-values of the regression coefficients to reach sufficient global and local model fit. As a result, this provides the **global fit**, the **direct effects** (regression coefficients), as well as **indirect** and **total effects** for the final model of healthy and effective self-regulation as suggested by Weiber & Mühlhaus (2014). Beyond that, the **correlations** between all variables that have been hypothesized to be causally related has been identified.

The following methods are used to tackle **research goal 2**:

To develop and test interventions for healthy and effective self-regulation in the context of entrepreneurship, Design Science Research is used, in specific, the frame of **Design Science Research Methodology** (DSRM) by Peffers, Tuunanen, Rothenberger, & Chatterjee (2007). Therefore, the six steps that they propose are conducted (see Figure 2).

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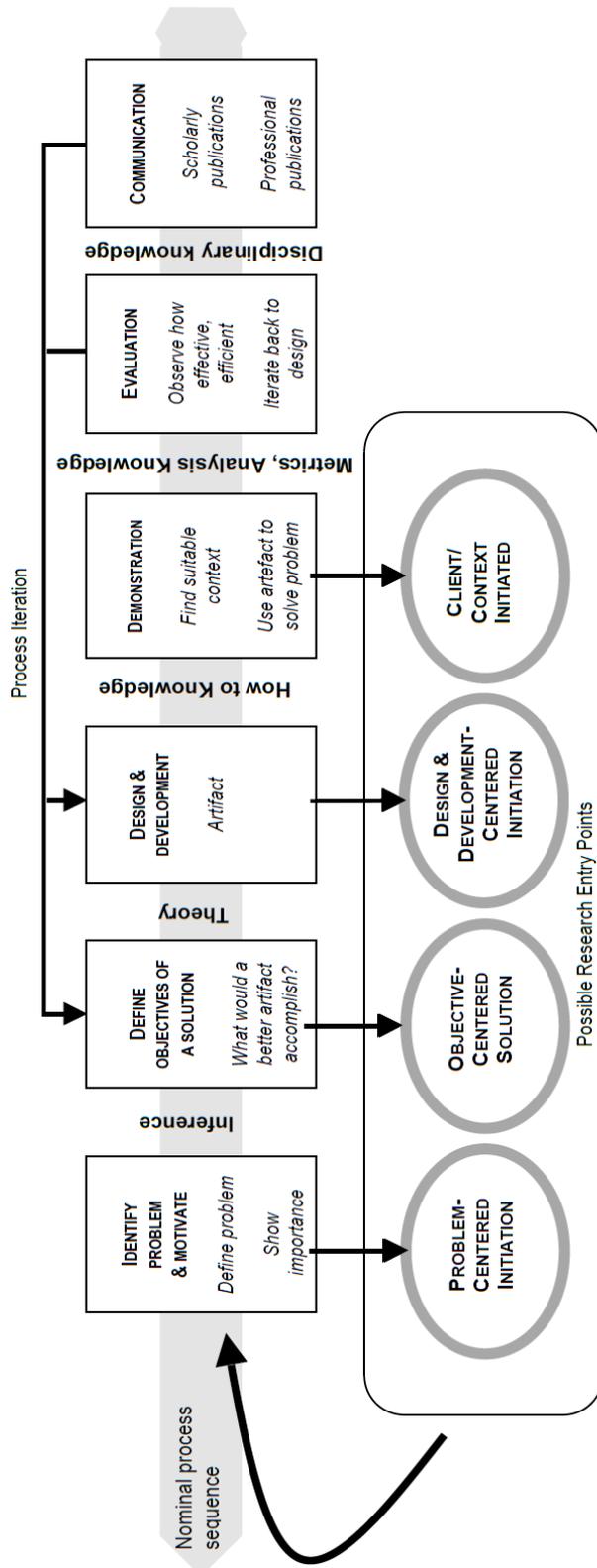


Figure 2: Design Science Research Methodology (DSRM) Process Model (Peffers et al., 2007, p. 44)

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In the **first step**, the problem and motivation based on the results of the first empirical study are identified (see chapter 4.2). In the **second step**, the objectives of a solution are defined (see chapter 4.3). In particular, the functional objectives are derived from the causal model. In the **third step**, the artifact (see chapter 4.4) and its evaluation characteristics are designed and developed (see chapter 4.5). In the **fourth step**, the artifact is applied in the context of entrepreneurship (see chapter 4.6) and then evaluated in the **fifth step** (see chapter 4.7). At this point, a loop is made back to the design of the artifact as proposed by Peffers et al. (2007). After making some adaptations and additions to the artifact, it is applied again in the context of entrepreneurship and further evaluated. Finally, the **sixth step** is conducted, in which the findings are discussed, and implications for research and practice are derived.

1.4. Structure

After the **introduction** to the dissertation in **chapter 1**, the following **chapter 2** presents **state of the art** in research fields relevant to the research goals. **Chapter 2.1.** specifies the term entrepreneurs to provide a basic understanding of the interventions' target group. Besides, a characterization of the entrepreneurs' subject of action, often referred to as "entrepreneurial opportunity" is done. The two subsequent chapters present research that indicates the relevance of entrepreneurs on the macro economical level. More specifically, **chapter 2.2.** discusses the entrepreneurs' impact on economic development, whereas **chapter 2.3.** discusses the entrepreneurs' impact on socially and ecologically sustainable development. **Chapter 2.4.** emphasizes the personal challenges on the entrepreneurial journey. The presented research indicates that entrepreneurial activity is highly self-directed, leading to the challenge of healthy and effective self-regulation for the individual entrepreneur. **Chapter 2.5.** shows that although there is a need for guidance concerning healthy and effective self-regulation in entrepreneurship, there is little science-based guidance. The research field is fragmented and not particularly integrated. Therefore, **chapter 2.6.** is dedicated to the compound research field of motivational psychology to give a more integrated view on self-regulation. Finally, **chapter 2.7.** presents a modern and prominent meta-theory of human motivation,

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called self-determination theory (SDT), which focuses on self-regulation. It presents how SDT's research findings can be used as a solid frame to develop an integrated model of healthy and effective self-regulation that can be applied in entrepreneurship. Based on state of the art in motivational psychology, especially in self-determination theory, **chapter 3** and **chapter 4** specify two research problems and address them with **two empirical studies**.

Study one (see chapter 3) emphasizes and approaches the first problem. It shows that although self-determination theory has a strong empirical base and has proposed an empirically derived integrated model of healthy and effective self-regulation, the single constructs and causalities are not specified well enough. The propositions lack the inclusion of some important mediators that have been found in recent studies as well as specific propositions for operationalization. Conducting those steps could lead to a well-defined causal model of healthy and effective self-regulation that can be tested empirically and applied in practical contexts. Therefore, **study one empirically develops and tests a model of healthy and effective self-regulation in the scope of self-determination theory** with structural equation modeling.

Based on the findings in study one, **study two (see chapter 4)** addresses the problem of little guidance for entrepreneurs on healthy and effective self-regulation. It does so by **developing and testing interventions for healthy and effective self-regulation with entrepreneurs**. The interventions are developed and tested based on the implications of the tested causal model from study 1. They are conducted as field experiments with post measurements and represent two iterations in the scope of the design science methodology.

Chapter 5 provides an overall discussion that summarizes the results, describes the contributions to former research, shows limitations, and gives an outlook.

Chapter 6 lists all references, while **chapter 7** presents all attachments.

2. STATE OF THE ART

2. STATE OF THE ART

2.1. Entrepreneurs and entrepreneurial opportunity

In this chapter, the target group “entrepreneurs” are specified. Furthermore, a key entrepreneurial process is discussed: the creation, respectively, the discovery of an “entrepreneurial opportunity”.

Despite a rising amount of research into entrepreneurship, most researchers do not share a common definition of entrepreneurs. Many different definitions can be found in the research literature (Wickham, 2006; Venkataraman, 1997, Shane et al., 2003). Regardless of the lack of consensus, many scholars implicitly or explicitly acknowledge two premises (Venkataraman, 1997). The first premise, often referred to as the weak premise, is that most markets are inefficient most of the time. This provides opportunities for enterprising individuals to enhance wealth by exploiting these inefficiencies (Venkataraman, 1997). This weak premise is clearest articulated in the works of Kirzner (1979; 1985). It is implicitly present in many studies about entrepreneurship (Venkataraman, 1997). The second premise, often referred to as the strong premise, is that even if markets are at a state of equilibrium, at a certain point of time, enterprising individuals will disturb the equilibrium sooner or later with the lure of profits and advancing knowledge and technology (Venkataraman, 1997). The strong premise has its roots in work by Joseph Schumpeter (1942). In his work, he refers to this premise as the process of “creative destruction” (Schumpeter, 1942). Both premises build upon the assumption that change is a fact of life. Thus, the market is subject to ongoing change (e.g. customer needs, regulations, fluctuating economic performance) and has to adapt to those changes (Venkataraman, 1997). Most scholars appear to agree on the definition of **entrepreneurs** as individuals who can adapt to changing market conditions and trigger change in the market themselves. They do so through new factor combinations leading to new products, production methods, or business models (Schumpeter, 1942). The process of adapting to or triggering a change in the market is often referred to as grasping an entrepreneurial opportunity (Alvarez & Barney, 2007; Alvarez, Barney, & Young, 2010; Alvarez, Barney, & Anderson,

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2013; Shane & Venkataraman, 2000; Eckhardt & Shane, 2010). There are two major points of view on the nature of an **entrepreneurial opportunity**. However, they differentiate the process of “grasping” an opportunity. Researchers assume that entrepreneurs either create (creation theory) or discover (discovery theory) entrepreneurial opportunities (Alvarez & Barney, 2007; Alvarez et al., 2010; Alvarez et al., 2013; Shane & Venkataraman, 2000; Eckhardt & Shane, 2010). The **discovery theory**'s (Shane, 2000; Eckhardt & Shane, 2010) paradigm of opportunities is that an individual has to search for objective information and be alert to grasp the objective opportunities that hold the greatest potential. Opportunities are seen as “lost luggage” that only has to be found and claimed. Therefore, the discovery theory has a rather external and objective orientation. The **creation theory** (Alvarez & Barney, 2007; Alvarez et al., 2010; Alvarez et al., 2013) has a different paradigm. Searching has little meaning in the creation theory. Entrepreneurs are said to create opportunities based on their beliefs about reality. Without the unique perceptions of the entrepreneur, opportunities would not exist. Thus, the creation theory has a rather internal and subjective orientation.

In the scope of this dissertation, it is argued that both approaches towards a definition of entrepreneurial opportunity, the discovery theory, and the creation theory, have their justification. However, the underlying constructivist view of the creation theory may be more relevant for this work, as it focuses on the subjective, motivational aspects of the entrepreneurs that may help them to move healthily and effectively through the entrepreneurial journey.

2.2. Impact of entrepreneurs on economic development

In this chapter, the discussion of why entrepreneurs can be seen as a target group that is important for economic development is considered. Hereby, the goal is to highlight the relevance of this work with entrepreneurs.

Baumol (2002) has argued that traditional factors for economic growth such as labor, capital, and knowledge capital are undoubtedly important. However, the capacity to harness new market opportunities by creating new enterprises around an innovative

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product or service may also be essential for economic growth. Schumpeter & Backhaus (2003) already stated in their book “The Theory of Economic Development” that entrepreneurs are the prime cause of economic development. He describes the process of creative destruction in which innovating entrepreneurs challenge existing firms through inventions that may make current products or services obsolete. In this process, entrepreneurs would foster economic growth through employment, innovation, and welfare effects (Schumpeter & Backhaus, 2003; Acs & Audretsch, 1988; Wennekers & Thurik, 1999; Baumol, 2002). Nevertheless, entrepreneurship is a multidimensional concept often defined differently (Audretsch & Keilbach, 2004). Consequently, the concrete impact of entrepreneurs on economic performance is difficult to measure (Carree & Thurik, 2005). Despite those inconsistent definitions, **some studies try to theoretically or empirically grasp the effects of entrepreneurship on economic growth** (Carree & Thurik, 2005).

Several studies indicate a positive relationship between entrepreneurship and economic growth. Galindo & Méndez-Picazo (2013) used panel data from 13 developed countries to analyze the relationship between entrepreneurship, innovation, and economic growth. They found that the national entrepreneurial activity in each country was positively related to economic growth (GDP). In support of this, a study by Audretsch & Keilbach (2004) introduces the concept of entrepreneurship capital, which is the number of startups in a respective region in relation to its population. Based on the ZEW foundation panels, they identified all startups in the German Trade Register for western Germany. They found that in western Germany, the regions with higher entrepreneurship capital were positively related to economic performance (measured with the production function). A study by Foelster (2000) shows a positive relation of entrepreneurship with employment rates. They showed that the self-employment rate was positively correlated with total employment in Swedish counties from 1976 to 1995. This is also supported by Acs et al. (2018), who found a positive relationship between the Global entrepreneurship index (GEI) and economic growth. The data in the global entrepreneurship index consists of participants from 46 countries in the period between 2002 and 2011.

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However, **some studies indicate that entrepreneurship may not always be good for economic growth.** Caree et al. (2002) investigated whether there is an optimal level of self-employment in a country. They found that countries with relatively high self-employment rates (e.g., Italy) or relatively low self-employment rates (e.g., Scandinavian countries) may have weaker economic growth rates. Thus, they conclude that there may be an optimal rate of self-employment. In support of their findings, a study by Audretsch, Thurik, Verheul, & Wennekers (2002) found that there may be an optimal degree of small firm presence for economic growth. Acs & Varga (2005) made an empirical study that encompasses 11 countries. They found that there are different orientations of entrepreneurial activities that may influence the effect on economic performance. Opportunity entrepreneurship seems to have a positive effect on economic development, whereas necessity entrepreneurship does not. Wong et al. (2005) did a more differentiated study in this scope based on the Global Entrepreneurship Monitor (GEM) data from 37 countries in 2002. They analyzed the relationship between four different types of entrepreneurship and economic growth. The four types of entrepreneurial activities were high growth potential total entrepreneurial activity, necessity total entrepreneurial activity, opportunity total entrepreneurial activity, and overall total entrepreneurial activity. They found that only high growth potential total entrepreneurial activity had a significant impact on economic growth. This indicates that not business startups in general but fast-growing new business startups foster economic growth.

Beyond those studies, a comprehensive study by Wennekers et al. (2005) took a different perspective to answer how entrepreneurship relates to economic development. They investigated the relationship between nascent entrepreneurship rates and per capita income, as well as between nascent entrepreneurship and the innovative capacity index in 36 countries. Looking at all countries, they found a U-shaped relationship for both constellations (see Figure 3 and Figure 4).

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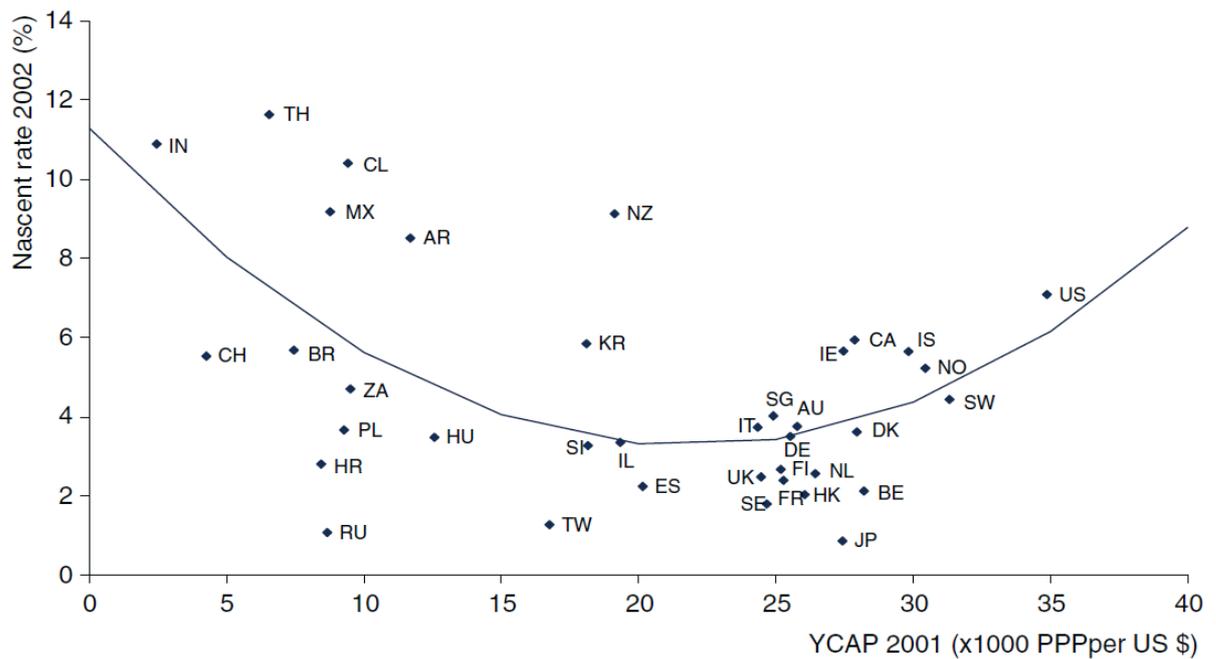


Figure 3: Nascent entrepreneurship in relation to per capita income (Wennekers et al., 2005, p. 302)

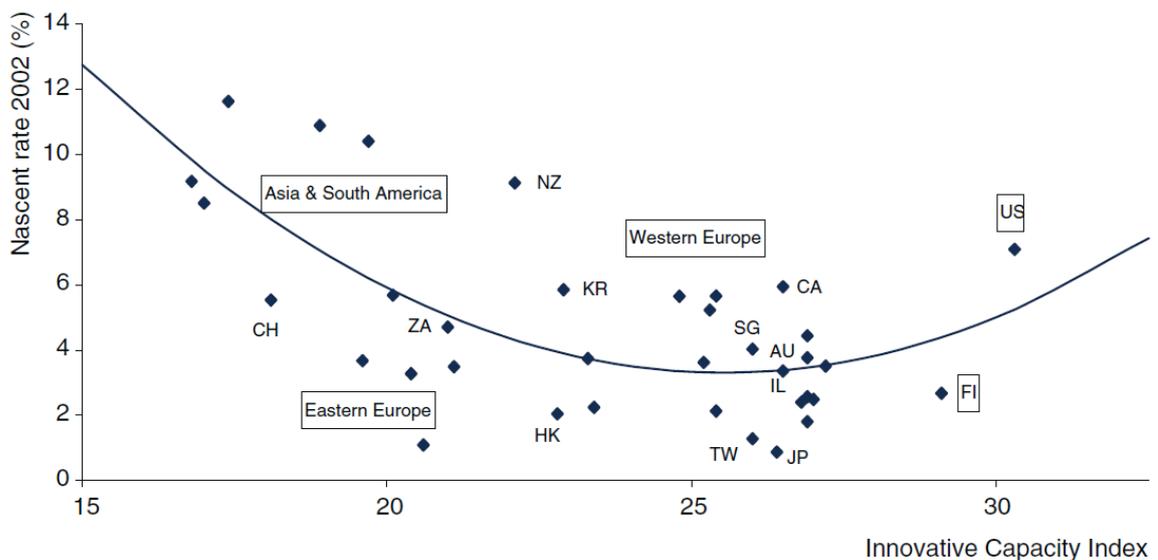


Figure 4: Nascent entrepreneurship and innovative capacity (Wennekers et al., 2005, p. 303)

In attachment 7.1, the abbreviations for each analyzed country are presented (based on Wennekers et al., 2005, p. 308).

The findings indicate that beyond the type of entrepreneurial activity, the level of economic development has to be taken into account to decide whether the

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entrepreneurial activity has a positive or negative impact on economic development. The authors suggest that the positive effects of entrepreneurial activities in general are stronger in developed countries than in developing countries. As an implication for policy, it is inferred that promoting new business startups should be a top priority for developed countries, but not for developing countries (Wennekers et al., 2005). Thus, in developed countries, e.g., Germany and Denmark in Western Europe, fostering entrepreneurship is rather recommended than in developing countries such as India or Thailand. Economic development in developing countries may rather be fostered through investments in management qualities of their population and exploiting scale economies.

In this context, **Carree & Thurik (2010) summarize the results of theoretical and empirical studies** in the “Handbook of entrepreneurship research” specifically in the chapter “The Impact of Entrepreneurship on Economic Growth”. They distinguished between studies of **regional evidence**, **industry evidence**, or **country evidence**. The studies subsumed under regional evidence concentrate on the relation between the share of new or small firms in one region and subsequent economic growth compared to another region. The studies gathered under industry evidence investigate the relation between the number of market participants and economic growth. The studies collected under country evidence focus on the relation between self-employed individuals or individuals with entrepreneurial intentions and subsequent economic growth.

Carree & Thurik (2010) present studies on the regional level made in Germany, Sweden, the USA, and the UK. The studies indicate positive relations between the number of new or small firms in a region and economic growth, especially the ones with more recent data. For the industry level, Carree & Thurik (2010) discuss studies that were made in Europe. The studies found evidence for 17 European countries that the number of market participants is positively related to the economic growth of the analyzed industry. Hereby, the industry that was mainly taken into regard was the manufacturing industry. For the country level, Carree & Thurik (2010) consider studies

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that focus on some or all of the OECD countries. The studies indicate that for the ratio of self-employed over the labor force there exists an optimal equilibrium (see Figure 5).

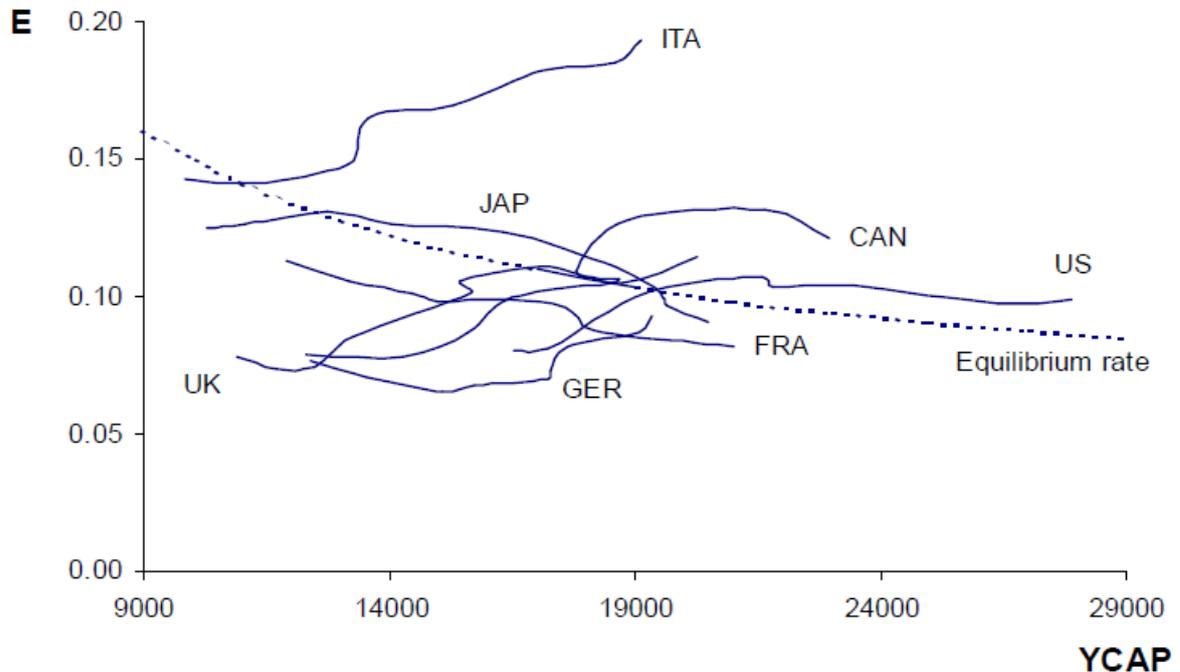


Figure 5: The actual and equilibrium rate of business ownership for G7-countries from 1972-2004, and per capita GDP (Carree et al., 2007, p. 10, Carree & Thurik, 2010, p. 582)

Consistent with Wennekers et al. (2005), the economy in countries like Germany or France, which have a relatively low rate of business owners could benefit from a policy that fosters the creation of new business startups. Also in line with Wennekers et al. (2005), countries such as Canada or the USA may rather profit from a policy that fosters the exploitation of existing scale economies (Carree & Thurik, 2010).

To sum those findings up, it is concluded that it depends on many factors of whether entrepreneurship should be fostered or not. As some studies indicate a generally positive influence on economic growth, some more differentiated studies showed that it may depend on factors such as country, region, industry, state of development in the country, and rate of self-employment to labor force whether entrepreneurship should be fostered or not. Having said that, based on the presented studies, it is inferred that entrepreneurship should be fostered on the country level in Germany given it is a

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developed country with a self-employment to labor force rate that is under the equilibrium rate (see Figure 5).

2.3. Impact of entrepreneurs on the ecologically and socially sustainable economic development

In this chapter, it is discussed why entrepreneurs can be seen as a target group that is not only important for economic development, but also for ecologically and socially sustainable development. It is intended to hereby analyze the relevance of this work with entrepreneurs.

In the current research literature on economic development, one observes an emphasis on the need for the sustainable development of the economy. The term sustainable development can be characterized as a development that meets the needs of the present without compromising the needs of future generations (e.g. Brundtland, 1987; Pacheco, Dean, & Payne, 2010, United Nations, 2015). One prominent and well-established source to specify the need for sustainable development is the work of the United Nations in the scope of the UN sustainable development goals (United Nations, 2015). In this context, the UN emphasize major challenges for the sustainable development of the planet. They list the challenges of poverty, freshwater scarcity, rising inequality within and among countries, youth unemployment, gender inequality, natural resource depletion, more frequent and intense natural disasters, climate change as well as mental and physical health threats (United Nations, 2015). Based on these challenges, 17 specific goals were developed and agreed on in the UN 2013 Agenda for sustainable development in all countries (United Nations, 2015). “They address some of the systemic barriers to sustainable development and contain better coverage of, and balance between, the three dimensions of sustainable development – social, economic, and environmental – and their institutional/governance aspects.” (Costanza et al., 2016, p. 350). These 17 goals are called sustainable development goals. The following three goals serve as examples: “Ensure access to affordable, reliable, sustainable, and modern energy for all” (United Nations, 2015, p. 21); “End poverty in all its forms everywhere” (United

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Nations, 2015, p. 17); “Take urgent action to combat climate change and its impact” (United Nations, 2015, p.25).

A proportion of the research literature views entrepreneurs as an engine for the development of an ecologically and socially sustainable economy. For instance, Pacheco et al. (2010) expect that the innovative power of entrepreneurs can foster a more sustainable and social future.

However, as Parrish (2010) points out, it may depend on the motivation of the entrepreneur, in other words, whether she or he takes into account social or environmental aspects when pursuing the own business venture. Entrepreneurs who are just driven by a market opportunity may not develop a socially and environmentally sustainable business. Whereas entrepreneurs who are mainly driven by sustainability aspects probably will. In this scope, subdomains of entrepreneurship such as sustainable entrepreneurship (e.g. Dean & McMullen, 2007), green entrepreneurship (e.g. Berle, 1991), eco-entrepreneurship (e.g. Bennett, 1991; Schaper, 2002), environmental entrepreneurship (e.g. Anderson & Leal, 2001; Dean & McMullen, 2007), and social entrepreneurship (e.g. Dees, 2001) have developed. These are examples of entrepreneurial directions that are motivated by altruistic reasons. From the perspective of the author of this dissertation, it is out of the question that these individuals impact ecologically and socially sustainable development. It is their primary motivation to do so, and there are many examples of successful entrepreneurs in the listed subdomains. As a result, it is intended to investigate further whether the general domain of entrepreneurship contributes to sustainable development.

For ordinary entrepreneurs, the question of whether or not to align their own business with aspects of sustainable development can feel like a prisoner’s dilemma (Pacheco et al., 2010). A business model that takes sustainability aspects into regard may have collective benefits, however, it may also create costs on the personal side which competitors, whose business may not be sustainable, do not have. Thus, if the existing incentives in the domain fail to encourage sustainable practices, it is a dilemma of

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individual benefits versus collective benefits. From this perspective, entrepreneurs who want to escape from this dilemma, seem to be constrained to contexts in which collective and individual incentives are aligned (Pacheco et al., 2010, p. 465). Following this thought, entrepreneurs would be rather passive actors in the movement of ecologically and socially sustainable development, who can mainly contribute to industries that have collectively beneficial regulations through political action. This may be true to some degree, however, Pacheco et al. (2010) outline another potential escape from the dilemma.

Pacheco et al. (2010) argue that entrepreneurs can not only proactively escape the dilemma but also have a competitive advantage to others by doing so. Such an escape of the dilemma would be characterized by proactively transforming the “rules of the game”. Based on the paradigm of creation theory concerning opportunities (see chapter 2.1), an entrepreneur has the power to proactively develop and alter institutional structures in a way that supports collectively beneficial behavior. Pacheco et al. (2010, p. 471) give many examples of entrepreneurs who managed to escape the dilemma in such a way. The examples include entrepreneurs who proactively influenced the development or alteration of norms, property rights, or governmental legislation. By being proactive and fostering the change themselves, they created a competitive advantage and thus managed to connect individual with collective benefits. E.g. in the tourism industry in Eastern Australia, some small and local diving entrepreneurs have created internal norms of behavior to protect the Great Barrier reef, which were soon be transferred into governmental regulations. Before these regulations, the Great Barrier Reef was threatened through degeneration because the incentives fostered harmful behavior of the competitors. Diving schools that brought their clients closer to the reef got a competitive advantage, although this way of conduct was destroying the reef and hereby the existential base of all competitors in the long term. By introducing informal norms of behavior to protect the reef, which were quickly well-known to potential customers through good marketing, many diving companies quickly followed these norms, which were soon transformed into governmental laws. This example and many others (see Pacheco et

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al., 2010, p. 471) indicate that entrepreneurs can combine individual and collective benefits by using intelligent strategies to develop or alter institutional structures in a way that support socially and environmentally sustainable behavior.

Based on the studies described above, it can be stated that entrepreneurs, independent of their aspirations and their industry's incentives system, as possible facilitators of an ecologically and socially sustainable economy. By proactively fostering institutional structures that lead to collectively beneficial behavior, they can combine individual and collective benefits. In that way, they can not only have a positive impact on sustainable development but also strengthen the competitive capabilities of their business venture.

2.4. Entrepreneurs' challenge of healthy and effective self-regulation

In this chapter, it is highlighted that as essential as the impact of entrepreneurs on this planet may be, there is a personal challenge to master that may be particularly demanding for individuals in the context of business creation: healthy and effective self-regulation.

In comparison to employees, who often get led by others (e.g. superiors or rules in the company), entrepreneurs often have to lead themselves on their own. Investors or lenders may exert pressure on their performance, but ultimately the success of their business rests on the founder's shoulders. Therefore, the nature of entrepreneurial activities is highly self-directed (D'Intino, Goldsby, Houghton, & Neck, 2007). Research shows that self-directed nature (Kollmann, Hensellek, Jung, Kleine-Stegemann, 2018; Kirkley, 2010; Frese & Gielnik, 2014; Van Gelderen, 2010) is one of the main motivators of entrepreneurs. It is often paired with ambition and passion for their own business idea (Neck, Houghton, Sardeshmukh, Goldsby, & Godwin, 2013; Kirkley, 2010, Warr, 2018; Kollmann et al., 2018).

However, research indicates that although entrepreneurs experience high degrees of self-direction and passion for their business, they subjectively experience high working demands, especially in terms of working hours (Blanchflower, 2004; Shane 2008) and psychological stress (Shane, 2008). Some of the main stressors are their own

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need to achieve, immersion in business, loneliness, and people problems (Boyd & Gumpert, 1983). These factors were found to be possible antecedents for entrepreneurial burnout (Fernet, Torrès, Austin, St-Pierre, 2016; Wei, Cang, & Hisrich, 2015).

It is seen that an entrepreneur's path of self-direction and passion often leads to high personal demands. Without functional mechanisms to navigate and balance through this path, there are potential threats for business success and for the entrepreneurs' health (D'Intino et al., 2007).

Consistent with these observations, research in the scope of motivation and self-regulation indicates that likely more than any other individual in the business context, entrepreneurs have the challenge of **healthy and effective self-regulation** (Baron, Mueller & Wolfe, 2016; D'Intino et al., 2007; O'Shea, Buckley, & Halbesleben, 2017). There are different definitions of self-regulation. In the described context, the literature refers to **self-regulation as the efforts of the human self to regulate its own behavior, emotions, and thoughts to achieve goals.** (O'Shea et al., 2017; Vohs & Baumeister, 2004). In other words, **healthy and effective self-regulation** refers to the question of how the self can move oneself in a way that leads to health and effectiveness.

Neck, Neck, Manz & Godwin (1999, p. 477) propose that the application of strategies from the context of healthy and effective self-regulation offers the potential to enhance individual performance and mental states for both, practicing and aspiring entrepreneurs. D'Intino et al. (2007) state that applying the right self-regulatory processes to entrepreneurs would assist the self-directed nature of building and growing a business. A recent empirical study by the World Bank supports that statement. It shows that psychology-based interventions with entrepreneurs can be more effective in fostering business success, than traditional business trainings that focus on professional aspects like finance and marketing (Campos et al., 2017). Neck et al. (2013) make further propositions for the context of entrepreneurship education. They argue that incorporating training on healthy and effective self-regulation in

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entrepreneurship education programs would help students to learn how to cope healthy and effectively with entrepreneurial work demand, thus reducing failure and abandonment.

Although research emphasizes the importance of functional self-regulatory processes in the context of entrepreneurship, a **lack of guidance for entrepreneurs on how to self-regulate through the entrepreneurial journey in a healthy and effective way** can be noticed. Most of the research on healthy and effective self-regulation for entrepreneurs are theoretical discussions. Empirical studies in this context are sparse (Neck et al., 2013, O'Shea et al., 2017).

2.5. The fragmented field of healthy and effective self-regulation in the context of entrepreneurship

In the following section, the main body of research is presented that has been conducted on self-regulation in the context of entrepreneurship.

As O'Shea et al. (2017) point out, the research on self-regulatory processes in the context of entrepreneurship only considers a limited array of psychological concepts. Furthermore, there is the impression that the research field does not currently look at the concepts in an integrated way. It is rather fragmented research that has not been integrated into a bigger picture yet. Therefore, after presenting the single fragments of healthy and effective self-regulatory processes in the context of entrepreneurship, there will be great concentration on motivational psychology (see chapter 2.6) to develop an integrated picture of self-regulation and to apply it in the context of entrepreneurship.

A set of proposed self-regulatory processes that have been discussed as being positive for entrepreneurs are some of the “**self-leadership strategies**”. They were developed by Manz & Neck (Manz, 1986, Neck & Houghton, 2006) and describe a self-influence process through which people can achieve the self-direction and self-motivation necessary to perform their tasks and work. These strategies can be categorized as (1) behavior-focused strategies: self-observation, self-goal setting, self-reward or self-punishment, and self-cueing; (2) natural reward strategies: integrate satisfying tasks,

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focus on the enjoying aspects of a task; and (3) constructive thought pattern strategies: self-dialogue, evaluating beliefs and assumptions, and mental imagery (e.g. D'Intino et al., 2007; Neck et al., 1999). There are empirical studies that support the positive effects of self-leadership strategies on personal health and effectiveness in application fields like sports (e.g. Van Raalte et al., 1994; Ming & Martin, 1996; Feltz & Landers, 1983), education and communication (e.g. Swanson & Kozleski, 1985), and organizational psychology (e.g. Neck & Manz, 1996).

Nonetheless, the application in the context of entrepreneurship is rather sparse. Whereas all are said to influence the entrepreneur's health and effectiveness positively, concrete reasons were only discussed for the constructive thought pattern strategies.

Constructive thought pattern strategies assist an individual in forming constructive thought patterns that can positively impact health and effectiveness. Constructive thought pattern strategies include self-dialogue, evaluating beliefs and assumptions, and mental imagery (D'Intino et al., 2007).

Self-dialogue (self-talk) can be defined as what we tell ourselves (Manz & Neck, 1991,1992). It is suggested that entrepreneurs could enhance their performance and health if they bring self-defeating internal statements into consciousness and reverbitalize these inner dialogues in a positive way (Neck et al., 1999). Neck et al. (1999, p. 485) provide the following example: "an owner of a startup publishing house after having a confrontation with an employee may say to himself, "Hey, I can't believe I lost my patience with him. He will now be extremely unmotivated and unproductive. Now I'm sure he won't come through by the deadline date", could be replaced with "I'm going to improve my people management skills. I will create an environment where people want to work. Next time I will be more understanding with individual situations. I will praise him when the job is complete". Thus, what entrepreneurs tell themselves is important. In the above example, self-talk was directly serving to benefit the entrepreneur's proactiveness - that is, he was anticipating via his self-talk how he would handle this problematic employee in the future."

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Furthermore, it is suggested that entrepreneurs could benefit from **evaluating beliefs and assumptions**. They could actively analyse their beliefs, identify and confront their dysfunctional beliefs and replace them with more rational beliefs (Neck et al., 1999). Neck et al. (1999, p. 486) give the following example: “Imagine an aspiring entrepreneur who ‘freezes’ up during a business plan presentation to a venture capitalist (VC). The entrepreneur stumbles when asked about his valuation method even though he was an investment banker for eight years. Additionally, the venture capitalist claims his pro forma statements are exaggerated given market conditions. Rather than defending his position, the entrepreneur agrees with the VC. The end result is zero financing from the venture capitalist. The entrepreneur leaves the presentation and thinks to himself, ‘I am the worst presenter. I’ll never be able to get funding for this venture. Never.’”. Based on Neck et al. (1999), the entrepreneur derived a rather dysfunctional and irrational belief. She uses extreme black and white thinking. She should re-evaluate her belief and consider that many successful entrepreneurs have to present to more than 20 venture capitalists before receiving financing, and some now successful entrepreneurs did not get an external investment at all. Thus, she or he could reshape her or his dysfunctional belief of “being a failure” into “I can learn from this experience and will improve for the next presentation” (Neck et al., 1999).

Mental imagery is also discussed as being positive for entrepreneurs’ health and effectiveness. Manz (1992, p. 75) describes mental imagery as follows: “We can create and, in essence, symbolically experience imagined results of our behavior before we actually perform”. Neck et al. (1999) suggest that an entrepreneur could benefit by mentally visualizing successful performance. Referring again to the situation of a business presentation, the entrepreneur could imagine a successful pitch before the presentation actually takes place. The mental visualization of a successful talk should increase the entrepreneurs chance to also perform the presentation effectively in the real scenario. In contrast, if the entrepreneur is afraid to perform poorly and visualizes this scenario, this could lead to a lack of confidence which could result in a bad performance in the real pitch.

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D'Intino et al. (2007) find reasons to believe that other psychological constructs are important to stay disciplined using self-leadership strategies. One construct that is discussed in this relation is **optimism**. Only with an outlook of hope and passion for their business idea the entrepreneur could remain committed to their vision. Besides that, the concepts of emotional intelligence (Slovev & Mayer, 1990) and flow (Csikszentmihalyi, 1990) are discussed as being positive for healthy and effective self-regulation. **Emotional intelligence** (EI) represents the ability to perceive, understand and regulate own or another person's emotions (Salovey & Mayer, 1990). D'Intino et al. (2007) state that entrepreneurs who have higher EI would be able to lead themselves and others more effectively. The concept of **flow** is described as the joy and creativity that come from the process of total involvement with life. An essential part of this is emancipating oneself from social controls which could be achieved through the ability to find rewards in the events of each moment. (Csikszentmihalyi, 1990). Therefore, for entrepreneurs to be healthy and effective it would be important to focus on the journey of creating and developing a business and trying to find happiness in the different moments during this journey rather than to focus on following social norms or expecting some kind of external reward from the process (D'Intino et al., 2007).

In addition to having EI and being able to flow, D'Intino et al. (2007) point out that the **knowledge and use of own character strengths** (Peterson & Seligman, 2004) could be beneficial for entrepreneurs. By creating a working environment in which the entrepreneur can exert the strongest character strengths (signature strengths) is said to have a positive influence on effectiveness and health of the entrepreneur. An empirical study by Daoussi (2019) can be used to support this. In her study, aspiring entrepreneurs as well as practicing entrepreneurs rated higher on the knowledge and use of character strengths.

One of the most compound study on the topic of healthy and effective self-regulation in the context of entrepreneurship was conducted by Berg (2017). Intending to introduce a model of self-regulation that especially applies to the context of

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entrepreneurship, she empirically developed and tested the transformational self-leadership model that is based on the concept of transformational leadership (Downton, 1973; Burns, 1978; Bass, 1985; 1990) and psychological capital (Luthans, Luthans, & Luthans, 2004). Her model integrates self-efficacy expectation, knowledge and use of personal strengths, self-worth independent of performance, self-worth independent of environment, consequent pursuit of personal tasks and goals, clarity about personal values and meaning in life, self-complexity, emotional stability, growth through perseverance, optimism. In support of the model, Berg (2017) empirically found that entrepreneurs benefit more from transformational self-leadership than non-entrepreneurs. Entrepreneurs' transformational self-leadership had a stronger positive correlation with facets of subjective well-being (Diener, Emmons, Larsen, & Griffin, 1985) and stronger negative correlations with a scale for depression (Lovibond & Lovibond, 1995). Especially the variables **knowing and using personal strengths** as well as **clarity about personal values and meaning in life** had stronger correlations (Berg, 2017).

Whereas the preceding studies discussed the impact of self-regulatory processes on entrepreneurs' health and effectiveness, the subsequent studies only indicate which self-regulatory processes are used by entrepreneurs.

A study by Bryant (2007) indicates that the regulatory focus "promotion focus" is more frequently used by entrepreneurs. The study examined two types of regulatory focus (Higgins et al., 2001): promotion focus and prevention focus. The regulatory focus in general describes a person's orientation towards future goals. **Promotion focus** describes an orientation in which a person's goals are motivated by **values like growth and advancement**. Prevention focus describes an orientation in which a person's goals are motivated by values like security and safety. In the study, entrepreneurs rated higher on promotion focus than on prevention focus.

Furthermore, in studies in the scope of the theory of planned behavior (Ajzen, 1991) psychological constructs that could be seen as related to the fields of self-regulation, have been analyzed with entrepreneurs. The theory of planned behavior indicates that

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a person's behavior is preceded by the person's intentions and perceived control over the behavior. Furthermore, the person's intentions are influenced by the attitude towards the behavior, by subjective norms and also by perceived control over the behavior (see Figure 6). Whereas **attitude towards the behavior** refers to the degree to which a person has a favorable or unfavorable evaluation of the behavior, **subjective norms** refer to the perceived social pressure to perform or not perform the behavior. **Perceived behavioral control** refers to the perceived ease or difficulty of performing the behavior. It takes past experience into regard (Ajzen, 1991). The proposed relation between the constructs has been supported in many empirical studies in different application fields (Lortie & Castogiocanni, 2015).

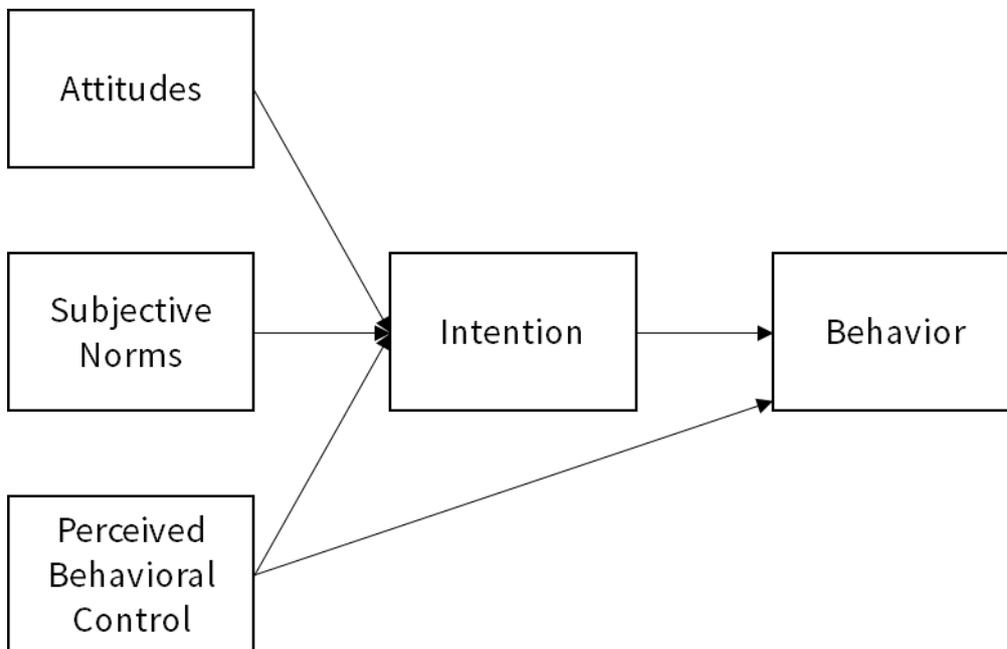


Figure 6: Theory of planned behavior (based on Ajzen, 1991)

Lortie & Castogiocanni (2015) made a meta-analysis and also supported the model in the entrepreneurship-context. In addition, they identified studies that look at other relevant psychological constructs that directly or indirectly have a positive relation with entrepreneurial intention or entrepreneurial behavior. Among these are psychological constructs that are relevant in the scope of self-regulation. They found that the values **self-realization** and **autonomy** are antecedents of positive attitudes towards entrepreneurial behavior. Furthermore, they found **self-efficacy** as an

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antecedent for high perceived behavioral control for entrepreneurial behavior. Whereas self-efficacy is defined as the belief that one can successfully perform the behavior in question (Sherer et al., 1982).

Not only specific values can be seen as regulators for entrepreneurial behavior, but values in general. Entrepreneurs are said to have a rather autonomous than controlled motivation, which means that entrepreneurs are rather motivated by **personal values** and **authentic interests** than by external rewards and punishments, or introjected feelings such as shame or fear (Van Gelderen, 2010).

Furthermore, there is research that suggests that **mindfulness** plays an important role in the self-regulation of entrepreneurs. Whereas mindfulness in this context is often referred to as “the awareness that emerges through paying attention on purpose, in the present moment, and non-judgmentally to the unfolding of experience, moment by moment” (Kabat-Zinn, 2003, p. 145). Kelly & Dorian (2017) propose that there is a positive relation between mindfulness and entrepreneurial opportunity recognition and evaluation. Concerning opportunity recognition, they state based on Gordon & Schaller (2014) that there is a positive relation between mindfulness and the market analysis that is required for idea creation and entrepreneurial discovery. Concerning opportunity evaluation, they note that an entrepreneur can use mindfulness to become aware of external conditions as well as internal resources needed to be able to effectively exploit an opportunity. Mindfulness would help to see both worlds clearly, the external as well as the internal world, with less bias created through own thinking. Kelly & Dorian (2017) propose that the positive effects of mindfulness on opportunity recognition and opportunity evaluation would be mediated by metacognition and emotional self-regulation. Whereas **metacognition** describes self-awareness and understanding of one’s own thinking. It can also be characterized as the degree to which a person is aware and can reflect on own thinking processes (Haynie & Shepherd, 2009). Kelly & Dorian (2017) propose that greater metacognition helps an entrepreneur to become aware of an opportunity and to evaluate it in a way that has less cognitive and emotional bias to reality. **Emotional self-regulation** is

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defined as “the ability to respond to the ongoing challenges of life and regulate one’s range of emotions in a way that one’s behavior is acceptable within society’s norms but also spontaneous when needed” (Koole, 2009, cited by Kelly & Dorian, 2017). It is a key component of emotional intelligence which has been linked to entrepreneurial success (Cross & Travaglione, 2003). Kelly & Dorian (2017) emphasize that emotional self-regulation would help entrepreneurs to optimize risk-taking behavior, so that it is neither too strong nor too weak and that it would also help to delay decision-making while experiencing strong emotions that could influence their actions. Moreover, Kelly & Dorian (2017) propose that there is a positive relationship between mindfulness and ethical decision-making in the process of opportunity recognition and evaluation, which would be mediated by compassion.

Although the importance of mindfulness is discussed in the scope of self-regulation of entrepreneurs, an empirical study by Daoussi (2019) found no significant difference of the degree of mindfulness between aspiring entrepreneurs, practicing entrepreneurs and non-entrepreneurs. However, the results of the study show higher positive correlations between **mindfulness and strengths knowledge** as well as between **mindfulness and strengths use** for aspiring and practicing entrepreneurs in comparison to non-entrepreneurs. Based on additional theoretical studies, these results were interpreted in the way that aspiring as well as practicing entrepreneurs have a stronger benefit from mindfulness when it comes to discovering personal strengths as well as using them. The reason may be that entrepreneurial individuals experience more freedom to set tasks for themselves which fit their personal strengths and thus put in more effort to get to know their personal strengths (Daoussi, 2019).

Research by Shane et al. (2003) on entrepreneurial motivation looked at motivational factors of entrepreneurs that are beneficial for entrepreneurial activities (see Figure 7).

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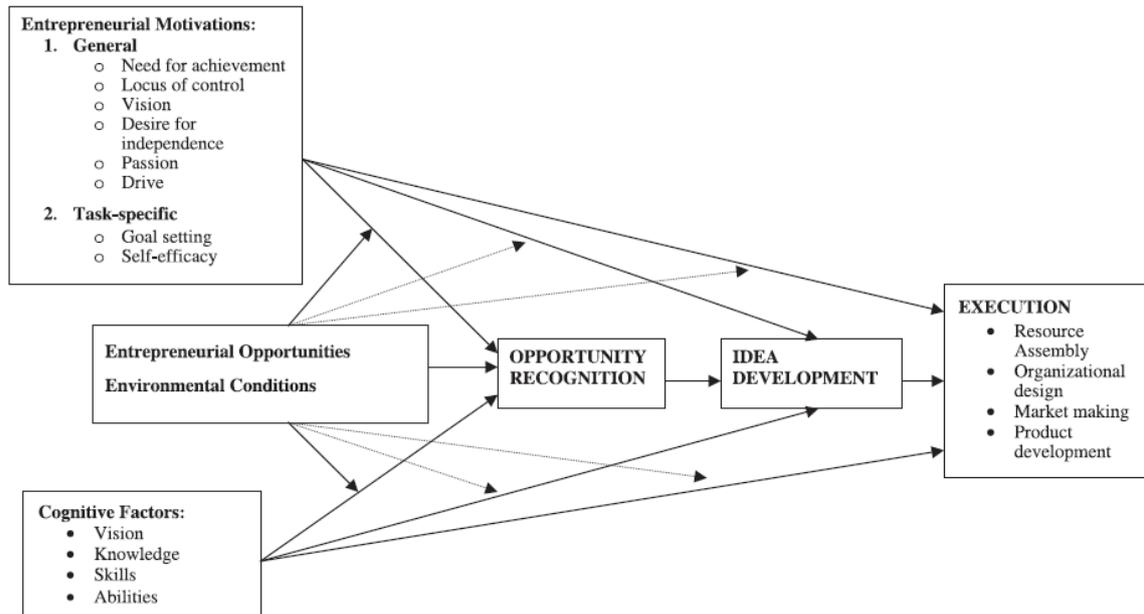


Figure 7: Model of entrepreneurial motivation and the entrepreneurship process (Shane et al., 2003, p. 274)

What they found is that general tendencies like the **need for achievement, internal locus of control, vision, the desire of independence, passion,** and **drive** benefit the entrepreneurial activities. Furthermore, task-specific aspects such as **setting goals** that are specific (quantified) as well as having high **self-efficacy** towards the goal are beneficial. Besides these factors, cognitive factors like **vision, knowledge, skills,** and **abilities** seem important.

There may be more fragments on healthy and effective self-regulation in the context of entrepreneurship, however, one can argue that the most prominent research studies are listed and that further investigation in this context may reveal other single fragments, but would fail to lead to an integrated view on self-regulation for entrepreneurs.

*Entrepreneurship-theory and -practice lack an integrated view on healthy and effective self-regulation. Therefore, one devotes time to the compound research field of **motivational psychology.***

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2.6. Motivational psychology and self-regulation

In this chapter, the research field of motivational psychology is characterized and it is pointed out, how self-regulation can be seen as a specific perspective of motivational psychology. Prominent theories of motivational psychology are then presented and it will be focused on one theory that as a scientifically sound framework for an integrated model of healthy and effective self-regulation in the context of entrepreneurship.

In general, motivational psychology is not a uniform field of research. Depending on the used theory, aspects such as research questions, considered variables, and used methods differ (Heckhausen & Heckhausen, p. 12). This could be due to the fact that motivational psychology has many connections to other psychological research fields. For example, there are overlaps in content with basic disciplines such as social psychology and differential psychology, as well as with application-oriented disciplines such as organizational psychology and health psychology. Methodological overlaps exist in fields such as social cognition research and cognitive psychology (Brandstätter, Schüler, Puca, Lozo, 2013). Nevertheless, this chapter attempts to capture the core content of today's motivational psychology in which self-regulatory processes play a substantial role.

The word "motivation" comes from the Latin verb "movere", which translated into English means "to move somebody or something". In general terms, scientific **motivational psychology deals with the forces that move people to do something** (Brandstätter et al., 2013, p. 91).

If one looks for more specific scientific definitions, one will find different definitions depending on the author (Brandstätter et al., 2013). In the following, some definitions by important representatives of scientific motivational psychology are picked out to derive the essential defining characteristics of the research field.

John W. Atkinson, one of the pioneers of experimental motivation research, defines motivational psychology as an analysis of the various factors that stimulate and direct the actions of an individual (Atkinson, 1964). Bernard Weiner, who has made important contributions to attribution theory, writes that motivational psychology

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studies why organisms do, think, and behave the way they do (Weiner, 1985). A more comprehensive definition is offered by Falko Rheinberg, professor of general psychology. He defines motivation as an activating orientation of the current life course towards a positively assessed target state (Rheinberg, 2008). This also includes an activating orientation away from a negatively assessed target state (Vollmeyer, 2005). The term motivation is not to be understood as a homogeneous unit but as an abstract and complex structure in which, of the many different processes of life accomplishments, those components or partial aspects that have to do with the persistent target orientation of our behavior are picked out and treated (Rheinberg, 2008). The task of motivational psychology is to describe and record the various components and sub-processes in their interaction, to determine their dependencies and influenceability and to clarify their effects in the experience and subsequent behavior (Rheinberg, 2008).

From the definitions of the various representatives of motivational psychology, of which only a few have been picked out here as examples, Brandstätter et al. (2013) deduce essential defining characteristics for modern motivational psychology. Accordingly, motivational psychology attempts to explain the **goal-oriented behavior of people**. Reflexes, i.e. involuntary, rapid and similar reactions to a stimulus (e.g. the song ending reflex), and automated processes at the neuromuscular level (e.g. the fine motor sequence when typing a text on the keyboard) are not the subject of this field of research (Brandstätter et al., 2013).

Concerning goal-oriented behavior, motivational psychology attempts to explain three characteristics in particular: orientation, persistence, and intensity (Heckhausen & Heckhausen, 2010).

The defining characteristic of **orientation** is why a person does one thing and not another, e.g. why they pursue certain goals and not others (Brandstätter et al., 2013). In the previously discussed context, one could also ask, why some people choose to work independently and others choose to be employed or why some people strive for material prosperity while others strive for social justice (own thought).

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The **persistence** characteristic is used to investigate why in some cases, goal pursuit is maintained despite interruptions, difficulties, or distractions, while in other cases, it is abandoned (Brandstätter et al., 2013). For example, why one entrepreneur manages to stick to their startup despite multiple interruptions and why another gives up the startup after only a few months (own thought).

Intensity examines why more effort is invested in pursuing some objectives than in pursuing others. Besides, it examines why the subjective feeling of effort can vary depending on the goal (Brandstätter et al., 2013). For instance, why one entrepreneur invests 200 hours into the preparation of a pitch and another only 10 hours; and why the one investing 200 hours may experience it as easy, while the other has difficulty investing the 10 hours into the preparation of the pitch (own thought).

To explain the orientation, persistence, and intensity of goal-oriented behavior, a variety of factors are included. Depending on which representatives of motivational psychology one refers to, the factors that are in focus differ (Brandstätter, 2013). However, the factors allow differentiating between **person-related** and **situation-related** factors, e.g. factors that lie within the person and factors that lie outside the person (Brandstätter, 2013; Heckhausen & Heckhausen, 2010).

Personal factors considered in today's motivational psychology are in particular **needs, implicit motives, and explicit motives** (Heckhausen & Heckhausen, 2010).

Needs are inherent organismic necessities in every human being, which are essential for human well-being. A distinction is made between physiological needs (e.g. hunger, thirst, and sexuality) and psychological needs (e.g. autonomy, competence, and relatedness) (Brandstätter et al., 2013; Deci & Ryan, 2000). Many motivational psychologists see needs as inborn tendencies that have none or less inter-individual differences (Deci & Ryan, 2000; Rheinberg, 2008). For example, Edward Deci and Richard Ryan, the proponents of the self-determination theory, describe in their empirically and internationally developed theory of human motivation that the human being is an active organism that naturally strives for psychological growth as well as for individual and social integrity. They conceptualize this innate striving as the

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three universal psychological needs of autonomy, competence, and relatedness (Deci & Ryan, 2000).

Motives are generally defined as individual preferences for certain incentive classes (McClelland et al., 1989, cited by Brandstätter et al., 2013). Milton Rokeach describes them as the cognitive representation and transformation of needs (Rokeach, 1973). They describe the individual way in which each person tries to satisfy their needs (Kasser, 2002). In contrast to needs, motives are described by many representatives of motivational psychology not as innate, but as acquired in the course of life (Deci & Ryan, 2000).

In the last two decades, empirical studies have divided motives into implicit and explicit (Heckhausen & Heckhausen, 2010). **Implicit motives** are enduring, emotionally colored, and often unconscious individual preferences for certain incentive classes. It is assumed that these are mainly shaped in early childhood (Heckhausen & Heckhausen, 2010).

Explicit motives are conscious, linguistically representable attributions of what is perceived as subjectively important. They can, for example, be defined in the form of goals or values (trans-situational goals) (Heckhauser & Heckhausen, 2010).

The tendency to look at individual dispositions in the explanation of inter-individual differences in behavior is reinforced by the obvious heritability of many characteristics. These include e.g. physical differences or differences in abilities (Heckhausen & Heckhausen, 2010). However, if one would try to explain goal-oriented behavior exclusively by means of factors inherent in a person, one would overlook the world surrounding a person with its situational peculiarities. Thus, **situational factors** also play a role in the explanation of motivation. These are, in particular, the **incentives** and the **opportunity** that the actor anticipates (Brandstätter et al, 2013).

Incentives are everything positive and negative that a situation promises a person. They can lie in the action itself, but also in the outcome or consequences of the action.

Opportunities are situations that give someone the chance to perform a certain

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action. The incentive character of a situational opportunity depends on whether the opportunity is compatible with the implicit and explicit motives of the person (Heckhausen & Heckhausen, 2010). Thus, an entrepreneur who has e.g. the implicit and explicit motive of independence may not want to grasp the opportunity of taking an investor on board whereas an entrepreneur with the implicit and explicit motive of getting social recognition would be more likely to do so (own thought).

Modern motivational psychology assumes that goal-oriented action is determined by the **interaction of situational and personal factors**. Thus, the incentive character of an opportunity is determined by whether the incentives correspond to the motives, in other words to the individually preferred incentive classes (Brandstätter et al., 2013; Heckhausen & Heckhausen, 2010). This interaction leads to a behavior, which again leads to a result that in turn creates consequences like external evaluation, self-evaluation, or material advantages (see Figure 8).

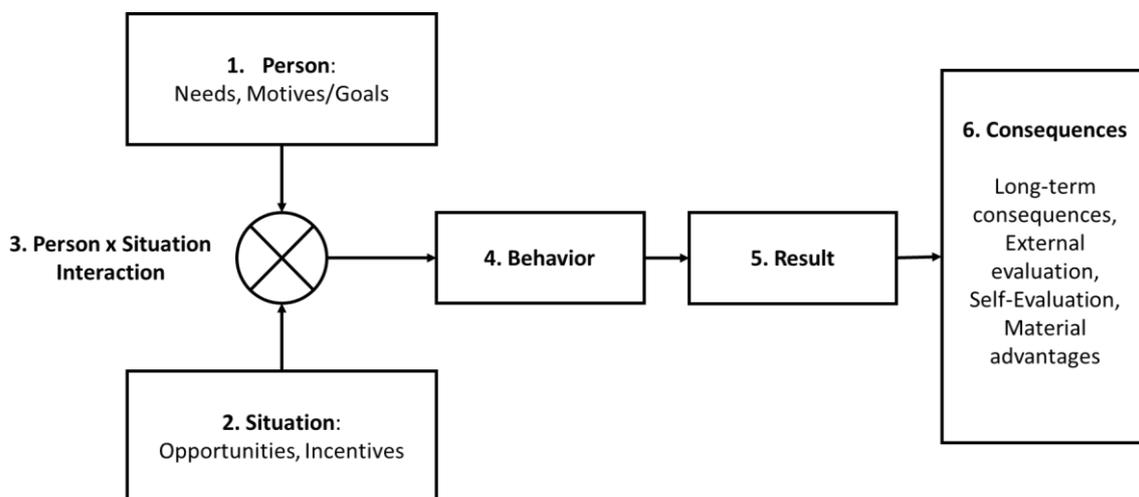


Figure 8. Overview about determinants of motivated behavior (Heckhausen & Heckhausen, 2010, p. 3)

Even if it does not directly emerge from the overview of the determinants, emotional, and cognitive processes are included in relation to the person, in addition to needs, motives, and goals. Cognitive processes such as perception, attention, and introspection play a role in explaining motives. Affective processes, i.e. emotions such as joy, fear, and shame are also considered (Brandstätter et al., 2013; Heckhausen &

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Heckhausen, 2010). For example, the assessment of whether an action serves a motive is explained by both rational consideration and emotions. In this case, emotions are classified as navigation aids. E.g. to select from many possible action alternatives, the one that best suits the often subconscious needs and motives, emotional feedback can be used (Heckhausen & Heckhausen, 2010).

This conceptualization (see Figure 8) is seen as a well-defined and well-researched frame to embed self-regulation. According to Vohs & Baumeister (2004), self-regulation describes the efforts of the human self to regulate its behavior, emotions, and thoughts to achieve goals. Based on Schultz & Ryan (2015), it encompasses the processes of the self that define why it moves (rather external reasons or rather internal reasons), what moves it (specific motives like personal growth or recognition) and how it moves (rather aware and mindful or rather unaware and reactive). It is argued based on this definition, that **self-regulation** can be seen as one specific perspective in motivational psychology. It is not the outside motivational perspective on a person, but the inside motivational perspective of the self on oneself. Therefore, the relevant determinants such as needs, values, goals, emotions, and cognition do also apply.

The following digs deeper into theories of motivational psychology to get an integrated understanding of self-regulation. There are many motivational psychologists that conduct research in the context of motivation and self-regulation. While the roots can be found in writings by ancient philosophers like the Pre-socratics, Socrates, Platon, Aristoteles, Aristippus of Cyrene, and Epicure, the first approaches that could be characterized as systemized theories of motivational psychology emerged at the beginning of the 20th century. Those early approaches reach from “psychoanalysis” by Freud, “deep psychology” by Adler and Jung to “drive theory” by Hull, “field theory” by Lewin, “needs theory” by Murray and Maslow as well as “volition theory” by Ach. Some of the prominent modern systemized motivational theories are “expectancy theory” by Vroom, “goal-setting theory” by Locke & Latham and “self-

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determination theory” by Deci & Ryan (Brandstätter et al., 2013; Heckhausen & Heckhausen, 2010).

There are many theories in the scope of motivational psychology. It is believed that many of the theories have a justified existence and give insights into important aspects with respect to motivated human behavior. It can still be argued that for the purpose of getting an integrated view on self-regulation, the self-determination theory by Deci and Ryan can serve as a frame as it is a modern and well-integrated theory of human motivation that integrates aspects of several other theories. Furthermore, the self-determination theory has a focus on self-regulation and stands out because it is widely researched empirically and internationally in different application fields.

2.7. Self-Determination theory (SDT) as a frame for an integrated view on healthy and effective self-regulation

In this section, a detailed overview of the self-determination theory (SDT) is provided, as SDT is used as a scientifically sound framework to develop and test a model of healthy and effective self-regulation that can be used by and with entrepreneurs (study 1). Beyond that, this model is applied to develop and test interventions for healthy and effective self-regulation with entrepreneurs (study 2).

2.7.1. Theoretical background

The self-determination theory (SDT) is an **integrated theory of human motivation** that has been developed in the last four decades. It integrates six mini theories: cognitive evaluation theory, organismic integration theory, causality orientation theory, basic psychological needs theory, goal contents theory, and relationships motivation theory. This integrative approach leads to a compound framework to explain human behavior (Deci & Ryan, 2000). It was initiated by the two researchers Richard Ryan and Edward Deci, who have their expertise in positive psychology. Although the theory has its roots in the 1970s, the first comprehensive work (Deci & Ryan, 1985; Reeve, 2012) was published in 1985. Since then, SDT has mushroomed and been further developed by an extensive network of researchers around the world (Deci & Ryan, 2008). The main concern of the self-determination theory is to support the

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human's natural tendency to behave in healthy and effective ways (Deci & Ryan, 2000, 2010). One of the strengths of self-determination theory is that it has a profound empirical base through the studies that have been made by researchers around the globe. The implications of this research are already applied in practice in fields such as education, healthcare, relationships, psychotherapy, psychopathology, organizations, sports and exercise, goals, health and well-being as well as sustaining the planet (Deci & Ryan, 2008).

Based on an extensive body of empirical studies, research around the **self-determination theory has developed an integrated concept of healthy and effective self-regulation** (Ryan et al., 2008; Schultz & Ryan, 2015). In the scope of this research, SDT identifies four aspects that seem to be essential for healthy and effective self-regulation. These aspects are autonomous motivation (also called the “why” of healthy and effective self-regulation), intrinsic aspirations (also called the “what” of healthy and effective self-regulation), mindfulness (also called the “how” of healthy and effective self-regulation) and the satisfaction of the three psychological needs of autonomy, relatedness and competence (could be interpreted as output variables that consider health in particular) (Ryan et al., 2008; Schultz & Ryan, 2015).

To better understand SDT as a theory and to use it as a frame for developing an integrated view on healthy and effective self-regulation, the constructs that are relevant in SDT's definition of healthy and effective self-regulation will be explained.

2.7.2. Basic psychological needs

The most central concept of SDT is the concept of the **three basic psychological needs** (Deci & Ryan, 2000). SDT characterizes the basic psychological needs as the “*innate psychological nutriments that are essential for ongoing psychological growth, integrity, and well-being*” (Deci & Ryan, 2000, p. 229). Through an extensive body of theoretical as well as empirical studies, they specify three basic psychological needs and show that the satisfaction of those needs is directly related to engagement, well-being, and health. In the scope of SDT, the three basic psychological needs are the need for competence, autonomy, and relatedness (Deci & Ryan, 2000).

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The need for **competence** is characterized as the need *to engage in optimal challenges and experience mastery or effectance in the physical and social worlds* (Deci & Ryan, 2000, p. 252). Ryan & Deci (2013) also describe this need as the need to feel some sense of mastery of things that are important to oneself. The need emphasizes the generally open, playful, curious, and by that for ongoing psychological growth-oriented human nature (Deci & Ryan, 2000).

The need for **autonomy** is characterized as the need to do activities that are self-endorsed (Ryan & Deci, 2013). This can be e.g. achieved by engaging in activities that one either finds interesting (intrinsic motivation) or important (strongly internalized extrinsic motivation) (Deci & Ryan, 2000). Ryan & Deci (2013) also describe this need as the striving to engage in activities that one wholeheartedly stands behind. The need is part of the deep inner design of humans to develop into an integrated self and to avoid self-fragmentation. It emphasizes the natural human tendency to strive for individual integrity and volition (Deci & Ryan, 2000). Thus, the need for autonomy in the scope of SDT is not the same as independence. One can be dependent but also stand wholeheartedly behind what he or she is doing (Ryan & Deci, 2013).

The need for **relatedness** is characterized as the need *to seek attachments and experience feelings of security, belongingness, and intimacy with others*. (Deci & Ryan, 2000, S. 252). Ryan & Deci (2013) also describe this need as striving to be cared for and feel connected to others. The need is not only limited to the role that other people and other things play in one's life but also encompasses what role oneself plays in the life of others (Ryan & Deci, 2013). The need emphasizes the natural human tendency to strive for social integrity (Deci & Ryan, 2000).

Through many empirical studies, SDT has shown **positive relations of psychological needs satisfaction with scales of engagement, well-being, and health** (Deci & Ryan, 2000). Among these results are positive relations with engagement variables like vigor (e.g., Broeck, Vansteenkiste, De Witte, Soenens, & Lens, 2010), organizational commitment (e.g., Broeck et al., 2010), and performance (e.g., Broeck et al., 2010); positive relations with well-being variables such as positive affect (e.g., Sheldon, Ryan,

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& Reis, 1996), life-satisfaction (e.g., Neubauer & Voss, 2016), job satisfaction (e.g., Broeck et al. 2010), vitality (e.g., Ilardi, Leone, Kasser, & Ryan, 1993; Sheldon, Ryan, & Reis, 1996), self-esteem (e.g., Ilardi et al., 1993; Neubauer & Voss, 2016); negative relations with negative health conditions and feelings like depression (e.g., Neubauer & Voss, 2016; Wei, Shaffer, Young, & Zakalik, 2005), loneliness (e.g., Neubauer & Voss, 2016), anxiety (e.g., Ilardi et al., 1993, Wei et al. 2005), and shame (e.g., Wei et al. 2005).

Schultz & Ryan (2015) state that psychological needs satisfaction could be used to measure human health as an output variable of healthy and effective self-regulation.

*The basic psychological needs form the core concept that describes a human's nature in the scope of SDT. Backed up with various empirical studies, SDT describes that basic psychological needs satisfaction is a central aspect representing human health. Thus, **psychological needs satisfaction could be used to measure health** as an output variable of healthy and effective self-regulation.*

2.7.3. Autonomous motivation (The „why“ of healthy and effective self-regulation)

The first concept of healthy and effective self-regulation, the three basic psychological needs, specify the core of human nature by describing what the major tendencies of humans are that have to be satisfied to function well. Thus, the psychological needs could be seen as a defining output variable that represents whether a person is healthy. The second concept focusses more directly on the “locus of causality” of the regulatory processes that can foster higher levels of psychological needs satisfaction, representing higher levels of health.

Studies about the influence of external incentives on the motivation to do a specific task have shown that external incentives have a negative influence on the motivation of those participants who were already motivated to do the task without any incentives (Deci & Ryan, 1985). It seems that extrinsic incentives can undermine the motivation to perform inherently interesting activities. This negative effect is called „overjustification“ (Lepper, Greene, & Nisbett 1973). These results motivated studies to analyze the positive and negative effects that different **types of regulatory focus**

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can have on different output variables like need satisfaction, engagement, well-being, and health (Deci & Ryan, 2000). Based on empirical research, Deci and Ryan developed the self-determination continuum (see Table 1).

Type of motivation	Amotivation	Extrinsic Motivation				Intrinsic Motivation
Behavior	Not self-determined	Partly self-determined				Self-determined
Type of regulation	None	External	Introjected	Identified	Integrated	Intrinsic
Processes of regulation	Non-intended Regulation	Rewards and punishments	Self-esteem and anxiety	Importance of values and goals	Coherence among goals and values	Interest and enjoyment of the task
Locus of Causality	Impersonal	External	Somewhat External	Somewhat internal	Internal	Internal
Goal		Controlled	Controlled	Autonomous	Autonomous	Autonomous

Table 1: Self-determination continuum (Deci & Ryan, 2000; Gagné & Deci, 2005)

Using the concept of the self-determination continuum, several studies have found positive effects for participants who are motivated by rather self-determined, internal, autonomous reasons than by rather not self-determined, external, controlled reasons (Deci & Ryan, 2000). E.g., Sheldon & Elliot (1999) analyze on the level of personal goals what influence autonomous goal setting, and respectively controlled goal setting have on engagement variables like the effort and the progress of the goal pursuit as well as on psychological needs satisfaction and well-being. Autonomous goal setting often referred to as **autonomous goals**, describes goals that are motivated by authentic interests and personal values. Given this definition, autonomous goals have an internal locus of causality. In contrast, controlled goal setting, often referred to as **controlled goals**, describes goals that are motivated by external rewards and punishments or introjected feelings such as fear or shame. By that, they can be categorized as goals that have an external locus of causality (Sheldon & Elliot, 1999; Sheldon, 2014).

Sheldon & Elliot (1999) show that individuals with rather autonomous goals make better progress with their goals and have higher satisfaction of psychological needs. The goal progress seems to be mediated by sustained effort into the pursuit of autonomous goal. A similar causal chain was also observed by Smith, Ntoumanis,

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Duda, & Vansteenkiste (2007, 2011) in the context of sport. Taylor et al. (2014) indicate in a meta-analysis that autonomous motivation also fosters school achievement, whereas the intrinsic reason proved to be most significant. The concept of autonomous goals also relates to concepts like self-involvement (Gendolla, 2004), which has shown to be a possible facilitator of the effort that is mobilized for the goal pursuit (e.g. Gendolla & Richter, 2010). However, in contrast to Sheldon & Elliot (1999), Werner, Milyavskaya, Foxen-Craft, & Koestner (2016) found that the mediational effect does not necessarily have to be the effort that is invested into autonomous goals, but that it could instead be the ease and naturalness of goal pursuit. The interpretation is that goals that are pursued for autonomous reasons feel easier and more natural than those who are pursued for controlled reasons. By that, the progress of autonomous goals is faster.

Schultz & Ryan (2015) state that the degree of autonomous motivation could be measured and used to specify the “why” of human self-regulation.

The degree of autonomous motivation represents the “why” of healthy and effective self-regulation. It determines if the locus of causality, in other words, the reasons why the self moves are rather external (e.g. rewards and punishments) or internal (e.g. authentic interests and personal values).

2.7.4. Intrinsic life-goals (The „what“ of healthy and effective self-regulation)

The third concept of healthy and effective self-regulation in the scope of the self-determination theory focuses on the content of individuals' life-goals, often referred to as aspirations or values (Kasser, 2002).

Ryan, Sheldon, Kasser, & Deci (1996) argue that the pursuit of specific life goals may lead to higher levels of basic psychological needs satisfaction than others (Deci & Ryan, 2000). Through empirical work, Grouzet et al. (2005) divide aspirations into intrinsic and extrinsic aspirations. Intrinsic aspirations arise from the innate natural human tendency to achieve effectiveness, connectedness, and coherence (Deci & Ryan, 2000). By that, they are characterized to be those kinds of life goals that rather

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lead to the satisfaction of the basic psychological needs (Deci & Ryan, 2000, Kasser, 2002). Examples of intrinsic aspirations are affiliation, self-acceptance, community, and physical health (Grouzet et al., 2005). Extrinsic aspirations rather arise from the wish to get external signs of worth or contingent approval. By that, they are said to be less likely to lead to the satisfaction of basic psychological needs (Deci & Ryan, 2000). Examples of extrinsic aspirations are conformity, popularity, image, and financial success (Grouzet et al., 2005).

Empirical studies in the scope of the self-determination theory not only show that the pursuit of **intrinsic life goals** is positively related to the satisfaction of the basic psychological needs. They also indicate that the positive effects of intrinsic aspirations go beyond that. E.g., intrinsic aspirations have been linked to higher psychological well-being (Kiaei & Reio, 2014, Kasser & Ryan, 1993, 1996, 2001), higher subjective well-being (Kasser & Ryan, 1996; Niemiec, Ryan, & Deci, 2009), higher vitality (Kasser & Ryan, 1996), higher self-esteem (Kasser & Ryan, 2001), lower levels of depression (Kasser & Ryan, 1996, 2001) and anxiety (Kasser & Ryan, 1996), lower consumption of television, drugs, cigarettes, and alcohol (Kasser & Ryan, 2001), less physical symptoms like headaches, faintness and sore muscles (Kasser & Ryan, 1996), deeper processing of learning materials and persistence at learning activities (e.g. Vansteenkiste, Lens, De Witte, De Witte, Deci, 2004) more social (McHoskey, 1999) and ecologically friendly (Brown & Kasser, 2005; Sheldon & McGregor, 2000) behavior. In the same studies, the opposite effects have been linked with extrinsic aspirations. Additionally, they have shown that extrinsic aspirations are linked to overconsumption and hoarding of material resources (Sheldon & McGregor, 2000).

The concept of intrinsic and extrinsic life-goals has been mainly analyzed with the concept of aspirations developed by Grouzet et al. (2005). According to Kasser (2002), it would be promising to analyze a wider range of different life goals and how they affect the outcomes of goal-directed behavior. A suggested concept besides aspirations is the concept of human values. One of the most profound models in this context is the universal continuum of human values by Shalom Schwartz (1992). In

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this scope, human values are defined as “trans-situational goals that vary in importance and serve as guiding principles in the life of a person or a group.” (Schwartz, 2007, p. 712). The continuum derived from intercultural studies in more than 80 countries (Schwartz, 2012). The original model in 1992 had 10 distinct values (Schwartz, 1992). The model has been refined in the last years through empirical studies. It now comprises 19 different life-goals in the form of human values that can be found across different cultures (see Figure 9) (Schwartz et al., 2012; Cieciuch, Davidov, Vecchione, & Schwartz, 2014). In addition, the 19 values are categorized through higher-order values such as self-transcendence on the first level, social focus on the second level, and growth/anxiety-free on the third level (see Figure 9).

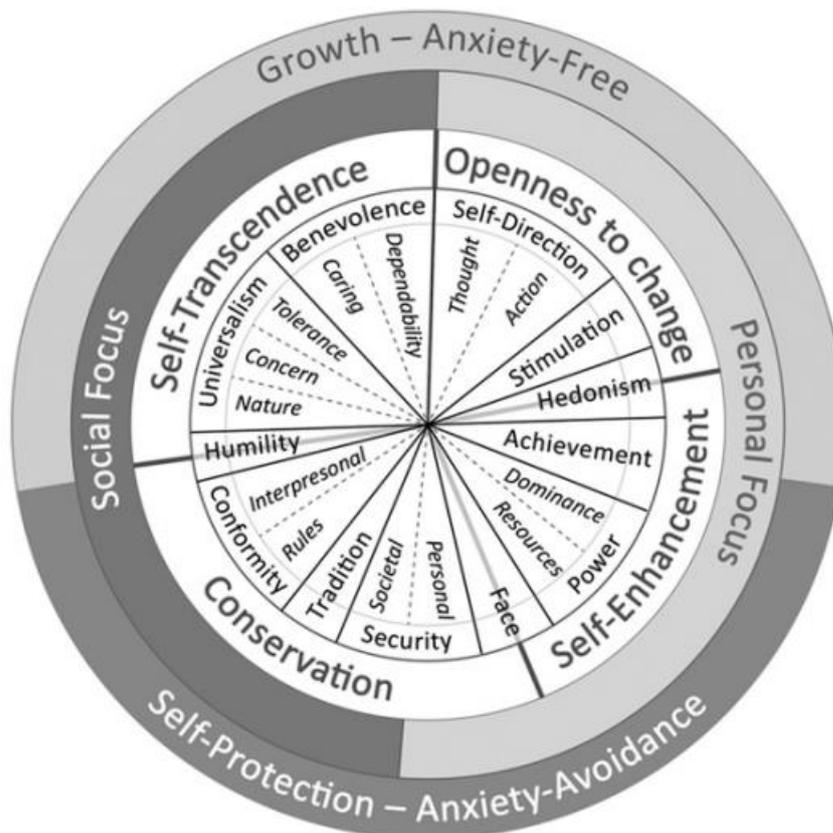


Figure 9: Refined universal continuum of human values by Schwartz (Schwartz et al., 2012; Cieciuch et al., 2014)

Several studies attempt to find indications of how the concept of intrinsic and extrinsic aspirations could be transferred on the universal continuum of human values by

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Schwartz. There are theoretical discussions like the sketches for a self-determination theory of values by Tim Kasser (2002) and also empirical studies that analyze the relationship of the importance of the different personal values with different types of well-being such as subjective well-being (Bobowik, Basabe, Páez, Jiménez, & Bilbao, 2011, Haslam, Whelan, & Bastian, 2009, Joshanloo & Ghaedi, 2009; Sagiv & Schwartz, 2000; Sortheix & Schwartz, 2017), mental health (Sagiv & Schwartz, 2000), psychological well-being (Bilbao, Techi, & Páez, 2007; Cohen & Shamai, 2007; Joshanloo & Ghaedi, 2009), and social well-being (Bilbao et al., 2007; Joshanloo & Ghaedi, 2009). Furthermore, a study by Hanel & Wolfradt (2016) analyzed the relationship between the importance of personal values and negative health conditions such as anxiety, depression, and stress. Although the results are not consistent through the studies, the overall results indicate that values with growth orientation are positively related to different well-being scales and negatively related to negative health conditions. This effect was stronger between the growth orientation- and personal focus-values than for the growth orientation and social focus values (Sortheix & Schwartz, 2017). Moreover, self-protection values demonstrate a negative relationship to scales of subjective well-being and negative health conditions (Sortheix & Schwartz, 2017).

In addition to theorizing the same categorization, Hebllich & Terzidis (2016) extracted the value of physical and mental health through multidimensional scaling from the value of private security. It was found to be a rather separate value from personal security and thus, positioned between stimulation and hedonism based on the results of the multidimensional scaling. The different position is supported by studies of Schwartz (e.g., Schwartz, 2012), wherein he states that the position of health can vary between cultures.

Figure 10 shows the refined continuum of human values by Schwartz (Schwartz et al., 2012) with the additional value health as well as with the theorized and empirically indicated distinction in **intrinsic values** and extrinsic values.

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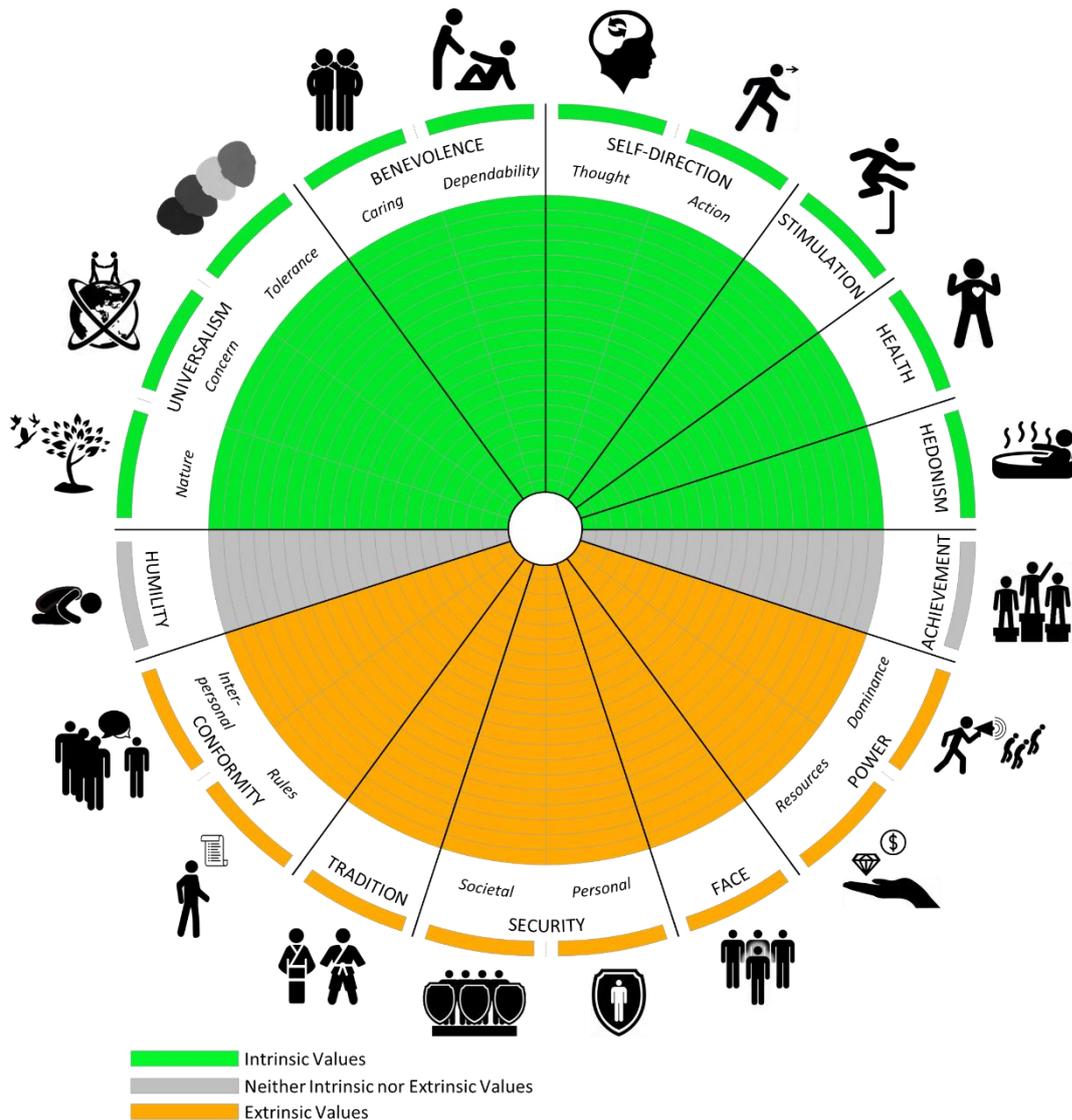


Figure 10: Refined universal continuum of human values by Schwartz (Schwartz et al., 2012; Cieciuch et al., 2014) in the adapted version by Hebllich & Terzidis (2016)

In this regard, the Portraits Value Questionnaire - Revised (PVQ-RR, Schwartz & Butenko, 2014), the most recent measurement instrument to measure the 19 distinct values with 57 items (3 items for each value), was adapted to a 60 items-version and then used by the author to measure intrinsic and extrinsic values in the scope of self-determination theory. It is recommended to conduct more empirical studies to validate the used distinction more broadly. An advantage of the universal continuum of human values to the model of aspirations by Grouzet et al. (2005) is that it covers

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more distinct life goals. With that, it allows for a more holistic view on an individual's degree of extrinsic or intrinsic life goal importance (see Figure 10).

Schultz & Ryan (2015) state that intrinsic and extrinsic aspirations/values of individuals can be measured and used to specify the “what” of healthy and effective self-regulation.

The degree of intrinsic aspirations/values orientation represents the “what” of healthy and effective self-regulation in the scope of SDT. It determines whether the motives of a person are closely connected to the satisfaction of psychological needs (as an important determinant of health).

2.7.5. Mindfulness (The „how“ of healthy and effective self-regulation)

The fourth concept of healthy and effective self-regulation in the scope of self-determination theory addresses how an individual can achieve to get autonomous motivation and intrinsic life goals to achieve psychological needs satisfaction.

Researchers in the scope of the self-determination theory argue that **a particular type of awareness facilitates autonomous motivation and intrinsic life goal importance** (Ryan et al., 2008; Schultz & Ryan, 2015). In SDT, this kind of awareness is called *mindfulness*. It is conceptualized as

“a receptive state of mind wherein attention, informed by a sensitive awareness of what is occurring at the moment, plainly observes internal (e.g., psychological and somatic experiences) and external events that are taking place” (Brown & Ryan, 2003; Kabat-Zinn, 2003 cited by Schultz & Ryan, 2015, p. 84).

Besides, it is often described as an awareness that is pre-reflexive and non-evaluative (Ryan et al., 2008; Schultz & Ryan, 2015). Seen as a metaphor, this quality can be illustrated as polishing a mirror, whereby a more polished mirror reflects what is in front of it without distortions such as thoughts and perceptions. Thus, mindfulness enables individuals to self-reflect in an open, non-judgmental, and observative way. This may allow individuals to get clarity on concepts such as personal values and personal strengths. Through this inner reflective clarity, one may more easily engage

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in autonomous behavior that is congruent with the true self compared to someone who is simply motivated by external pressures or internal distortions (Schultz & Ryan, 2015). Furthermore, this type of awareness can help individuals to realize that extrinsic life-goals are more distant from the basic psychological needs than intrinsic life goals. In other words, mindfulness could lead to a more intrinsic life-goal-selection as well as higher levels of psychological needs satisfaction and well-being (Schultz & Ryan, 2015).

The positive effects of mindfulness on autonomous regulation, intrinsic aspirations and psychological needs satisfaction are not only described theoretically but also empirically. Brown & Ryan (2003) show that mindfulness is positively related to autonomy. Moreover, the results of the study by Brown & Kasser (2005) point out that mindfulness is positively related to intrinsic aspirations. An empirical study by Brown & Ryan (2003) also indicates positive relations with the three basic psychological needs as well as well-being scales like vitality, self-actualization, and life satisfaction. Beyond that, the study shows negative relations with negative health conditions like anxiety and depression. Both studies are examples of the positive effects of mindfulness on effective and healthy self-regulation in the scope of SDT. Whereas mindfulness has been measured with the mindful attention awareness scale (MAAS) by Brown & Ryan (2003). There is an extensive body of studies that indicate more positive effects of mindfulness. Especially the experimental studies that analyze the positive effects of the eight-week mindfulness-based stress reduction (MBSR) program (Kabat-Zinn, 2013) indicate many positive effects of mindfulness for human functioning and well-being (e.g., Carmody, Baer, Lykins, & Olendzki, 2009), e.g. on emotion regulation (Goldin & Gross, 2010), anxiety, depression, heart disease, cancer and pain (Grossman, Niemann, Schmidt, & Walach, 2004) as well as on sleep disturbance, stress symptoms, mood disturbance, fatigue, and sleep quality (Carlson & Garland, 2005).

Schultz & Ryan (2015) state that the degree of mindfulness of individuals can be measured and used to specify the “how” of healthy and effective self-regulation.

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The degree of mindfulness represents the “how” of healthy and effective self-regulation. It determines whether a person has pre-reflexive awareness of inner and outer processes, which is said to help to get to the core of personal motivation.

2.7.6. Towards an integrated, yet open, empirical model of healthy and effective self-regulation

In this section, the pieces of healthy and effective self-regulation in the scope of SDT are put together to reach a more integrated view.

There are many papers in the scope of SDT that investigate single fragments of healthy and effective self-regulation or even larger parts. The highly cited (more than 25.000 citations to date in google scholar) paper “The ‘What’ and ‘Why’ of Goal Pursuits: Human Needs and the Self-Determination of Behavior” by Deci & Ryan (2000) is one of the papers that grasps a larger part of healthy and effective self-regulation in the scope of SDT. Besides their work, it is argued that there are two more recent papers in the scope of SDT that try to empirically derive an integrated model of healthy and effective self-regulation. Chronologically speaking the first paper is “Living well: A Self-Determination Theory Perspective on Eudaimonia” by Ryan et al. (2008). The second paper is “The “Why,” “What,” and “How” of Healthy Self-Regulation: Mindfulness and Well-Being from a Self Determination Theory Perspective” by Schultz & Ryan (2015). Both papers focus on similar constructs with slight, non-essential differences.

They present researched constructs in the scope of SDT and summarize them to an approach of healthy and effective self-regulation in the scope of SDT, which Ryan et al. (2008) label as an “integrated, yet open, empirical model”. They state that those constructs could be seen as grounded in a rather Aristotelean view on happiness (eudaimonia), but do also integrate aspects of a rather hedonic view on happiness on the level of well-being outcomes.

Ryan et al. (2008) and Schultz & Ryan (2015) state that three concepts of healthy and effective self-regulation, namely autonomous motivation, intrinsic life-goals and mindfulness, would lead to the satisfaction of the three psychological needs. Thus, the

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satisfaction of the three basic psychological needs would be seen as an outcome of the other three variables (see Figure 11).

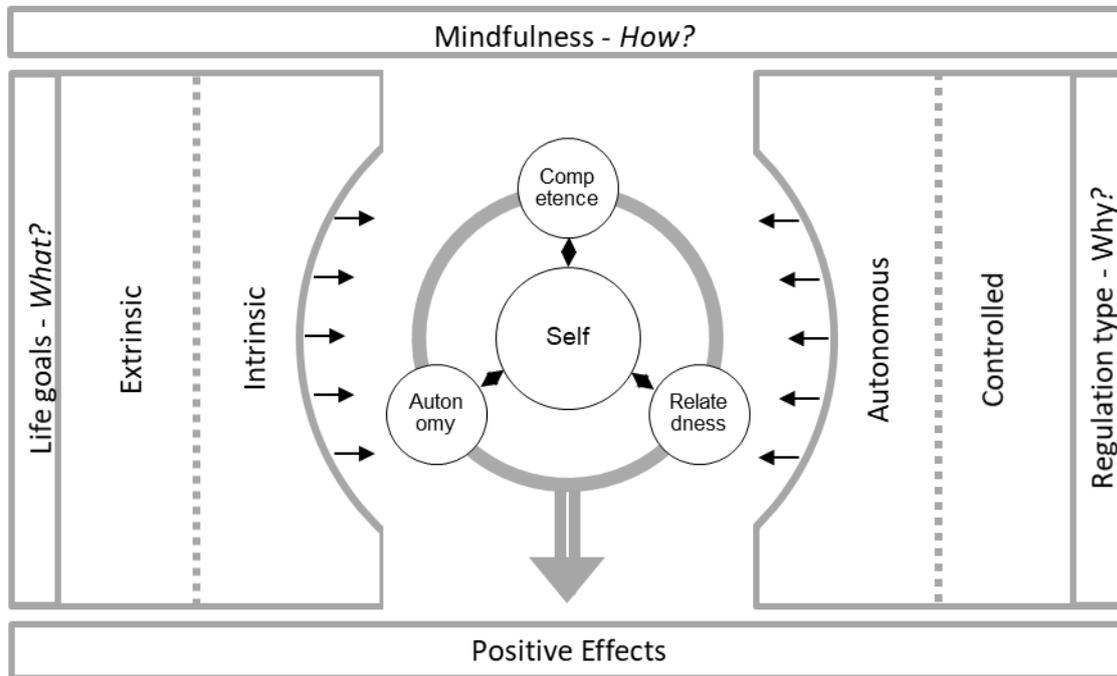


Figure 11: A basic model of healthy and effective self-regulation (own visualization based on Ryan et al., 2008 and Schultz & Ryan, 2015)

Beyond the four constructs mindfulness, life-goals, regulation type, and basic psychological needs, which are well-researched empirically, they also theorize other constructs to be important output variables in the context of healthy and effective self-regulation. They can be subdivided into variables that describe positive effects on the individual and positive effects on the societal level. On the individual level, they describe positive effects like higher levels of subjective and psychological well-being (Ryan et al., 2008). They explicitly emphasize positive affect and satisfaction with life (Diener et al., 2009) as two possible outcomes that could be subsumed under subjective well-being as well as meaning in life (Steger, Frazier, Oishi, & Kaler, 2006) and subjective vitality (Ryan & Frederick, 1997) that could be subsumed under psychological well-being (Ryan et al., 2008). On the societal level, they describe positive effects such as prosocial and ecological-friendly behavior (Ryan et al., 2008).

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Although the two summarizing papers by Ryan et al. (2008) and by Schultz & Ryan (2015) give a sound overview of essential variables of healthy and effective self-regulation in the scope of SDT, there is little empirical explanation of the specific causalities between the variable. Most of the causalities have not been empirically tested but mainly theoretically hypothesized. It is argued that it would be useful to empirically refine and test the integrative, yet open causal model of healthy and effective self-regulation in the scope of SDT. As far as the author of this dissertation overlooks the state of the art, this work is perceived as a valuable step towards a better understanding of the causalities between the psychological constructs. Subsequently, a validated causal model of healthy and effective self-regulation could be used as a motivational framework in further scientific studies. This could not only serve the purpose of having and using an integrated model of healthy and effective self-regulation with entrepreneurs, but it could also serve other contexts such as education, healthcare, organizations, and policy if they pursue the purpose of fostering individual effectiveness and health as well as global well-being.

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3.1. Research Problem

In the business context, entrepreneurs usually have to lead themselves and are rarely led by others. For this reason, research in the scope of motivation and self-regulation indicates that more than any other type of individuals in business, entrepreneurs have the challenge to develop and use processes of self-regulation that are effective and healthy (see chapter 2.4). Although research studies emphasize the **need for guidance for entrepreneurs on healthy and effective self-regulation**, the existing **research on self-regulation in the context of entrepreneurship is sparse and rather fragmented than integrated** (see chapter 2.5). Looking at the field of motivational psychology, the self-determination theory (SDT) is identified as a well-developed meta-theory of human motivation with a focus on self-regulatory processes. Thus, it is argued that this theory could be used as a solid framework to derive guidance on healthy and effective self-regulation for entrepreneurs (see chapter 2.6). Reviewing the self-determination theory (SDT) in detail, the main body of research is identified which adds to an integrated view on healthy and effective self-regulation and that could be applied in the context of entrepreneurship (see chapter 2.7). The study by Ryan et al. (2008), as well as the study by Schultz & Ryan (2015), provide a substantial overview of constructs and causations that depict healthy and effective self-regulation from SDT's perspective (see Figure 11). Ryan et al. (2008) label the body of constructs and causations as an integrated yet empirically open model. It is decided to take the next step and combine the constructs and causations to an integrated causal model and test it empirically. Given recent research studies, it is also argued that constructs and causal paths, which go beyond those that are emphasized by Ryan et al. (2008) and Schultz & Ryan (2015), could be added as refinement.

3.2. Research goal

The research goal is to **develop and test a causal model of healthy and effective self-regulation in the scope of SDT** that integrates the constructs suggested by Ryan

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et al. (2008) and Schultz & Ryan (2015) as well as relevant constructs from recent research in the field. It is argued that an empirically tested yet open causal model of healthy and effective self-regulation in the scope of SDT could support individuals and organizations in fostering health and effectiveness. **Entrepreneurs, whose work is characterized by a high degree of self-direction, could benefit from guidance derived from such a model.**

3.3. Research design

As the resulting causal model will have many constructs and causations, it would be difficult, if not impossible, to test the resulting model as a whole in an experimental setting. Therefore, it is decided to use the method of **structural equation modeling**. To conduct structural equation modeling, it is oriented on the eight steps that are proposed by Weiber & Mühlhaus (2014). As data, cross-sectional information is gathered with quantitative measurement instruments for each construct from a non-representative international sample of the general population. Of course, causality cannot be shown with cross-sectional data, but it can be used to investigate whether certain paths can be falsified. Given the remarks about structural equation modeling by Sheldon & Elliot (1999) as well as the methodological explanations about structural equation modeling by Weiber & Mühlhaus (2014) and by Homburg & Klarmann (2006), it is perceived as a promising approach to show hints for causalities in cross-sectional data and argue that it goes beyond the value of correlational analysis.

At this point, the first two of the **eight steps** proposed by Weiber & Mühlhaus (2014) will be described in detail, and the following steps broadly as setting hypotheses is already part of the method and will follow in the next chapter (see chapter 3.4). Steps three to eight will be described in detail in chapter 3.5.. In the **first step**, the hypothesized causal model is developed based on theoretical as well as empirical studies that were mainly made in the scope of SDT (see chapter 3.4). Therefore, the constructs and causations that are theorized by Ryan et al. (2008), as well as by Schultz & Ryan (2015) are integrated. Furthermore, the model is refined with constructs and causations from recent research results. In the **second step**, Weiber & Mühlhaus propose to conceptualize each construct. In chapter 3.4, it is done implicitly by

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defining and labelling each construct. The following steps will be described when being applied (chapter 3.5). However, a summary of the following steps is already given at this point. Suggestions for the use of specific quantitative measurements for each construct will be given (chapter 3.5.3), conducting SEM will be prepared (chapter 3.5.2 and 3.6.1), the model's global fit will be estimated and the model will be adapted, if necessary (see chapter 3.6.2.1), as well as local model fits will be tested and again the model adapted, if necessary (see chapter 3.6.2.2). As a result, a final causal model of healthy and effective self-regulation in the scope of SDT with good global as well as local model fit (see chapter 3.6.2.3) that can be used with entrepreneurs in particular is provided.

3.4. Hypotheses

3.4.1. Hypothesis 1: Mindfulness causes clarity about personal values, clarity about personal strengths, autonomy of goals, intrinsic values orientation as well as psychological needs satisfaction

Ryan et al. (2008) as well as Schultz & Ryan (2015) state that mindfulness represents the “how” of healthy and effective self-regulation. They underpin this statement by referring to empirical studies (e.g., Brown & Ryan, 2003) that indicate that mindfulness is positively related to intrinsic live goals (“what”), autonomy of goals (“why”), and the psychological needs satisfaction. The study by Schultz & Ryan (2015) also summarizes studies that indicate that there is also a causal direction between these variables. Those studies suggest that mindfulness can be seen as a pathway to autonomy of goals, intrinsic values orientation as well as psychological needs satisfaction (Schultz & Ryan, 2015). Therefore, it is hypothesized that mindfulness causes autonomy of goals, intrinsic values orientation as well as psychological needs satisfaction. Furthermore, based on Schultz & Ryan (2015) it is suggested that there is a reflexive state of mind that mediates the pre-reflexive state of mindfulness and the operationalization of self-determined inner drivers (autonomous goals). Based on Brown & Ryan (2003), Schultz & Ryan (2015) argue that mindfulness is associated with self-knowledge and self-insight (e.g. Silvia & Duval, 2001). Therefore, it is suggested that mindfulness could also cause higher levels of reflexive self-knowledge such as the

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recognition and knowledge of personal values, which is part of the construct of valued living of Trompetter (2014). Another important construct for reflexive self-knowledge could be strengths knowledge (Govindji & Linley, 2007). By that, mindfulness is not only seen as a pathway to get clarity about what is important to oneself but also as a pathway to get clarity about what one's unique combination of talents, acquired knowledge, and skills are. With this definition of strengths, it is built on the strengths concept by Buckingham & Clifton (2001). To have a more consistent wording throughout the constructs, it is referred to the recognition and knowledge of personal values, which belong to the valued living scale by Trompetter (2014), as *clarity about personal values* and to strengths knowledge by Govindji & Linley (2007) as *clarity about personal strengths*. We hypothesize that mindfulness causes clarity about personal values and clarity about personal strengths. Figure 12 illustrates all hypotheses.

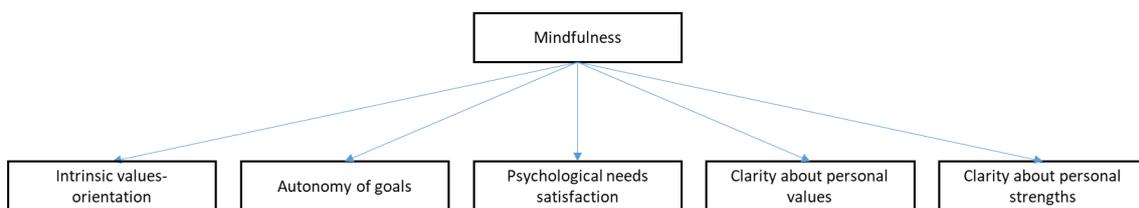


Figure 12: Hypothesized causal paths of hypothesis 1

3.4.2. Hypothesis 2: Clarity about personal values causes autonomy of goals

As it was already argued based on Schultz & Ryan (2015), it is suggested that clarity about personal values (Trompetter, 2014) as a construct of reflexive self-knowledge could be a mediator between mindfulness and the autonomy of goals. It is argued that mindfulness could lead to clarity about personal values and in consequence to more integrated, especially identified reasons for goal pursuit, whereas identified reasons are one specific part of the construct autonomy of goals. Thus, it is hypothesized that clarity about personal values causes autonomy of goals. Figure 13 illustrates all hypotheses and highlights the hypothesized causal paths of hypothesis 2.

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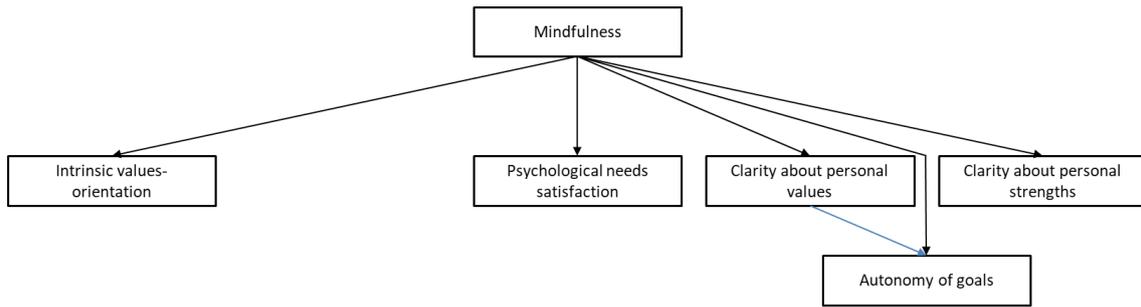


Figure 13: Hypothesized causal paths of the present hypotheses; hypothesis 2 highlighted

3.4.3. Hypothesis 3: Clarity about personal strengths causes autonomy of goals

As it was already argued based on Schultz & Ryan (2015), it is suggested that clarity about personal strengths (Govindji & Linley, 2007) as a construct of reflexive self-knowledge could be a mediator between mindfulness and the autonomy of goals. It is argued that clarity about personal strengths could also lead to more integrated reasons for goal pursuit. Although strengths are not specifically measured in the construct autonomy of goals as a reason for goal pursuit, they can be seen as well-integrated inner constructs. Therefore, it is hypothesized that clarity about personal strengths causes autonomy of goals. Figure 14 illustrates all hypotheses and highlights the hypothesized causal paths of hypothesis 3.

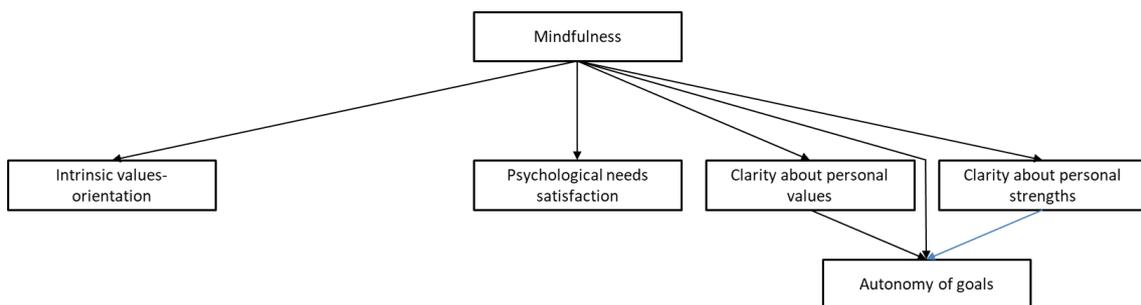


Figure 14: Hypothesized causal paths of the present hypotheses; hypothesis 3 highlighted

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3.4.4. Hypothesis 4: Intrinsic values-orientation causes ecological behavior, social behavior as well as psychological needs satisfaction

Referring to studies by Sheeran, Norman & Orbell (1999) and Butenko & Schwartz (2013) on attitudes/values-behavior fit, it is argued that so far the dimension of behavior is not sufficiently grasped by Ryan et al. (2008) as well as by Schultz & Ryan (2015). The study by Sheeran et al. (1999) in the scope of the theory of planned behavior (Ajzen, 1991) emphasizes that attitudinal intentions have a stronger relation to behavior than controlled intentions. Therefore, it is suggested that personal values lead to behavior that reflects those values and that this insight should be integrated into the causal model. To answer the question of how to integrate the results by Sheeran et al. (1999), an explanation based on Schwartz (2012) of how attitudes could be seen as related to values is given. Schwartz (2012, p. 16) defines attitudes as “evaluations of objects as good or bad, desirable or undesirable”. The underlying constructs for those evaluations would be personal values (Schwartz et al., 2012). Thus, it is suggested that personal values can determine personal attitudes and by that lead to behavior that reflects those values. This can also be supported by the study of Butenko & Schwartz (2013) that shows that personal values in the universal continuum of human values are strongly associated with referring dimensions of behavior. Therefore, intrinsic behavior is integrated to the model and it is also hypothesized that intrinsic values orientation causes intrinsic behavior. Furthermore, intrinsic values-orientation are seen as a construct that is similar to intrinsic aspirations as it is measured by Grouzet et al. (2005). Similar to intrinsic aspirations, intrinsic-values are specified as life goals that tend to be congruent with the human’s natural tendency to strive for psychological growth as well as individual and social integrity (e.g., Kasser & Ryan, 1996). Thus, it is hypothesized that intrinsic values orientation causes psychological needs satisfaction. Figure 15 illustrates all hypotheses and highlights the hypothesized causal paths of hypothesis 4.

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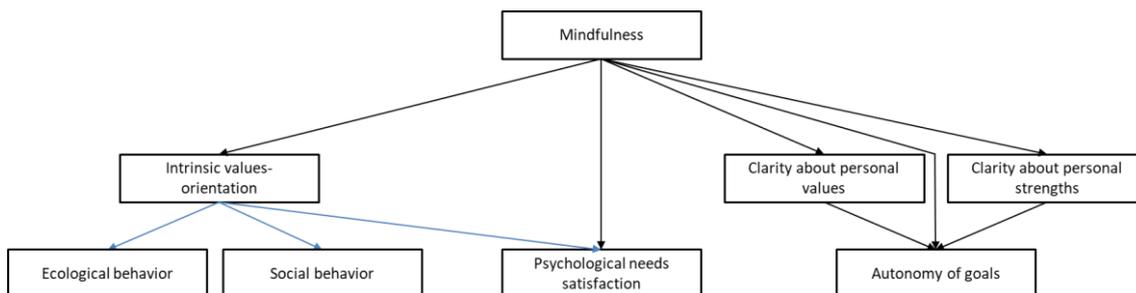


Figure 15: Hypothesized causal paths of the present hypotheses; hypothesis 4 highlighted

3.4.5. Hypothesis 5: Autonomy of goals causes ease of goal pursuit, values-behavior fit, strengths-behavior fit, effort into goal pursuit, goal progress as well as psychological needs satisfaction

The study by Sheldon & Elliot (1999) indicates that autonomy of goals causes sustained effort into goal pursuit, goal progress, and psychological needs satisfaction. Based on a recent mediational study about the ease of goal pursuit (Werner et al., 2016), it is argued that autonomy of goals also causes ease of goal pursuit. It is considered that the pursuit of autonomous goals, in other words goals that are motivated by authentic interests and personal values, could feel easier and more natural. Therefore, the hypothesis is made that autonomy of goals causes ease of goal pursuit and hence effort into goal pursuit. Besides, it is suggested based on studies about bridging the intention-behavior gap (e.g., Sheeran et al., 1999) in the scope of the theory of planned behavior (Ajzen, 1991) and a study about values-behavior congruence (Butenko & Schwartz, 2013), that autonomous goals could be seen as a type of intention (what Sheeran et al., 1999 call attitudinal intentions). Consequently, the identified reason for autonomous goals could be interpreted as a specification of values. Sheeran et al. (1999) show that attitudinal intentions are better predictors for behavior than controlled intentions. Thus, it is stated that autonomy of goals, which is similar to the concept of attitudinal intentions (especially the identified reason), could more frequently lead to behavior that is congruent with personal values. Therefore, it is hypothesized that autonomy of goals leads to values-behavior fit,

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which is measured based on one dimension of the concept of valued living by Trompetter (2014).

Based on a study about strengths knowledge and strengths use (Govindji & Linley, 2007), which shows a relation between strengths knowledge and strengths use, further suggestions that personal strengths could also be seen as a well-integrated reason for goal pursuit are considered. Although personal strengths are not specifically measured as one reason for goal pursuit in the construct autonomy of goals (see measures), it is suggested that autonomous goals also lead to behavior that encompasses more often the use of well-integrated constructs like personal strengths. As the construct strengths use measures how much individuals use their strengths in a variety of settings (Govindji & Linley, 2007), it is hypothesized that autonomy of goals causes strengths use, which is labelled as “strengths-behavior fit”. Figure 16 illustrates all hypotheses and highlights the hypothesized causal paths of hypothesis 5.

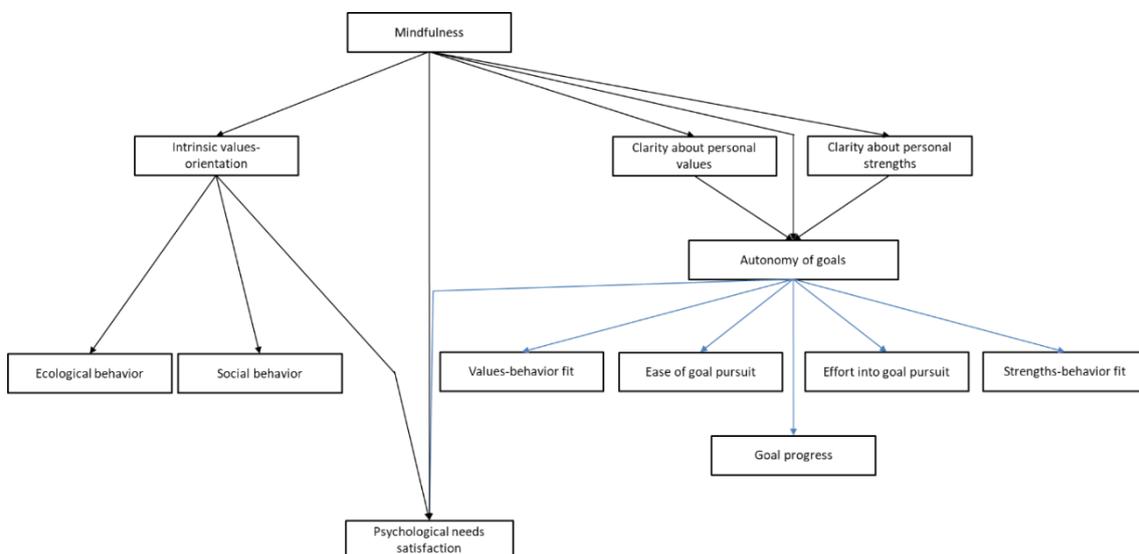


Figure 16: Hypothesized causal paths of the present hypotheses; hypothesis 5 highlighted

3.4.6. Hypothesis 6: Ease of goal pursuit causes goal progress

The mediational study by Werner et al. (2016) indicates that the ease of goal pursuit could be a mediator between autonomy of goals and goal progress. It is also argued

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that the pursuit of goals that are motivated by authentic interests and personal values could feel easier and more natural and thus lead to better goal progress. Given this argument, it is hypothesized that ease of goal pursuit causes goal. Figure 17 illustrates all hypotheses and highlights the hypothesized causal paths of hypothesis 6.

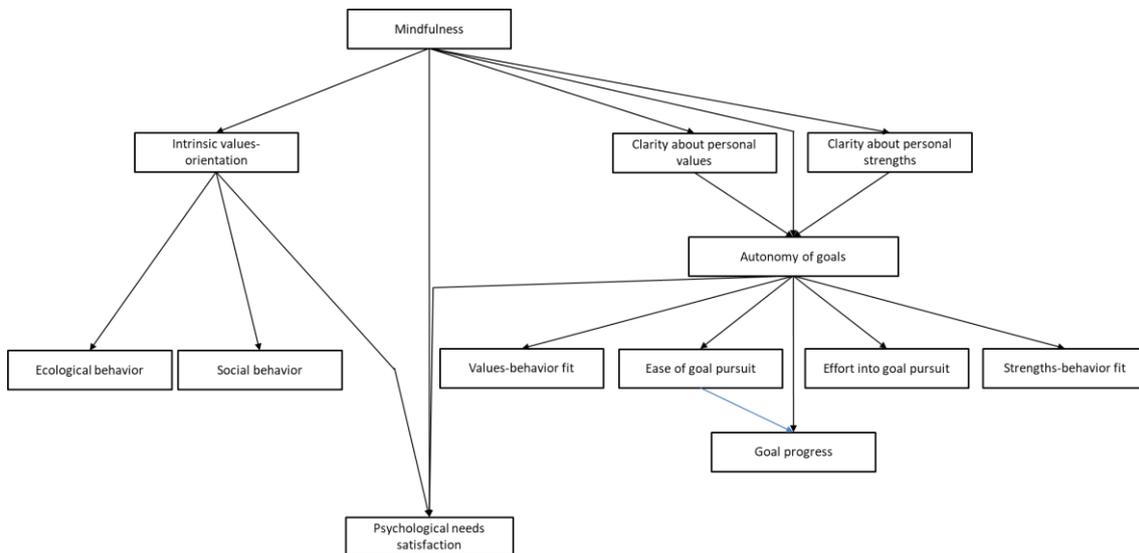


Figure 17: Hypothesized causal paths of the present hypotheses; hypothesis 6 highlighted

3.4.7. Hypothesis 7: Values-behavior fit causes goal progress

In reference to the study by Butenko & Schwartz (2013) about values-behavior congruence and a study by Sheeran et al. (1999) about bridging the intention-behavior gap through attitudinal intentions, it was suggested that intrinsic values could cause behavior that is congruent with those values. This was called intrinsic behavior. Furthermore, it is argued that the study by Sheeran et al. (1999) also implies that operationalized intentions (e.g. goals) proceed better (in the model “goal progress”) in case one has an attitudinal intention and by that has a stronger relation between intentions and behavior than one who has controlled intentions. It is considered that attitudinal intentions are similar to the construct of autonomous goals because goals are one type of intentions, and attitudes are based on personal values, which in turn are one dimension of autonomous goals. Thus, it is argued that attitudinal intentions (in the model part of “autonomous goals”) lead to behavior that is based on those intentions (in the model “values-behavior fit”) and finally lead to better fulfilment of

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those intentions (in the model “goal progress”). This is why it is suggested that values-behavior-fit could also be a mediator between goal autonomy and goal progress. It is hypothesized that values-behavior fit causes goal progress. Figure 18 illustrates all hypotheses and highlights the hypothesized causal paths of hypothesis 7.

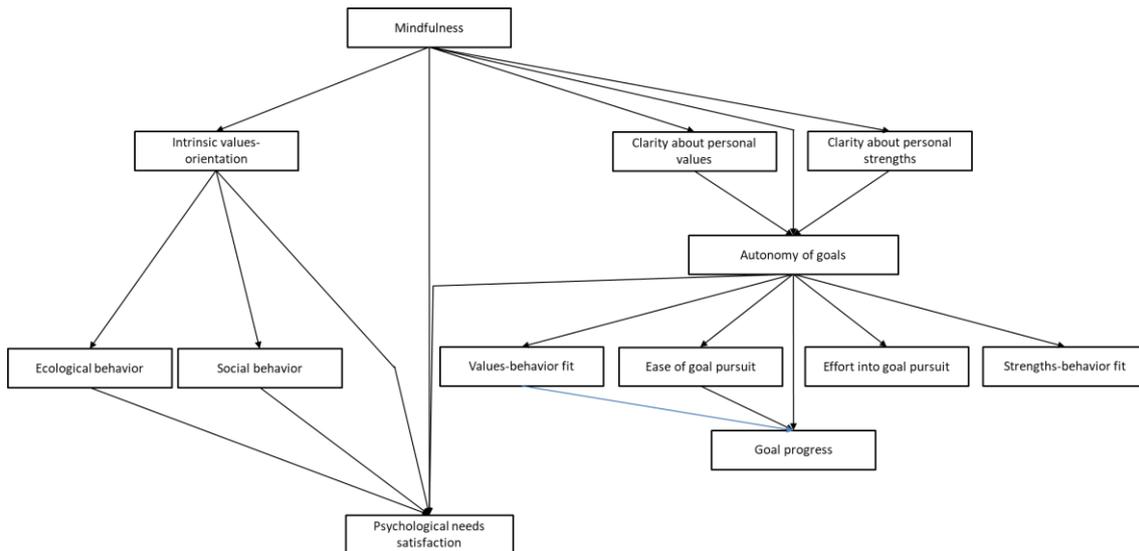


Figure 18: Hypothesized causal paths of the present hypotheses; hypothesis 7 highlighted

3.4.8. Hypothesis 8: Strengths-behavior fit causes goal progress

A study by Govindji & Linley (2007) indicates that strengths use has a strongly positive relation to the construct self-efficacy, whereas self-efficacy is defined as one’s belief in one’s ability to achieve goals (Bandura, 1997). It is argued that this could be interpreted in the way that the use of strengths helps to pursuit goals in a way that one is more effective. The experienced efficacy results in stronger belief in one’s ability to achieve goals. Based on this hypothesized causal chain, it is argued that by using personal strengths, defined as using the own unique combination of talents, acquired knowledge, and skills (Buckingham & Clifton, 2001), one can more easily overcome obstacles in the pursuit of goals and thus makes more progress. Therefore, it is hypothesized that strengths use, which is labelled for more consistent wording with the other constructs as “strengths-behavior fit”, causes goal progress. Figure 19

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illustrates all hypotheses and highlights the hypothesized causal paths of hypothesis 8.

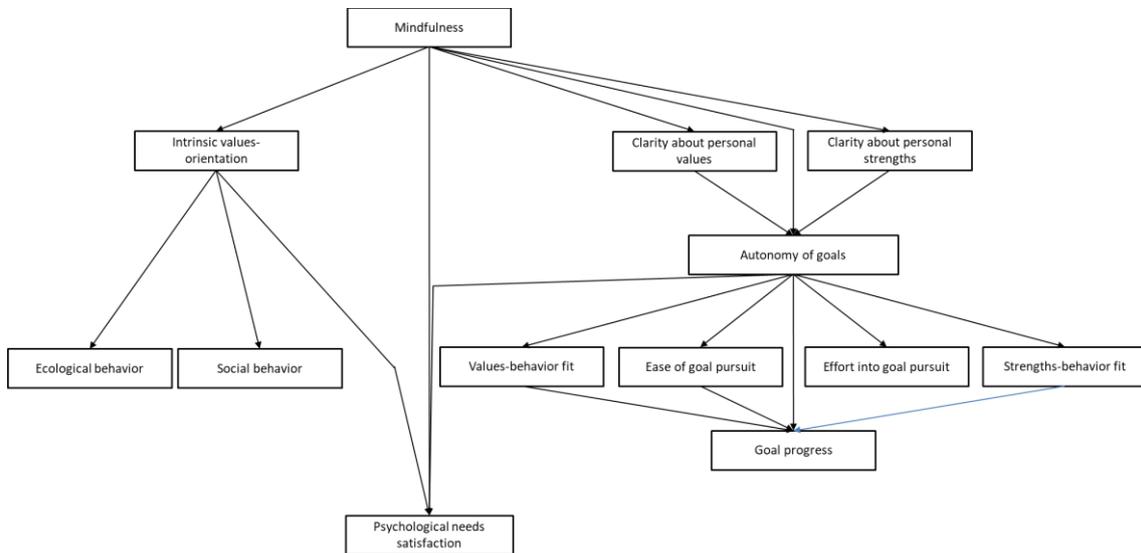


Figure 19: Hypothesized causal paths of the present hypotheses; hypothesis 8 highlighted

3.4.9. Hypothesis 9: Effort into goal pursuit causes goal progress

The study by Sheldon & Elliot (1999) suggests that sustained effort into goal pursuit mediates autonomy of goals and goal progress. Based on this indication, it is argued that a goal, in which one puts in more effort should on average lead to more progress. Thus, it is hypothesized that effort into goal pursuit causes goal progress. Figure 20 illustrates all hypotheses and highlights the hypothesized causal paths of hypothesis 9.

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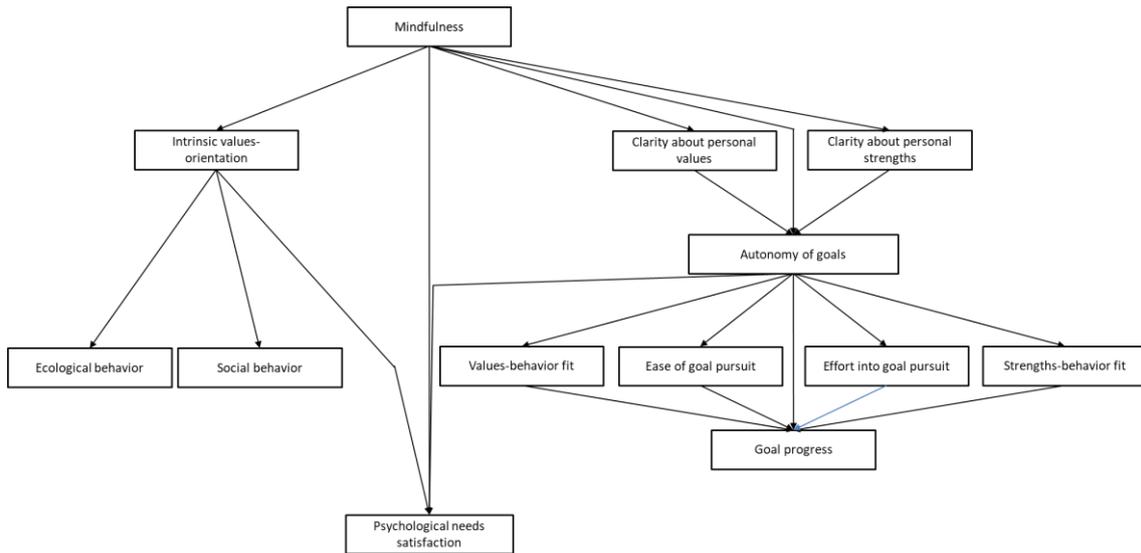


Figure 20: Hypothesized causal paths of the present hypotheses; hypothesis 9 highlighted

3.4.10. Hypothesis 10: Goal progress causes psychological needs satisfaction

The study by Sheldon & Elliot (1999) indicates through the method of structural equation modeling that goal progress leads to psychological needs satisfaction. However, a study by Sheldon & Kasser (1998) implies that the amount of increased well-being depends on the degree of “organismic congruence” (p. 1319), which recent studies would describe as autonomy of goals. Nevertheless, the results indicate a causal relationship between goal progress and psychological needs satisfaction, independent of the goal’s autonomy. Thus, it is hypothesized that goal progress causes psychological needs satisfaction. Figure 21 illustrates all hypotheses and highlights the hypothesized causal paths of hypothesis 10.

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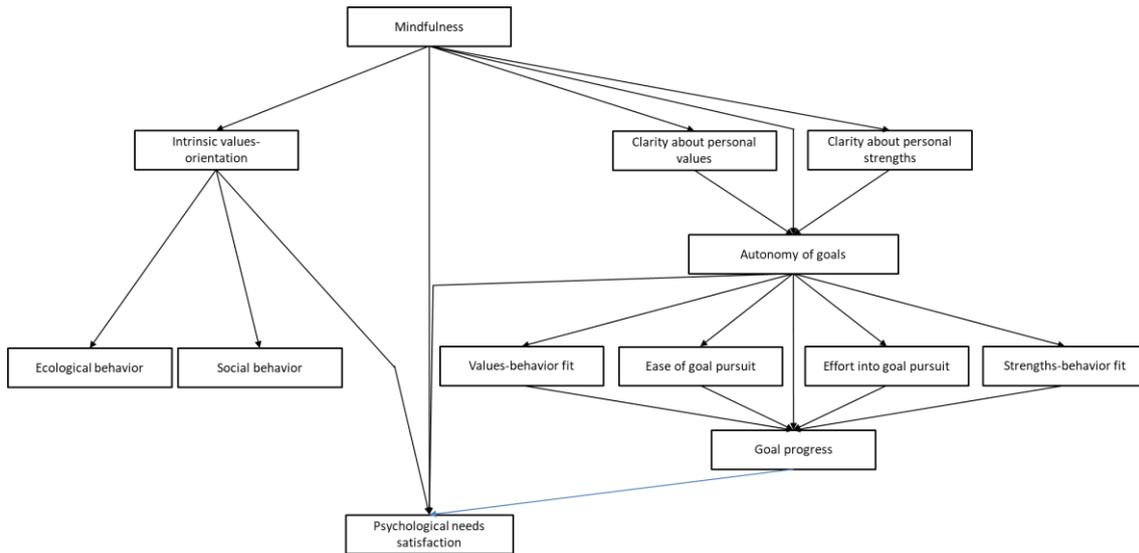


Figure 21: Hypothesized causal paths of the present hypotheses; hypothesis 10 highlighted

3.4.11. Hypothesis 11: Ecological behavior as one dimension of intrinsic behavior causes psychological needs satisfaction

Based on Grouzet et al. (2005) and Kasser & Ryan (1996), it was previously argued that intrinsic values orientation leads to psychological needs satisfaction. Furthermore, there is a body of studies (e.g., Brown & Kasser, 2005; Kasser, 2009; Kasser, 2016; Steger, Kashdan, & Oishi, 2008) that indicates that not only intrinsic values can lead to psychological needs satisfaction, but also intrinsic behavior. The results by Brown & Kasser (2005) and Kasser (2009) suggest that ecological behavior as a dimension of intrinsic behavior leads to higher levels of psychological needs satisfaction as well as higher levels of well-being. Given the central role of psychological needs satisfaction on well-being, which is described in the scope of SDT (Deci & Ryan, 2000, Ryan et al., 2008), it is argued that the positive effects of ecological behavior on well-being could be mediated through psychological needs satisfaction. Thus, it is hypothesized that ecological behavior causes psychological needs satisfaction. Figure 22 illustrates all hypotheses and highlights the hypothesized causal paths of hypothesis 11.

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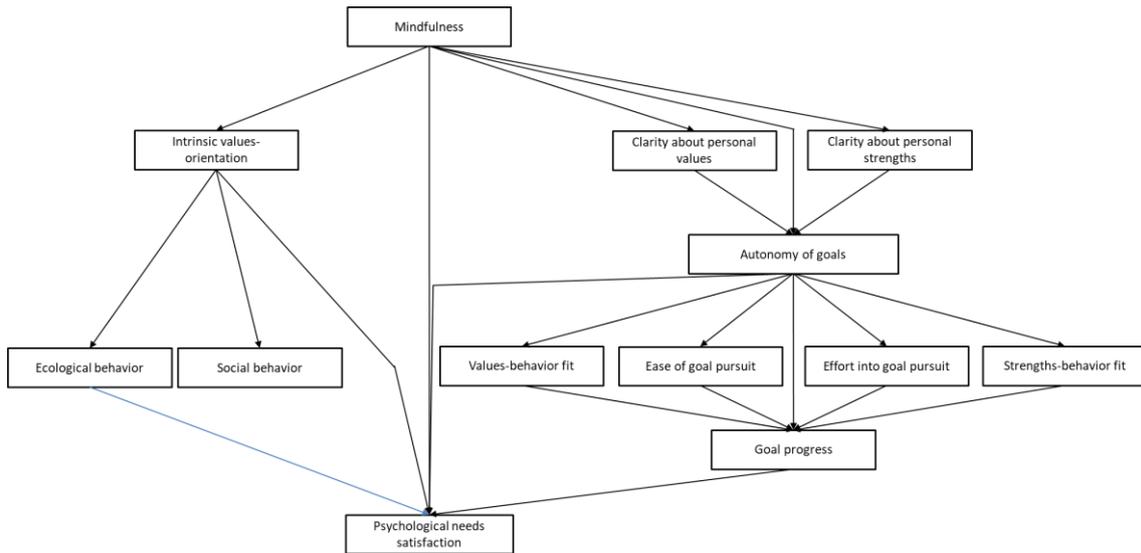


Figure 22: Hypothesized causal paths of the present hypotheses; hypothesis 11 highlighted

3.4.12. Hypothesis 12: Social behavior as one dimension of intrinsic behavior causes psychological needs satisfaction

The study by Steger et al. (2008) indicates that social behavior as a dimension of intrinsic behavior leads to higher levels of well-being. Based on Deci & Ryan (2000) as well as Ryan et al. (2008) it is argued that the positive effects of social behavior on well-being could be mediated through psychological needs satisfaction. Thus, it is hypothesized that social behavior causes psychological needs satisfaction. Figure 23 illustrates all hypotheses and highlights the hypothesized causal paths of hypothesis 12.

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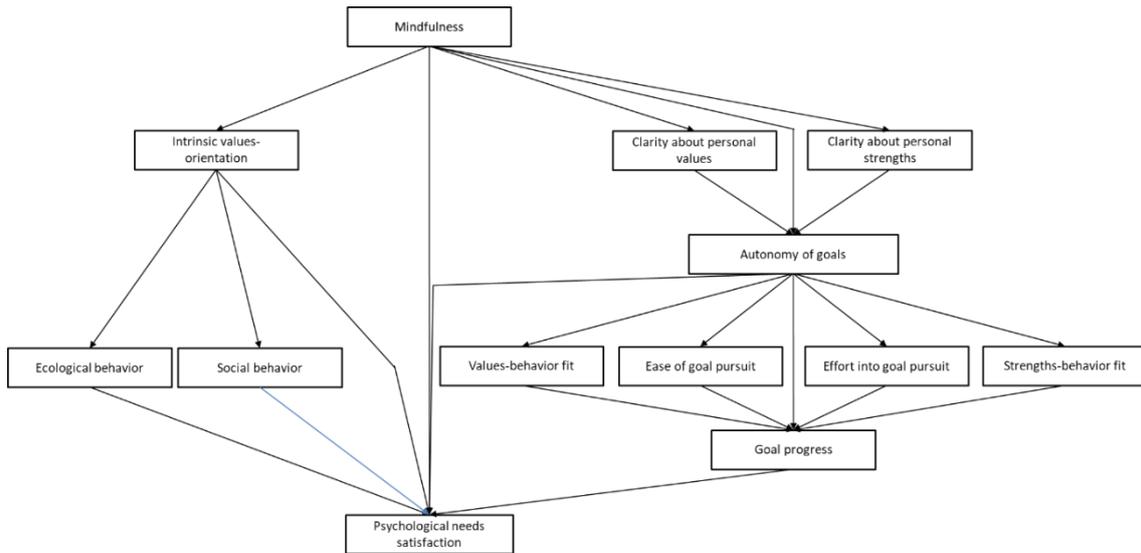


Figure 23: Hypothesized causal paths of the present hypotheses; hypothesis 12 highlighted

3.4.13. Hypothesis 13: Psychological needs satisfaction causes positive affect, satisfaction with life, meaning in life and subjective vitality

Ryan et al. (2008) describe subjective well-being and psychological well-being as possible outcomes of healthy and effective self-regulation in terms of SDT. They specify positive affect and satisfaction with life as two dimensions of subjective well-being as well as meaning in life and subjective vitality as two dimensions of psychological well-being. Based on the central role of psychological needs satisfaction in fostering well-being that is described in the scope of SDT (Deci & Ryan, 2000, Ryan et al., 2008), the positive effects on well-being is argued to be an aspect that could be mediated by the satisfaction of the psychological needs. Thus, it is hypothesized that the satisfaction of the psychological needs causes positive affect, satisfaction with life, meaning in life, and subjective vitality. Figure 24 illustrates all hypotheses and highlights the hypothesized causal paths of hypothesis 13.

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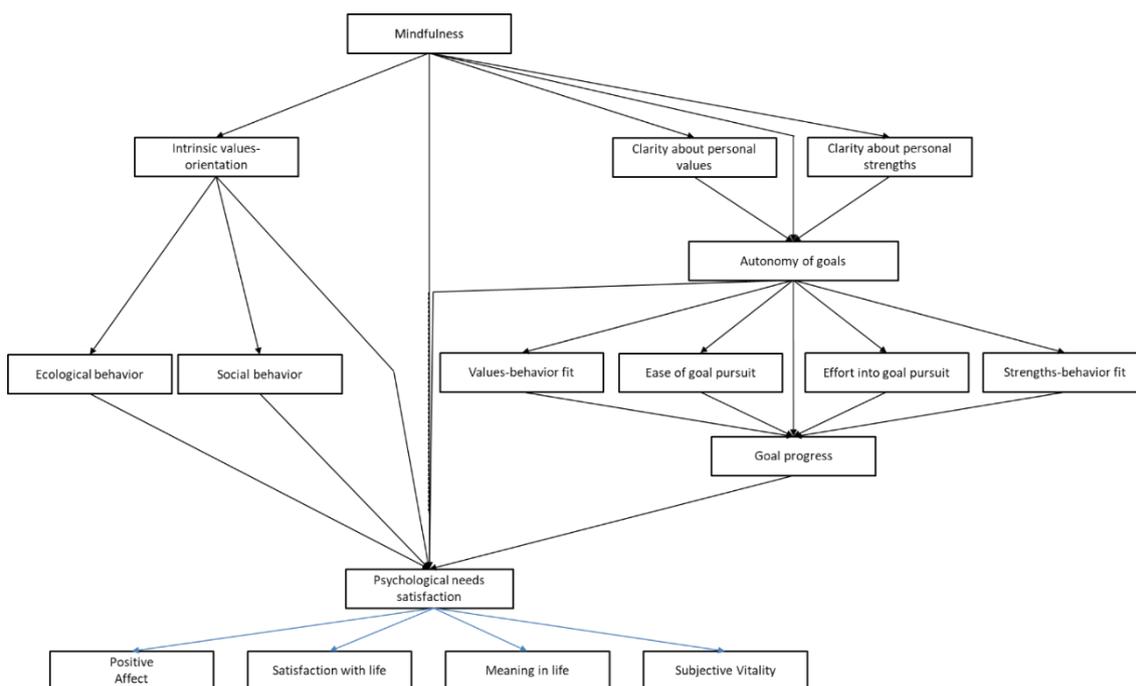


Figure 24: Hypothesized causal paths of the present hypotheses; hypothesis 13 highlighted

3.4.14. Overview of all hypothesized variables and causal paths as well as semantic categorization

The model is further divided into semantic parts (see Figure 25). Intrinsic values-orientation, clarity about personal values, and clarity about personal strengths are seen as constructs of reflexive self-knowledge. Autonomy of goals could be interpreted as the operationalization of one’s personal values, authentic interests, and as hypothesized of personals strengths through personal goals. It is argued that all four constructs describe well-integrated or intrinsic drivers of a person on the motivational level. That is why this category is labelled as “**Motivation**”. Intrinsic behavior, goal progress as well as the mediators between autonomy of goals and goal progress all refer to behavior. Those constructs are seen as the realization of motivation through behavior. Therefore, we label this part as “**Behavior**”. The right part, especially goal progress, is seen as a construct that reflects effective behavior on the individual level and the left part as effective behavior on the collective level. Therefore, the model’s title healthy and effective self-regulation not only encompasses underlying motivational drivers respectively output variables that are

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related to an individual's efficacy but also those that are related to collective efficacy, whereas collective efficacy is conceptualized as behavior that is prosocial or ecologically-friendly. Psychological needs satisfaction, as well as the well-being scales, could be labelled as psychological needs satisfaction and well-being. However, it is argued that "**Health**" could better depict the positive implications of the model. Although health conditions such as depression, loneliness, or anxiety, in particular are not measured, indirect positive indications are integrated through psychological needs satisfaction and the different well-being construct on healthy functioning. Thus, it is admitted that the label "Health" does not precisely represent the used constructs, but its implications. In doing so, the intention is to make the model more understandable for individuals outside the research domain as it is argued that positive effects on "Health" can be more easily understood than positive effects on psychological needs satisfaction and well-being. At last, "**Mindfulness**" is seen as its own semantic part that influences all other parts directly or indirectly. As it is described as being a pre-reflexive quality, it would not be subsumed under motivation, rather seen as a preceded construct.

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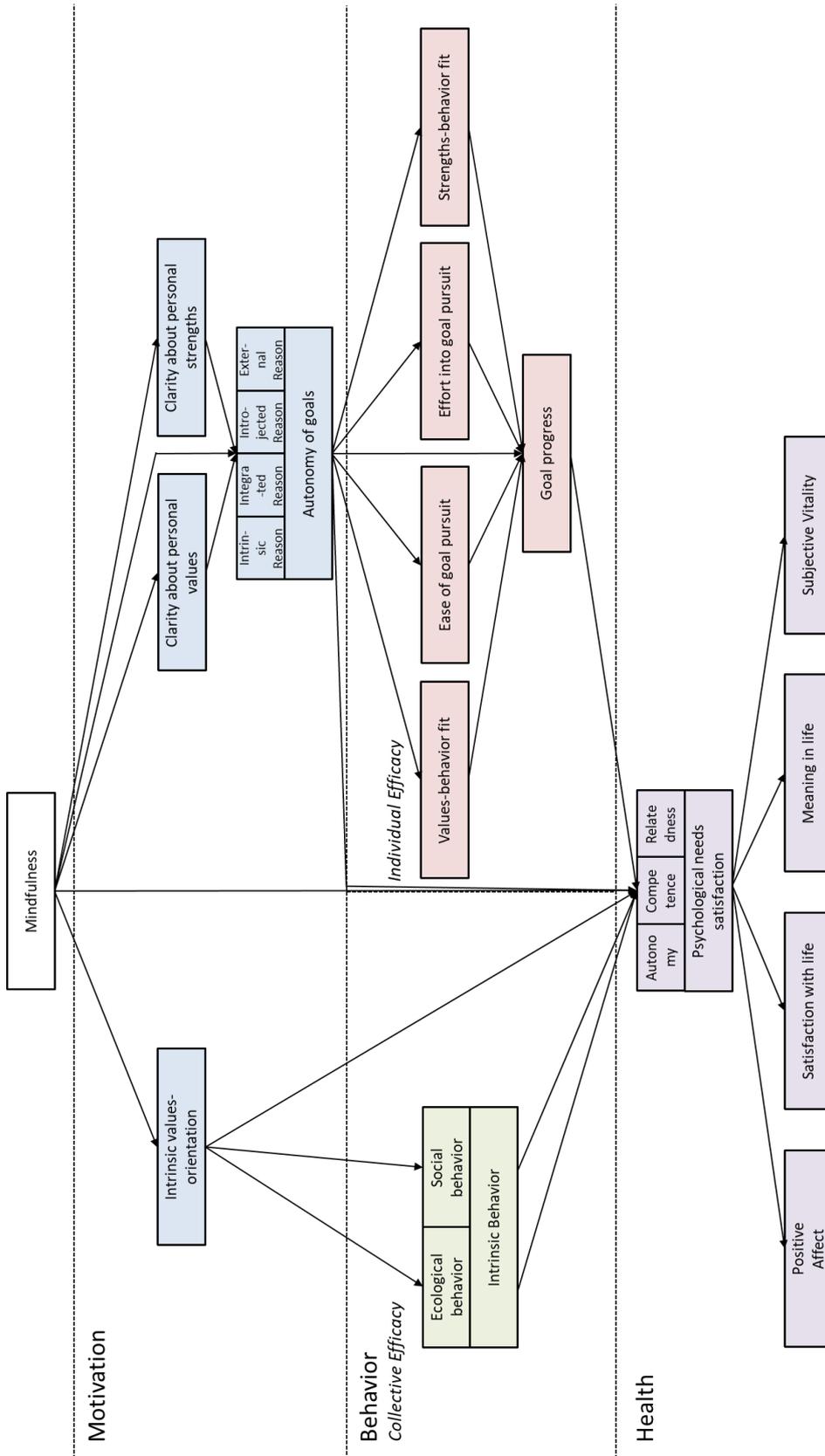


Figure 25: Hypothesized causal paths of the model of healthy and effective self-regulation with semantic division

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3.5. Method

3.5.1. Setting and Procedure

The cross-sectional data for structural equation modeling is gathered through a website that provides insights into one's personality based on an online questionnaire (www.findyourvalues.com). The online questionnaire integrates all measures as well as demographic questions. The questionnaire also contains control questions to verify whether the survey was conducted thoroughly by the participant. After conducting the questionnaire, each participant receives a personal evaluation, which includes, among other things, a visualization of the personal values as a result. Participants either complete the questionnaire self-selected or as part of a startup accelerator program. Similar to the website, the questionnaire is usable in English or German.

After we have built the hypothesized causal model and conceptualized all variables (chapter 3.4), we continue with the next steps that are suggested for **structural equation modeling** by Weiber & Mühlhaus (2014). The **third step** is to operationalize each construct of the causal model of healthy and effective self-regulation (see Figure 25). For the operationalization, we suggest and use the most recent quantitative measurement instrument (see chapter 3.5.3 "Measures"). As a **fourth step**, Weiber & Mühlhaus (2014) propose to test for validity and reliability of each construct's measurement instrument. As we mainly use instruments that were already tested for their validity and reliability in previous research, we do not test each instrument's validity and reliability in this study. In a **fifth step**, the data is prepared for the use of SEM by controlling true outliers (see chapter 3.5.2 "Sample") and testing all constructs for normal distribution (chapter 3.6.1 "Test for normal distribution"). In a **sixth step**, we estimate the model by using the maximum likelihood estimator and testing it for global model fit using CFI (Confirmatory Fit Index) and RMSEA (Root Mean Square Error of Approximation) (see chapter 3.6.2.1 "Global model fit and adaption"). In a **seventh step**, we evaluate and adopt the model based on modification indices to achieve a better global model fit (see chapter 3.6.2.1 "Global model fit and adaption"). In the **eighth step**, we test the model for local model fit (see chapter 3.6.2.2 "Local model fit and adaption") and make final adjustments based on the p-values of the regression

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coefficients to reach sufficient global and local model fit. As a result, we provide, as suggested by Weiber & Mühlhaus (2014), the global fit, the regression coefficients (direct effects), as well as indirect and total effects for the final model of healthy and effective self-regulation. Beyond that, we provide correlations between all variables that have been hypothesized to be causally related.

3.5.2. Sample

Our sample consists of N = 1,205 individuals. As we gathered the data via a website, we used control questions to test, whether the participants fill out the questionnaire thoroughly. In one question, we presented a paragraph to them which included the instruction to type in “online” in the answer field. Furthermore, we asked them to type in three personal goals (see “Measures”). Any person that did not answer the first question correctly and did not type anything reasonable into the answer fields for the three personal goals was excluded. This resulted in a reduced sample of N= 1,024 individuals. As we added the variables clarity about personal strengths and strengths-behavior fit to a later point in time, we only have N = 144 for those two variables. Referring to the total sample, 612 (59.8 %) did the German version of the questionnaire, whereas 412 (40.2 %) did the English questionnaire. 585 (57.2 %) were female and 439 (42.8 %) were male. Table 2 and Figure 26 show the range of age. Most participants (854; 83.4 %) are in the range of 16 years to 40 years of age.

Range of age	frequency	percentage	Cumulated percentage
11-15	34	3.3	3.3
16-20	148	14.5	17.8
21-25	301	29.4	47.2
26-30	226	22.1	69.2
31-35	114	11.1	80.4
36-40	65	6.3	86.7
41-45	39	3.8	90.5
46-50	37	3.6	94.1
51-55	28	2.7	96.9

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56-60	24	2.3	99.2
61-65	6	0.6	99.8
71-75	1	0.1	99.9
81-85	1	0.1	100.0
Overall	1,024	100.0	

Table 2: Participant's range of age

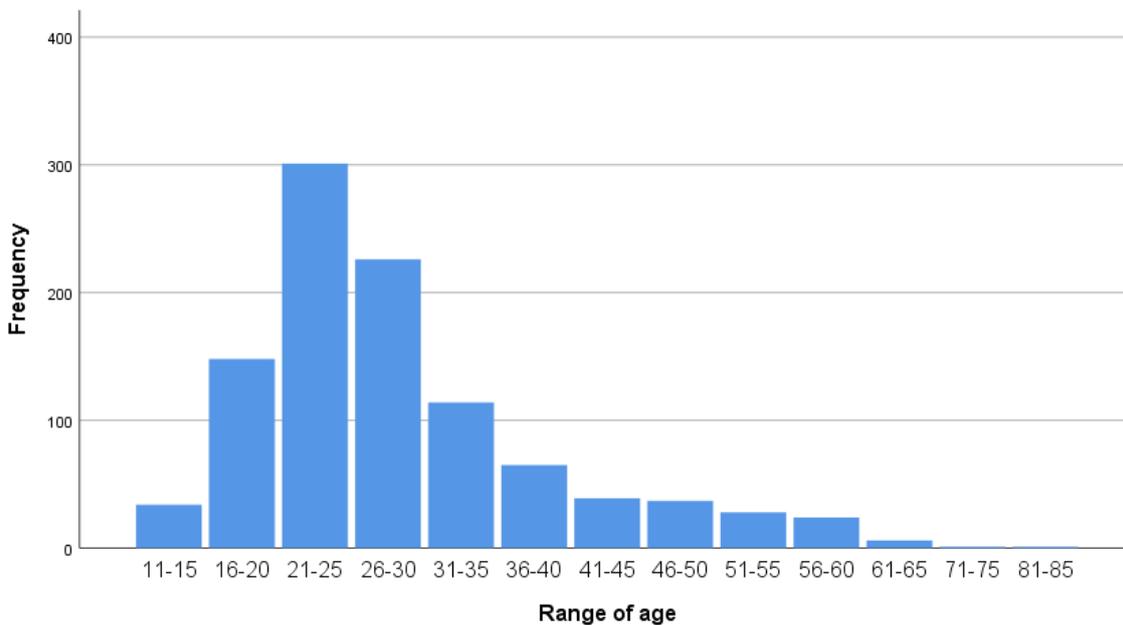


Figure 26: Range of age, histogram

Most participants live in Germany (632; 61.7 %). 365 (35.6 %) participants stated to live in other countries (see Table 3). By explaining the procedure of data gathering, we want to make a data-based guess about where these participants are from. At the beginning of gathering our data, we only provided four options for the place of living (Austria, Germany, Switzerland, and other country). However, at the end of the gathering, we realized that many individuals seem to be from other countries. Based on Google Analytics, most of them were either from India or the U.S.A.. Therefore, we added more countries (India, Malaysia, Nigeria, Pakistan, U.S.A.) as options at the end of our data gathering, which only the last 25 participants received. Given our Google Analytics data, we guess that most of the people who chose 'other country' are from the U.S.A., followed by India.

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Place of living	frequency	percentage
Austria	10	1.0
Germany	632	61.7
India	1	0.1
Malaysia	1	0.1
Nigeria	1	0.1
Pakistan	1	0.1
Switzerland	12	1.2
U.S.A.	1	0.1
Other country	365	35.6
Overall	1,024	100.0

Table 3: Participant's place of living

Concerning the type of employment, most of the participants are students (441; 43.1 %) followed by participants, who are employed for wages (285; 27.8 %) and participants, who are self-employed (120; 11.7 %) (see Table 4).

Type of employment	frequency	percentage
Apprentice	15	1.5
Employed for wages	285	27.8
Housemaker	14	1.4
Pensioner	3	0.3
Pupil	58	5.7
Self-employed	120	11.7
Student	441	43.1
Unemployed (no student, pupil or apprentice)	49	4.8
Working for military service or alternative (community) service	3	0.3
Other	36	3.6
Overall	1,024	100.0

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Table 4: Participant's type of employment

3.5.3. Measures

3.5.3.1. Mindfulness

The **Mindfulness Attention Awareness Scale (MAAS, Brown & Ryan, 2003)** is a 15-item scale that measures mindfulness on the dispositional and on the state level (Schultz & Ryan, 2015). It was developed in the scope of SDT by Brown & Ryan (2003). Participants were asked to answer how frequently or infrequently they currently have each experience (e.g., item 6: "I forget a person's name almost as soon as I've been told it for the first time."). They answer on a Likert scale from 1 (almost always) to 6 (almost never). To calculate a person's mindfulness, the mean of the 15 items is computed. Higher scores reflect higher levels of mindfulness (Brown & Ryan, 2003).

3.5.3.2. Clarity about personal values

To measure the clarity of personal values, four items of the **Valued living scale (Trompetter, 2014)** are used. The valued living scale measures "the recognition and knowledge of personal values as well as undertaking behavioral actions congruent with these values" (Trompetter, 2014, p. 74). Participants are asked to rate on a Likert scale from 1 (strongly disagree) to 6 (strongly agree) how much they agree with each of the statements. The four items that were included (e.g., item 1: "I have values that give my life more meaning") represent the recognition and knowledge of personal values and are the ones with the highest factor loadings (Trompetter, 2014). With the motivation to make the construct more precise, two items were added by the author ("I know my personal values" and "I have clarity about my deeply held values"). To calculate a person's clarity about personal values, the mean of the six items is computed. Higher scores reflect higher levels of clarity about personal values (based on Trompetter, 2014).

3.5.3.3. Clarity about personal strengths

To measure the clarity of personal strengths, four items of the **strengths knowledge scale (Govindji & Linley, 2007)**, are used. Participants are asked to rate on a Likert scale from 1 (strongly disagree) to 6 (strongly agree) how much they agree with each

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of the statements. The four items that were included (e.g., item 4: “I am aware of my strengths”) are chosen from the five items with the highest factor loadings of the construct. The item with the second-highest factor loading was excluded (“I know when I am at my best”) as the author remarks that it could be misinterpreted. To calculate a person’s clarity about personal strengths, the mean of the four items is computed. Higher scores reflect higher levels of clarity about personal strengths (Govindji & Linley, 2007).

3.5.3.4. Goal description

In line with Werner et al. (2016), participants are asked to list three personal goals. Because the author intends to ask about personal goals in the context of work, the construct of **personal strivings by Emmons (1986)** was adapted and the question formulated in the following way: “Please describe three things that you have explicitly or implicitly planned for your future career. In the following, those plans are called “goals””. The goal description serves as a basis to ask questions about goal autonomy, goal progress, and the hypothesized mediators.

3.5.3.5. Goal autonomy (self-concordance)

After each goal’s description, participants are asked questions to measure the goal’s degree of autonomy. Therefore, the four questions that were developed in the scope of SDT to assess an external, introjected, identified and intrinsic reason for the goal pursuit (e.g., intrinsic reason: “I pursue goal 1 because of the fun and enjoyment that it provides me.”) were integrated (Sheldon & Elliot, 1999; Sheldon, 2014). Participants again answer on a Likert scale from 1 (strongly disagree) to 6 (strongly agree). In line with **Sheldon & Elliot (1999)** a **relative autonomy index (RAI)** is calculated by averaging the intrinsic and identified reason with the reverse of the introjected and external scores over all three goals. Higher scores reflect higher levels of goal autonomy (Sheldon & Elliot, 1999).

3.5.3.6. Ease of goal pursuit

In line with **Werner et al. (2016)**, the **ease of goal-pursuit** is measured as a possible mediator between goal autonomy and goal pursuit. Therefore, participants are asked to answer on a Likert scale from 1 (strongly disagree) to 6 (strongly agree) how much

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they agree with the following statement for each of the three goals: “It is easy and natural for me to work on goal 1” (example for the question on goal 1 based on Werner et al., 2016). To assess the overall ease and naturalness of the pursued goals, the mean over the three goals is calculated. Higher scores reflect higher levels of ease and naturalness of the goals (Werner et al., 2016).

3.5.3.7. Values-behavior fit

To measure the degree of fit between personal values and behavior, that we call “values-behavior fit”, four items of the **Valued living scale (Trompetter, 2014)** are used. The valued living scale measures “the recognition and knowledge of personal values as well as undertaking behavioral actions congruent with these values” (Trompetter, 2014, p. 74). Participants are asked to rate on a Likert scale from 1 (strongly disagree) to 6 (strongly agree) how much they agree with each of the statements. The four items that were included (e.g., item 5: “I make choices based on my values, even if it is stressful”) represent the statements that measure undertaking of behavioral actions that are congruent with personal values (Trompetter, 2014). Only one item from the original scale was excluded (item 9: “I believe that how I behave fits in with my personal wants and desires”) because the author’s definition of personal values based on research by Schwartz (Schwartz, 1992; Schwartz et al., 2012) is not congruent with “wants and desires”. Personal values are rather seen as deeply held beliefs that are inextricably linked to affect and that can be seen as trans-situational goals (Schwartz, 2012). For the author, “wants” are more superficial goals and not necessarily linked to affect. To calculate a person’s degree of values-behavior fit, the mean of the six items is computed. Higher scores reflect higher levels of values-behavior fit (based on Trompetter, 2014).

3.5.3.8. Strengths-behavior fit

To measure the degree of fit between personal strengths and behavior, that we call “strengths-behavior fit”, four items of the **strengths use scale (Govindji & Linley, 2007)** were used. Participants are asked to rate on a Likert scale from 1 (strongly disagree) to 6 (strongly agree) how much they agree with each of the statements. The four items that were included (e.g., item 3: “I always try to use my strengths”) are the

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ones that have the highest factor loadings in the study by Govindji & Linley (2007). To calculate a person's degree of strengths-behavior fit, the mean of the six items is computed. Higher scores reflect higher levels of strengths-behavior fit (Govindji & Linley, 2007).

3.5.3.9. Effort into goal pursuit

In line with **Sheldon & Elliot (1999)**, we measure the **effort into goal pursuit** as a possible mediator between autonomy of goals and the goal progress. Therefore, participants were asked to answer on a Likert scale from 1 (strongly disagree) to 6 (strongly agree) how much they agree with the following statement for each of the three goals: "I work really hard to achieve goal 1" (example for the question on goal 1 based on Sheldon & Elliot, 1999). To assess the overall effort that one puts into the pursuit of all goals, the mean over the three goals is calculated. Higher scores reflect higher effort that was put into the pursuit of the goals (Sheldon & Elliot, 1999; Werner et al., 2016).

3.5.3.10. Goal progress

In line with **Sheldon & Elliot (1999)**, the **goal progress** was measured for each goal. Hereby, the author attempts to understand how effective one is in achieving personal strivings. Participants were asked on a Likert scale from 1 (strongly disagree) to 6 (strongly agree) how much they agree with the following statement for each of the three goals: "I make good progress toward goal 2" (example for the question on goal 1 based on Sheldon & Elliot, 1999). Higher scores reflect better goal progress (Sheldon & Elliot, 1999).

3.5.3.11. Intrinsic values orientation

Intrinsic values orientation is computed based on the **refined universal continuum of human values** by Shalom Schwartz (**Schwartz et al., 2012; Cieciuch et al., 2014**). The measurement instrument that is used is the refined Portraits Values Questionnaire Revised (PVQ-RR, Schwartz & Butenko, 2014). It measures the importance of 19 distinct values with 57 items. Each value's importance is measured through three items (Schwartz & Butenko, 2014). The version used in this study also includes the value of health as a separate value with three additional items. This is

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motivated by the study of Hebllich & Terzidis (2016), which indicates based on multidimensional scaling that the value of health seems to be a separate concept and not part of the value of personal security. In line with Schwartz et al. (2012), the 60 items represent statements about a person (e.g., item 1: “It is important to her to form her views independently”; one of three items that measure self-direction thought). Participants are asked to rate on a Likert scale from 1 (not like me at all) to 6 (very much like me) how much this person is like them or not. To compute the importance of a personal value, the mean of the three referring items is calculated. The relative importance of a personal value is calculated by subtracting the individual’s mean rating of all twenty personal values (Schwartz & Butenko, 2014). In line with Schwartz et al. (2012), we call this the centered value score. To measure intrinsic values orientation, one calculates the relative importance of intrinsic values. Based on the methodology in the aspiration index by Grouzet et al. (2005), the relative importance of intrinsic values respectively extrinsic values through averaging the referring centered values is calculated. For intrinsic values orientation, the average of the ten centered intrinsic values was calculated. For extrinsic values orientation, the average of the eight extrinsic values was calculated (see Figure 10). Higher scores reflect higher levels of intrinsic respectively extrinsic values orientation (based on Grouzet et al., 2005).

3.5.3.12. Intrinsic behavior

To measure whether a person with intrinsic values behaves in compliance with those values, it is decided to measure dimensions of intrinsic behavior. As it is intended to keep the overall questionnaire as short as possible, while grasping societal implications of the model of healthy and effective self-regulation as proposed by Ryan et al. (2008), only the two dimensions ecological behavior and social behavior as two dimensions of intrinsic behavior dimensions are integrated. This was operationalized through a measurement instrument that measures behavior in the same dimensions as the refined universal continuum of human values (Schwartz et al., 2012; Cieciuch et al., 2014). This measurement instrument is called the **Everyday Behavior Questionnaire (EBQ, Butenko & Schwartz, 2013)**. It is a measurement instrument

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that was developed by Butenko & Schwartz (2013) to measure the 19 personal values in the universal continuum of human values on the level of behavior. Each dimension of behavior represents the realization of a personal value through action. Each dimension of behavior is measured with four items. We included the four questions for the universalistic behavior “nature” as a representation for ecologically friendly behavior (e.g., “Avoid buying items that might harm the environment”) and the four questions for the universalistic behavior “concern” as a representation for social behavior (e.g., “Talk with someone about reducing inequality in society”). Participants were asked to estimate on a Likert scale from 0 (never) to 4 (always) how often they had engaged in each behavior during the past year relative to the number of times they had the opportunity to do so. Higher scores reflect higher levels of ecological friendly respectively social behavior (Butenko & Schwartz, 2013).

3.5.3.13. Basic psychological needs satisfaction

To measure the satisfaction of the three basic psychological needs, we use the **Psychological well-being scale (MIDUS – II, Ryff, 1989; Ryff & Keyes, 1995)**. The scale measures six dimensions of psychological well-being, which are autonomy, environmental mastery, personal growth, positive relations with others, purpose in life, and self-acceptance. Each dimension is measured with seven items. We only used three dimensions to measure the satisfaction of the basic psychological needs. In line with Brown & Ryan (2003), the need for autonomy is measured through the dimension autonomy, the need for competence is measured through the dimension of environmental mastery, and the need for relatedness is measured through the dimension of positive relations to others. Thus, the part of the scale applied encompasses 21 items (7 items for each need). Participants are asked to answer on a Likert scale from 1 (strongly disagree) to 6 (strongly agree) how much they agree with the presented statements (e.g., item 1: “I am not afraid to voice my opinions, even when they are in opposition to the opinions of most people.”, one of seven items that measure autonomy). The scale also includes items that are reversed (e.g., item 3: “I tend to be influenced by people with strong opinions.”, one of seven items that measure autonomy) (Ryff, 1989; Ryff & Keyes, 1995). To compute the need satisfaction

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for one need, the mean of the referring 7 items is calculated. Higher scores reflect higher levels of need satisfaction in the referring dimension. To compute an overall basic psychological needs satisfaction, the mean of all 21 items is calculated. Ryff (1989) does not use the mean but the sum to calculate the single dimensions and the overall value: However, the mean is taken to have similar ranges of numbers to our other scales, especially the four other well-being scales in use.

Another well-known and frequently used scale to measure psychological needs satisfaction is the Basic Needs Satisfaction in General – Scale (BNSG-S, Deci & Ryan, 2000). The use of this scale could be seen by many researchers as the first choice to measure the three basic psychological needs as it was developed by the founders of SDT, Richard Ryan and Edward Deci. However, empirical studies indicate weaknesses of the scale. Johnston & Finney (2010) show, that there is no model fit for a three-factor model as well as low external validity. Sheldon & Hilpert (2012) conducted a confirmatory factor analysis with the BNSG-S, which indicates that some items do not fit the three-factor model (Johnston & Finney, 2010; Sheldon & Hilpert, 2012). Based on these results, Sheldon & Hilpert (2012) developed the balanced measure of psychological needs (BMPN). This scale has a better fit in a three-factor model. However, it is stated that the used items conceptualize the need for autonomy mainly in the sense of independence (e.g., item 4: “There were people telling me what I had to do.” (Sheldon & Hilpert, 2012). Ryan & Deci (2013) expressively emphasize that the need for autonomy is not similar to independence (see also chapter 2.1.3.). In line with Brown & Ryan (2003) the scale by Ryff (1989) is used. It is stated that it better fits for autonomy in particular because it not only encompassed items that could be subsumed under independence but also items that measure what Ryan & Deci (2013) call “wholeheartedness” behind the behavior, regardless of whether one is independent in the situation (e.g., item 7: “I judge myself by what I think is important, not by the values of what others think is important.”) (Ryff, 1989; Ryff & Keyes, 1995).

3.5.3.14. Positive Affect

To measure positive affect as the relation of positive feelings to negative feelings, the Scale for **Positive And Negative Experience (SPANE, Diener et al., 2009)** is used.

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This scale is one of two constructs that can be subsumed under the concept of subjective well-being (Diener et al., 1985, Diener, 2000). It comprises 12 items. Participants are asked to answer on a Likert scale from 1 (Never or very rarely) to 5 (very often or always) how much they experienced each of the presented feelings in the past four weeks. Six questions represent the experience of negative feelings (e.g., item 6: "... I had unpleasant feelings.") and six questions represent the experience of positive feelings (e.g., item 5: "... I had pleasant feelings) (Diener et al., 2009). Positive affect represents the relation of experienced positive feelings to negative feelings. The overall positive affect of a participant is calculated by averaging the six experienced positive feelings with the reversed average of the six experienced negative feelings (Diener et al., 2009). Higher scores reflect higher levels of positive affect (Diener et al., 2009).

3.5.3.15. Satisfaction with life

To measure satisfaction with life, the **satisfaction with life scale is used (SWLS, Diener et al., 1985; Kobau, Snizek, Zack, Lucas, & Burns, 2010)**. Beside positive affect, it is the second dimension of the concept of subjective well-being (Diener et al., 1985, Diener 2000). The scale comprises five items. Participants are asked to answer on a Likert scale from 1 (strongly disagree) to 7 (strongly agree) how much they agree with each item (e.g., item 3: "I am satisfied with my life") (Diener et al., 1985, Kobau et al., 2010). The overall satisfaction is computed by calculating the mean of all five items. Higher scores reflect higher levels of satisfaction with life (Diener et al., 1985, Kobau et al., 2010).

3.5.3.16. Meaning in life

As one of two measures of a deep psychological level of well-being, the **meaning in life scale (Steger et al., 2006)** is integrated. The scale encompasses ten items. Five items measure the presence of meaning in life and another five items the search of meaning in life. This work focuses on the five items that measure the presence of meaning in life (e.g., item 1: "I understand my life's meaning). Participants answer on a Likert scale from 1 (strongly disagree) to 7 (strongly agree) how much they agree with the statements. To assess the overall presence of meaning in life the mean over the

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five items is calculated, whereas the score of item five gets inverted (item five: “my life has no clear purpose”) as it was negatively formulated. Higher scores reflect higher levels of presence of meaning in life (Steger et al., 2006).

3.5.3.17. Subjective vitality

The second scale that measures well-being on a deep psychological level is the **subjective vitality scale (Ryan & Frederick, 1997)**. It measures how frequently one feels full of energy. The scale originally encompasses seven items. However, Bostic, Rubio, & Hood (2000) empirically find weaknesses concerning the validity of two items. Therefore, those items are excluded. The resulting scale encompasses five items. Participants are asked on a Likert scale from 1 (strongly disagree) to 7 (strongly agree) to indicate how much they agree with each statement when concerning their feelings in the last four weeks. To assess the overall vitality of a participant, the mean of all five items is calculated. Higher scores reflect higher levels of subjective vitality (Ryan & Frederick, 1997).

3.6. Results

3.6.1. Test for normal distribution

In accordance with Weiber & Mühlhaus (2014), a univariate normal distribution is tested, to apply structural equation modeling. Therefore, it was started by using the Kolmogorov-Smirnov and the Shapiro-Wilk test. The null hypothesis of the Kolmogorov-Smirnov test as well as of the Shapiro-Wilk test assumes that the answers are normally distributed for the referring construct. Therefore, the null hypothesis must be rejected if $p < .05$. The results (see Table 5) indicate that some constructs might not be normally distributed (clarity about personal values, clarity about personal strengths, ease and naturalness of goal pursuit, values-behavior fit, strengths behavior fit, effort into goal pursuit, goal progress, ecological behavior, social behavior, subjective vitality, and meaning in life).

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Construct	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Statistics	df	Significance	Statistics	df	Significance
Mindfulness	0.052	133	.200*	0.992	133	0.644
Clarity_about_personal_values	0.087	133	0.016	0.960	133	0.001
Clarity_about_personal_strengths	0.122	133	0.000	0.939	133	0.000
Autonomy_of_goals	0.058	133	.200*	0.990	133	0.413
Intrinsic_values_orientation	0.058	133	.200*	0.991	133	0.594
Ease_of_goal_pursuit	0.085	133	0.020	0.972	133	0.008
Values_behavior_fit	0.133	133	0.000	0.957	133	0.000
Strengths_behavior_fit	0.080	133	0.036	0.963	133	0.001
Effort_into_goal_pursuit	0.096	133	0.004	0.961	133	0.001
Goal_progress	0.073	133	0.078	0.969	133	0.004
Ecological_behavior	0.085	133	0.019	0.966	133	0.002
Social_behavior	0.103	133	0.002	0.970	133	0.005
Autonomy	0.091	133	0.008	0.990	133	0.494
Competence	0.061	133	.200*	0.992	133	0.685
Relatedness	0.069	133	.200*	0.990	133	0.495
Overall_needs_satisfaction	0.060	133	.200*	0.985	133	0.160
Positive_Affect	0.060	133	.200*	0.989	133	0.357
Satisfaction_with_life	0.049	133	.200*	0.984	133	0.109
Subjective_vitality	0.083	133	0.025	0.967	133	0.002
Meaning_in_life	0.081	133	0.032	0.968	133	0.003

*. This is the lower limit for true Significance.

a. correction of significance in line with Lilliefors

Table 5: Test for univariate normal distribution based on Kolmogorov-Smirnov and Shapiro-Wilk test

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Weiber & Mühlhaus (2014) state that for conducting SEM it is not necessary to have a strictly normal distribution as it is tested with the Kolmogorov-Smirnov test or the Shapiro-Wilk test. According to Weiber & Mühlhaus (2014), the normal distribution for SEM can also be tested with the critical ratios (c.r.) of the univariate kurtoses. A strictly normal distribution respectively a moderately normal distribution has a cutoff level of $c.r. < 1,96$ respectively $c.r. < 2,57$. They argue based on Browne (1982) that it is sufficient to test the critical ratios of the kurtoses on univariate for moderate normal distribution. Table 6 shows the critical ratios on the univariate and multivariate level. Weiber & Mühlhaus (2014) suggest to also test for moderately multivariate normal distribution. This can be done based on the multivariate kurtosis. The multivariate kurtosis is calculated with the mardia's coefficient. Table 6 excludes the constructs clarity about personal strengths and strengths-behavior fit because they have missing data and thus AMOS is not able to provide results for those two variables.

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Construct	min	max	skew	c.r.	kurtosis	c.r.
Mindfulness	1.067	6.000	-.152	-1.985	-.317	-2.072
Clarity_about_personal_values	1.000	6.000	-.415	-5.420	-.602	-3.934
Autonomy_of_goals	-4.333	5.000	-.189	-2.463	-.073	-.478
Effort_into_goal_pursuit	1.000	6.000	-.424	-5.536	-.249	-1.625
Values_behavior_fit	1.000	6.000	-.552	-7.212	-.027	-.174
Ease_of_goal_pursuit	1.000	6.000	-.374	-4.883	-.361	-2.356
Goal_progress	1.000	6.000	-.344	-4.491	-.275	-1.797
Intrinsic_values_orientation	-.850	1.933	.087	1.142	.198	1.295
Overall_needs_satisfaction	1.524	5.762	-.278	-3.631	-.293	-1.912
Subjective_vitality	1.000	7.000	-.240	-3.135	-.787	-5.141
Meaning_in_life	1.000	7.000	-.238	-3.110	-.991	-6.473
Satisfaction_with_life	1.000	7.000	-.342	-4.469	-.643	-4.202
Positive_Affect	-4.000	4.000	-.308	-4.021	-.444	-2.899
Social_behavior	.000	4.000	-.146	-1.909	-.699	-4.569
Ecological_behavior	.000	4.000	.035	.459	-.635	-4.145
Multivariate					27.822	19.712

Table 6: Test for univariate and multivariate normal distribution based on the critical ratios of univariate and multivariate kurtoses

The data show that there are violations of the cut-off rule of $c.r. < 2.57$ on the univariate as well as the multivariate level. Gao, Mokhtarian, & Johnston (2008) argue that one possibility to reach a univariate and multivariate normal distribution is to delete true outliers. However, they suggest that deleting those outliers should be balanced

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against the loss of model power in the interpretation of the results. They have shown in many data sets they reference that the violation of the cut-off levels similar to this study's data rarely leads to changes in the global and local fit. They state that in case true outliers were identified and already excluded, a multivariate kurtosis of 28.78 and a critical ratio of 28.56 does rarely lead to a misinterpretation of results when comparing it with data in which more observations were deleted to achieve a normal distribution. As some control questions are already used to identify and then delete the participants that did not seem to answer the questions thoroughly, it is decided to keep all remaining observations. Thus, it is admitted having violations of univariate and multivariate normal distributions. However, those violations are allowed for structural equation modeling as it is expected to achieve results that are closer to reality. Hereby it is argued in reference to Gao et al. (2008) that this can still lead to valid results. As the correlations between the hypothesized causal paths are also provided, it is decided to use the Spearman correlation coefficient and not the Pearson correlation coefficient. The Spearman correlation coefficient is the coefficient to use if data may not be normally distributed.

3.6.2. Structural equation modeling

3.6.2.1. Global model fit and adaption

Before each hypothesis can be tested based on the regression coefficients and the referring p-values, test the model has to be tested for global fit and adjusted accordingly, if necessary, based on modification indices. With regard to the suggestions by Weiber & Mühlhaus (2014), the model is tested (see Figure 25) for global fit by using the comparative fit index (CFI) as well as the root mean squared error of approximation (RMSEA). Homburg & Klarmann (2006) argue based on Browne & Cudeck (1993) as well as on Schermelleh-Engel, Moosbrugger, & Müller (2003) that $RMSEA < 0.05$ can be interpreted as good model fit and $RMSEA < 0.1$ as acceptable model fit. CFI should be > 0.9 .

Testing the model as a structural equation model (see Figure 27) with the proposed global fit indices, there is a poor model fit of $CFI = 0.548$ and $RMSEA = 0.175$. In alignment with Homburg & Klarmann (2006) and Weiber & Mühlhaus (2014), it is

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argued that a better model fit could be attained by making reasonable adjustments in the model and integrating them into our theory. These changes are implemented mainly based on the modification indices in SPSS. In doing so, one can achieve the highest probability to reach a better model fit with only a few reasonable adjustments (Homburg & Klarmann, 2006; Weiber & Mühlhaus, 2014). For every change made, a short explanation is provided for why it is a reasonable adoption of the model. Furthermore, the implications for the hypothesized model are discussed in detail in the chapter “summary of results”, which is part of the final discussion chapter.

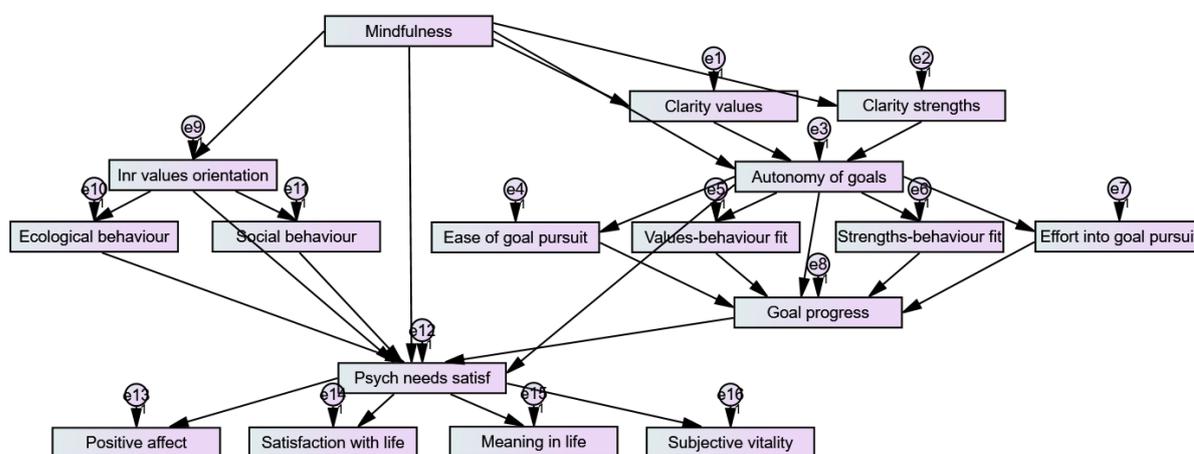


Figure 27: Structural equation model of the hypothesized causal model.

The highest modification index is between the error of clarity about personal values and the error of values-behavior fit (M.I.= 378,878). This appears as reasonable because both constructs’ origin is the valued living scale by Trompetter (2014). Clarity about personal values reflects “the recognition and knowledge of personal values as well as undertaking behavioral actions congruent with these values” (Trompetter, 2014, p. 74). Values-behavior fit reflects undertaking of behavioral actions that are congruent with personal values. Based on the theory of planned behavior, it is argued that clarity about personal values may foster attitudinal intentions (Sheeran et al., 1999) which have to be shown to have a stronger relation to congruent behavior than controlled intentions. Thus, it is suggested that a causal relation between clarity about personal values and values-behavior fit is most reasonable. Individuals who have clarity about their personal values may have more attitudinal intentions, which could

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lead to behavior that fits those values/attitudes. Therefore, a causal path from clarity about personal values directly to values behavior fit is included. With this change (see Figure 28), there is a model fit of CFI = 0.548 and RMSEA = 0.153.

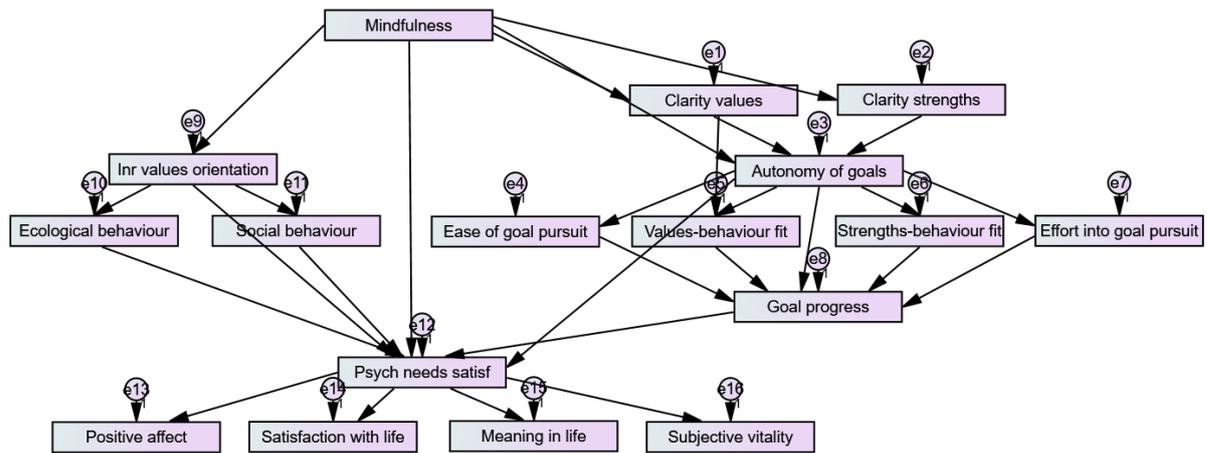


Figure 28: First adoption for the structural equation model of the hypothesized causal model

Moreover, modification indices indicate that there is a relation between the well-being scales, e.g., M.I. = 273,768, the error of positive affect and the error of subjective vitality.

Based on Ryan et al. (2008), it is argued that they are on the same causal level. However, one could also argue that meaning in life and subjective vitality as two dimensions of psychological well-being mediate psychological needs satisfaction and positive effect as well as satisfaction with life as two dimensions of subjective well-being. This argumentation also appears as reasonable given the fact that psychological well-being is often described as being a deeper dimension of well-being than subjective well-being (Ryff, 1989) However, it is suggested referring to Ryan et al. (2008) that they may be on the same causal level. Thus, it is concluded that a bidirectional influence is reasonable. Therefore, covariances are allowed between the well-being scales. The new model (see Figure 29) has a model fit of CFI= 0.745 and RMSEA = 0.136.

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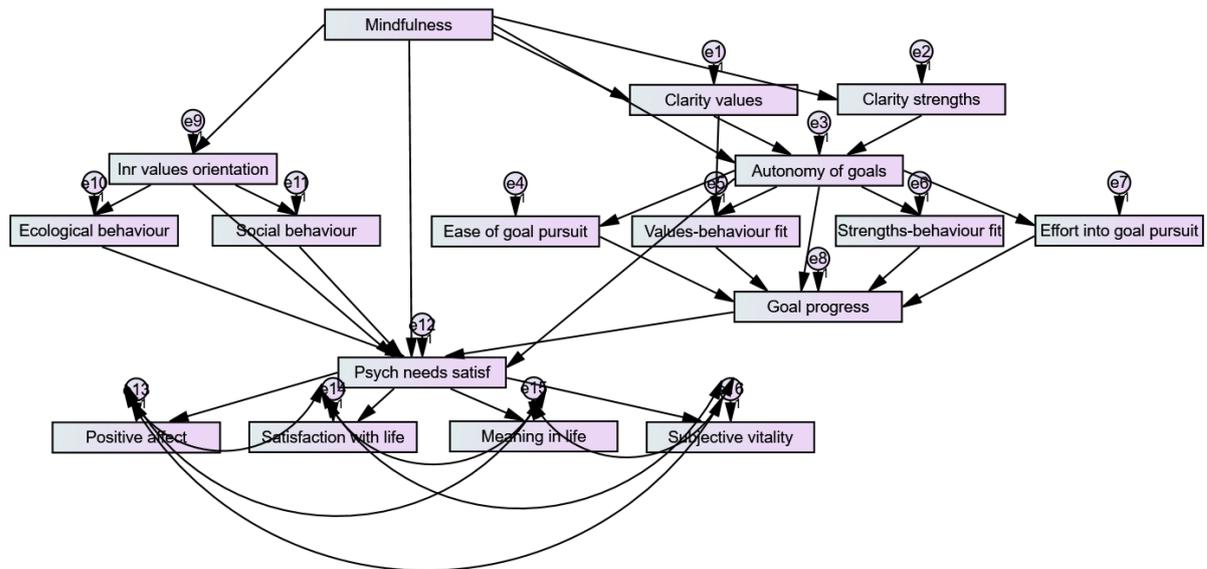


Figure 29: Second adoption for the structural equation model of the hypothesized causal model

Furthermore, the modification indices indicate that ease of goal pursuit and effort into goal pursuit (M.I. = 166,772) as well as values-behavior fit and effort into goal pursuit (M.I. = 149,018) are related to each other. One could discuss whether there is a causal relationship between those variables or whether this is a bidirectional relation. E.g. whether strengths-behavior fit causally influences ease of goal pursuit, because one uses the personal strengths in the daily activities and thus could experience the goal pursuit as easier. However, at this point, it is stuck to the original hypotheses and they are left on the same causal level as possible mediators between autonomy of goals and goal progress. Therefore, causal paths are not added but covariance is allowed between those variables. The resulting model (see Figure 30) has a model fit of CFI = 0.769 and RMSEA = 0.131.

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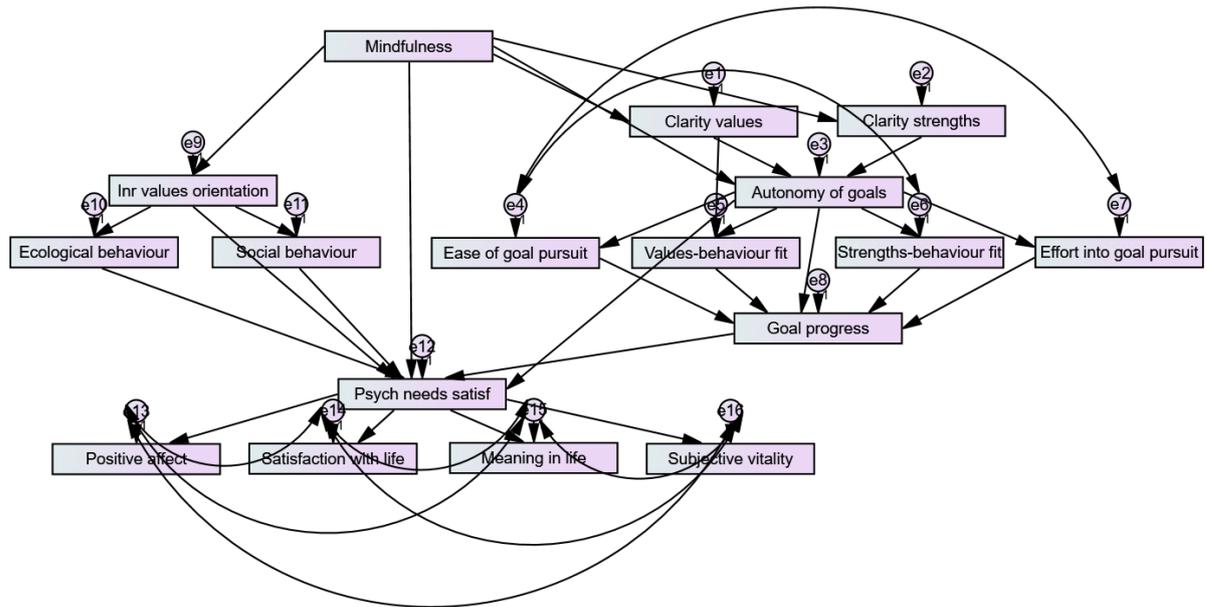


Figure 30: Third adoption for the structural equation model of the hypothesized causal model

For the same reason the first adjustment of the model was done, it is argued that there could be a direct causal relation between clarity about personal strengths and strengths behavior fit. Although they do not originate from the same scale, they relate to the same concept (strengths) on the level of self-knowledge (clarity about personal strengths) and on the level of behavior (strengths-behavior fit). This was also true for clarity about personal values and values-behavior fit. However, since there is incomplete data for clarity about personal strengths and strengths-behavior fit (N = 133), it is not possible to calculate modification indices but instead test whether the adjustment leads to better model fit. The resulting model (see Figure 31) shows a better model fit of CFI = 0.795 and RMSEA = 0.124, which supports this study's argument.

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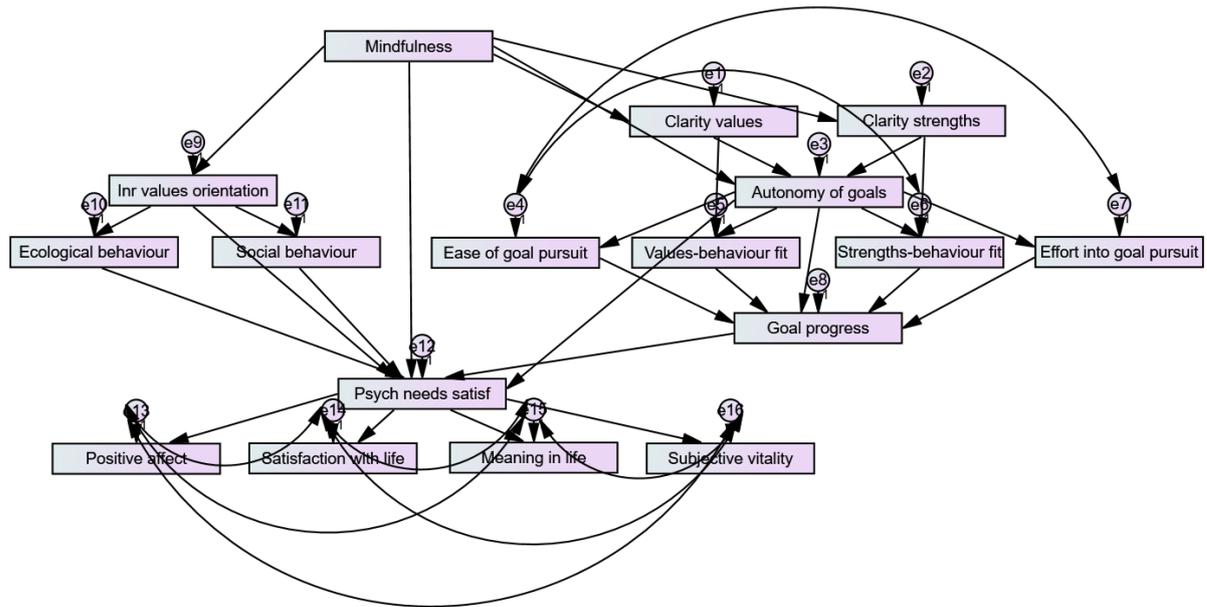


Figure 31: Fourth adoption for the structural equation model of the hypothesized causal model

The modification indices also indicate that clarity about personal values has a direct effect on psychological needs satisfaction (M.I. = 81,593) as well as on meaning in life (M.I. = 184,156). Therefore, causal paths from clarity about personal values to psychological needs satisfaction and meaning in life are integrated. The resulting model (see Figure 32) has a model fit of CFI = 0.849 and RMSEA = 0.107. This adoption is viewed as a significant improvement of the model's global fit, which emphasizes that clarity about personal values may not only have an indirect causal effect on health but even a direct causal effect.

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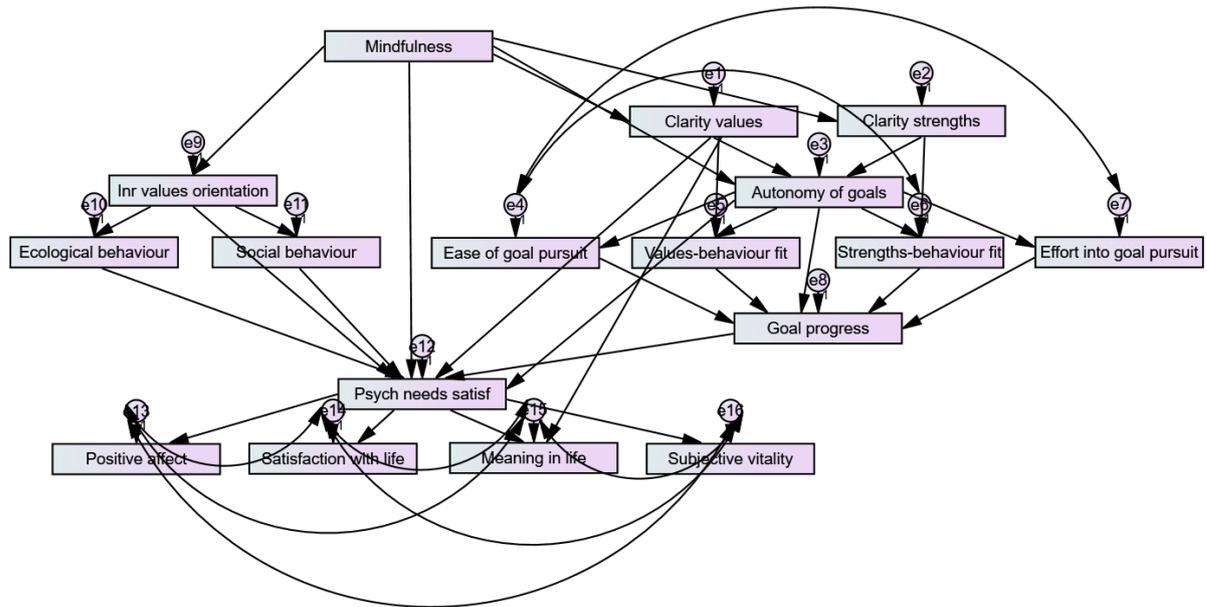


Figure 32: Fifth adoption for the structural equation model of the hypothesized causal model

Furthermore, the modification indices indicate that ecological behavior and social behavior are highly related to each other (M.I. = 276,641). It is argued that this relation is unsurprising given both constructs were developed as similar concepts and plotted directly next to each other in a multidimensional scaling (Schwartz et al., 2012). Therefore, covariance between those constructs is allowed. The resulting model (see Figure 33) has a model fit of CFI = 0.892 and RMSEA = 0.092.

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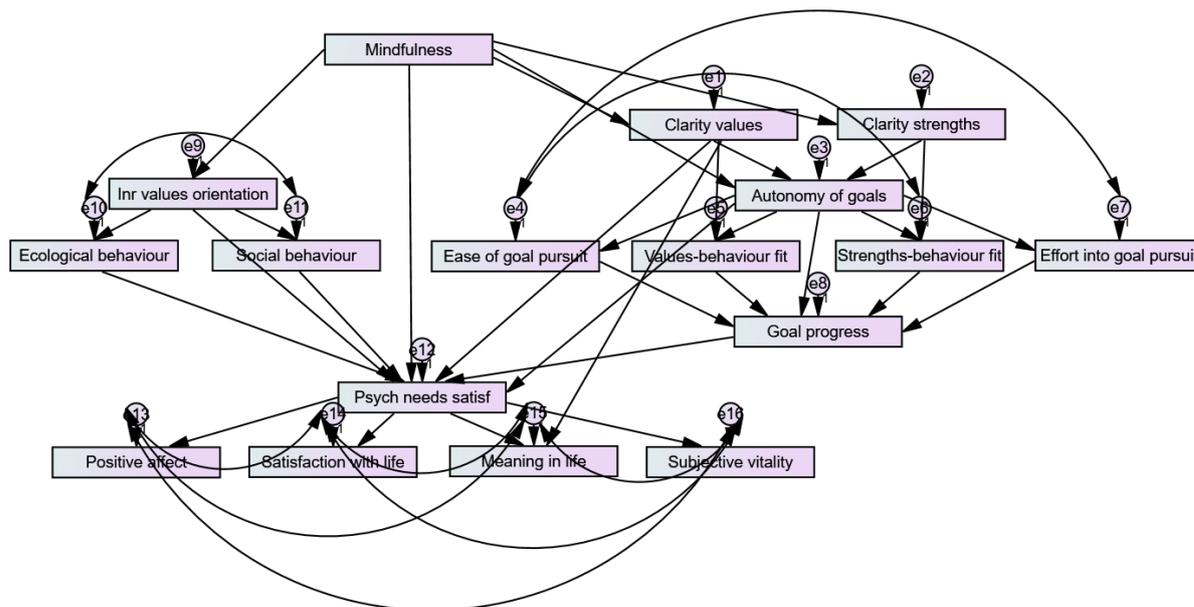


Figure 33: Sixth adoption for the structural equation model of the hypothesized causal model

The modification indices further indicate a positive relation between autonomy of goals and intrinsic values orientation (M.I. = 83,494). We argue that the result is conceivable because both constructs are part of a motivational process in which a person starts to find motivation from within and not from the outside (Deci & Ryan, 2000). Nonetheless, the constructs are conceptually different and intrinsic values orientation rather represents being free from any external forces whereas autonomy of goals rather describes volition, which can be even present if one is moved by external forces. We see both constructs as being causally on the same level, but state that they could influence each other bidirectionally. Therefore, we allow covariance between the two constructs. The resulting model (see Figure 34) has a model fit of CFI = 0.903 and RMSEA = 0.087. Based on the remarks by Homburg & Klarmann (2006) as well as by Weiber & Mühlhaus (2014), this can be interpreted as an acceptable model fit. We argue that we could likely reach a better global fit if we implement more adjustments based on modification indices. With regard to Homburg & Klarmann (2006), we believe that it is more reasonable to minimize the adaption steps, thus aiming only for an acceptable model fit.

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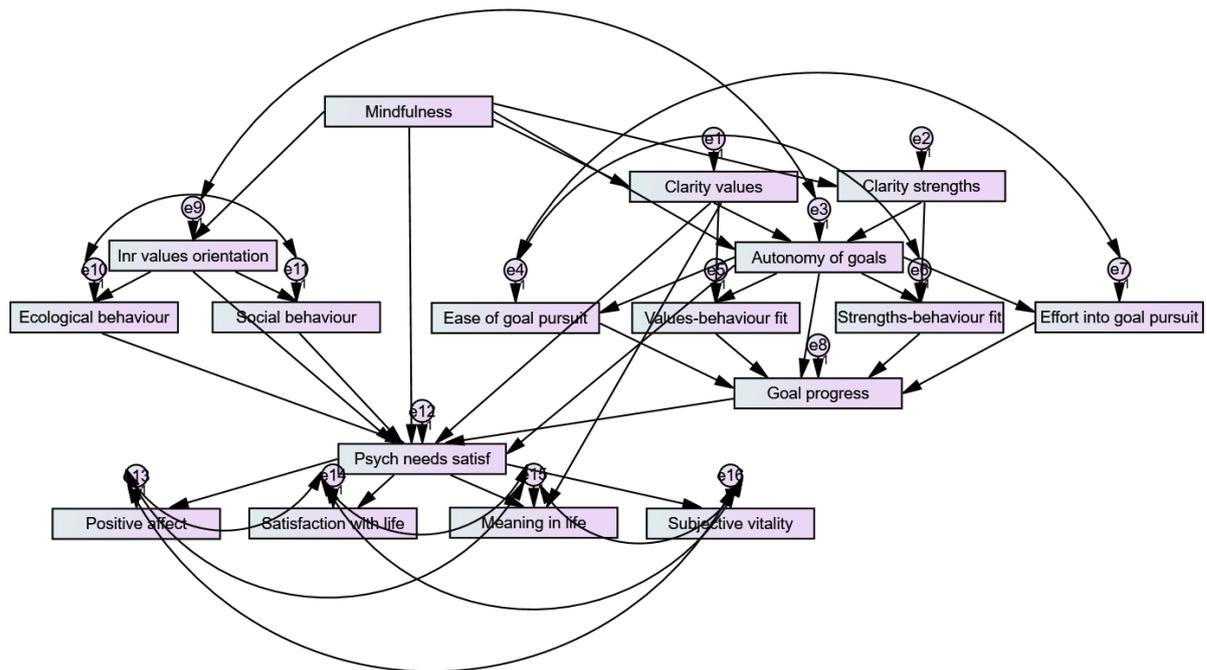


Figure 34: Seventh adoption for the structural equation model of the hypothesized causal model

3.6.2.2. Local model fit and adaption

3.6.2.2.1. Overview about standardized regression coefficients as well as indirect and total effects

With respect to the proposed steps by Weiber & Mühlhaus (2014), the model is tested for local fit after having achieved an acceptable global fit. It is done by looking at the standardized regression coefficients in the structural equation model of the adapted causal model (see Figure 35) as well as the referring p-value of each proposed path (see Table 7). Before discussing the results for each hypothesized path, special attention is devoted to the non-significant paths and a final adjustment by deleting the non-significant paths is performed. The implications of this adaption are discussed in chapter “summary of results”.

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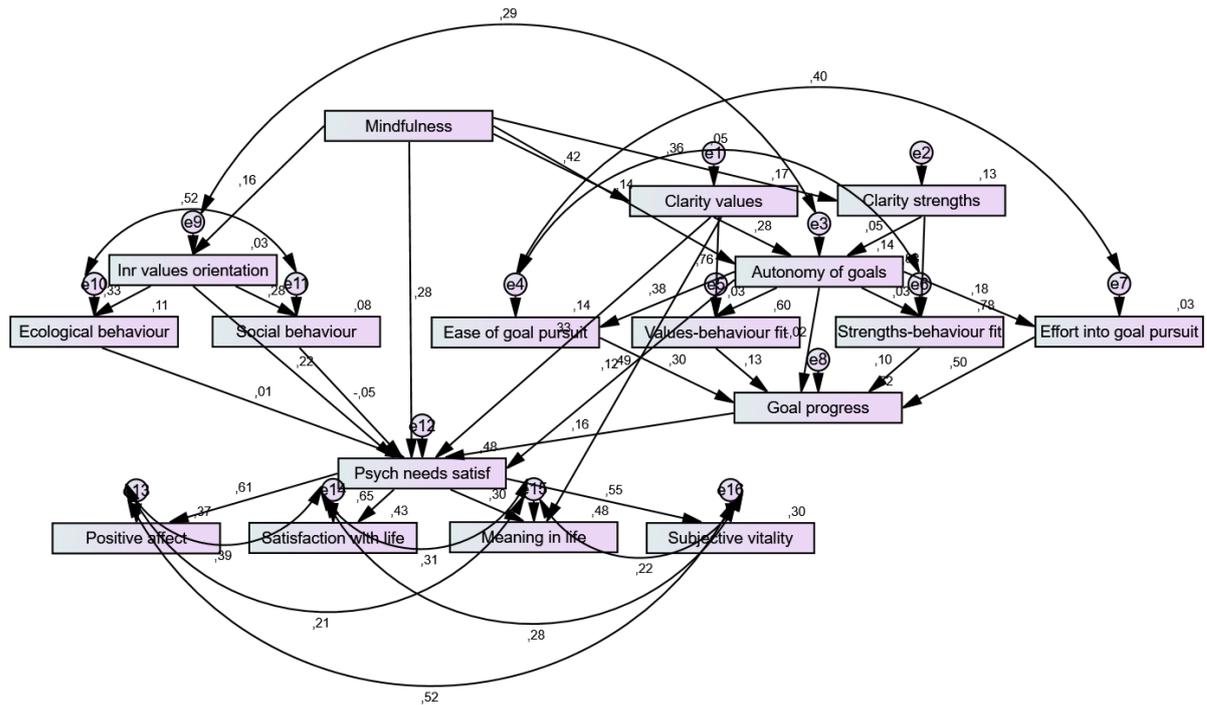


Figure 35: Structural equation model for the adapted causal model with standardized regression coefficients

Causal paths	Estimate	p-value
Clarity_about_personal_values <--- Mindfulness	.416	***
Clarity_about_personal_strengths <--- Mindfulness	.356	***
Autonomy_of_goals <--- Mindfulness	.137	***
Autonomy_of_goals <--- Clarity_about_personal_strengths	.048	.553
Autonomy_of_goals <--- Clarity_about_personal_values	.285	***
Intrinsic_values_orientation <--- Mindfulness	.158	***
Ease_of_goal_pursuit <--- Autonomy_of_goals	.379	***
Values_behavior_fit <--- Autonomy_of_goals	.031	.142
Strengths_behavior_fit <--- Autonomy_of_goals	.031	.440
Effort_into_goal_pursuit <--- Autonomy_of_goals	.178	***

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Causal paths			Estimate	p-value
Values_behavior_fit	<---	Clarity_about_personal_values	.763	***
Strengths_behavior_fit	<---	Clarity_about_personal_strengths	.880	***
Ecological_behavior	<---	Intrinsic_values_orientation	.334	***
Social_behavior	<---	Intrinsic_values_orientation	.282	***
Goal_progress	<---	Ease_of_goal_pursuit	.301	***
Goal_progress	<---	Values_behavior_fit	.131	***
Goal_progress	<---	Strengths_behavior_fit	.102	.040
Goal_progress	<---	Effort_into_goal_pursuit	.501	***
Goal_progress	<---	Autonomy_of_goals	-.022	.399
Overall_needs_satisfaction	<---	Intrinsic_values_orientation	.223	***
Overall_needs_satisfaction	<---	Autonomy_of_goals	.118	***
Overall_needs_satisfaction	<---	Mindfulness	.277	***
Overall_needs_satisfaction	<---	Ecological_behavior	.010	.716
Overall_needs_satisfaction	<---	Social_behavior	-.048	.082
Overall_needs_satisfaction	<---	Goal_progress	.161	***
Overall_needs_satisfaction	<---	Clarity_about_personal_values	.328	***
Positive_Affect	<---	Overall_needs_satisfaction	.611	***
Satisfaction_with_life	<---	Overall_needs_satisfaction	.654	***
Meaning_in_life	<---	Overall_needs_satisfaction	.297	***

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Causal paths			Estimate	p-value
Subjective_vitality	<---	Overall_needs_satisfaction	.546	***
Meaning_in_life	<---	Clarity_about_personal_values	.491	***

Table 7: Standardized Regression Coefficients and referring p-values, ***: $p < .001$

For this study, a significance level of $p < .001$ is demanded. Based on the resulting regression coefficients, all paths that are not significant on the level $p < .001$ are excluded. One exception is made to this rule by keeping the path from strengths-behavior fit to goal progress ($p = .040$) given its smaller sample size of $N = 133$. This path is expected to have a higher significance with a bigger sample size. Following this rule, we exclude the paths from autonomy of goals to values-behavior fit ($\beta = .031, p = .142$), strengths-behavior fit ($\beta = .031, p = .440$) and goal progress ($\beta = -.022, p = .399$). The path from clarity about personal strengths to autonomy of goals ($\beta = .048, p = .553$) is also excluded as well as the paths from ecological behavior ($\beta = .010; p = .716$) and social behavior ($\beta = -.048; p = .082$) to psychological needs satisfaction. Figure 36 shows the resulting structural equation model. Table 8 provides an overview of the resulting regression coefficients with the referring p-values.

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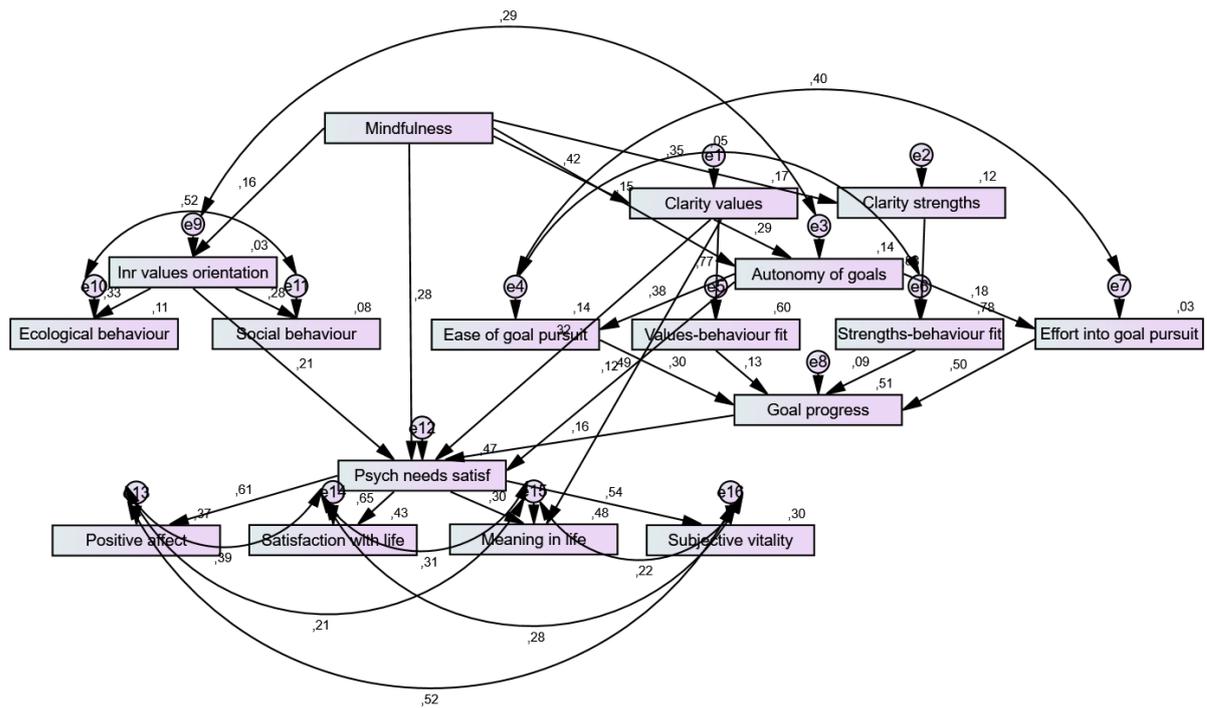


Figure 36: Adoption for the structural equation model based on the local fit indices

Causal paths	Estimate	p-value
Clarity_about_personal_values <--- Mindfulness	.416	***
Clarity_about_personal_strengths <--- Mindfulness	.349	***
Autonomy_of_goals <--- Mindfulness	.152	***
Autonomy_of_goals <--- Clarity_about_personal_values	.288	***
Ease_and_naturalness_of_goal_pursuit <--- Autonomy_of_goals	.379	***
Effort_into_goal_pursuit <--- Autonomy_of_goals	.178	***
Values_behavior_fit <--- Clarity_about_personal_values	.774	***
Strengths_behavior_fit <--- Clarity_about_personal_strengths	.885	***
Intrinsic_values_orientation <--- Mindfulness	.158	***
Goal_progress <--- Ease_of_goal_pursuit	.296	***
Goal_progress <--- Values_behavior_fit	.128	***

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Causal paths	Estimate	p-value
Goal_progress <--- Effort_into_goal_pursuit	.502	***
Goal_progress <--- Strengths_behavior_fit	.094	.055
Overall_needs_satisfaction <--- Intrinsic_values_orientation	.214	***
Overall_needs_satisfaction <--- Autonomy_of_goals	.122	***
Overall_needs_satisfaction <--- Mindfulness	.282	***
Overall_needs_satisfaction <--- Goal_progress	.159	***
Overall_needs_satisfaction <--- Clarity_about_personal_values	.317	***
Ecological_behavior <--- Intrinsic_values_orientation	.334	***
Social_behavior <--- Intrinsic_values_orientation	.282	***
Positive_Affect <--- Overall_needs_satisfaction	.610	***
Satisfaction_with_life <--- Overall_needs_satisfaction	.653	***
Meaning_in_life <--- Overall_needs_satisfaction	.297	***
Subjective_vitality <--- Overall_needs_satisfaction	.545	***
Meaning_in_life <--- Clarity_about_personal_values	.492	***

Table 8: Standardized Regression Coefficients and referring p-values, ***: $p < .001$

Referring to Weiber & Mühlhaus (2014), for a causal analysis based on structural equation modeling, it is adequate to not only devote attention to the regression coefficient of each path, which can be referred to as the direct causal effect but also as the indirect and total causal effect. The indirect causal effect describes the effect which an independent variable has through one or more intermediate variables on a dependent variable. This is calculated by multiplying the direct effects of all paths between the independent and the dependent variable. E.g., the indirect effect of mindfulness on social behavior is calculated by multiplying the direct effect of mindfulness on intrinsic values orientation with the direct effect of intrinsic values orientation on social behavior ($0.158 \times 0.282 = 0.045$). The total effect is the sum of the direct and the indirect effect. In this example it is $0 + 0.045 = 0.045$.

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Table 9 shows the standardized indirect effects while Table 10 depicts the standardized total effects in the final model.

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	Mindfulness	Clarity_about_personal_values	Autonomy_of_goals	Clarity_about_personal_strengths	Strengths_behaviour_fit	Effort_into_goal_pursuit	Values_behaviour_fit	Easiness_and_naturalness_of_goal_pursuit	Goal_progress	Intrinsic_values_orientation	Overall_neds_satisfaction
Clarity_about_personal_values	0	0	0	0	0	0	0	0	0	0	0
Autonomy_of_goals	0,12	0	0	0	0	0	0	0	0	0	0
Clarity_about_personal_strengths	0	0	0	0	0	0	0	0	0	0	0
Strengths_behaviour_fit	0,308	0	0	0	0	0	0	0	0	0	0
Effort_into_goal_pursuit	0,049	0,051	0	0	0	0	0	0	0	0	0
Values_behaviour_fit	0,322	0	0	0	0	0	0	0	0	0	0
Easiness_and_naturalness_of_goal_pursuit	0,103	0,109	0	0	0	0	0	0	0	0	0
Goal_progress	0,125	0,157	0,202	0,083	0	0	0	0	0	0	0
Intrinsic_values_orientation	0	0	0	0	0	0	0	0	0	0	0
Overall_neds_satisfaction	0,219	0,06	0,032	0,013	0,015	0,08	0,02	0,047	0	0	0
Subjective_vitality	0,273	0,205	0,084	0,007	0,008	0,043	0,011	0,026	0,087	0,117	0
Meaning_in_life	0,353	0,112	0,046	0,004	0,004	0,024	0,006	0,014	0,047	0,064	0
Satisfaction_with_life	0,327	0,246	0,101	0,009	0,01	0,052	0,013	0,031	0,104	0,14	0
Positive_Affect	0,306	0,23	0,094	0,008	0,009	0,049	0,012	0,029	0,097	0,131	0
Social_behaviour	0,045	0	0	0	0	0	0	0	0	0	0
Ecological_behaviour	0,053	0	0	0	0	0	0	0	0	0	0

Table 9: Standardized indirect effects

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	Mindfulness	Clarity_about_personal_values	Autonomy_of_goals	Clarity_about_personal_strengths	Strengths_behaviour_fit	Effort_into_goal_pursuit	Values_behaviour_fit	Easiness_and_naturalness_of_goal_pursuit	Goal_progress	Intrinsic_values_orientation	Overall_neds_satisfaction
Clarity_about_personal_values	0,416	0	0	0	0	0	0	0	0	0	0
Autonomy_of_goals	0,272	0,288	0	0	0	0	0	0	0	0	0
Clarity_about_personal_strengths	0,349	0	0	0	0	0	0	0	0	0	0
Strengths_behaviour_fit	0,308	0	0,885	0	0	0	0	0	0	0	0
Effort_into_goal_pursuit	0,049	0,051	0,178	0	0	0	0	0	0	0	0
Values_behaviour_fit	0,322	0,774	0	0	0	0	0	0	0	0	0
Easiness_and_naturalness_of_goal_pursuit	0,103	0,109	0,379	0	0	0	0	0	0	0	0
Goal_progress	0,125	0,157	0,202	0,083	0,094	0,502	0,128	0,296	0	0	0
Intrinsic_values_orientation	0,158	0	0	0	0	0	0	0	0	0	0
Overall_neds_satisfaction	0,501	0,377	0,154	0,013	0,015	0,08	0,02	0,047	0,159	0,214	0
Subjective_vitality	0,273	0,205	0,084	0,007	0,008	0,043	0,011	0,026	0,087	0,117	0,545
Meaning_in_life	0,353	0,604	0,046	0,004	0,004	0,024	0,006	0,014	0,047	0,064	0,297
Satisfaction_with_life	0,327	0,246	0,101	0,009	0,01	0,052	0,013	0,031	0,104	0,14	0,653
Positive_Affect	0,306	0,23	0,094	0,008	0,009	0,049	0,012	0,029	0,097	0,131	0,61
Social_behaviour	0,045	0	0	0	0	0	0	0	0	0,282	0
Ecological_behaviour	0,053	0	0	0	0	0	0	0	0	0,334	0

Table 10: Standardized total effects

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Based on the regression coefficients (direct) as well as the total effects which also encompass the indirect effects, the results for each hypothesis are provided. Although the **theoretical hypotheses** are formulated in the form of hypothesized causal relations, the **statistical hypotheses** chosen refer to the question whether it is possible to **reject the hypothesis of no significant relation between the referring constructs**. This is represented by the following statistical hypothesis:

H₀: no significant relation; H₁: positive causal relation

However, **H₁ can only be indicated in combination with the theoretical base** built by deriving the hypotheses (see chapter 3.4) as well as **if β_{direct} is positive**.

3.6.2.2.2. The relation between mindfulness and clarity about personal values, clarity about personal strengths, autonomy of goals, intrinsic values orientation as well as psychological needs satisfaction

The resulting standardized regression coefficients (see Table 8, Table 10) show that mindfulness is significantly positively related to clarity about personal values ($\beta_{\text{direct}} = .416^{***}$), clarity about personal strengths ($\beta_{\text{direct}} = .349^{***}$), autonomy of goals ($\beta_{\text{direct}} = .152^{***}$; $\beta_{\text{total}} = .272^{***}$), intrinsic values orientation ($\beta_{\text{direct}} = .158^{***}$) and the overall satisfaction of the three basic psychological needs ($\beta_{\text{direct}} = .282^{***}$; $\beta_{\text{total}} = .501^{***}$). Thus, the **statistical null hypothesis** that mindfulness is not related to clarity about personal values, clarity about personal strengths, autonomy of goals, intrinsic values orientation, as well as psychological needs satisfaction **can be rejected**. Combined with the theoretical base that was built in chapter 3.4.1, it can be used as an **indicator that the hypothesized causalities are true**.

3.6.2.2.3. The relation between clarity about personal values and autonomy of goals

The resulting standardized regression coefficients (see Table 8) show that clarity about personal values is significantly positively related to the autonomy of goals ($\beta_{\text{direct}} = .288^{***}$). Thus, **the statistical null hypothesis** that clarity about personal values is not related to the autonomy of goals **can be rejected**. Combined with the theoretical

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base that was built in chapter 3.4.2, it can be used as an **indicator that the hypothesized causality is true.**

3.6.2.2.4. The relation between clarity about personal strengths and autonomy of goals

The resulting standardized regression coefficients that have been calculated before the last adaption step (see Table 8) showed that clarity about personal strengths is not significantly positively related to the autonomy of goals ($\beta_{\text{direct}} = .048$, $p = .553$). Thus, **the statistical null hypothesis** that clarity about personal strengths is not related to the autonomy of goals **cannot be rejected.** This is an **indicator that the hypothesized causality is not true.** In consequence, the path was removed for the final model.

3.6.2.2.5. The relation between intrinsic values-orientation and ecological behavior, social behavior as well as psychological needs satisfaction

The resulting standardized regression coefficients (see Table 8) show that intrinsic values orientation is significantly positively related to ecological behavior ($\beta_{\text{direct}} = .334^{***}$), social behavior ($\beta_{\text{direct}} = .282^{***}$) and psychological needs satisfaction ($\beta_{\text{direct}} = .214^{***}$). Thus, **the statistical null hypothesis** that intrinsic values orientation is not related to ecological behavior, social behavior as well as psychological needs satisfaction **can be rejected.** Combined with the theoretical base we built in chapter 3.4.4 this can be used as an **indicator that the hypothesized causalities are true.**

3.6.2.2.6. The relation between autonomy of goals and ease of goal pursuit, values-behavior fit, strengths-behavior fit, effort into goal pursuit, goal progress as well as psychological needs satisfaction

The resulting standardized regression coefficients (see Table 8, Table 10) show that autonomy of goals is significantly positively related to ease of goal pursuit ($\beta_{\text{direct}} = .379^{***}$), effort into goal pursuit ($\beta_{\text{direct}} = .178^{***}$), and psychological needs satisfaction ($\beta_{\text{direct}} = .122^{***}$, $\beta_{\text{total}} = .154^{***}$). Thus, **the statistical null hypothesis** that autonomy of goals is not related to ease of goal pursuit, effort into goal pursuit, and psychological needs satisfaction **can be rejected.** Combined with the theoretical base that was built in chapter 3.4.5, it can be used as an **indicator that the hypothesized**

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causalities between autonomy of goals and ease of goal pursuit, effort into goal pursuit, and psychological needs satisfaction are true.

The resulting standardized regression coefficients that have been calculated before the last adaption step (see Table 7) showed that there is no positive relation between autonomy of goals and values-behavior fit ($\beta_{\text{direct}} = .031, p = .142$), strengths-behavior fit ($\beta_{\text{direct}} = .031, p = .440$), as well as goal progress ($\beta_{\text{direct}} = -.022, p = .399$). Thus, **the statistical null hypothesis** that autonomy of goals is not related to values-behavior fit, strengths-behavior fit, and goal progress **cannot be rejected**. In consequence, the paths were removed for the final model. This is an **indicator that the hypothesized causalities between autonomy of goals and values-behavior fit, strengths-behavior fit, and goal progress are not true.**

3.6.2.2.7. The relation between ease of goal pursuit and goal progress

The resulting standardized regression coefficients (see Table 8) show that the ease of goal pursuit is significantly positively related to goal progress ($\beta_{\text{direct}} = .296^{***}$). Thus, **the statistical null hypothesis** that ease of goal pursuit is not related to goal progress **can be rejected**. Combined with the theoretical base that was built in chapter 3.4.6, it is an **indicator that the hypothesized causality is true.**

3.6.2.2.8. The relation between values-behavior fit and goal progress

The resulting standardized regression coefficients (see Table 8) show that values-behavior fit is significantly positively related to goal progress ($\beta_{\text{direct}} = .128^{***}$). Thus, **the statistical null hypothesis** that values-behavior fit is not related to goal progress **can be rejected**. Combined with the theoretical base that was built in chapter 3.4.7, it is an **indicator that the hypothesized causality is true.**

3.6.2.2.9. The relation between strengths-behavior fit and goal progress

The resulting standardized regression coefficients (see Table 8) show that strengths-behavior fit is positively related to goal progress ($\beta_{\text{direct}} = .102, p = .055$). The significance is below the required significance level of $p < .001$. However, since the sample size is smaller for strengths-behavior fit and clarity about personal values ($N = 133$) in comparison to the other variables ($N = 1,024$), an exception is made for this relation and a low level of significance for this relation is accepted. It is argued that

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the p-value we would probably be below .001 if the sample size would be $N = 1,024$. Thus, **the statistical null hypothesis** that strengths-behavior fit is not related to goal progress **can be rejected**. Combined with the theoretical base that was built in chapter 3.4.8, it is an **indicator that the hypothesized causality is true**.

3.6.2.2.10. The relation between effort into goal pursuit and goal progress

The resulting standardized regression coefficients (see Table 8) show that effort into goal pursuit is significantly positively related to goal progress ($\beta_{\text{direct}} = .502^{***}$). Thus, **the statistical null hypothesis** that effort into goal pursuit is not related to goal progress **can be rejected**. Combined with the theoretical base that was built in chapter 3.4.9, it is an **indicator that the hypothesized causality is true**.

3.6.2.2.11. The relation between goal progress and psychological needs satisfaction

The resulting standardized regression coefficients (see Table 8) show that goal progress is significantly positively related to psychological needs satisfaction ($\beta_{\text{direct}} = .159^{***}$): Thus, **the statistical null hypothesis** that goal progress is not related to psychological needs satisfaction **can be rejected**. Combined with the theoretical base that was built in chapter 3.4.10, it is an **indicator that the hypothesized causality is true**.

3.6.2.2.12. The relation between ecological behavior as one dimension of intrinsic behavior and psychological needs satisfaction

The resulting standardized regression coefficients that have been calculated before the last adaptation step (see Table 7) show that ecological behavior as one dimension of intrinsic behavior is not significantly positively related to psychological needs satisfaction ($\beta_{\text{direct}} = .010$, $p = .716$). Thus, **the statistical null hypothesis that ecological behavior as one dimension of intrinsic behavior is not related to psychological needs satisfaction cannot be rejected**. This is an **indicator that the hypothesized causality is not true**. In consequence, the path was removed for the final model.

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3.6.2.2.13. The relation between social behavior as one dimension of intrinsic behavior and psychological needs satisfaction

The resulting standardized regression coefficients that have been calculated before the last adaption step (see Table 7) show that social behavior as one dimension of intrinsic behavior is not significantly positively related to psychological needs satisfaction ($\beta = -.048$; $p = .082$). Thus, **the statistical null hypothesis that social behavior as one dimension of intrinsic behavior is not related to psychological needs satisfaction cannot be rejected.** This is an **indicator that the hypothesized causality is not true.** In consequence, the path was removed for the final model.

3.6.2.2.14. The relation between psychological needs satisfaction and positive affect, satisfaction with life, meaning in life as well as subjective vitality

The resulting standardized regression coefficients (see Table 8) show that psychological needs satisfaction is significantly positively related to positive affect ($\beta_{\text{direct}} = .610^{***}$), satisfaction with life ($\beta_{\text{direct}} = .653^{***}$), meaning in life ($\beta_{\text{direct}} = .297^{***}$) and subjective vitality ($\beta = .545^{***}$). Thus, **the statistical null hypothesis that psychological needs satisfaction is not related to positive affect, satisfaction with life, meaning in life, and subjective vitality can be rejected.** Combined with the theoretical base that was built in chapter 3.4.13, it is an **indicator that the hypothesized causalities are true.**

3.6.2.3. Overview of indications for hypotheses and of the resulting final causal model

Table 11 shows the indications for the hypotheses based on the local fit indices (β_{direct} and β_{total}) and the referring p-values.

Hypotheses	Path from	To	Indicated Causality
1.1.	Mindfulness	Clarity about personal values	Yes
1.2.	Mindfulness	Clarity about personal strengths	Yes
1.3.	Mindfulness	Autonomy of goals	Yes
1.4.	Mindfulness	Intrinsic values orientation	Yes
1.5.	Mindfulness	Psychological needs satisfaction	Yes

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2	Clarity about personal values	Autonomy of goals	Yes
3	Clarity about personal strengths	Autonomy of goals	No
4.1.	Intrinsic values-orientation	Intrinsic Behavior: Ecological Behaviour	Yes
4.2.	Intrinsic values-orientation	Intrinsic Behavior: Social Behavior	Yes
4.3.	Intrinsic values-orientation	Psychological needs satisfaction	Yes
5.1.	Autonomy of goals	Ease of goal pursuit	Yes
5.2.	Autonomy of goals	Values-behavior fit	No
5.3.	Autonomy of goals	Strengths-behavior fit	No
5.4.	Autonomy of goals	Effort into goal pursuit	Yes
5.5.	Autonomy of goals	Goal progress	No
5.6.	Autonomy of goals	Psychological needs satisfaction	Yes
6	Ease of goal pursuit	Goal progress	Yes
7	Values-behavior fit	Goal progress	Yes
8	Strengths-behavior fit	Goal progress	(Yes)
9	Effort into goal pursuit	Goal progress	Yes
10	Goal progress	Psychological needs satisfaction	Yes
11	Intrinsic Behavior: Ecological Behaviour	Psychological needs satisfaction	No
12	Intrinsic Behavior: Social Behavior	Psychological needs satisfaction	No
13.1.	Psychological needs satisfaction	Positive Affect	Yes
13.2.	Psychological needs satisfaction	Satisfaction with Life	Yes
13.3.	Psychological needs satisfaction	Meaning in Life	Yes
13.4.	Psychological needs satisfaction	Subjective Vitality	Yes

Table 11: Overview of indications for hypotheses, “Yes” := $p < .001$, “No” := $p \geq .001$, “(Yes)” := $p = 0,55$ (based on a smaller sample of $N = 133$)

The significance level is for all hypotheses $p < .001$ (see Table 11). The only exception is the path from strengths-behavior fit to goal progress ($p = .055$). As emphasized above, the lower significance of this one path is allowed for strengths-behavior fit with $N = 133$.

Figure 37 shows the resulting final causal model which is based on the final structural equation model.

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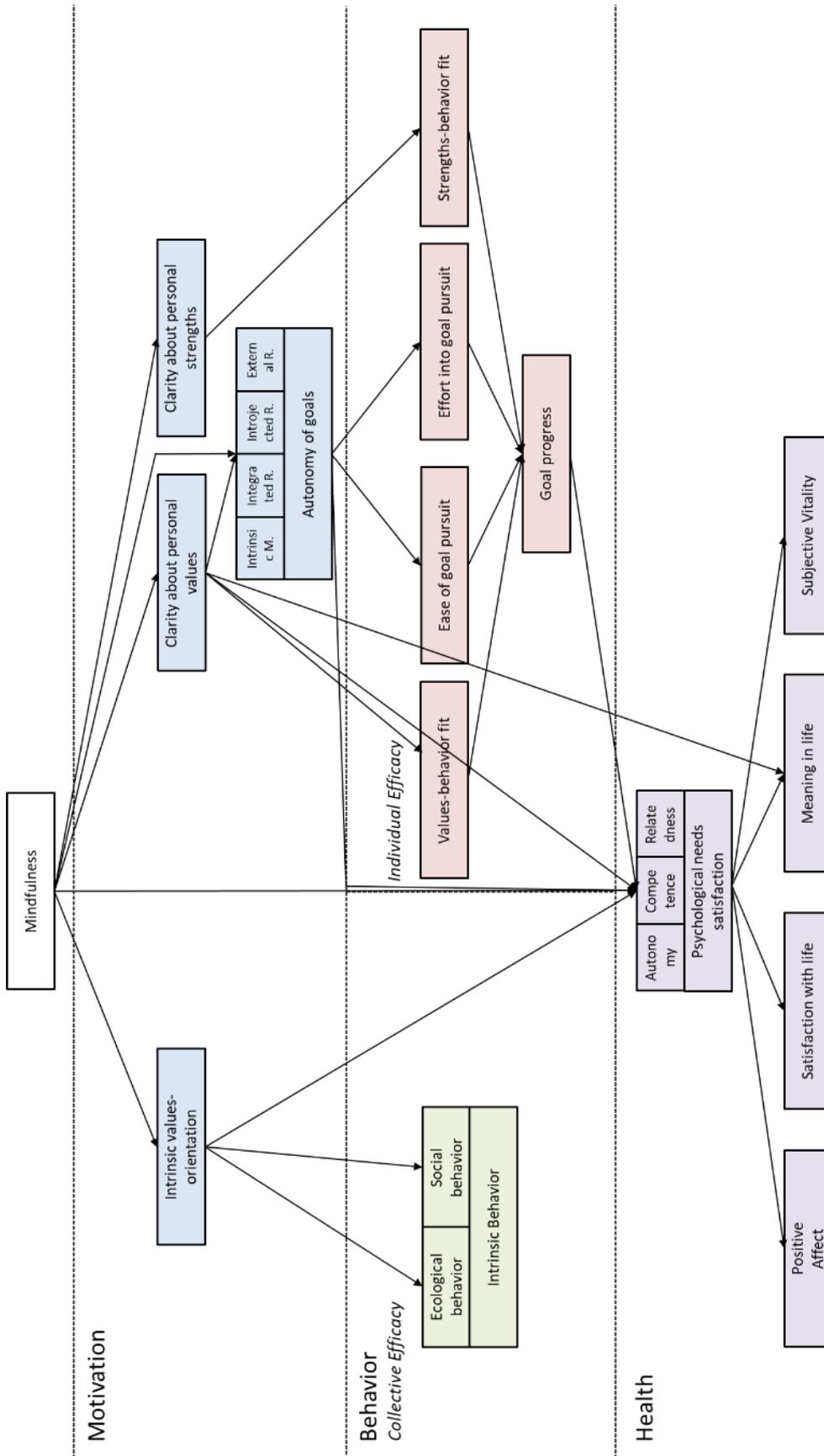


Figure 37: Final causal model of healthy and effective self-regulation

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For the final evaluation of the model's global fit, it is went beyond the CFI and the RMSEA to provide more indications for the model's validity. Homburg & Klarmann (2006) suggest using RMSEA, SRMR (Standardized Root Mean Square Residual), CFI, NNFI (Nonnormed Fit Index), which is sometimes also called TLI (Tucker Lewis Index), as well as a Chi-square/df. Homburg & Klarmann (2006) argue based on Browne & Cudeck (1993) as well as on Schermelleh-Engel et al. (2003), that an RMSEA respectively an SRMR < 0.05 can be interpreted as good model fit, while an RMSEA respectively an SRMR < 0.1 can be described as an acceptable model fit. CFI and NNFI should be > 0.9. Furthermore, Chi-square/df should be < 3. However, Homburg & Klarmann (2006) state that those cut-off levels should not be seen as absolute, but rather as a rough guideline. Thus, a violation of a cut-off level does not automatically lead to the rejection of the model, but should always be documented (Homburg & Klarmann, 2006).

All fit indices except the SRMR were calculated, as SPSS Amos provides no SRMR if one has missing data, which was the case for clarity about personal strengths as well as strengths-behavior fit (N = 133 in comparison to the overall N = 1024). Thus, the following results are obtained for the global fit indices: RMSEA = .084, CFI = .903, NNFI = .853, Chi-square/df = 8.285 (see Table 12).

RMSEA	CFI	NNFI/TLI	CHI-SQUARE/df
.084	.903	.853	8.285

Table 12: Global fit indices for the structural equation model of the final causal model

Based on these results, an acceptable model fit is obtained for RMSEA and CFI, and violations of the cut-off level for NNFI and Chi square/df. Based on Homburg & Klarmann (2006), it is argued that due to the complexity of the model, such violations can be accepted and do not automatically lead to rejection. Better global fit indices could be obtained by cutting away or adding more paths based on the modification indices. However, the objective was to stay as close as possible to the originally

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hypothesized model. Therefore, the model was only adopted until there was an acceptable global fit based on RMSEA and CFI.

3.7. Discussion

3.7.1. Interpretation of results

The following three illustrations give an overview of the development of the original hypothesized model to the final model.

Figure 38 shows the originally hypothesized causal model with the hypotheses that were rejected (red paths) and the hypotheses that were not rejected (black paths).

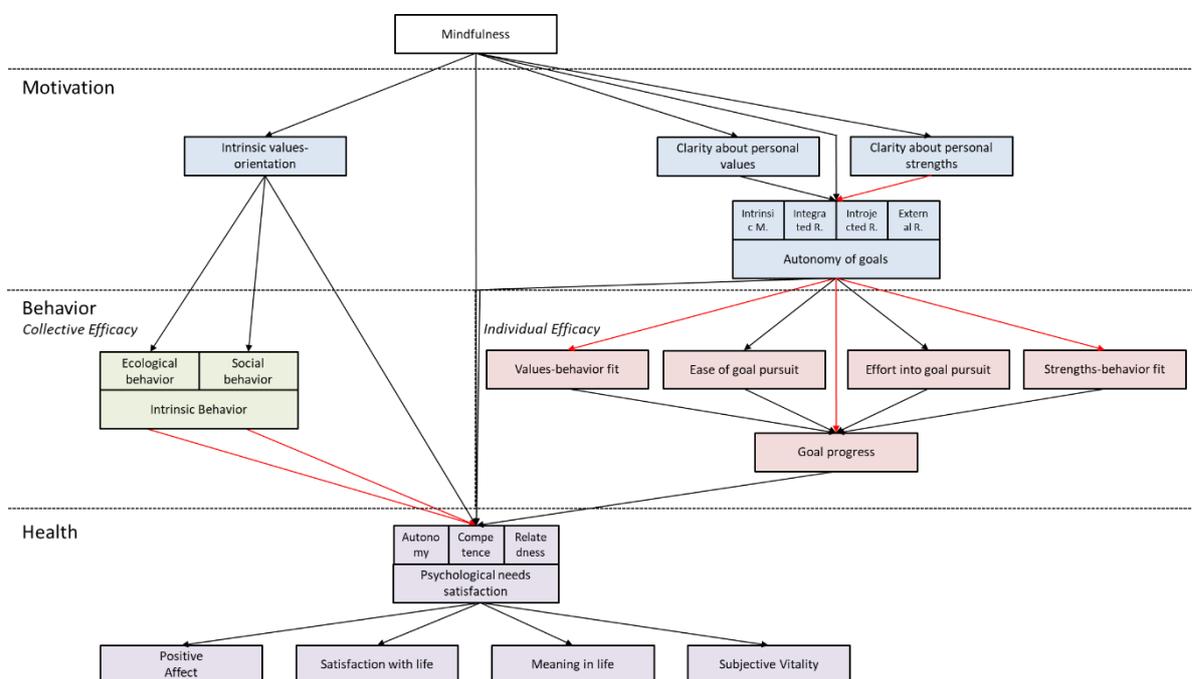


Figure 38: Originally hypothesized causal model with the hypotheses that were rejected

Figure 38 shows that most causal hypotheses were indicated as being true based on the rejection of the statistical hypotheses of no relationship between the variables in combination with the discussed theoretical foundations. As it was hypothesized based on Ryan et al. (2008) as well as on Schultz & Ryan (2015), mindfulness could be the how of healthy and effective self-regulation and could have a positive effect on intrinsic values orientation, autonomy of goals as well as on psychological needs satisfaction. This is supported by the data with significant direct causal effects (on autonomy of goals: $\beta_{\text{direct}} = .152^{***}$; on intrinsic values orientation: $\beta_{\text{direct}} = .158^{***}$; on satisfaction of

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the psychological needs: $\beta_{\text{direct}} = .282^{***}$) as well as indirect causal effects (on autonomy of goals: $\beta_{\text{indirect}} = .120$; on satisfaction of psychological needs: $\beta_{\text{indirect}} = .219$). Given these results, mindfulness is interpreted as a pathway to do what one volitionally wants to do (autonomy of goals) and to find out what is truly important to oneself and goes beyond conscious motives (intrinsic values orientation). Mindfulness can further be seen as a direct as well as an indirect pathway to healthy functioning (psychological needs satisfaction). In addition to that mindfulness seems to have indirect effects on goal progress ($\beta_{\text{indirect}} = .125$) which is used as a measurement for personal effectiveness as well as on all well-being measures (on positive affect: $\beta_{\text{indirect}} = .306$; on satisfaction with life: $\beta_{\text{indirect}} = .327$; on meaning in life: $\beta_{\text{indirect}} = .353$; on subjective vitality: $\beta_{\text{indirect}} = .273$). It is interpreted in the way that mindfulness could be a quality that helps to feel and understand the deeper psychological needs and by that help to be and do what nurture those. Moreover, mindfulness could support one through receptive awareness not to lose this path by preventing one to fall into dysfunctional automatisms that are not driven by the inner needs. Thus, mindfulness is proposed to be essential for healthy and effective self-regulation, whereby mindfulness is defined as “a receptive state of mind wherein attention, informed by a sensitive awareness of what is occurring at the moment, plainly observes internal (e.g., psychological and somatical experiences and external events that are taking place” (Brown & Ryan, 2003; Kabat-Zinn, 2003 cited by Schultz & Ryan, 2015, p. 84).

Furthermore, the results indicate that mindfulness influences reflexive qualities that refer to inner clarity. More precisely, the reflexive quality of having clarity about personal values (Trompetter, 2014) appears to be a mediator between the pre-reflexive state of mindfulness and the operationalization of internalized personal goals in form of autonomous goals. This interpretation is based on the direct causal effect of mindfulness on clarity about personal values ($\beta_{\text{direct}} = .416^{***}$) as well as the direct causal effect of clarity about personal values on autonomy of goals ($\beta_{\text{direct}} = .288^{***}$) and the indirect causal effect of mindfulness on autonomy of goals ($\beta_{\text{indirect}} = .12$). Thus, being aware in the present moment and being able to observe internal as well as external processes in a non-judgemental way can foster

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clarity about what is important to oneself. Based on this clarity, one may more easily choose goals that reflect the well-internalized inner drivers. In addition to that, mindfulness also shows a positive influence on having clarity about personal strengths. The model used indicates a direct causal effect of mindfulness on clarity about personal strengths ($\beta_{\text{direct}} = .349^{***}$). Besides revealing what is important to oneself, it is proposed that the open and receptive state of mindfulness can also help the identification of one's unique talents, acquired skills, and knowledge. Being aware in a non-judgmental way may help to detach from prejudices. By that, one can more authentically compare the own nature in comparison to others. Those observations could help to see what one has in common with other human beings but also what may be unique manifestations of one's talents, acquired knowledge or skills. Thus, it is argued that mindfulness is a pathway to discover what is important to oneself as well as one's unique capabilities. Having said that, results indicate that clarity about personal strengths, in contrary to clarity about personal values, has no direct causal effect on autonomy of goals ($\beta_{\text{direct}} = .048$; $p = .553$). It is argued that this might have different reasons. The first two reasons relate to the method chosen. Due to a relatively small sample size ($N = 133$) for clarity about personal strengths, it could be that this prevented significant results in comparison to the other variables ($N = 1,024$). Another reason could be that autonomous goals, which represent well internalized and intrinsic reasons for goal pursuit, only measure personal values and interests as specific reasons. It has been already argued that strengths could also be seen as a kind of intrinsic reason for goal pursuit, especially as doing things in which you feel competent can lead to the experience of joy (Deci & Ryan, 2000). However, the instrument, which was used to measure the autonomy of goals (Relative autonomy index: Sheldon & Elliot, 1999; Sheldon, 2014), does not specifically measure strengths as a reason for autonomous goal pursuit, which could explain the non-significant causal effects. In addition to that, it could also be argued that personal strengths are not part of the motivational continuum that reflects the volition of goal pursuit. Based on these possible reasons, further studies are perceived as necessary to understand

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whether clarity about personal strengths has a significant causal effect on the autonomy of goals.

Concerning the mediators between autonomy of goals and goal progress, the results indicate that effort into goal pursuit (Sheldon & Elliot, 1999), as well as ease of goal pursuit (Werner et al., 2016) have mediational effects between the autonomy of goals and goal progress. This interpretation is based on the direct effect of autonomy of goals on effort into goal pursuit ($\beta_{\text{direct}} = .178^{***}$) and the direct effect of autonomy of goals on ease of goal pursuit ($\beta_{\text{direct}} = .379^{***}$) as well as the direct effect of effort into goal pursuit on goal progress ($\beta_{\text{direct}} = .502^{***}$) and ease of goal pursuit on goal progress ($\beta_{\text{direct}} = .296^{***}$). Based on these results, it is argued that pursuing personal goals that reflect authentic interests and/or personal values may be pursued more effectively because the pursuit feels easier and more natural and one is willing to put in more effort. However, the results also indicate that values-behavior fit (Trompetter, 2014) and strengths-behavior fit (Govindji & Linley, 2007) are not mediating autonomy of goals and goal progress. This is due to the non-significant direct causal effects of autonomy of goals on values-behavior fit ($\beta_{\text{direct}} = .031, p = .142$) and on strengths-behavior fit ($\beta_{\text{direct}} = .031, p = .440$). For strengths-behavior fit, it could be again due to the possible reasons that were given for the non-significance of clarity about personal strengths on the autonomy of goals. The non-significant effect of autonomy of goals on values-behavior fit is difficult to explain. Especially because personal values are specifically measured as a well-internalized reason for goal pursuit in the construct autonomy of goals. Given the theory of planned behavior (Ajzen, 1991; Sheeran et al., 1999) and the studies about values-behavior fit by Butenko & Schwartz (2013), it is argued that operationalized intentions in form of goals should lead to behavior that is congruent with those goals. This should be even more the case if personal values are the reason for goal pursuit. It would be interesting to see if other studies using similar measurement instruments come to the same counterintuitive result. So far, it is argued that the non-significant effect could be due to autonomous goals being measured as the sum of authentic interests and personal values as the reason for goal pursuit in relation to the sum of controlled reasons, that are external or introjected.

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By that, the effects of personal values as a reason for goal pursuit may be not strong enough to lead to significant results with values-behavior fit. Looking at the direct causal effect of autonomy of goals on goal progress, it is seen that it is non-significant ($\beta_{\text{direct}} = -.022$, $p = .399$). This contradicts the results of studies that have been made on the positive effects of autonomous goals (e.g., Sheldon & Kasser, 1998; Sheldon & Elliot, 1999). One explanation might be that individuals who pursue goals for autonomous reasons could tend to define higher goals than individuals who define and pursue goals for controlled reasons. Therefore, autonomous goals could cause more work. Although the pursuit of autonomous goals may feel easier as well as more natural and the effort that is put in by those pursuing these goals is higher, the goal progress could take as long as for controlled goals. Goal progress is perceived as not sufficient as the only measurement for individual efficacy. One approach could be to try to objectify the amount of work that is needed to achieve a specific goal. It could be a path to further analyze whether autonomous goals lead to more effective goal pursuit. However, it is argued that this will be hard, if not impossible, to do. Therefore, the current approach seems still reasonable with the limitation of not knowing the amount of work that each personal goal requires.

Based on the theory of planned behavior (Ajzen, 1991; Sheeran et al., 1999) as well as on studies about values-behavior congruence by Butenko & Schwartz (2013) it was also hypothesized that intrinsic values orientation leads to behavior that is congruent with those intrinsic values. In this study, only two dimensions were measured that could be seen as representatives of intrinsic values on the level of behavior (social behavior and ecological behavior). The data shows significant direct causal effects of intrinsic values orientation on both dimensions of behavior (on social behavior: $\beta_{\text{direct}} = .282^{***}$; on ecological behavior: $\beta_{\text{direct}} = .334^{***}$). Therefore, it is proposed that being close to ones rather implicit/intrinsic motives in the form of intrinsic values also leads to behavior that is more congruent with those values, in this case, behaving more social and ecologically-friendly. In addition to that, it is proposed based on Grouzet et al. (2005) and Kasser & Ryan (1996) that intrinsic values orientation leads to the satisfaction of the psychological needs. The data collected in

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this study supports this hypothesis ($\beta_{\text{direct}} = .214^{***}$). It is interpreted in a way that the distinction of intrinsic and extrinsic values in the universal continuum human values (Schwartz et al., 2012; Cieciuch et al., 2014 in the adapted version by Hebllich & Terzidis, 2016) fit to the conceptualization of intrinsic/extrinsic aspirations (Grouzet et al., 2005) as those values tend to lead to the satisfaction of the psychological needs. However, further studies should be conducted to see if a general distinction in intrinsic respectively extrinsic values can be made. The empirical studies by Sortheix & Schwartz (2017) and by Hebllich & Terzidis (2016) as well as the theoretical discussion by Kasser (2002) are a good start in transferring the concept of intrinsic life-goals from aspirations to personal values, but further research is necessary to make a more valid distinction in intrinsic and extrinsic values in the universal continuum of human values.

With regard to the body of studies by especially Tim Kasser on intrinsic aspirations and values (e.g., Brown & Kasser, 2005; Kasser, 2009, 2016) and Steger et al. (2008) on eudaimonic behavior, we further hypothesized that social respectively ecological behavior as two dimensions of intrinsic behavior could have a direct causal effect on psychological needs satisfaction. This is not supported by our data ($\beta_{\text{direct}} = -.048$, $p = .082$; respectively $\beta_{\text{direct}} = .010$; $p = .716$). One reason could be that social as well as ecologically-friendly behavior may be a behavior that adds to global well-being but not directly to individual well-being. However, another argument is perceived as more realistic. In accordance with the studies by Tim Kasser, it is believed that social and ecological behavior also have positive influence on individual well-being. In order to measure social as well as ecological friendly behavior, the two referring dimensions of the everyday behavior questionnaire by Shalom Schwartz (Butenko & Schwartz, 2013) are used. This questionnaire is designed to measure the personal values in the universal continuum of human values on the level of behavior. However, when looking at the items, one gets the impression that many items indirectly also measure how extroverted a person is or how much a person wants to convince others of their own opinion (e.g., “Discuss suffering and poverty in the world with another person” or “Bring up the topic of threats to the environment in conversation with others”). An

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argument is made that this could lead to bias. Some individuals may behave ecological-friendly or prosocial but do not talk about it or do not try to convince other people of their opinion. Besides this reason, there is another possible methodological issue. To measure relatedness, an instrument by Ryff (see chapter 3.5.3.13) is used. This instrument rather focuses on the experienced relatedness concerning close relationships. However, Deci & Ryan (2000) emphasize that the need for relatedness cannot be limited to close relationships. It is a tendency towards relatively broad connectedness with others. This broad connectedness could not only encompass pro-social, but also pro-environmental action to satisfy this tendency (Ryan et al., 2008, Darner, 2009). Thus, it is argued that the used instrument only encompasses pro-social action with in-group people like friends and family, but may not fully capture the need for relatedness. To get deeper insights, causal paths are added from both types of behavior to all well-being variables. Thus, it is desired to bypass the maybe insufficient measurement of relatedness to see whether there is a positive effect on individual well-being. However, the resulting estimates were not significant. Therefore, the assumption that the first argument for the non-significant relation between social and environmental behavior is more reasonable is made. It is proposed that to analyze the positive effects of prosocial and ecological behavior, other measurement instruments for social and environmentally-friendly behavior should be tested. They should measure the two types of behavior more broadly to minimize the explained possible bias.

At last, it is hypothesized based on Ryan et al. (2008) that the satisfaction of the psychological needs could have direct causal effects on the well-being concepts positive affect (Diener et al, 1985, 2009), satisfaction with life (Diener et al., 1985; Kobau et al., 2010), meaning in life (Steger et al., 2006) and subjective vitality (Ryan & Frederick, 1997). This is supported by our data (on positive affect: $\beta_{\text{direct}} = .611^{***}$; on satisfaction with life: $\beta_{\text{direct}} = .654^{***}$; on meaning in life: $\beta_{\text{direct}} = .297^{***}$; on subjective vitality: $\beta_{\text{direct}} = .546^{***}$). It is interpreted it in the way that the satisfaction of the psychological needs apparently has a mediating role between the how, the what, and the why of healthy and effective self-regulation and well-being variables like

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subjective and psychological well-being. The strong direct causal effects of psychological needs satisfaction on the used well-being constructs also support the central role that SDT (e.g., Deci & Ryan, 2000) gives the psychological needs satisfaction for healthy human functioning.

Until now, the discussion has been about the results for the hypothesized causal paths. The following part will discuss the new paths that have been added in the structural equation model based on the modification indices to achieve a global fit. Figure 39 gives an overview of the new paths with significantly positive regression coefficients highlighted in blue.

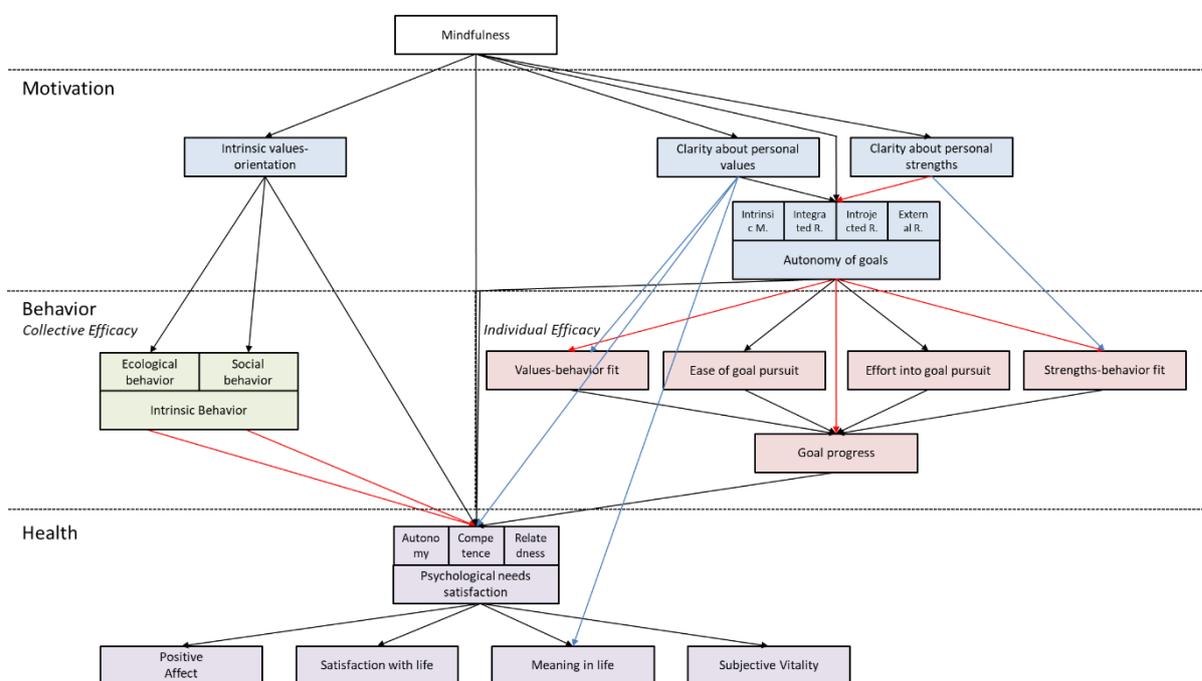


Figure 39: Originally hypothesized causal model with the hypotheses that were rejected and causal paths that were added

One direct causal path was added from clarity about personal strengths to strengths-behavior fit ($\beta_{\text{direct}} = .885^{***}$). As this is one of the strongest causal relations in the model, it implies that clarity about personal strengths leads to behavior in which one can use one's strengths. As discussed previously, the autonomy of goals is apparently not a mediator of this effect. It is perceived as an unsurprising effect that there is a direct causal relation between clarity about personal strengths and

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strengths-behavior fit. It was not expected to find such a strong causal relation. It is interpreted in a way that having clarity about what one's unique talents, acquired knowledge and skills strongly encourages individuals to engage in activities in which they can use them, which then leads to more effective goal progress.

The last three direct causal paths were all added to clarity about personal values as an independent variable. They go from clarity about personal values to values-behavior fit ($\beta_{\text{direct}} = .774^{***}$), psychological needs satisfaction ($\beta_{\text{direct}} = .317^{***}$) and meaning in life ($\beta_{\text{direct}} = .492^{***}$). As those paths were added based on the highest modification indices as methodologically proposed by Weiber & Mülhhaus (2014), the results indicate how central the reflexive quality of having clarity about personal values seems to be in the model of healthy and effective self-regulation. This is also reflected in the indirect causal effects on all well-being variables. Like mindfulness, the construct also has strong indirect effects on all well-being measures (on positive affect: $\beta_{\text{indirect}} = .230$; on satisfaction with life: $\beta_{\text{indirect}} = .246$; on meaning in life: $\beta_{\text{indirect}} = .601$; on subjective well-being: $\beta_{\text{indirect}} = .205$). Based on these results, the proposal is to perceive clarity about personal values as an important psychological construct in a multi-causal and complex chain of psychological constructs to regulate oneself effectively and healthily. Having clarity about what is important to oneself, about the personal values, can be a key ingredient to self-regulate in a way that fits those values, nurtures the psychological needs, and leads to psychological as well as subjective well-being. However, based on theories of ego development (e.g., Cook-Greuter, 2013; Wilber, 2001; Whitehead, Bates, & Elphinstone, 2019) it is stated that there could be a part of an adult's development, especially in the post-conventional stages, in which mindfulness as a way to present moment awareness, psychological needs satisfaction, and higher well-being is particularly important, but personal values tend to lose importance. Those individuals might tend to get construct-aware and rather focus on the present moment than on the values and goals of their former idealizing and separate self (Cook-Greuter, 2013). Nevertheless, the results indicate that clarity about personal values has an important role for many individuals to regulate behavior in effective and healthy ways.

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Figure 40 shows the final causal model with a semantic division.

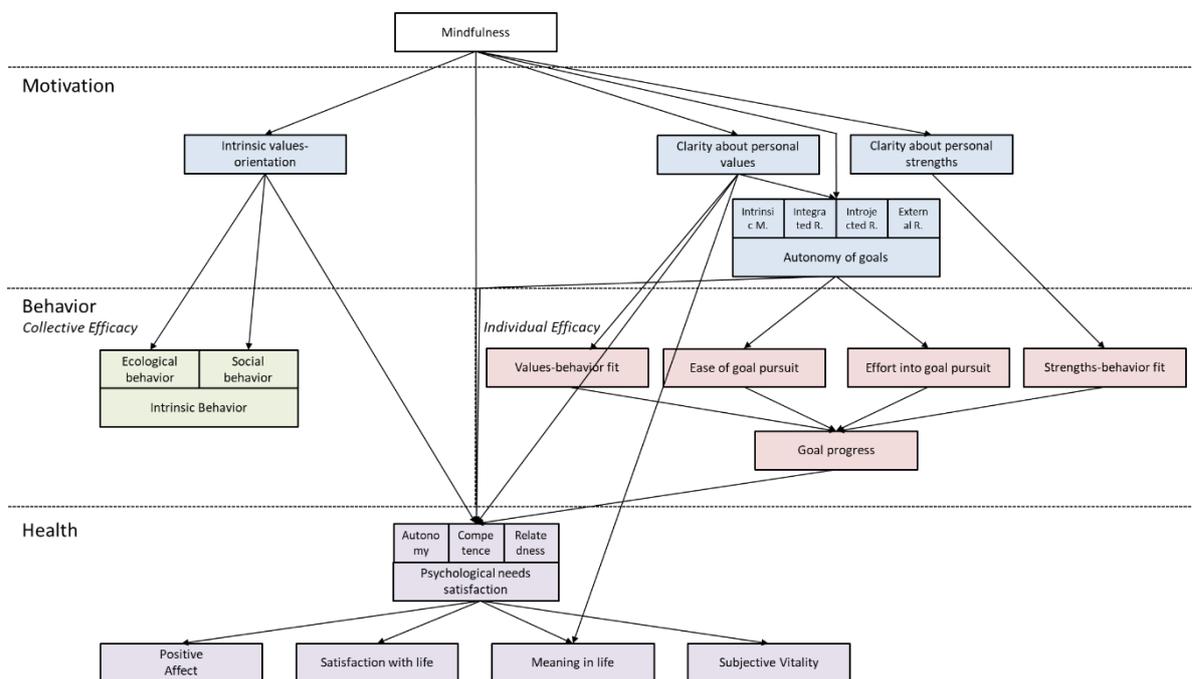


Figure 40: Final causal model with semantic division

In the following section, the attention is shifted from direct causal relations towards the resulting causal chains and discuss the implications further.

The significant total effects of clarity about personal values on psychological needs satisfaction ($\beta_{total} = .377^{***}$) as well as on all the well-being scales: subjective vitality ($\beta_{total} = .205^{***}$), meaning in life ($\beta_{total} = .604^{***}$), satisfaction with life ($\beta_{total} = .246$) indicate that clarity about personal values. In other words, clarity about what is important to oneself, fosters well-being and health. It may not be as strong as the positive effects of mindfulness, but as it is not as much studied as mindfulness, the results are an indication that programs that foster healthy and effective human functioning should also integrate methods that can help the participants to get clarity about their personal values.

When looking at the construct values-behavior fit, which is causally dependent on clarity about personal values, it is interesting that values-behavior fit has neither a significant total effect on psychological needs satisfaction nor on the well-being scales. For this study, this result is counterintuitive. However, it is important to

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address the interpretations derived from discussions with experts of the field as well as our own thoughts. Based on the used scales, one could say that individuals, who have clarity about personal values tend to be happier and healthier. However, behaving in a way that represents those personal values does not have positive effects on health and well-being. Several interpretations of those results are seen. One interpretation is related to the three agency model by Freud (1923). In this structured model of a human's psyche, Freud describes that every human's psyche encompasses the super-ego, the ego, and the id. Whereas the ego has to mediate between the super-ego and the id. It is argued that personal values are explicit constructs that rather belong to the super-ego. Having clarity about the super-ego's personal values can help to understand oneself better and make decisions that reflect the super-ego's tendencies. However, only acting based on those explicit personal values could lead to the suppression of rather implicit motives, emotions, and primal drives. Therefore, it is argued that acting in congruence with only the personal values may neglect implicit motives, emotions, and primal drives. Explicit personal values could be used as a simplification of life and as a shield to hide from personal uncertainties, also called shadows. With regard to Carl Gustav Jung (1933), those shadows are rather layered in the unconscious part of the personality. Thus, if one does not also integrate those rather unconscious constructs, healthy human functioning may be blocked by the suppressed shadows.

Another interpretation relates to the question of whether solely achieving a goal or also pursuing it can enhance well-being and health. This discussion could be seen as one based on philosophical discussions. In specific terms, whether one argues that one exists because one thinks ("Cogito in ergo sum", e.g. Descartes, 1641), which could be rather related to the Aristotelean view of happiness in the ancient times, or one exists because of simply being, which could be rather related to the Cyrene or Stoic view of happiness in the ancient times (Waterman, 2008). Representatives of the first philosophical perspective would likely see more benefits in achieving a goal or solving a problem than representatives of the second philosophical perspective. The second group would probably see the goal pursuit, "the way" as the goal and would argue that

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achieving this goal does not add too much to personal well-being and health. This could be also supported by a study by Kaftan & Freund (2018). This study indicates that subsequent emotional well-being can be achieved during the goal progress, if the pursued goal is highly autonomous and effective coping strategies are used. As personal values were conceptualized as trans-situational goals based on Schwartz (2007), it is argued based on the second perspective that having already achieved the personal values by acting in congruence with them may not add to healthy functioning. Furthermore, this can be supported with an additional finding that came up in the adaption process of the causal model. When adapting the model to achieve a better fit, it was also attempted to add to the now final model a causal path from values-behavior fit to psychological needs satisfaction as well as meaning in life. It was done so because of an assumption that it could be similar to the positive effects of clarity about personal values. It was discovered that values-behavior fit would have a significantly negative relation to meaning in life ($\beta_{\text{Direct}} = -0,236^{***}$). At first, this result felt counterintuitive. However, it is argued that it could be due to the second philosophical perspective introduced. The pursuit of personal values, or in other words the way to achieve them may add more to well-being and health than having achieved values-behavior fit. Even more, acting in congruence with one's personal values, in other words, having achieved the personal values, can lead to a loss of meaning, because one may have nothing to strive for anymore.

A third interpretation could also be stated which is based on the ego-development theory (e.g., Cook-Greuter, 2013). The ego-development theory defines different developmental stages of the ego. The first stages are subsumed under the label pre-conventional/conventional stages and the last stages are subsumed under the label post-conventional/transcendent stages. One major transitional process in adult development could exist between the conventional stages and the post-conventional stages. As the development of the ego through the pre-conventional and conventional stages foster differentiation towards a separate adult self with clearly defined boundaries, the post-conventional and transcendent stages foster deconstruction of constructed boundaries towards a conscious union (Cook-Greuter, 2013). At the end

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of conventional stages, the amount of individuals, who have already achieved what their personal values define through behavior that is congruent with them, might be disproportional. At this stage, the major transition from conventional stages to post-conventional stages can occur. Individuals could lose a sense of meaning even if they do what their personal values define, due to rising awareness of subjective constructs such as personal values. Acknowledging the relativity of subjective constructs such as personal values could make them less important to the self. This process is also often accompanied by a shift from future strivings such as personal values to present moment awareness (Cook-Greuter, 2013). Based on these arguments, it is stated that the negative causal relation, that was observed between values-behavior fit and meaning in life, could also be due to the transitional process of the ego from doing what one fully believes is important to the realization that those constructs are relative and subjective.

Besides analyzing the total effects of constructs that are related to personal values, it would be worthwhile to also take a look at the total effects of clarity about personal strengths and strengths-behavior fit on psychological needs satisfaction and well-being scales. Interestingly, the results do not show significantly positive total effects of both scales on psychological needs satisfaction or on any of the well-being scales. This could be a crucial result in the scope of healthy and effective self-regulation. Knowing personal strengths as well as using them in daily activities may not add to well-being and health. Therefore, it is argued that personal strengths, defined as one's unique combination of talents, acquired knowledge, and skills (Buckingham & Clifton, 2001) may not play an important role for healthy and effective behavior regulation as e.g. mindfulness or clarity about personal values. It may be more important to mindfully pursue activities that help to achieve clearly defined personal values, compared to doing something that one is good at, but does not see any personal value in. Therefore, it may be even more healthy for someone in the business context to pursue a job in which one has to learn new things that she or he is not good at if he values the job he is doing as well as the company's vision and culture.

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At last, based on the total effects on the output variables that are conceptualized under individual efficacy, collective efficacy as well as health that four constructs at the beginning of the causal model appear to have the strongest impact on health and efficacy are highlighted. Those four constructs are mindfulness, clarity about personal values, autonomy of goals, and intrinsic values orientation (see Figure 41). Whereas the impact of mindfulness and clarity about personal values on efficacy and health seems strongest.

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	Mindfulness	Clarity_about_personal_values	Autonomy_of_goals	Clarity_about_personal_strengths	Strengths_behaviour_fit	Effort_into_goal_pursuit	Values_behaviour_fit	Easiness_and_naturalness_of_goal_pursuit	Goal_progress	Intrinsic_values_orientation	Overall_needs_satisfaction
Clarity_about_personal_values	0,416	0	0	0	0	0	0	0	0	0	0
Autonomy_of_goals	0,272	0,288	0	0	0	0	0	0	0	0	0
Clarity_about_personal_strengths	0,349	0	0	0	0	0	0	0	0	0	0
Strengths_behaviour_fit	0,308	0	0	0,885	0	0	0	0	0	0	0
Effort_into_goal_pursuit	0,049	0,051	0,178	0	0	0	0	0	0	0	0
Values_behaviour_fit	0,322	0,774	0	0	0	0	0	0	0	0	0
Easiness_and_naturalness_of_goal_pursuit	0,103	0,109	0,379	0	0	0	0	0	0	0	0
Goal_progress	0,125	0,157	0,202	0,083	0,094	0,502	0,128	0,296	0	0	0
Intrinsic_values_orientation	0,158	0	0	0	0	0	0	0	0	0	0
Overall_needs_satisfaction	0,501	0,377	0,154	0,013	0,015	0,08	0,02	0,047	0,159	0,214	0
Subjective_vitality	0,273	0,205	0,084	0,007	0,008	0,043	0,011	0,026	0,087	0,117	0,545
Meaning_in_life	0,353	0,604	0,046	0,004	0,004	0,024	0,006	0,014	0,047	0,064	0,297
Satisfaction_with_life	0,327	0,246	0,101	0,009	0,01	0,052	0,013	0,031	0,104	0,14	0,653
Positive_Affect	0,306	0,23	0,094	0,008	0,009	0,049	0,012	0,029	0,097	0,131	0,61
Social_behaviour	0,045	0	0	0	0	0	0	0	0	0,282	0
Ecological_behaviour	0,053	0	0	0	0	0	0	0	0	0,334	0

Figure 41: Highlighted total effects of mindfulness, clarity about personal values, autonomy of goals, and intrinsic values orientation

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In the context of the research problem of missing guidance for entrepreneurs on healthy and effective self-regulation, this model indicates that interventions for entrepreneurs could be most effective if they focus on the four variables mindfulness, clarity about personal values, autonomy of goals, and intrinsic values orientation.

3.7.2. Contribution to former research

This model of healthy and effective self-regulation is the first draft of a causal model that integrates the essential variables for healthy and effective self-regulation proposed by Ryan et al. (2008) as well as by Schultz and Ryan (2015). Thus, it is an attempt to capture the state of the art of healthy and effective self-regulation in the scope of SDT.

Based on the number and strengths of causal relations in the final causal model, It is believed that this study empirically supports the proposition by Ryan et al. (2008) as well as by Schultz & Ryan (2015) that the concepts of mindfulness, intrinsic values orientation, autonomy of goals, and psychological needs satisfaction are essential for healthy and effective self-regulation. This model also adds to current research by using the concept of intrinsic respectively extrinsic life goals in the context of personal values based on Hebllich & Terzidis (2016). Furthermore, it refines the model by integrating other relevant variables based on current research as well as uses state of the art measurement instruments. Especially the integration of the Portraits-Values-Questionnaire Revised (PVQ -RR) as an instrument to measure intrinsic respectively extrinsic life-goals is a significant refinement. Moreover, the integration of the concepts clarity about personal values respectively clarity about personal strengths based on the work by Trompetter (2014) respectively by Govindji & Linley (2007) as well as the integration of values-behavior fit by Trompetter (2014) and strengths-behavior fit by Govindji & Linley (2007) reflects a refinement.

Besides, this model adds to current research by indicating that clarity about personal values may be important for healthy and effective self-regulation. It is argued that this insight is underrepresented, if not new, in former research. Clarity about personal values has many positive direct as well as indirect causal effects on psychological

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needs satisfaction and well-being as well as indirect causal effects on goal progress. Thus, the clarity of personal values is seen as a reflexive state of mind that mediates between mindfulness and autonomy of goals as well as directly contributes to psychological needs satisfaction. In contrast, behaving in ways that already fit personal values did not add to well-being and health. Different possible interpretations of this result were found. The results also indicate that the autonomy of goals does not automatically lead to better goal progress. This contradicts former research and demands further research of possible mediators and moderators.

Furthermore, the results indicate that having clarity about personal strengths and using them in everyday life does not add to healthy and effective self-regulation. Thus, the results generally question the role of strengths in intervention programs. This could impact work by Buckingham & Clifton (2001), who developed StrengthsFinder 2.0 (Rath, 2007) or by Govindji & Linley (2007) who work on and research strengths coaching.

Beyond the development and refinement of a causal model for healthy and effective self-regulation in the scope of SDT, contributions are made to current research by using a strong empirical method as well as a big international sample. By testing the causal model with structural equation modeling based on a large international sample (N = 1,024), empirical support and adoption of the model was successful. Based on the observed direct and indirect effects in particular, all hypotheses were tested. Thus, it is argued that this study empirically supports the propositions of the empirical, yet open, integrated model of self-regulation by Ryan et al. (2008) as well as by Schultz & Ryan (2015). Furthermore, a proposal is made that structural equation modeling has helped to empirically identify new essential constructs as well as causal paths. In specific, the strongest contribution is seen in the indication that **the constructs mindfulness, clarity about personal values, autonomy of goals, and intrinsic values orientation have a strong impact on health as well as on individual and collective efficacy**. Whereas the impact of mindfulness and clarity about personal values seems strongest.

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In the context of entrepreneurship, this model fills the gap of missing guidance on healthy and effective self-regulation for entrepreneurs (Baron et al., 2016; D’Intino et al., 2007; O’Shea et al., 2017). Based on the causal model, interventions could be developed for entrepreneurs that focus on enhancing mindfulness, clarity about personal values, autonomy of goals, and intrinsic values orientation.

3.7.3. Limitations

The first limitation is that it is not possible to claim that this sample is representative in a certain dimension (see chapter 3.5.2). However, given the demographic questions, it can be specified that most of the participants are female (57.2 %), live in Germany (632; 61.7 %), are in the range of 16 years to 40 years (854; 83.4 %) and are either students (441; 43.1 %), employed for wages (285; 27.8 %), or self-employed (120; 11.7 %).

Because data was gathered via an online questionnaire that participants took to gain insights into their personalities, a self-selection bias is faced. Individuals, who took part in the questionnaire, may consciously or subconsciously see more benefits in some analyzed psychological constructs than individuals, who are not attracted by the website and do not take part in the questionnaire. The website especially promises to give insight into personal values based on the universal continuum of human values by Shalom Schwartz (Schwartz et al., 2012; Ciecuch et al., 2014 in the adapted version by Hebllich & Terzidis (2016)). By that, in particular, the results concerning clarity about personal values, intrinsic values orientation as well as values-behavior fit could be biased. There was an attempt to reduce this bias by including participants of German Startup Accelerator programs, who had to fill out the questionnaire as part of the accelerator program. However, this is only a small subsample of (N = 77).

As quantitative measurement instruments were used to measure all variables, there could be a common method bias. Söhnchen (2007) points out that many researchers (e.g., Ernst, 2003; Podsakoff, MacKenzie, Lee, Podsakoff, 2003) claim that using a research design that only uses singular type of methods (e.g., only quantitative psychometric measurement instruments) could create a systemic bias called common

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method variance or common method bias (Greve, 2006). This common method bias is also emphasized by Homburg & Klarmann (2006). Other researchers claim that the discussion about common method bias is exaggerated and that it rarely occurs (Crompton & Wagner, 1994; Spector, 2006). However, based on Söhnchen (2007), it is believed that common method bias could have a significant effect on these results. The probably best way to avoid common method bias is to use different types of methods. However, because of the existing valid and reliable quantitative measurement instruments for the variables analyzed (see chapter 3.5.3), other types of methods were not included. Nevertheless, to prevent this bias, the four recommended methodological steps by Söhnchen (2007) were followed when only singular data is used. First, the questionnaire is divided in different parts that were introduced and displayed sequentially. Secondly, it is made sure that the participants can stay anonymous and they were encouraged during the introductions to not try to answer what they think should be answered but to honestly answer the questions for themselves. This is also encouraged by giving the respondents the incentive of a personal evaluation that gives them insights about their personality. By that, not only the common method bias is mitigated, but also the social desirability bias. Third, the sequence of the used measurement instruments does not represent the order of the hypothesized causal system. By that, participants are prevented from inferring any causal hypothesis. At last, different Likert-scales are used for the different measurement instruments to prevent a non-thoroughly habitual clicking that does not represent the honest answer. It is admitted, that it may not fully prevent common method bias that way, but hazard the consequences for having measured all variables with valid and reliable measurement instruments (see chapter 3.5.3).

Another major limitation of this study is that cross-sectional data is used for causational analyses. It is known that causations can hardly be tested with cross-sectional data. MacCallum & Austin (2000) describe that longitudinal data could lead to stronger indications for causations in structural equation modeling because cross-sectional data would infer that causational influence operates essentially instantaneously. However, due to the complexity of the resulting model, it is argued

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that it would be difficult, if not impossible, to test it with longitudinal data or even in an experimental setting. It is argued that conducting SEM in a non-experimental setting is a reasonable procedure that is also conducted by researchers which research causal models with similar complexity (e.g., Sheldon & Elliot, 1999; Werner et al., 2016) in the scope of SDT. Nevertheless, future research could further verify single causational paths with longitudinal data or even in an experimental setting in order to enhance the validity of the model.

Furthermore, even after eliminating outliers in the data, there is neither a univariate nor a multivariate normal distribution for all variables. Given studies with similar issues (e.g., Gao et al., 2008) as well as research on structural equation modeling (Weiber & Mühlhaus, 2014) it is explained why the path of purifying the data is not started by removing more outliers in order to achieve a univariate or a multivariate normal distribution but used the full data set with the limitation of some non-univariate and an overall non-multivariate normal distribution.

With respect to the ego-development theory by Cook-Greuter (2013), another possible limitation was pointed out. This model's idea of finding and connecting important elements of healthy and effective self-regulation may not integrate possible personal development stages of individuals sufficiently. However, based on theories like ego-development by Cook-Greuter (2013), it is believed that individuals may pass different personal development stages. For each stage, other psychological constructs could be more important for healthy and effective functioning. A person who is at the stage of an achiever could have stronger positive effects from e.g. clarity about personal values than a person who is on the level of the pluralist. A pluralist rather values the present moment and by that could have fewer benefits from having clarity about trans-situational goals like values. Thus, mindfulness could be e.g. more beneficial for a person that is at the stage of a pluralist.

Beyond that, this model of healthy and effective self-regulation is only one perspective of what essential variables of healthy and effective self-regulation could look like. This perspective is strongly grounded in the self-determination theory. Therefore, many

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concepts were not included that may be important for healthy and effective self-regulation, because they are not at the core of SDT. One example is the concept of implementation intentions, which showed to be an important mediator between intentions and constructs that relate to personal efficacy like goal attainment (e.g. Gollwitzer & Sheeran, 2006, Koestner, Lekes, Powers, & Chicoine, 2002, Webb & Sheeran, 2007). Future studies could expand this model with more relevant psychological constructs.

At last, a limitation is seen in the underlying philosophical assumptions of SDT. SDT mainly focuses on an Aristotelian view of happiness, called eudaimonia. This is represented in the focus on the three psychological needs of autonomy, competence, and relatedness (Deci & Ryan, 2000). By that, one could argue that physical needs are underrepresented in SDT's view on healthy functioning. Another concept that could be used to support this limitation is Freud's distinction of a person's personality structure in the Id, the super-ego as well as the ego that mediates between them (Freud, 1923). It is argued that SDT strongly focuses on the needs of the super-ego which the ego tries to integrate but may focus too little on the rather physiological needs of the Id. Thus, this model of healthy and effective self-regulation could also be biased through the underlying rather Aristotelean view of happiness.

3.7.4. Retrospection and outlook

This study has **empirically developed and tested a causal model of healthy and effective self-regulation in the scope of SDT that can be used in the context of entrepreneurship**. The results indicate that the concepts **mindfulness, autonomy of goals, intrinsic values orientation, and clarity about personal values foster health and effectiveness**. This is in line with propositions by Schultz & Ryan (2015) as well as Ryan et al. (2008). Furthermore, a significant contribution of this study in the integration of psychological constructs and causal paths is seen that have not yet been emphasized in the scope of SDT. In particular, the newly integrated construct clarity about personal values appears to have many direct and indirect causal effects on health and effectiveness.

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The overall causal model implies that individuals, who strive for healthy and effective self-regulation, may **benefit from exercising present moment awareness**. Being in the present moment has shown to directly impact psychological needs satisfaction and by that well-being and health. The causal model also uncovers causational chains beginning with mindfulness that appear to happen in parallel to this direct effect on psychological needs satisfaction. Through mindfulness, individuals may bring unconscious layers of personality into consciousness, which foster health and effectiveness. In specific terms, the non-judgmental and observing character of mindfulness was found to help to reveal personal values and strengths as well as setting autonomous goals that are in congruence with them. This process appears to also foster effectiveness (goal progress) and health. Besides that, the construct of mindfulness seems to be a pathway to rather pursue implicit motives, such as intrinsic values, compared to extrinsic motives, which also have a direct causal effect on health.

The construct **clarity about personal values was found to have a unique role that goes beyond the described causal chain and indirect effects**. Having clarity about what is important to oneself seems to directly foster psychological needs satisfaction as well as meaning in life. Therefore, it is argued that clarity about personal values is an essential construct in healthy and effective self-regulation and likely as important as the four constructs mindfulness, autonomy of goals, intrinsic values orientation, and psychological needs satisfaction. New studies are encouraged in the scope of SDT to further analyze the construct clarity about personal values and its role in healthy and effective self-regulation.

Beyond the positive implications of our model for individual health and effectiveness, it is argued that it also indicates **positive effects on global well-being and health**. The intrinsic values orientation, which leads to intrinsic behavior, fosters facets of behavior that are rather universalistic. Strictly speaking, these results indicate that social and ecological friendly behavior is fostered. However, the results further show that intrinsic behavior may not foster individual well-being and health. It can be stated that this may be due to the biased measurement instrument used for the two

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types of behavior. A closer look could reveal that behaving in social and ecologically friendly ways as two facets of intrinsic behavior enhance not only global but also individual well-being as well as health.

Although this causal model has many limitations and is based on a rather Aristotelean view of happiness, it is believed that it serves individuals and organizations to foster individual health and efficacy as well as global well-being. Researchers are encouraged to validate and refine this model of healthy and effective self-regulation. In particular, experimental studies could be conducted to test single causal relations. Future work will contribute to this process by **empirically developing and testing comprehensive interventions in the context of entrepreneurship that focus on mindfulness, intrinsic values orientation, autonomous motivation, and clarity about personal values**. Thus, the aim is at putting scientific knowledge into practice and further validating the predicted positive effects on individual health and efficacy as well as on global well-being.

4. STUDY 2: EMPIRICAL DEVELOPMENT AND TESTING OF INTERVENTIONS TO FOSTER HEALTHY AND EFFECTIVE SELF-REGULATION IN ENTREPRENEURS

4.1. Design Science Research as a methodological frame to develop the interventions

To develop and test interventions for healthy and effective self-regulation in the context of entrepreneurship that focus on mindfulness, intrinsic values orientation, autonomous motivation, and clarity about personal values, the **Design Science Research methodology** is applied. Design science research is described as a research paradigm in which a designer answers questions relevant for human problems via the creation of innovative artifacts. Thus, contributing knowledge to the body of scientific research (Hevner & Chatterjee, 2010). In short, it is the design of an artifact with an embedded solution to a research problem (Peffers et al., 2007). Artifacts can be constructs (e.g. vocabulary or symbols), models (e.g. abstractions or representations), methods (e.g. algorithms or practices), and instantiations (e.g. implemented or prototype systems) (Hevner, March, Park, & Ram, 2004, p. 77). The design of the artifact is described as an inherently iterative and incremental activity, in which the evaluation of the artifact provides essential feedback (Hevner et al., 2004). It can be argued that design science research provides a well-developed methodological frame for these purposes as it enables us to iteratively design a method with feedback loops from practice. In the current dissertation, “methods” are iteratively developed and tested in the form of interventions to foster healthy and effective self-regulation in the context of entrepreneurship.

Different frameworks can be used to conduct Design Science Research (e.g. Tadeka, Veerkamp, & Yoshikawa, 1990; Nunamaker et al., 1991; Vaishnavi & Kuechler, 2004; Peffers et al., 2007; Sein, Henfredsson, Purao, Rossi, & Lindgren, 2011; Johannesson & Perjons, 2014). The framework of the Design Science Research Methodology (DSRM) by Peffers et al. (2007) is used. Albeit other frameworks can be used too, DSRM by Peffers et al. (2007) is opted for as it is perceived as an easy to understand and lean framework for conducting Design Science Research. Furthermore, DSRM has been

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validated through several case studies (Peffer et al., 2007). Therefore, the six steps that are proposed by Peffer et al. (2007) (see Figure 42) are conducted.

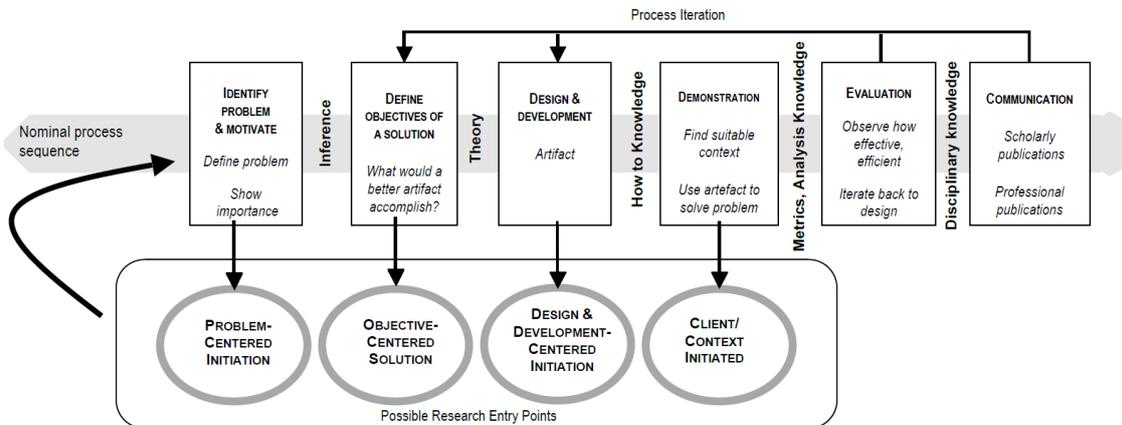


Figure 42: Design Science Research Methodology (DSRM) Process Model (Peffer et al., 2007, p. 44)

In the **first step**, the problem and the respective motivation are identified (see chapter 4.2). In this scope, the specific research problem is defined and the value of a solution is justified. Hereby a presentation is made for the state of the art of research on mindfulness, clarity about personal values, intrinsic values orientation, and autonomy of goals in the context of entrepreneurship as well as on interventions for the four variables.

In the **second step**, objectives of a solution are defined. As a general guide to evaluate the solution, the ISO standard 9126 is leveraged as guidance, which is a recommended standard for the evaluation of design science artifacts (Venable, Pries-Heje, & Baskerville, 2016). In particular, the functional objectives are derived from the causal model while making adjustments concerning the operationalizations.

In the **third step**, the artifact is designed and developed (see chapter 4.4) as well as its evaluation characteristics (see chapter 4.5.). In the **fourth step**, the artifact is applied in the context of entrepreneurship (see chapter 4.6). In the **fifth step**, the artifact is evaluated (see chapter 4.7). At this point, the design of the artifact is returned to as it is proposed by Peffer et al. (2007). After making adaptations and additions to the artifact, it is again applied in the context of entrepreneurship and further evaluated.

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At last, the **sixth step** is conducted by discussing the findings and deriving implications for research and practice (see chapter 4.8). Despite the sequential order of both iterations, they are presented in parallel.

4.2. Identify problem and motivate

According to the first study, mindfulness, clarity about personal values, autonomy of goals and intrinsic values orientation can be seen as psychological constructs that are worth enhancing in interventions, if one attempts to foster healthy and effective self-regulation. Furthermore, they have the potential to directly and/or indirectly foster individual health and efficacy as well as global well-being (see Figure 43).

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	Mindfulness	Clarity_about_personal_values	Autonomy_of_goals	Clarity_about_personal_strengths	Strengths_behaviour_fit	Effort_into_goal_pursuit	Values_behaviour_fit	Easiness_and_naturalness_of_goal_pursuit	Goal_progress	Intrinsic_values_orientation	Overall_needs_satisfaction
Clarity_about_personal_values	0,416	0	0	0	0	0	0	0	0	0	0
Autonomy_of_goals	0,272	0,288	0	0	0	0	0	0	0	0	0
Clarity_about_personal_strengths	0,349	0	0	0	0	0	0	0	0	0	0
Strengths_behaviour_fit	0,308	0	0	0,885	0	0	0	0	0	0	0
Effort_into_goal_pursuit	0,049	0,051	0,178	0	0	0	0	0	0	0	0
Values_behaviour_fit	0,322	0,774	0	0	0	0	0	0	0	0	0
Easiness_and_naturalness_of_goal_pursuit	0,103	0,109	0,379	0	0	0	0	0	0	0	0
Goal_progress	0,125	0,157	0,202	0,083	0,094	0,502	0,128	0,296	0	0	0
Intrinsic_values_orientation	0,158	0	0	0	0	0	0	0	0	0	0
Overall_needs_satisfaction	0,501	0,377	0,154	0,013	0,015	0,08	0,02	0,047	0,159	0,214	0
Subjective_vitality	0,273	0,205	0,084	0,007	0,008	0,043	0,011	0,026	0,087	0,117	0,545
Meaning_in_life	0,353	0,604	0,046	0,004	0,004	0,024	0,006	0,014	0,047	0,064	0,297
Satisfaction_with_life	0,327	0,246	0,101	0,009	0,01	0,052	0,013	0,031	0,104	0,14	0,653
Positive_Affect	0,306	0,23	0,094	0,008	0,009	0,049	0,012	0,029	0,097	0,131	0,61
Social_behaviour	0,045	0	0	0	0	0	0	0	0	0,282	0
Ecological_behaviour	0,053	0	0	0	0	0	0	0	0	0,334	0

Figure 43: Highlighted total effects of mindfulness, clarity about personal values, autonomy of goals, and intrinsic values orientation

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In this chapter, the aim is to understand how this applies to the specific context of entrepreneurship and whether interventions already exist that are or could be used with entrepreneurs. Therefore, there is an attempt to answer three specific questions for each of the four variables: do entrepreneurs differ in these variables to non-entrepreneurs? What are the specific effects of the variables in the context of entrepreneurship? What science-based interventions exist to foster these variables? Due to a lack of interventions that were specifically developed for the context of entrepreneurship, the focus is on interventions for the general population. Based on the answers to the three questions raised above, the problem is identified and the respective motivation for a solution design.

4.2.1. Mindfulness in the context of entrepreneurship

4.2.1.1. Mindfulness of entrepreneurs

An empirical study by Daoussi (2019) does not find a significant difference of the degree of mindfulness between aspiring entrepreneurs, practicing entrepreneurs, and non-entrepreneurs. Other studies that analyze the differences in mindfulness between entrepreneurs and non-entrepreneurs could not be found. The fact that a significant difference has not been found, must not be misinterpreted as evidence that a significant difference does not exist, however, such an assumption can still be made until proven otherwise.

*The assumption is made that there is **no substantial difference in mindfulness between entrepreneurs and non-entrepreneurs.***

4.2.1.2. The effects of mindfulness in the context of entrepreneurship

The study by Daoussi (2019) shows higher positive correlations between mindfulness and **strengths knowledge** as well as between mindfulness and **strengths use** for aspiring and practicing entrepreneurs in comparison to non-entrepreneurs. Based on additional theoretical studies, these results are interpreted in the way that aspiring as well as practicing entrepreneurs have a stronger benefit from mindfulness when it comes to discovering personal strengths as well as using them. The reason may be that individuals in the context of entrepreneurship experience more freedom to set

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tasks for themselves, which fits their personal strengths and, thus, they also put in more effort to get to know their personal strengths (Daoussi, 2019).

Ndubisi, Uslay, & Capel (2014) theorize that mindfulness can foster entrepreneurial activity. The heightened awareness, which comes with mindfulness, helps entrepreneurs to **recognize opportunities, analyze opportunities**, and to respond appropriately by creating new ventures that house the solutions that **exploit those opportunities**. The authors argue that this happens through five subprocesses of mindfulness: openness to novelty, alertness to distinction, sensitivity to different contexts, awareness of multiple perspectives, and orientation in the present. E.g. openness to novelty would help to generate fresh ideas and solutions that can effectively grasp the recognized market opportunity.

Based on the same conceptualization of mindfulness with five subprocesses, Gordon & Schaller (2014) theorize that mindfulness supports the **opportunity evaluation** process, in particular the process of market analysis. Mindfulness would help to reduce the reliance on cognitive heuristics, reduce cognitive errors, and reduce the reliance on positive or negative affect. Thus, it would help to process information in a rather open and unbiased way. This would result in an overall evaluation of an opportunity that relies more on the true nature of available and relevant information than on a biased perspective on the information.

Based on a sample of 184 people who participated in an online survey in an empirical study, Chinchilla & Garcia (2017) find a positive relationship between mindfulness and **social entrepreneurship intention** ($\beta = .27, p < .05$). Moreover, Roche, Haar, & Luthans (2014) find significant relationships between mindfulness and **psychological capital** ($\beta = .19, p < .05$), **emotional exhaustion** ($\beta = -.52, p < .01$), and **cynicism** ($\beta = -.54$) based on a sample of 107 entrepreneurs from New Zealand.

Kelly & Dorian (2017) make theory-based claims about the role of mindfulness in entrepreneurship. They state that there is a positive relationship between mindfulness and entrepreneurial **opportunity recognition** and **evaluation**. Greater mindfulness would increase the entrepreneur's ability to become aware of an

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opportunity. Furthermore, it would help to evaluate that opportunity in a way that corrects for individual biases and emotional reactions. This effect would be moderated by emotional self-regulation. They further say that emotional self-regulation modulates the risk-taking behavior so that someone does neither take too little nor too much risk. Furthermore, the authors propose that mindfulness is positively related to ethical decision making in the opportunity recognition and evaluation process and that this process is moderated by compassion and emotional self-regulation. The authors argue based on former studies that mindfulness leads to more compassion and emotional self-regulation. This heightened sensitivity to the feeling of others and the possibility to regulate own emotions would lead to the ability to see their own venture not separate from others but as connected with others. This would lead to more ethical decision making of the entrepreneurs.

However, Rerup (2005) argues that mindfulness can do both **help and/or harm entrepreneurs in discovering and exploiting opportunities**. Rerup defines five subprocesses of mindfulness: preoccupation with failure, reluctance to simplify interpretations, sensitivity to operations, commitment to resilience, and underspecification of structure. The author argues that in the subprocess “sensitivity to operations” concerning opportunity discovery, mindfulness could help to generate a “big picture”, but it could also harm through cognitive overload, misinterpretation, and scattered attention focus. It is argued that the harm-based interpretation may not be correct when referring to SDT’s definition of mindfulness (see chapter 2.7.5), because mindfulness does not refer to cognitive processes, but rather to a pre-reflexive state of mind that is characterized by an open, non-cognitive awareness. Thus, the authors argumentation is understood and acknowledged but question the described harmful effects are questioned, if one bases the argumentation on SDT’s understanding of mindfulness.

*Based on the presented studies, it is argued that mindfulness has positive effects on the effectiveness and health of both individuals in general and entrepreneurs in particular. Mindful entrepreneurs are arguably more effective in the **discovery, evaluation, and***

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exploitation of opportunities as well as in discovering and using their personal strengths.

4.2.1.3. Interventions on mindfulness

In scientific literature, different practices are described that can foster mindfulness. Most of them refer to some type of meditation (Brown & Ryan, 2004).

There is consensus in research that **meditation** is an effective practice to foster mindfulness. Thus, interventions that teach meditative practices can provide participants with a method to foster mindfulness (Kabat-Zinn, 2003; Bishop et al., 2004; Brown & Ryan, 2004). There are two major types of meditation practices that can be distinguished: **concentration meditation** and **awareness/insight meditation**. Concentration meditation involves solely focusing attention on an internal object (e.g. breath or mantra) or an external object (e.g. a flower or a tree). When attention moves away from the object, e.g. towards thoughts, it is gently brought back to the object. Concentration meditation can set the stage for awareness meditation. Awareness/insight meditation brings consciousness to the moment-to-moment flow of present experience, sensing thoughts, feelings, and impressions as they happening with a heightened awareness. A specific attentional object is less required in awareness/insight meditation. Concentration meditation appears to have a calming effect on the mind, whereas awareness/insight meditation appears to have an activating effect on the mind. Many scholars argue that both types of meditation can be important. Concentration meditation trains the attentional capacity of the mind, whereas awareness/insight meditation can give insights into the nature of conscious experience. Some scholars, e.g. Zen, use a stage model of meditation training. Students start with concentration meditation to train sustained attention over time, because without this capacity, the mind can be lost in thoughts, images, or emotions during awareness meditation (Brown & Ryan, 2004).

There are many different meditational practices. However, in this chapter the focus would be on the practices that are used and evaluated in scientific intervention programs. Hereby, the intention is to understand how the state of the art-

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interventions on mindfulness work. Furthermore, the aim is to apply the essence in an intervention on healthy and effective self-regulation for entrepreneurs.

The most prominent scientific-based meditational practices stem from clinical interventions (Carlson & Garland, 2005). There are interventions for specific contexts like “Mindfulness based Relapse Prevention” (MBRP) and “Mindfulness based Relationship Enhancement” (MBRE) as well as interventions that are used in a more general context such as **Mindfulness-based stress reduction (MBSR)** by John Kabat-Zinn, **Acceptance and Commitment Therapy (ACT)**, and **Mindfulness-based cognitive therapy (MBCT)** (Daoussi, 2019). In the following, the focus is on the elements of MBSR as the most prominent and effective research-based intervention on mindfulness in the general context. MBCT could be considered as well, however, as MBCT uses the same elements as MBSR does, with the mere difference that the focus is on individuals with burnout, anxiety, and depression, the need to further investigate MBCT is not seen. In regard to ACT, mindfulness is not the main focus of the intervention. Personal values and commitment to those appear to be a central part of the intervention. Therefore, ACT is not described in this chapter, but rather in the chapter on clarity about personal values.

Mindfulness-based stress reduction (MBSR) was developed by John Kabat-Zinn (1990) at the end of the seventies. It includes selected Buddhist practices. As it was originally focusing on helping patients with chronic diseases to better cope with the pain and stress of their disease, it also became quickly popular in the context of healthy benefits, e.g. in the organizational context (e.g. Klatt, Buckworth, & Malarkey, 2009) given its positive effects (Brown, Ryan, & Creswell, 2007). MBSR is an eight-week program with daily formal practices (45 minutes), weekly group sessions (150 minutes), and a full „retreat day“. The program includes basic formal elements like seated meditation, mindful body scanning, mindful breathing, mindful yoga, walking meditations, and additional informal routines to stay mindful during daily activities such as mindful eating, speaking, and listening (Reibel, Greeson, Brainard, & Rosenzweig, 2001; Santorelli, Kabat-Zinn, Blacker, Meleo-Meyer, & Koerbel, 2017).

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Experimental studies that analyze the positive effects of the eight-week mindfulness-based stress reduction (MBSR) program (Kabat-Zinn, 2013) indicate that the meditative practices have indeed positive effects on mindfulness (Carmody & Baer, 2008, Dobkin, 2008). Beyond that, a lot of positive effects on human functioning and well-being can be found (e.g. Carmody et al., 2009), e.g. on emotion regulation (Goldin & Gross, 2010), anxiety, depression, heart disease, cancer, and pain (Grossman et al., 2004) as well as on sleep disturbance, stress symptoms, mood disturbance, fatigue, and sleep quality (Carlson & Garland, 2005).

In the following section, details are not given on each element. However, the core element of MBSR is described, which is **mindful breathing**. The description used is based on a script used in MBCT during a laboratory study (Segal, Teasdale, Williams, & Gemar, 2002):

“Participants are guided to become aware of physical sensations—especially those associated with the process of breathing—and to observe them without the intention of altering them. Participants are asked to notice in an accepting, non-judgmental manner when their minds wander to something other than the exercise and to gently return focus to the sensations of breathing when this occurs. This basic meditation exercise embodies the central features of mindfulness practice: intentionally paying attention to moment-by-moment experience with an attitude of acceptance (Kabat-Zinn, 1994; Shapiro, Carlson, Astin, & Freeman, 2006). However, to reduce potential demand characteristics in self-reporting of decentering, instructions did not include language or techniques applied in MBCT (Segal et al., 2002) and other interventions that explicitly addressed viewing specific thoughts from an objective, decentered perspective. Such techniques include the use of metaphors (i.e., imagining thoughts are images projected on a movie screen), labeling thoughts (i.e., encouraging participants to label thoughts as worries, self-criticisms, etc.), or explicitly describing the idea of decentering (e.g., encouraging participants to view thoughts as “just thoughts” and not objective reality or a reflection of one’s true self). In contrast to these approaches, the primary focus of this exercise was on the direct perception of

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breathing rather than thoughts themselves. During the three minutes of silence, participants were encouraged to continue with this practice.” (Feldman, Greeson, & Senville, 2010, p. 7).

Going back to our foregoing categorizations of mindfulness practices, mindful breathing can be categorized as a concentration meditation.

A study by Mrazek, Smallwood, Schooler (2012) indicates that mindful breathing enhances mindfulness and reduces mind wandering. Furthermore, a study by Feldman et al. (2010) shows that mindful breathing appears to be better than progressive muscle relaxation and loving-kindness meditation for decentering and negative thought reactions to repetitive thoughts.

Thus, it is argued that the elements of MBSR, especially **mindful breathing**, yields positive effects for an individual’s mindfulness, effectiveness, and health (e.g. Carmody & Baer, 2008; Mrazek et al., 2012). It is seen as an effective concentration meditation. Thus, it could be particularly valuable for meditation beginners.

When it comes to the **context of entrepreneurship**, a recent empirical study by the World Bank indicates that psychology-based interventions with entrepreneurs can be more effective in fostering business success than traditional business trainings that focus on professional aspects like finance and marketing (Campos et al., 2017). Kelly & Dorian (2017) suggest that entrepreneurs, who are interested in fostering their opportunity recognition and evaluation ability, would benefit from taking part in a mindfulness training. As **two possible interventions**, they see **Mindfulness-Based Stress Reduction (MBSR)** by John Kabat-Zinn (Kabat-Zinn, 2013) or an independently developed, daily meditation practice using one of many **meditation apps**.

*Based on the presented studies, it is argued that mindful **breathing exercises are an effective type of concentration meditation to foster mindfulness with individuals, independent of their previous knowledge.***

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4.2.2. Clarity about personal values in the context of entrepreneurship

4.2.2.1. Clarity about personal values of entrepreneurs

At the current stage of the field, there is little research on the degree of clarity about the personal values of entrepreneurs. However, Shane et al. (2003) argue that entrepreneurs are often driven by passion about a business idea as well as a vision. From experience, those constructs are often inspired by personal values.

*Thus, it is argued that **entrepreneurs tend to have more clarity about their personal values than non-entrepreneurs**. This argument is supported by an empirical study by Berg (2017). She shows, with a mainly German sample of entrepreneurs and non-entrepreneurs, that entrepreneurs rate significantly higher on clarity about personal values and meaning in life than non-entrepreneurs.*

4.2.2.2. The effects of clarity about personal values in the context of entrepreneurship

In the study by Berg (2017), with a mainly German sample of entrepreneurs, clarity about personal values and meaning in life are positively correlated with **self-efficacy, knowledge, and use of personal strengths, self-worth, emotional stability, optimism, life satisfaction, and performance** while being negatively correlated with **stress and depression**.

Thus, it is assumed that the self-directive character of entrepreneurial activities creates a stronger need for having internal standards like personal values, on which to orientate when making decisions, leading to higher clarity about personal values. However, when it comes to the specific effects of having clarity about personal values in the context of entrepreneurship, context-specific relations have not yet been found.

4.2.2.3. Interventions to foster clarity about personal values

Current interventions on getting clarity about personal values mainly stem from the health sector. Patients get methods to think more effectively about the desirability of an option or an attribute of an option in which different treatment alternatives are presented. Most methods allow individuals to implicitly consider their personal values by getting to know the pros and cons of a decision option (Sheridan, Griffith, Behrend, Gizlice, Cai, & Pignone, 2010). Sheridan et al. (2010) argue that most of those methods

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on values clarification work rather implicitly. Explicit values clarification methods like choosing and ranking personal values from a list of possible values might yield additional benefits.

A major, prominent intervention program that is perceived as effective in the context of clarity about personal values is **Acceptance and Commitment Therapy (ACT)**, Hayes, Strosahl, & Wilson, 1999). “ACT clients are encouraged to abandon any interest in the literal truth of their own thoughts or evaluations, and instead to embrace a passionate and ongoing interest in how to live according to their values” (Hayes, 2004). “ACT therapists are passionately interested in what the client truly wants, but not necessarily with the means that the culture specifies for achieving these ends. (Hayes, 2004, p. 20).”

To help the clients to get clarity about their personal values, ACT therapists often use an assessment called the **Valued Living Questionnaire** (Wilson, Sandoz, Kitchens, & Roberts, 2010). It is a self-report tool in the context of ACT. Ten domains of living are listed (family, marriage and intimate relationships, parenting, friendship and interpersonal relationships, professional life, academic life, leisure and recreation, spirituality, citizenship, and self-care). The assessment is seen as a good starting point to define one’s personal values and priorities (Wilson et al., 2010).

An intervention in a more general context is a research-based visualization of personal values tendencies in the universal continuum of human values by Shalom Schwartz (1992). There is an offered assessment of the “SACS Consulting company” that does so based on the personal values survey by Schwartz, called the **SACS Values test** (SACS Consulting, 2020). It shows personal values tendencies in the old values model of Schwartz (1992) (see Figure 44).

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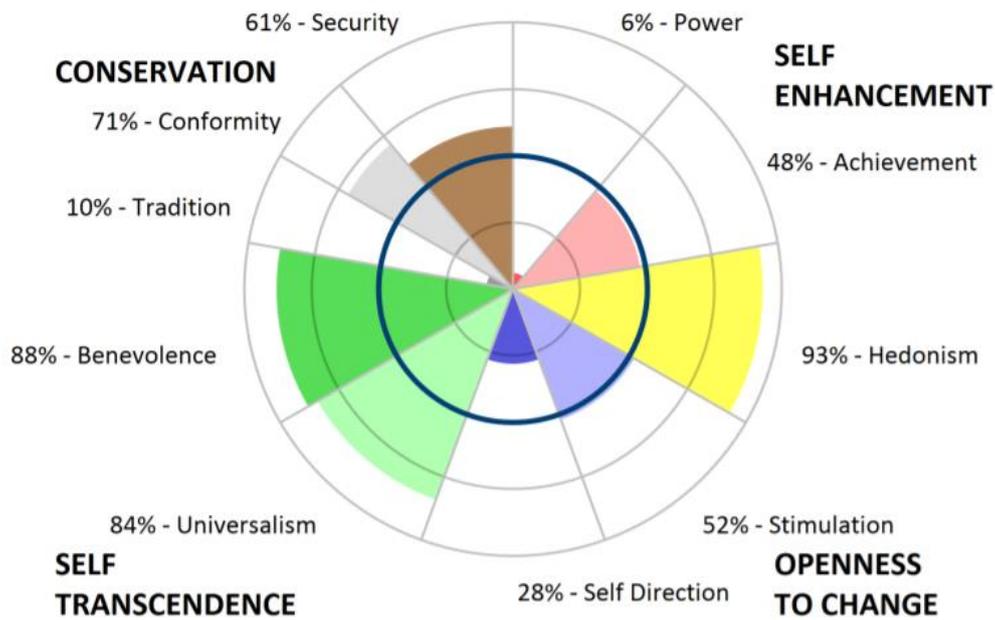


Figure 44: Visualisation of personal values tendencies

There is a similar assessment that is called the **Personal Values Assessment (PVA)** by the Barret Values Centre. One has to choose 10 values out of 67 listed values. The list is based on the hierarchical model by Shalom Schwartz (Leuty & Hansen, 2013). Based on the chosen values, a personal evaluation is created, which shows the personal values and how they are integrated in the Barrett Seven Levels of Consciousness Model (see Figure 45).

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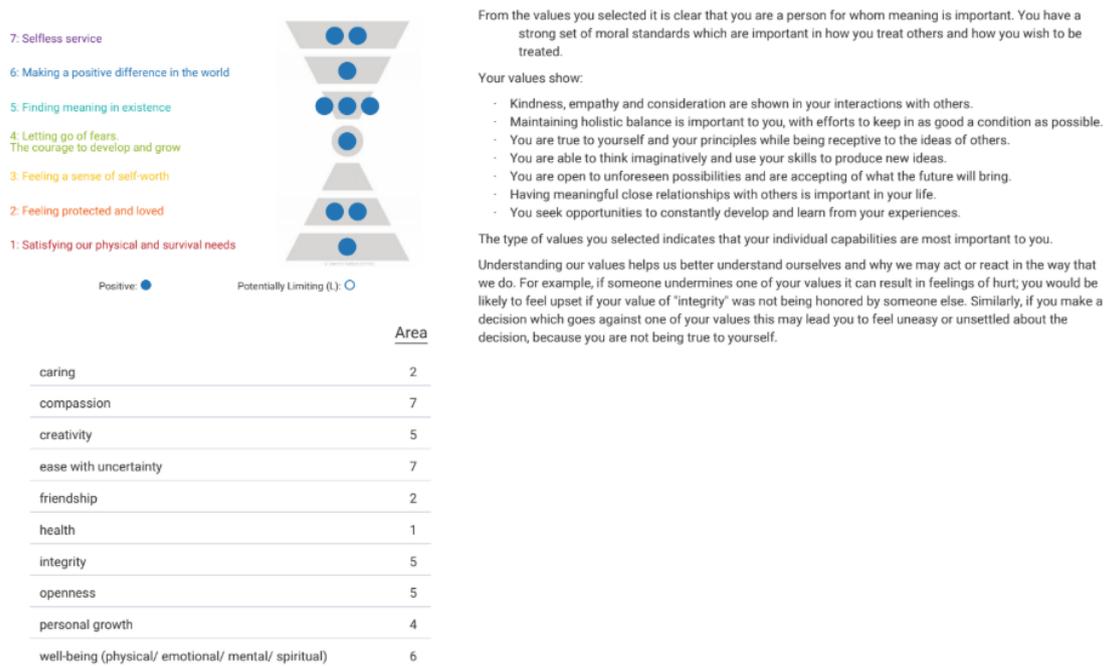


Figure 45: Example of a personal evaluation based on the PVA

The three values assessments, that were presented, seem to cover the main interventions for explicitly fostering clarity about personal values based on scientific research. As they are rather context-free applications, only a guess can be made in which contexts they are used. Looking at the websites of the providers, it seems that those tools are especially used in the health context and the organizational context. In the organizational context, they are applied on the individual level, division level, and company level.

*From this study's point of view, the presented interventions are good drafts for values assessments. However, some of them (e.g. the SACS Values test (SACS Consulting, 2020) are not using state of the art research and are not having an intuitive and precise design that makes results easier to understand and apply. Furthermore, for some of the assessments it is questionable whether they provide an additional value in comparison to just reflecting upon personal values. Picking values from a well-drafted list, e.g. Personal Values Assessment (Leuty & Hansen, 2013), may provide some additional value, but **more value is seen in an effective assessment of personal values, if most recent research based-questionnaires are used and results are presented in an intuitive and precise design.** Such an assessment could not only help individuals in general to*

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self-regulate in a healthy and effective way, but also entrepreneurs in particular to get clarity about their internal drivers and to use them in the context of venture creation.

4.2.3. Intrinsic values orientation in the context of entrepreneurship

4.2.3.1. Intrinsic values orientation of entrepreneurs

With regard to studies about intrinsic values orientation of entrepreneurs, a broader scope of studies is taken into account, in particular those that cover the topic of entrepreneurs' goals. Those goals are either rather trans-situational (like values) or more specific (like job reasons or attitudes). The intention is to better understand the content of entrepreneurs' goals, regardless of whether the content is rather intrinsically orientated or extrinsically orientated.

4.2.3.1.1. Personal values of entrepreneurs

Some studies measure personal values of entrepreneurs. In the following section, focus is kept on recent studies that measure personal values of entrepreneurs in the universal continuum of human values by Shalom Schwartz.

Jaén, Moriano, & Liñán (2010) investigate the relation between the 10 values in the universal continuum of human values by Schwartz and entrepreneurial intention based on a sample of 1,467 Spanish university students. Results show positive relations of **openness to change** and **self-enhancement values** (see Figure 9 to find the referred values) with entrepreneurial intentions (Figuroa et al., 2010).

Kirkley (2010) conduct interviews with 30 entrepreneurs in New Zealand. In the study, participants are asked to rate the most important values from a choice of five values (independence, ambition, choosing own goals, creativity, and daring). Those five values are derived from Schwartz's universal continuum of human values. **Independence is rated as most important value**, with **ambition** as second and **choice of own goals** as third most important value. Whereas independence and choice of own goals are sub-dimensions of the Schwarz value **self-direction** and ambition a sub-dimension of the Schwartz value **achievement** (see Figure 9 to find the referred values). Furthermore, Warr (2018) conduct a comparison of self-employed workers and those employed in an organization with the European Social Survey (ESS,

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Bilsky, Janik, & Schwartz, 2011) based on a sample of 2,304 Britons. Results show that self-employed workers rate higher on **self-direction** and **stimulation** values (see Figure 9 to find the referred values) than those who are employed by an organization.

The Startup Monitor 2018 (Kollmann et al., 2018) analyze 1,550 German start-ups not older than 10 years. Founders of the start-ups are asked to rate 5 motives according to their personal importance. The two rather intrinsic motives **challenge** and **independence** appear to be the most important motives, with the two rather extrinsic motives wealth and recognition as less important. The last motive also perceived as important is necessity.

4.2.3.1.2. Attitudes of entrepreneurs

Douglas & Shepherd (2002) find a strong relation of entrepreneurial intention with **risk tolerance** and with **independence** based on a sample of 300 alumni of an Australian university, who graduated with a bachelor degree in business within the last two to ten years. Results indicate that income is not a significant determinant for entrepreneurial intention.

4.2.3.1.3. Personality dimensions and entrepreneurship

Although personality dimensions do not directly refer to aspirations, some of the constructs that are researched do. Therefore, the findings concerning personality dimensions of entrepreneurs are also presented. Markmann & Barron (2003) present a framework of person-entrepreneurship fit and entrepreneurial success. Based on empirical research literature, they argue that entrepreneurial fit can be described through five personality dimensions that foster successful entrepreneurship. According to them, **self-efficacy, opportunity recognition, social skills, personal perseverance, and human capital** stand for a good entrepreneurial fit which fosters entrepreneurial success.

Rauch & Frese (2007) conduct a meta analysis, looking at the relation of personality dimensions to business creation and business success. Their results indicate that **need for achievement, generalized self-efficacy, innovativeness, stress tolerance,**

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need for autonomy, and **proactive personality** are positively related to business creation and business success.

Zhao, Seibert, & Lumpkin (2010) present a meta study, in which they look at the relation between the Big Five personality dimensions and risk propensities with entrepreneurial intentions respectively entrepreneurial performance. Their results indicate that **conscientiousness** and **openness to experience** is highly related with entrepreneurial intentions ($r = 0,18$; $r = 0,22$) and **entrepreneurial performance** ($r = 0,19$; $r = 0,21$). **Emotional stability and extraversion** are weakly related to entrepreneurial intention ($r = 0,14$; $r = 0,11$) and entrepreneurial performance ($r = 0,09$; $r = 0,05$) whereas agreeableness is negatively related ($r = -0,09$ with entrepreneurial intentions, $r = -0,06$ with entrepreneurial performance). Furthermore, **risk propensity** is only positively related to entrepreneurial intention ($r = 0,30$) and not to entrepreneurial performance.

Arguably the most comprehensive study on personality dimension is by Frese & Gielnik (2014). They make a meta-analysis of research that analyses the relation between personality dimensions and business creation respectively business performance. Their meta analyses indicate that **general self-efficacy, need for achievement, innovativeness, autonomy, and conscientiousness** are highly associated with business creation ($r \geq 0.2$). Concerning business performance, the personality dimensions **general self-efficacy, need for achievement, proactive personality, innovativeness, stress tolerance, openness to experience, and entrepreneurial orientation** are highly associated ($r \geq 0.2$).

4.2.3.1.4. Job reasons of entrepreneurs

Carter, Gartner, Shaver, & Gatewood (2003) compare the job reason of nascent entrepreneurs from USA ($N = 384$) with non-entrepreneurs ($N = 174$) from the USA on 6 scales (self-realization, financial success, roles, innovation, recognition, and independence). They do not find a significant difference on self-realization, financial success, innovation, and independence. However, nascent entrepreneurs **rate significantly lower on roles and recognition**. Whereas roles describe an individual's

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desire to follow family traditions or emulate the example of others and recognition the individual's intention to have status, approval, and recognition from one's family, friends, and from those in the community.

4.2.3.1.5. General impression about intrinsic values orientation of entrepreneurs

*Based on the studies about intrinsic goals on different abstraction levels (values, attitudes, personality dimensions, and job reasons), it is believed that **entrepreneurs have higher importance on personal values that could be categorized as intrinsic values** (e.g. independence, ambition, choice of own goals, stimulation, autonomy, openness to experience).*

4.2.3.2. The effects of intrinsic values orientation in the context of entrepreneurship

No studies were found that specifically show positive effects of intrinsic values orientation for entrepreneurs. However, based on studies on person-entrepreneurship fit (e.g. Markman & Baron, 2003), it is argued that intrinsic values like stimulation, self-direction, and achievement fit to the self-directive and demanding field of entrepreneurship.

*Therefore, **entrepreneurs who are strong on intrinsic values may have a higher person-entrepreneurship fit and thus experience positive effects like entrepreneurial intention and entrepreneurial performance** (based on Hsu et al., 2019; Markman & Baron, 2003).*

4.2.3.3. Interventions to foster intrinsic values orientation

Interventions that specifically foster intrinsic values orientation like it is conceptualized in the scope of SDT (see chapter 2.7.4.) are not found.

Potentially considered as a tool that fosters intrinsic values orientation is the **Values in Action (VIA) assessment**. The construct values in action (VIA) is described as character strengths. It focuses on inherently good, virtuous values. Thus, from our point of view, the construct can be seen as related to the construct of intrinsic values. However, they are not interchangeable. With regard to VIA, there are 24 specific values in action being measured: appreciation of beauty & excellence, bravery, creativity,

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curiosity, fairness, forgiveness, gratitude, honesty, hope, humility, humor, judgment, kindness, leadership, love, love of learning, perseverance, perspective, prudence, self-regulation, social intelligence, spirituality, teamwork, and zest. The assessment tool is based on a quantitative questionnaire in which participants answer 198 questions concerning their character strengths. Participants get an evaluation in which they can see a ranking and description of their character strengths (Niemi, 2013, VIA institute on character, 2020).

*The mechanisms of this self-application tool are believed to be comparable to the interventions for clarity about personal values (see chapter 4.2.2.3), with the difference that the focus is on character strengths, which could be seen as related to a subcategory of personal values, intrinsic values. However, it is argued **that there is more value in an effective assessment for intrinsic values orientation, if most recent research based-questionnaires are used and results are presented in an intuitive and precise design.***

4.2.4. Autonomy of goals in the context of entrepreneurship

4.2.4.1. Autonomy of goals of entrepreneurs

An empirical study by Edelman (2018) with German entrepreneurs indicates that **entrepreneurs rate higher on autonomy of goals than non-entrepreneurs**. The fact that entrepreneurs are often motivated by self-direction and autonomy (Kirkley, 2010; Warr, 2018) also supports a relatively high degree of autonomy of entrepreneurs' goals.

*Thus, it is believed that **entrepreneurs tend to have a high degree of autonomy of goals.***

4.2.4.2. The effects of autonomy of goals in the context of entrepreneurship

When it comes to positive effects of autonomy of goals in entrepreneurship, there is little context-specific research. A study by Siddiqui (2016) on entrepreneurial passion indicates that autonomy of goals can be seen as a **mediator between entrepreneurial self-efficacy and entrepreneurial performance**. Besides, Adam & Fayolle (2015) argue that **autonomy of goals bridges the entrepreneurial intention-behavior gap**.

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*Therefore, we argue that **entrepreneurs, who score high on autonomy of goals, have the positive effects of higher performance by bridging the intention-behavior gap.***

4.2.4.3. Interventions on autonomy of goals

There are many interventions that support individuals directly or indirectly in setting goals, which are based on personal values and authentic interests. However, focus is kept on presenting those interventions that are research-based and make autonomy of goals (also often labelled as self-concordance of goals) their main variable.

Burke & Linley (2007) show that **one on one coaching sessions** working on one personal goals can foster the autonomy (self-concordance) of the goal. The one on one coaching sessions were conducted by coaches who use the GROW model as basic structure for their coachings. The **GROW model** is not further delved into, but rather the emphasis is placed on the basics to understand which facets of the model may lead to enhanced autonomy of goals. GROW stands for “Goal”, “Reality”, “Options” and “Wrap-Up”. It describes that the coachee first formulates his or her current goals, then checks with reality, how well she or he is progressing, then assesses possible options for better progressing with the current goal or for adapting it, and finally next steps are defined. Unfortunately, the study by Burke & Linley (2007) does not state explicitly which specific mechanisms from the GROW model help to foster autonomy of goals. From the perspective of this dissertation, the concrete formulation of current goals as well as the reality check and the consideration of possible alternatives may be the most valuable steps to foster the autonomy of goals. Beyond that, specific research-based interventions that focus on fostering autonomy of goals were not found. There are only a few general discussions on how to integrate SDT in general as well as autonomy of goals in particular into interventions such as one-on-one coachings (e.g. Spence & Oades, 2011).

*Therefore, it is argued that it is **valuable to define personal goals with entrepreneurs and question their degree of autonomy.***

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4.2.5. Deriving the specific problem

The presented studies indicate that **entrepreneurs do not differ from non-entrepreneurs in terms of mindfulness**. However, concerning the variables **clarity about personal values, autonomy of goals, and intrinsic values orientation, entrepreneurs appear to rate higher than non-entrepreneurs**.

Several backed assumptions can be derived from the results. Focus is placed on those which are perceived as most relevant. The expectation is that entrepreneurs in particular would benefit from mindfulness-intervention, if they have not trained this ability yet. The presented studies indicate that this ability not only yields general positive effects on health and efficacy, but that it also yields context-specific effects like more effective discovery, evaluation, and exploitation of opportunities. It is further supposed that it is particularly valuable for aspiring entrepreneurs to foster the other three variables as they are important variables that entrepreneurs are strong at. Moreover, it is assumed that those three variables are also essential given the positive context-specific effects that have been shown for them. Clarity about personal values appears to help entrepreneurs in developing stronger passion for their ideas. Intrinsic values orientation can increase the person-entrepreneurship fit. Higher autonomy of goals can bridge the intention-behaviour gap. Based on the discussed assumptions, it is believed that it would be **valuable to find respectively develop and use interventions that focus on the four variables mindfulness, clarity about personal values, intrinsic values orientation, and autonomy of goals**.

As previously described, there are many research-based intervention programs that focus on enhancing one of the variables (e.g. Mindfulness based stress reduction programme (MBSR, Kabat-Zinn, 2003, 2013), Acceptance and Commitment Therapy (ACT, Hayes et al., 1999) and mindfulness based cognitive therapy (MBCT, Segal & Teasdale, 2018)) for mindfulness; Valued Living Scale (VLS) in the scope of ACT (Wilson et al., 2010) and Personal Values Assessment (PVA, Leuty & Hansen, 2013) for clarity about personal values; One on one coaching based on the GROW model (Burke & Linley, 2007) for autonomy of goals; the Values in Action (VIA) assessment (Niemi, 2013) to foster intrinsic values orientation. However, based on the knowledge of the

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research field, those interventions are either long therapeutic programs (MBSR, MBCT, ACT), intense one on one coachings (based on GROW), or simple self-help tools (VLS, PVA, VIA). Furthermore, except for acceptance and commitment therapy, the interventions only focus on one of the two variables. Based on the empirically developed causal model of healthy and effective self-regulation in study 1 (see Figure 37), it is believed that **a comprehensive, but precise and lean intervention, that focuses on enhancing all four variables, yields high potential to foster individual health as well as individual efficacy and global efficacy.** It could be particularly valuable to those individuals, who do not have access to or do not have the time for long intervention programs. Furthermore, based on related research in the context of entrepreneurship (Baron et al., 2016; Campos et al. 2017; D'Intino et al., 2007; O'Shea et al., 2017), it could be particularly valuable for entrepreneurs due to the highly self-directive character of entrepreneurial activities. **The combination of mindfulness, clarity about personal values, autonomy of goals, and intrinsic values orientation could serve entrepreneurs to authentically lead themselves through the entrepreneurial journey. Thus, creating their business in a healthy and effective way.**

4.3. Define objectives of a solution

The main objective of this study is to empirically develop and test interventions that enhance mindfulness, clarity about personal values, intrinsic values orientation, and autonomy of goals in entrepreneurs. This is intended to activate the causal chains (see Figure 46) that directly and/or indirectly foster individual health (psychological needs satisfaction, positive affect, satisfaction with life, meaning in life, subjective vitality) as well as individual efficacy (goal progress) and collective efficacy (intrinsic behavior).

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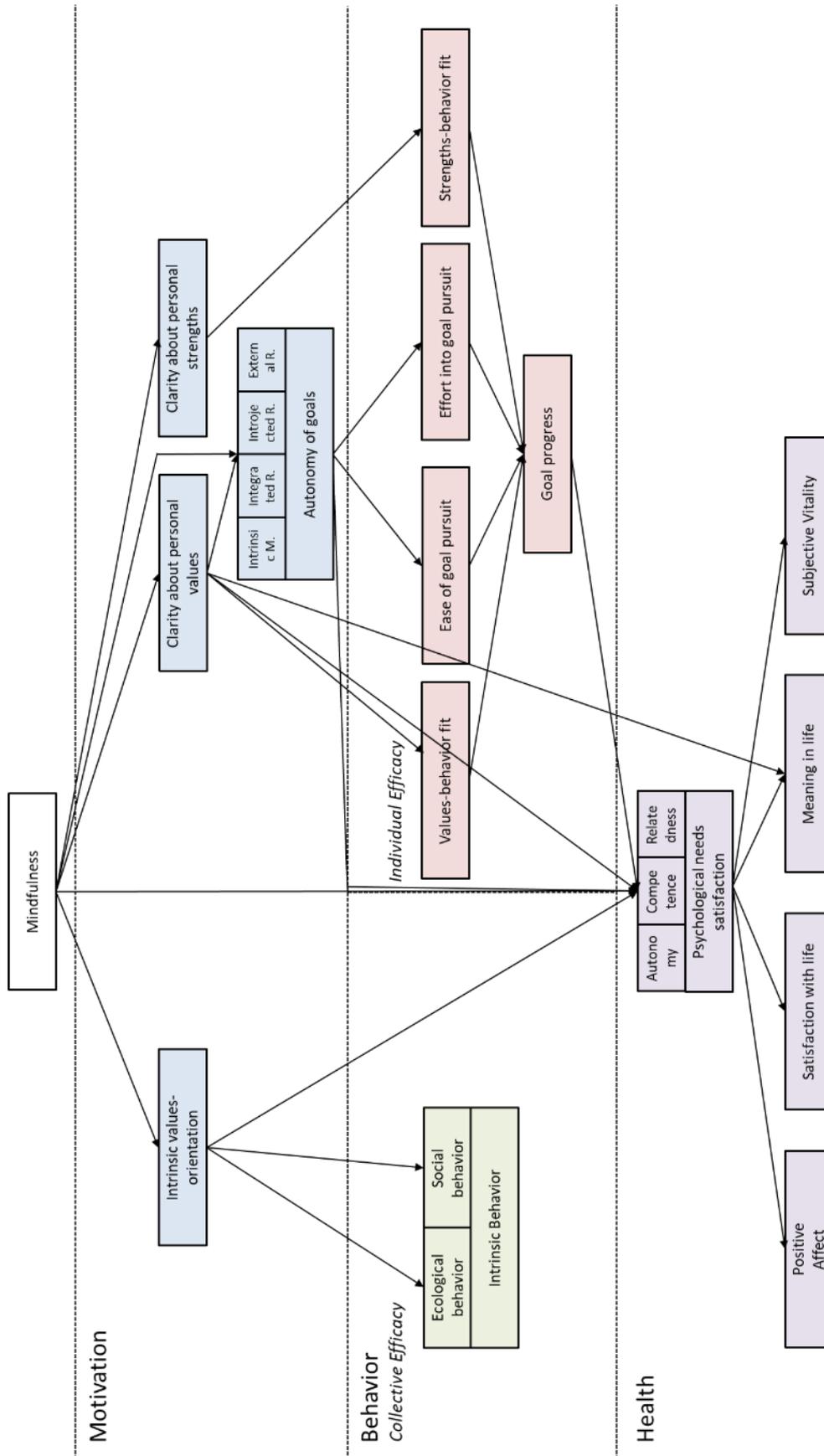


Figure 46: Causal model of healthy and effective self-regulation in the scope of SDT

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On a meta-level, the aim is to fulfil the quality characteristics of the **ISO standard 9126**, which is one recommended guide for software design evaluation in the scope of design science (Venable et al., 2016). This includes the quality characteristics “functionality”, “reliability”, “usability”, “efficiency”, “maintainability” and “portability” (OASIS, 2020).

Functionality is defined as “a set of attributes that bear on the existence of a set of functions and their specified properties. The functions are those that satisfy stated or implied needs” (OASIS, 2020). In this case, functionality is specified as the property of the artifact to foster mindfulness, clarity about personal values, intrinsic values orientation, and autonomy of goals and thus directly and/or indirectly foster individual health (psychological needs satisfaction, positive affect, satisfaction with life, meaning in life, subjective vitality) as well as individual efficacy (goal progress) and collective efficacy (intrinsic behavior).

Reliability is defined as “a set of attributes that bear on the capability of software to maintain its level of performance under stated conditions for a stated period of time.” (OASIS, 2020). In this case, reliability is specified as the property of the artifact to work without errors.

Usability is defined as “a set of attributes that bear on the effort needed for use, and on the individual assessment of such use by a stated or implied set of users” (OASIS, 2020). In this case, usability is specified as the property of the artifact that all its elements can be easily used and understood by the user.

Efficiency is defined as “a set of attributes that bear on the relationship between the level of performance of the software and the amount of resources used, under stated conditions.” (OASIS, 2020). In this case, efficiency is specified as the property of the artifact that the time required in the use of it is justified by the generated value of it.

Maintainability is defined as “a set of attributes that bear on the effort needed to make specified modifications” (OASIS, 2020). In this case, maintainability is specified

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as the property of the artifact that changes at all elements can be made easily by the developer.

Portability is defined as “a set of attributes that bear on the ability of software to be transferred from an environment to another” (OASIS, 2020). In this case, portability is specified as the property of the artifact that it can be used on different devices (smartphones from different providers, personal computers).

4.4. Design and development of the intervention

The design and development of the intervention is conducted in **two iterations**. The two iterations are conducted sequentially. The second iteration is based on the feedback on the intervention of the first iteration. However, in the following section both iterations are directly described as stated above. It is argued that the main goal is to develop an effective intervention. By directly presenting the results of both iterations, a result-orientated presentation is used that serves that goal.

Given the existing interventions (see chapter 4.2), it is assumed that a **comprehensive, but precise intervention** is able to touch the effectiveness of long intervention programs (like MBSR, ACT, MBCT) and intense one on one sessions (like based on GROW) embedded in the simplicity of a self-application tool (like VLS, PVA, VIA). In the following, a **first overview** is provided of the resulting interventions, before design and development of each sub-intervention is described in detail.

4.4.1. Overview of interventions from iteration 1 (VALUES FINDER)

Inspired by the simplicity of the self-assessment tools, in the **first iteration** a comprehensive, but precise **self-applicable tool** is empirically developed and tested that fosters mindfulness, clarity about personal values, intrinsic values orientation, and autonomy of goals. It is called it the **Values Finder**. The Values Finder comprises of several components: one component is the digitalized **questionnaire** that uses all scientific scales as used in study 1 (191 items). Thus, in comparison to existing self-assessment tools (e.g. Personal Values Assessment by Leuty & Hansen, 2013), the most recent scientific questionnaires are used. The digitalized questionnaire is realized through google forms. The answers to the scales are taken as a base for the second

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component of the Values Finder, the **personal evaluation and action plan**. The personal evaluation and action plan provide participants with explanations and visualizations. It especially explains the constructs of mindfulness, personal values, intrinsic values, autonomy of goals and emphasizes its importance for health and effectiveness. Moreover, it shows the individual degree of mindfulness, clarity about personal values, intrinsic values orientation and autonomy of goals of the participants, and visualizes personal values tendencies in the universal continuum of human values by Schwartz (Schwartz et al., 2012; Ciecuch et al., 2014). Furthermore, this method is not limited to a self-assessment, but **include self-applicable practices** in the action plan (e.g. a mindful breathing exercise), which can help participants to improve the four variables by themselves. Those self-applicable practices are mostly derived from research-based intervention programs. Thus, the tool developed is more than a self-assessment. It is a self-assessment that includes call to actions based on the results. In chapter 7.1 the personal evaluation and action plan of the Values Finder is attached to get a vivid impression of it. Besides, the digitalized questionnaire and the personal evaluation and action plan there is an additional component that is seen as part of the interventions from iteration 1. Participants access the questionnaire via a **website** that is developed (www.findyourvalues.com respectively www.findyourvalues.de). The website motivates visitors to identify their personal values. It does so especially through a motivational slider, a motivational video as well as explanations about the whole project.

The **usual sequence** that participants undergo when using the intervention from iteration 1 is the following: participants either access the website directly through a recommendation or they search for terms like “self-development tools” on the internet and click on the website. They likely read through the motivational material provided, decide to conduct the questionnaire, and receive in average within two weeks their personal evaluation and action plan. Finally, after two weeks they are asked to provide feedback via a structured online questionnaire. The full process is illustrated in Figure 47.

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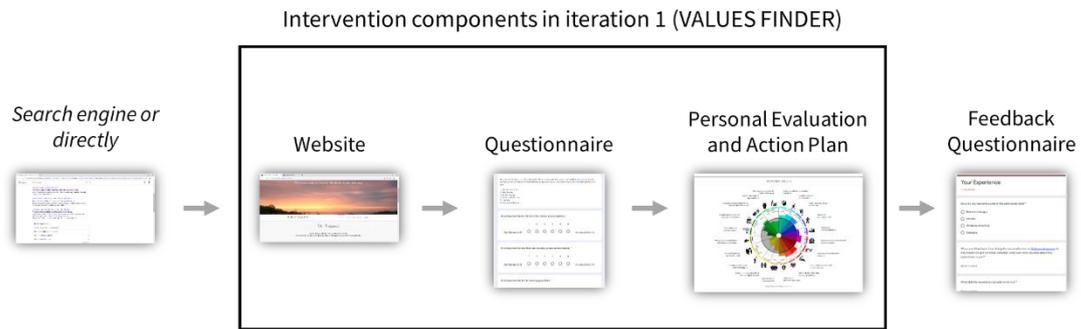


Figure 47: Process of the VALUES FINDER

Table 13 shows all interventions with the referring sub-interventions. As each sub-intervention is described in detail following the two overview chapters, the table serves as an overview and first insight into the position of each sub-intervention as well as its function.

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INTERVENTION COMPONENTS AND GENERAL FUNCTIONS		
<p>WEBSITE</p>  <p>Motivation to participate and explanations</p>	<p>QUESTIONNAIRE</p>  <p>Reflexion</p>	<p>PERSONAL EVALUATION AND ACTION PLAN</p>  <p>Explanation and visualization of personal results</p>
SUB-INTERVENTIONS FOR CLARITY ABOUT PERSONAL VALUES		
<p>Motivational slider to get more clarity about personal values</p> <p>Motivational video to get more clarity about personal values</p> <p>Explanations of what personal values are and why having clarity about personal values is important</p> <p>Explanation of the scientific base of our test to motivate people to get more clarity about personal values</p>	<p>Reflexion about personal values priorities</p> <p>Reflexion about one's degree of clarity about personal values</p>	<p>Visualization of personal priorities</p> <p>Visualization of one's degree of clarity about personal values</p> <p>Explanations to the visualizations</p> <p>Self-applicable practice "Carve out your core of personal values"</p>
SUB-INTERVENTIONS FOR MINDFULNESS		
	<p>Reflexion about one's degree of mindfulness</p>	<p>Visualization of one's degree of mindfulness</p> <p>Explanation of mindfulness and its importance</p> <p>Self-applicable practice "Polishing the mirror" exercise</p>
SUB-INTERVENTIONS FOR INTRINSIC VALUES ORIENTATION		
	<p>Reflexion about one's degree of intrinsic values orientation</p>	<p>Explanation and visualization of intrinsic values orientation</p> <p>Self-applicable practice "Carve out your core of personal values"</p>
SUB-INTERVENTIONS FOR AUTONOMY OF GOALS		
	<p>Reflexion about one's degree of autonomy of goals</p>	<p>Visualization of one's degree of autonomy of goals</p> <p>Self-applicable practice "Burning yes or gentle no" exercise</p>

Table 13: Overview of interventions from iteration 1 (VALUES FINDER)

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4.4.2. Overview of interventions from iteration 2 (CORE VALUES WORKSHOP)

The **second iteration** entails two motivational factors. Firstly, the feedback from the first iteration emphasizes a need for personal feedback on the results. Participants indicate that they would like to know what specific actions they can take given their results. Secondly, the intention is to make the intervention more applicable for the specific context of entrepreneurship with regard to the context-specific challenges in self-regulation as emphasized in chapter 2.5. As workshops are already conducted on business modeling for entrepreneurs at our institute, a decision is made to leverage those as resources. Therefore, **a workshop module is empirically developed and tested** on mindfulness, clarity about personal values, intrinsic values orientation, and autonomy of goals that integrates the intervention from iteration 1. It serves the entrepreneurs as a personal development module before business modeling. The workshop module takes four hours and **includes the components of the Values Finder**. The additional workshop components serve to intensify the methods that are provided with the Values Finder. They especially focus on conducting the self-applicable practices that are provided with the Values Finder together with the participants. Furthermore, as participants of the workshop are going to work together in teams (aspiring entrepreneurs) or join as an existing team of at least two (practicing entrepreneurs), the intention is to also incorporate the variables clarity about personal values and autonomy of goals on the team level. It is done by providing the participants with methods to not only discuss and define **personal values**, but also to discuss and define **team core values**. Based on the team core values, the teams discuss and define a **mission** and a **vision**. The workshop is complemented with a **PowerPoint presentation** that is developed in this dissertation.

The **process** that participants follow when participating in the intervention from iteration 2 (Core Values Workshop) begins with signing up for an entrepreneurship training at our institute, either as aspiring or as practicing entrepreneur. Then, a link to the website (www.findyourvalues.com) is provided and they are asked to use the ValuesFinder as a mandatory part of the training. However, participants do not get the

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results online, but in the workshop. In the workshop, joint concentration is placed on their results and exercise practices as described on the ValuesFinder to foster mindfulness, clarity about personal values, intrinsic values orientation, and autonomy of goals. Moreover, they are asked as a team to discuss and define the team core values as well as a team mission and vision. Two weeks after the workshop, they receive a digitalized feedback questionnaire. The complete process is illustrated in Figure 48.

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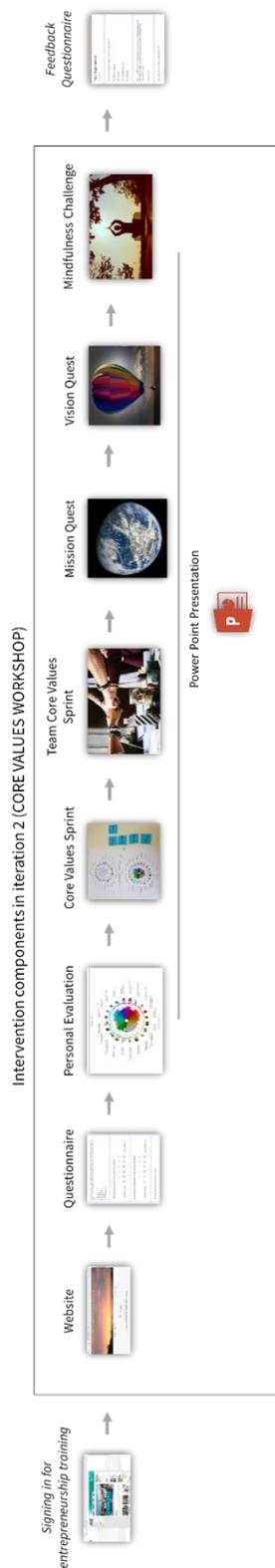


Figure 48: Process of the Core Values Workshop

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Table 14 and Table 15 show all interventions with the referring sub-interventions. As each sub-intervention will be described in detail after the two overview chapters, it serves as an overview for already getting an impression of the position of each sub-intervention as well as its function.

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INTERVENTION COMPONENTS AND GENERAL FUNCTIONS							
WEBSITE	QUESTIONNAIRE	PERSONAL EVALUATION AND ACTION PLAN	CORE VALUES SPRINT	TEAM CORE VALUES SPRINT	MISSION QUEST	VISION QUEST	MINDFULNESS CHALLENGE
							
Motivation to participate and explanations	Reflexion	Visualization of personal results	Explanation, reflexion and definition of personal values	Discussion and definition of team core values	Discussion and definition of a mission	Discussion and definition of a vision	Mindfulness Training
SUB-INTERVENTIONS FOR CLARITY ABOUT PERSONAL VALUES							
Motivational video slider to get more clarity about personal values	Reflexion about personal values priorities	Visualization of personal priorities	Explanation and discussion of personal values	Discussion and definition of the participants' personal values priorities on the team level			
Motivational video to get more clarity about personal values	Reflexion about one's degree of clarity about personal values	Visualization of one's degree of clarity about personal values	Explanation and discussion about the positive effects of having clarity about personal values				
Explanations of what personal values are and why having clarity about personal values is important		Explanations to the visualizations	Explanation and discussion of the refined universal continuum of human values by Schwartz and of its visualization				
Explanation of the scientific base of our test to motivate people get more clarity about personal values		Self-applicable practice "Carve out your core of personal values"	Reflexion about and definition of the participants' personal values priorities				

Table 14: Overview of interventions from iteration 2 (CORE VALUES WORKSHOP), part 1

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SUB-INTERVENTIONS FOR MINDFULNESS							
	Reflexion about one's degree of mindfulness	Visualization of one's degree of mindfulness					Explanation and discussion of mindfulness and its importance Self- applicable practice "Polishing the mirror" exercise
		Explanation of mindfulness and its importance Self- applicable practice "Polishing the mirror" exercise					
SUB-INTERVENTIONS FOR INTRINSIC VALUES ORIENTATION							
	Reflexion about one's degree of intrinsic values orientation	Explanation and visualization of intrinsic values orientation	Explanation, visualization and discussion of intrinsic values orientation				
		Self- applicable practice "Carve out your core of personal values"	Self- applicable practice "Carve out your core of personal values"				
SUB-INTERVENTIONS FOR AUTONOMY OF GOALS							
	Reflexion about one's degree of autonomy of goals	Visualization of one's degree of autonomy of goals			Discussion and definition of a values- based mission	Discussion and definition of a values- based vision	
		Self- applicable practice "Burning yes or gentle no" exercise					

Table 15: Overview of interventions from iteration 2 (CORE VALUES WORKSHOP), part 2

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In the following, details are provided about the different **sub-interventions** of each intervention. They are **described** and **their scientific base is also stated**. The scientific base can be distinguished into the scientific base for the **content** of the sub-intervention as well as the **reason for integrating** it. For most sub-interventions there is a scientific base for the content as well as the reason for integration. However, as design is a highly creative process that often works intuitively and associatively, there are exceptions. E.g. on the website, there is a motivational video slider, which uses a quote by Carl Gustav Jung. Albeit the quote is scientifically based, it represents a creative idea to integrate such a slider, which in turn has no scientific base. Those sub-interventions are highlighted with “own idea”. As a **structure** to describe the sub-interventions and their scientific base, the four constructs are used that are intended to be directly fostered through the interventions: clarity about personal values, mindfulness, intrinsic values orientation, and autonomy of goals. Furthermore, it is shown whether the sub-interventions originate from **iteration 1 (I1) as part of the ValuesFinder** or **iteration 2 (I2) as part of the Core Values Workshop**.

4.4.3. Sub-intervention for clarity about personal values in iteration 1 (ValuesFinder)

4.4.3.1. *Motivational video slider to get more clarity about personal values (on the website)*

The first part of the interventions on clarity about personal values consists of the motivational elements on the website, which exists as a German version (www.findyourvalues.de) and an English version (www.findyourvalues.com). The creation of a website is inspired by the website of the Values in Action assessment (VIA institute on character, 2020), which provides explanations to a self-assessment and motivates to participate. On the website, potential participants firstly see a **motivational video slider** with a landscape and a **quote by Carl Gustav Jung**: “Who looks outside, dreams; who looks inside, awakens” (Jung, 1973, p. 33) (see Figure 49).

The integration of a motivational video slider represents our **own idea**. It shall serve to catch the attention of potential participants as well as to make them understand

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and give them a feeling of what the value of having clarity about personal values can be.

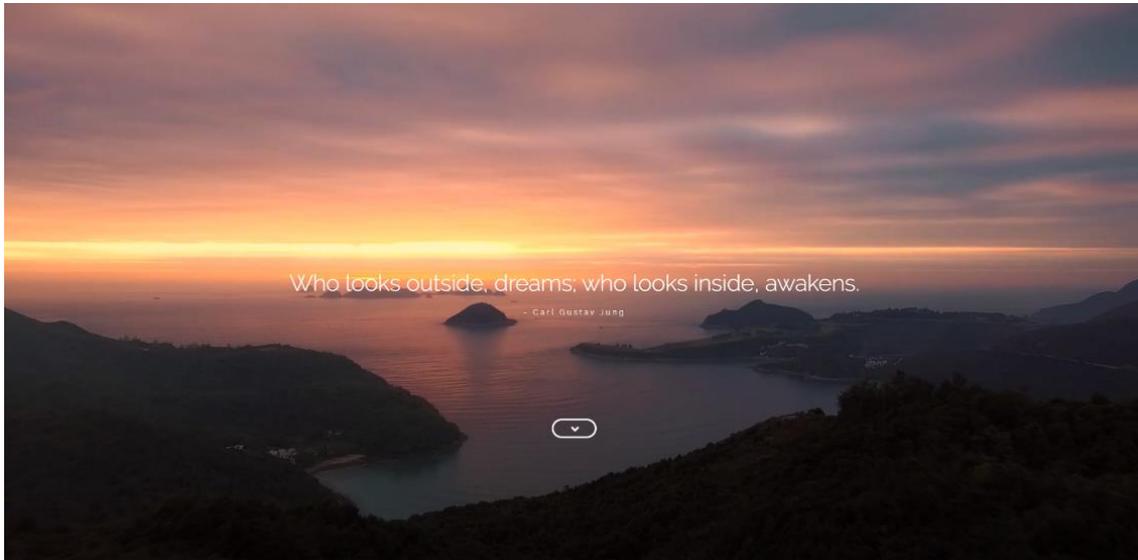


Figure 49: Motivational slider (on the website)

4.4.3.2. **Motivational video to get more clarity about personal values (on the website)**

An internally developed **motivational video** shall further motivate the potential participants to take part in the questionnaire and receive a personal evaluation and action plan (FindYourValues, 2017). The video emphasizes the positive effects of having clarity about personal values (**based on Kasser & Ryan 1993, 1996, 2001; Trompetter, 2014**) (see Figure 50).

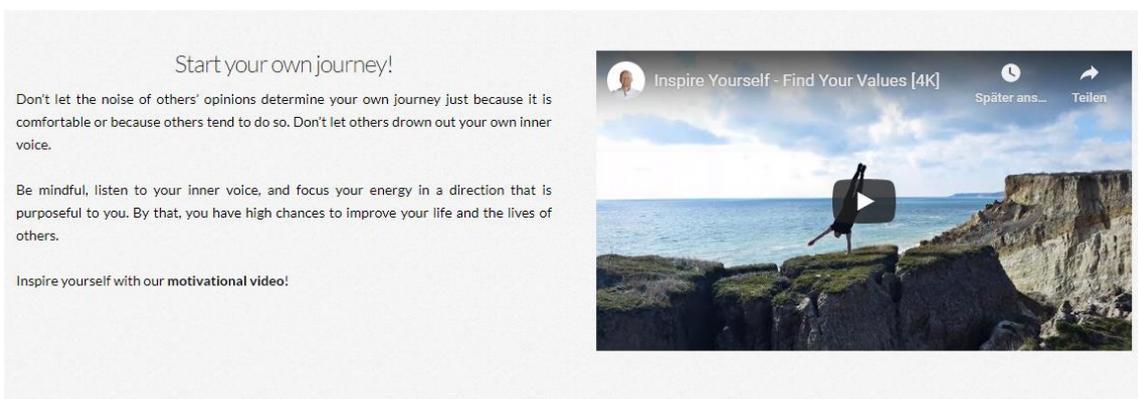


Figure 50: Motivational video (on the website)

The integration of a motivational video is **inspired by the motivational video of the Values in Action Assessment** (Niemic, 2013; VIA institute on character, 2020).

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4.4.3.3. Explanation of what personal values are and why having clarity about them is important (on the website)

An explanation is also provided for **what personal values are based on Schwartz' definition of personal values** (Schwartz, 2012). It is emphasized that values define what is important to a person in life throughout many different situations and that one tends to experience positive emotions when acting in congruence with ones values or when the environment is advocating them (see Figure 51).

Further attempt is made to motivate people to take part in the test by explaining **why having clarity about personal values yields positive individual and society effects (based on Kasser & Ryan 1993, 1996, 2001; Trompetter, 2014)**. It is emphasized that it can help them to be more successful and satisfied as well as to act more social and ecologically-friendly (see Figure 51).

With regard to the website of the Values in Action Assessment (e.g. Values in Action, VIA institute on character, 2020), it is stated that these explanations help potential participants to better understand the value of the Values Finder.

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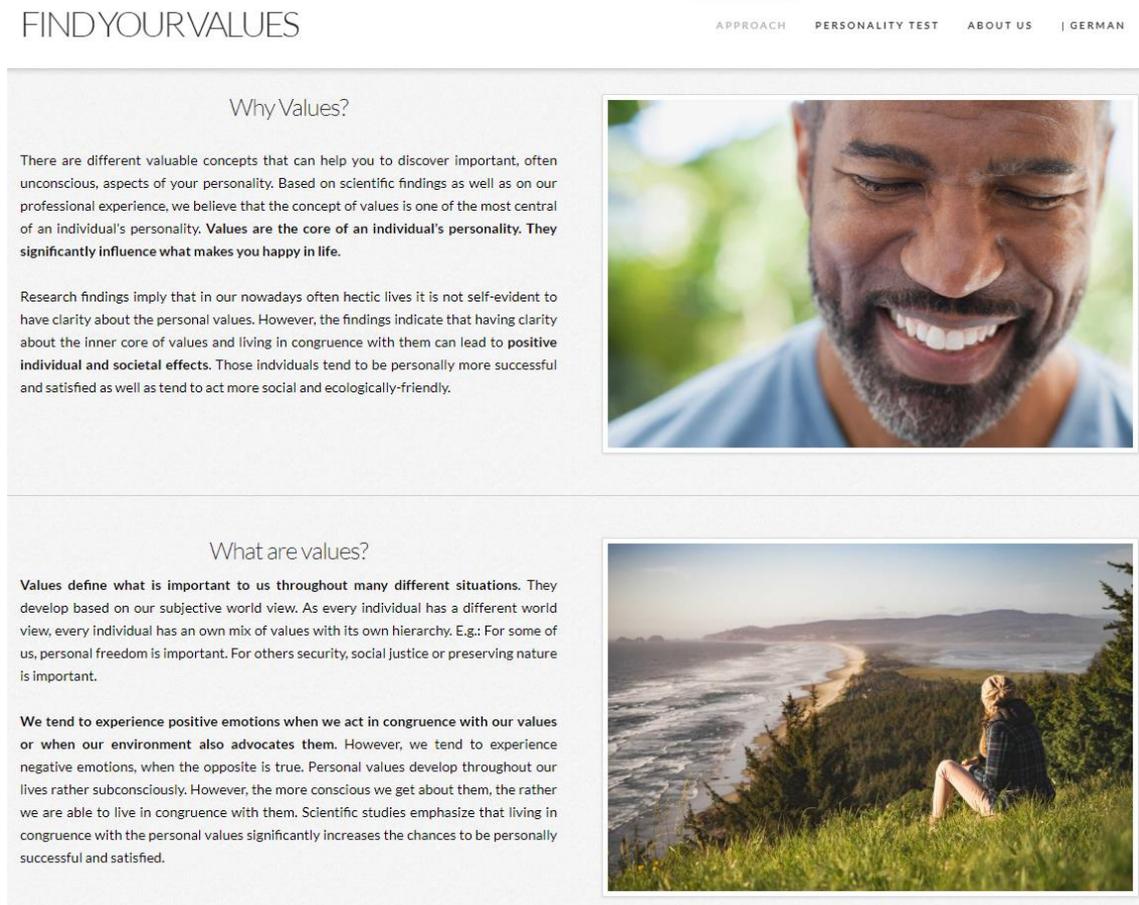


Figure 51: Explanations about what values are and why values are important (on the website)

4.4.3.4. **Explanation of the scientific base of our test to motivate people get more clarity about personal values (on the website)**

With the intention to further encourage participation, an emphasis is placed that the **work is based on scientific methods** and an explanation is given how the questionnaire and personal evaluation work and how they can participate. Directly following are the two buttons to start the questionnaire either in English or in German (see Figure 52). The content represents our **own idea**. It is believed that it can motivate people, especially in the context of psychological topics, to participate in a self-assessment, if they know that it has a scientifically sound base.

The integration of the explanations is again **inspired by the website of the Values in Action Assessment** (e.g. Values in Action, VIA institute on character, 2020). They also use similar explanations for their self-assessment.

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Methods

We focus on methods that are on the cutting edge of scientific research. The methods we apply are mainly from the field of psychology. As a first step, we recommend you to take our **in-depth psychological personality test**. As a result, you get an 18-pages personal evaluation with helpful visualizations und explanations about your values tendencies as well as other related psychological variables. The personal evaluation can serve you as an excellent starting point for structured and mindful self-reflection about your inner motivators.

Furthermore, we offer **individual coachings** and **group workshops**. In doing so, we support you based on the personality test to dig deeper into your internal drivers. Subsequently, we help you to ask yourself in a structured way whether your current life situation fits them. Finally, we develop and conduct together an action plan that fits your personal situation.



Personality Test

Our in-depth psychological personality test is based on scientific questionnaires from the field of motivational psychology. Based on your answers, we send you a **written evaluation and visualization of your personal values**. In addition, we illustrate indicators that show how congruent your current actions are with them and how satisfied you are. Altogether, the personal evaluation comprises 18 pages.

The personality test is for free and completely anonymised. We need at average two weeks until we send you your evaluation. This is due to the fact that we conduct a final quality check of your data.



Take the Personality Test

[German Version](#)

[English Version](#)

Figure 52: Explanations about scientific methods and buttons to the personality test (on the website)

4.4.3.5. Reflexion about personal values priorities (in Questionnaire)

The questions that participants have to answer about their personal values priorities represent another sub-intervention on clarity about personal values. The questionnaire is the same as in study 1. It is digitalized to an **online questionnaire** using Google forms (see Figure 53).

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Here we briefly describe different people. Please read each description and think about how much that person is or is not like you. Please decide on the scale from 1 to 6 how similar the described person is to you.

1: Not like me at all
2: Not like me
3: A little like me
4: Moderately like me
5: Like me
6: Very much like me

It is important to her to form her views independently. *

1 2 3 4 5 6

Not like me at all Very much like me

It is important to her that her country is secure and stable. *

1 2 3 4 5 6

Not like me at all Very much like me

It is important to her to have a good time. *

Figure 53: Excerpt of the digitalized questionnaire in google forms

The questions that are used to measure personal values priorities are from a scale out of study 1, the **Portraits Values Questionnaire** (PVQ-RR, Schwartz et al., 2012; Cieciuch et al., 2014). It measures the importance of 19 distinct values with 57 items. Each value's importance is measured through three items (Schwartz & Butenko, 2014). The version used in this study also includes the value of health as a separate value with three additional items. This is motivated by the study by Heblich & Terzidis (2016), which indicates based on multidimensional scaling that the value of health is a separate concept and not a part of the value of personal security. In line with Schwartz et al. (2012), the 60 items represent statements about a person (e.g., item 1: "It is

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important to her to form her views independently”; one of three items that measure self-direction thought). Participants are asked to rate on a Likert scale from 1 (not like me at all) to 6 (very much like me) how much this person is like them or not. To compute the importance of a personal value, the mean of the three referring items is calculated. The relative importance of a personal value is calculated by subtracting the individual’s mean rating of all twenty personal values (Schwartz & Butenko, 2014). In line with Schwartz et al. (2012), this is called the centered value score.

In the psychological context, especially in therapy, questions are often already seen as interventions (e.g. Adams, 1997; McGee, Vento, & Bavelas, 2005). Although the literature focuses on the therapeutic context, the informal feedback was obtained from the participants that the questions of the questionnaire themselves already led to insights. Thus, it is argued **based on Adams (1997) and McGee, Del Vento, & Bavelas (2005)** that the questions about personal values priorities can already lead to reflexion about personal values, which can enhance clarity about personal values.

4.4.3.6. Reflexion about one’s degree of clarity about personal values (in Questionnaire)

The first part of the sub-intervention on clarity about personal values are the questions that the participants have to answer about their clarity about personal values. The questionnaire is the same as in study 1. It is digitalized to an **online questionnaire** using Google forms. To measure the clarity about personal values, four items of the **Valued living scale** (VLS, Trompetter, 2014) are used. The valued living scale measures “the recognition and knowledge of personal values as well as undertaking behavioral actions congruent with these values” (Trompetter, 2014, p. 74). Participants are asked to rate on a Likert scale from 1 (strongly disagree) to 6 (strongly agree) how much they agree with each of the statements. The four items that are included (e.g., item 1: “I have values that give my life more meaning”) represent the recognition and knowledge of personal values and are the ones with the highest factor loadings (Trompetter, 2014). With the motivation to make the construct more precise, two items are added by the author (“I know my personal values” and “I have clarity about my deeply held values”). To calculate a person’s clarity about personal

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values, the mean of the six items is computed. Higher scores reflect higher levels of clarity about personal values (based on Trompetter, 2014).

Referring to the scientific reasoning for seeing the questions of the PVQ-RR already as an intervention (see chapter 4.4.3.5), it is further argued **based on Adams (1997) and McGee et al., (2005)** that the questions about clarity about personal values can motivate oneself to find out more about one's personal values and thus foster clarity about personal values.

4.4.3.7. Visualization of personal values priorities (in Personal Evaluation)

Based on the answers to the items of the Portraits Values Questionnaire (PVQ-RR, Schwartz & Butenko, 2014), the participants receive a **visualization of their personal values tendencies** in the **structure of the refined continuum of human values by Schwartz** (based on Heblich & Terzidis, 2016 and Schwartz & Butenko, 2014). Based on the sets of answers, the visualizations are created by the authors using a sunburst diagram in Microsoft Excel (see Figure 54).

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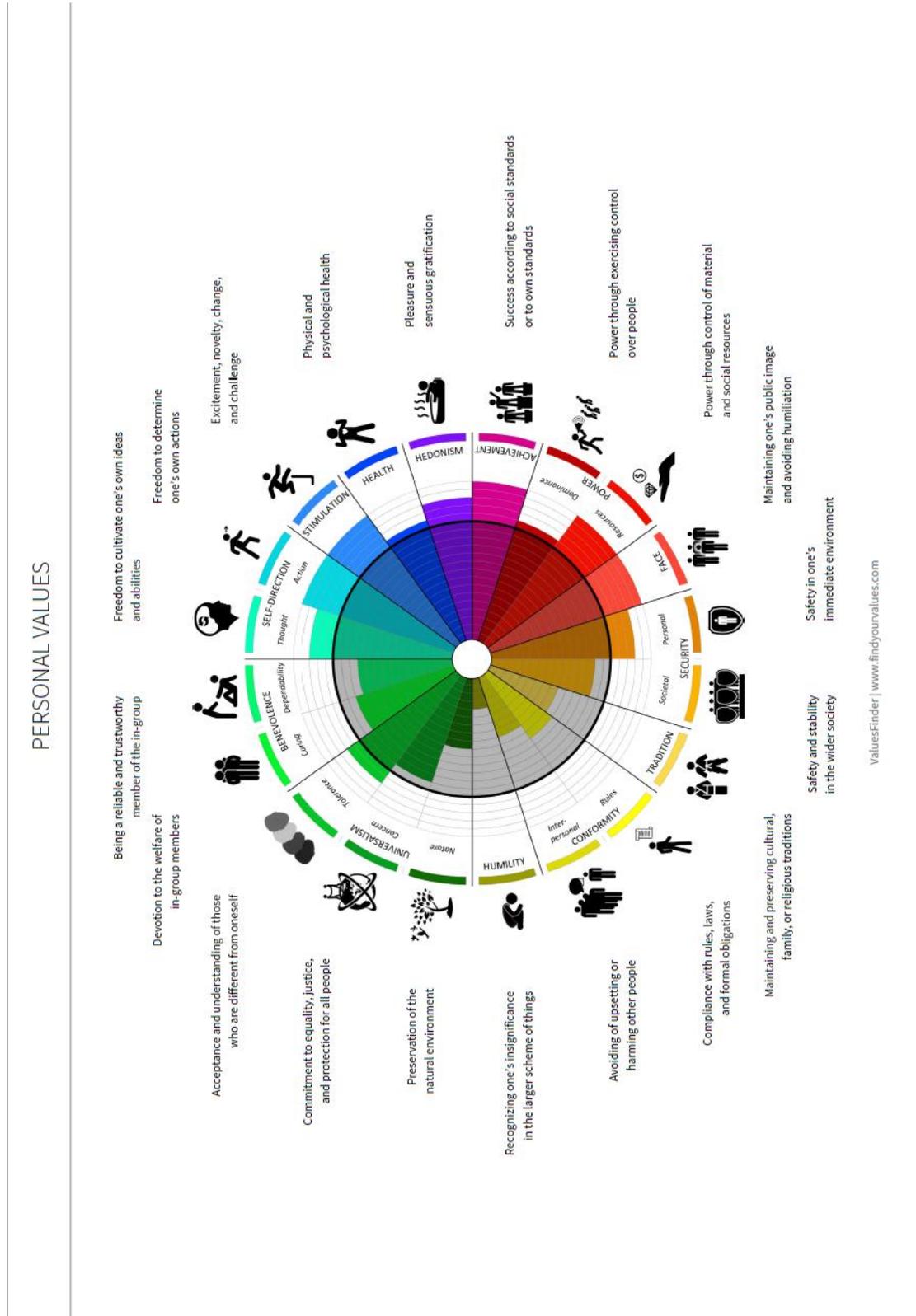


Figure 54: Example of the visualization of personal values in the refined continuum of human values (based on Heblich & Terzidis, 2016 and Schwartz & Butenko, 2014)

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In line with the PVQ-RR (Heblich & Terzidis, 2016 and Schwartz & Butenko, 2014), every sunburst represents a single personal value. The more a sunburst is coloured to the outer border of the continuum, the more important a personal value is for a person. To determine how important each personal value, in other words each sunburst, is for each participant, the average of the three referring items is used. Hereby, 3 represents the minimum, which is depicted by not colouring any cells in the respective piece of cake, whereas 18 describes the maximum, which is represented by 20 coloured cells. The border of the grey-coloured circle in the middle of the continuum represents a person's overall average. Thus, the visualization does not use the centered mean scores like the PVQ-RR does, but it takes the person's average into regard by showing the grey layered circle. Therefore, participants receive visual indications concerning the relative importance of each personal value. Each value is described with one sentence (see Figure 54).

All descriptions are based on Schwartz & Butenko (2014). The only exception is the personal value "health", which is described based on Heblich & Terzidis (2016). In addition to the descriptions of each personal values, the author added an icon to each personal value, representing the meaning of each personal value. The decision process addressing which icon to use is conducted in iterative feedback loops with several participants and experts. **Based on the visualization in the SACS Values test** (SACS Consulting, 2020), it is considered that the developed visualization of personal values priorities can be used as an effective tool to find and describe one's most important personal values.

4.4.3.8. Visualization of one's degree of clarity about personal values (in Personal Evaluation)

Based on the answers to the items of the **Valued living scale** (VLS, Trompetter, 2014), participants receive **visualizations of their degree of clarity about personal values**. Given their answers to the VLS, the visualizations are made with a bar chart in Microsoft Excel (see figure 31).

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HOW CLEAR ARE YOU ABOUT YOUR PERSONAL VALUES?



Figure 55: Visualization of a participant's degree of clarity about personal values

The integration of such a visualization reflects an **own idea**. It is argued that the visualization of one's degree of clarity about personal values using a scientific scale can help to understand one's own status quo. Furthermore, it can serve as a motivational incentive to work on one's clarity about personal values.

4.4.3.9. Explanation to the visualizations (in Personal Evaluation and Action Plan)

In addition to the visualizations of personal values priorities and clarity about personal values, participants are provided with explanations on **how these visualization can be understood (based on Schwartz et al., 2012; Ciecuch et al., 2014), what personal values are (based on Schwartz, 2012), and what the value of its visualization is (based on e.g. SACS Consulting, 2020; Kasser & Ryan, 1993, 1996, 2001; Trompetter, 2014)** (see Figure 56). The description is based on the **conceptualization of personal values by Schwartz (2012)**.

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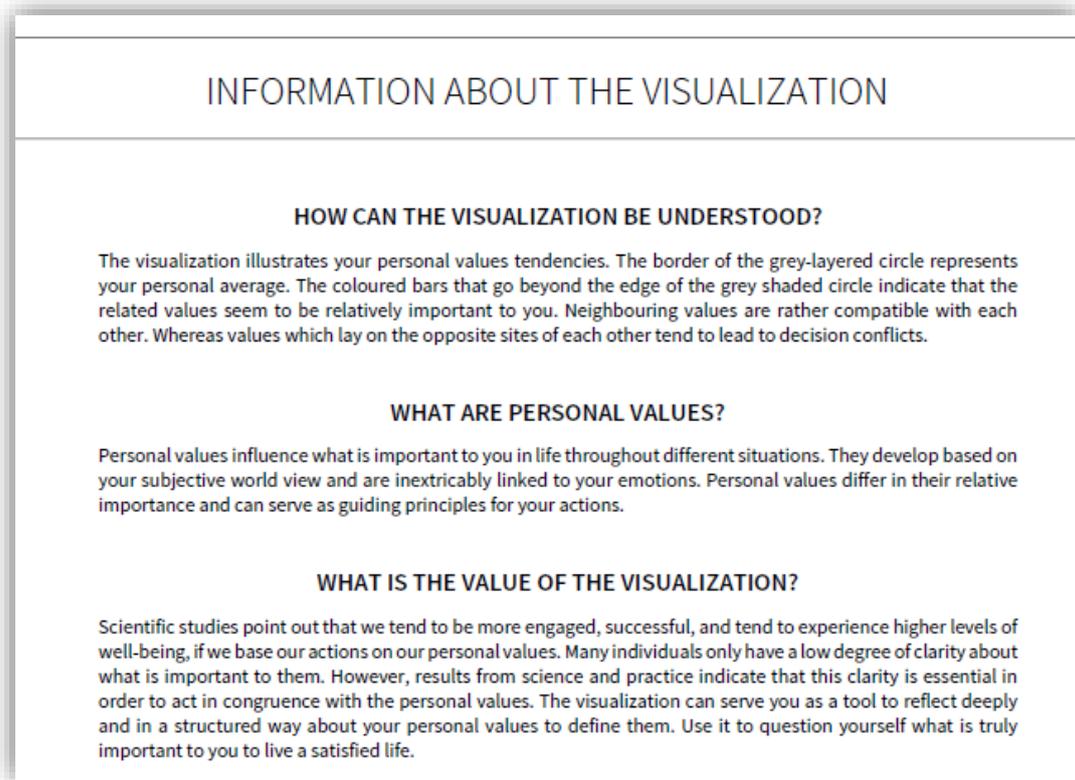


Figure 56: Information about personal values and its visualization

The integration of these explanations in the Personal Evaluation and Action Plan represents an **own idea**. It is argued that they help to better understand the nature of personal values as well as the visualizations themselves.

4.4.3.10. “Carve out your core of personal values” exercise (in Personal Evaluation)

The participants are provided with **self-applicable practices** that can help to get more clarity about personal values. The practice is explained under the title **“Carve out your core of personal values – What makes your hearth sing?”** (see Figure 57).

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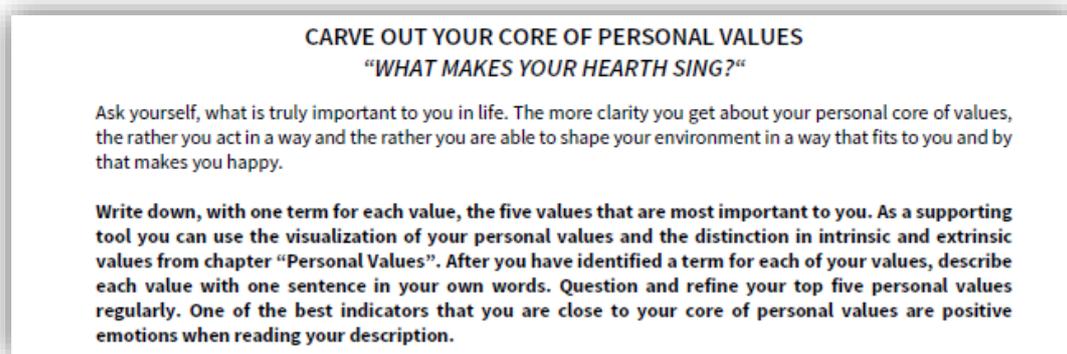


Figure 57: Explanation of the practice “Carve out your core of personal values” to find and describe personal values

In this practice, participants are firstly being asked to use the visualization of personal values tendencies as a starting point to write down their five most important values. They are asked to not only name them but also to describe them with one sentence and regularly refine them. As an additional help to validate whether the five described values authentically fit their personality, participants are advised to use emotional feedback. Whereas positive emotional feedback when reading their personal values’ description indicates that they touch their core of personal values. **Based on Schwartz’s characterization of personal values as being inextricably linked to emotions** (Schwartz, 2007), emotional feedback is believed to be an effective mechanism to do so.

Based on the mechanisms of the Personal Values Assessment by Leuty & Hansen, (2013), it is believed that ranking personal values based on a visualization of personal values priorities can help to find and describe one’s most important personal values.

4.4.4. Additional sub-intervention for clarity about personal values in iteration 2 (Core Values Workshop)

4.4.4.1. Explanation and discussion of personal values (In Core Values Sprint)

This sub-intervention complies with the explanations of the Values Finder from iteration 1. **Based on Schwartz’s definition of personal values** as “trans-situational goals that vary in importance and serve as guiding principles in the life of a person or a group.” (Schwartz, 2007, p. 712), **participants are explained what personal values**

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are. Explanations are enriched with everyday examples and participants are also asked for additional examples, which are then written down on a flip chart (see Figure 58) and further discussed in the group.

Integrating the explanations and discussing exemplary personal values represents an **own idea**. It is believed that the explanations in combination with the discussion help participants to understand what personal values are and to integrate the conceptualization in their world view.

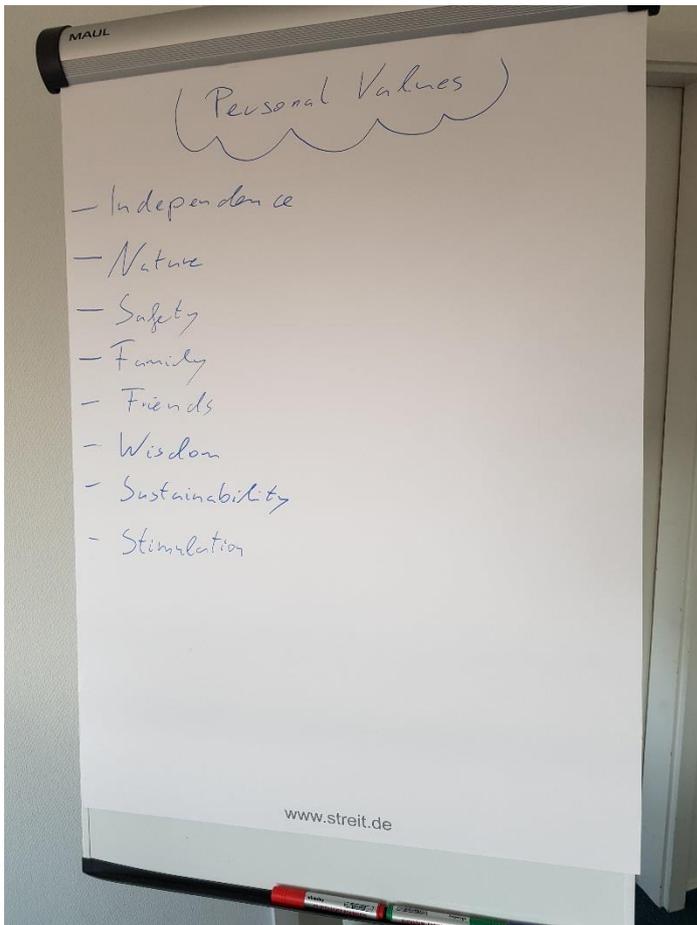


Figure 58: Examples of personal values on a flip chart

4.4.4.2. Explanation and discussion on the positive effects of having clarity about personal values (In Core Values Sprint)

Using the study's developed and tested causal model of healthy and effective self-regulation in the context of SDT (see study 1), potential **positive effects for oneself and the entrepreneurial team** are derived, if oneself and/or the team **have clarity about personal values**. After introducing basic concepts of SDT, focus is placed on

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the direct and indirect positive effects shown in relation to **efficacy variables** such as effective coping strategies (Smith et al., 2011), sustained effort (Sheldon & Elliot, 1999; Sheldon & Houser-Marko, 2001), easiness and naturalness of goals (Werner et al., 2016), goal progress (Sheldon & Elliot, 1999), reduced intention-behavior gap (Sheeran et al., 1999; Sheeran, 2002) as well as in relation to **health variables** such as psychological needs satisfaction (Sheldon & Elliot, 1999), psychological well-being (Sheldon & Kasser, 1995), and subjective well-being (Sheldon & Elliot, 1999; Smith et al., 2011). Additional figures are provided to visualize the positive effects. Furthermore, results are presented on the company level indicating that companies with a clear set of values, that are developed and lived through all divisions (so-called visionary companies) can have much **better financial performance** in comparison to companies in similar industries, but without that clarity (based on Collins, Collins, & Porras, 2005; Mackey & Sisodia, 2013). The following illustration serves as a showcase by putting the average financial performance of visionary companies in perspective (see Figure 59).

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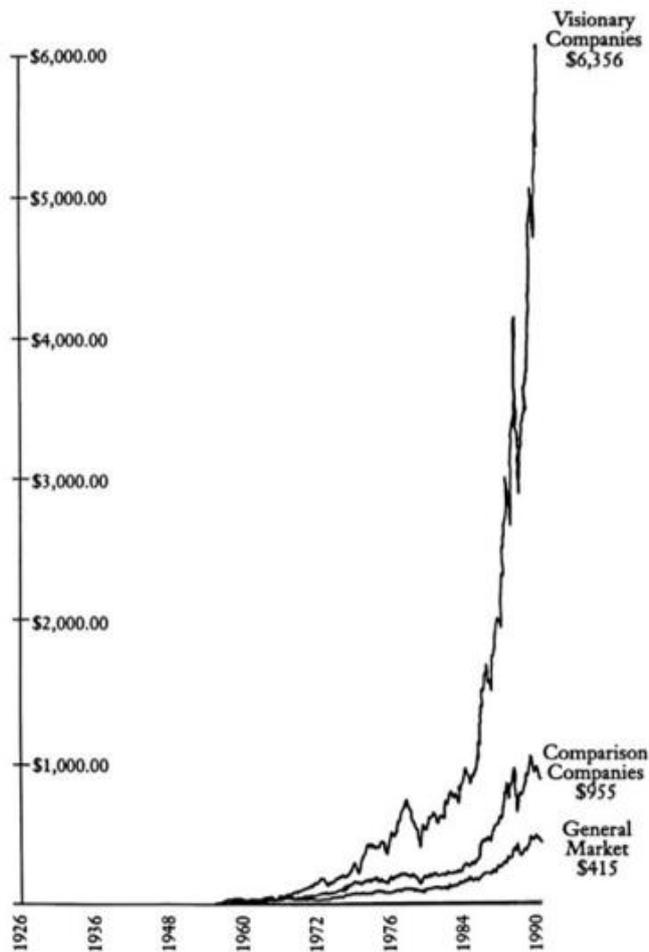


Figure 59: Ratio of cumulative stock returns to general market (1926-1990) (see Collins et al., 2005, p. 8)

After presenting these potential positive effects, an open, experience-based debate is conducted on what positive effects can occur in case clarity about personal or team values exist.

The integration of the explanations of positive effects is **inspired by the website of the Values in Action Assessment** (e.g. VIA institute on character, 2020), where explanations for the self-assessment are provided too. It is argued that the explanations of positive effects motivate participants to gain more clarity about personal values.

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4.4.4.3. *Explanation and discussion of the refined universal continuum of human values by Schwartz and of its visualization (In Core Values Sprint)*

In addition, the **universal continuum of human values by Schwartz and its visualization** are introduced and discussed in the Values Finder (**based on Hebllich & Terzidis, 2016 and Schwartz & Butenko, 2014**). Firstly, an explanation is given on the historical development of the continuum. In this context, it is highlighted that the continuum originates from intercultural studies in more than 80 countries (Schwartz, 2012) and that it presents a set of personal values existing across different cultures. Further elaboration is given on the fact that the visualization in the structure of the continuum (see Figure 60) can help to identify the relative importance of personal values through the border of the grey-layered circle as the border represents a person's average. Personal values, whose visualizations (sun bursts) go beyond the border, appear to be of relative importance to the respective participant. In accordance with the method of multidimensional scaling, which was used to develop the continuum (see Schwartz, 1992), it is also pointed out that personal values being next to each other have a rather good motivational fit (e.g. self-direction values and stimulation) in comparison to personal values opposing each other (e.g. self-direction values vs. security values), which often have a conflicting motivational fit. To conclude, the meaning of different values profiles with the participants is discussed

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(see Figure 60 as an example of a values profile).

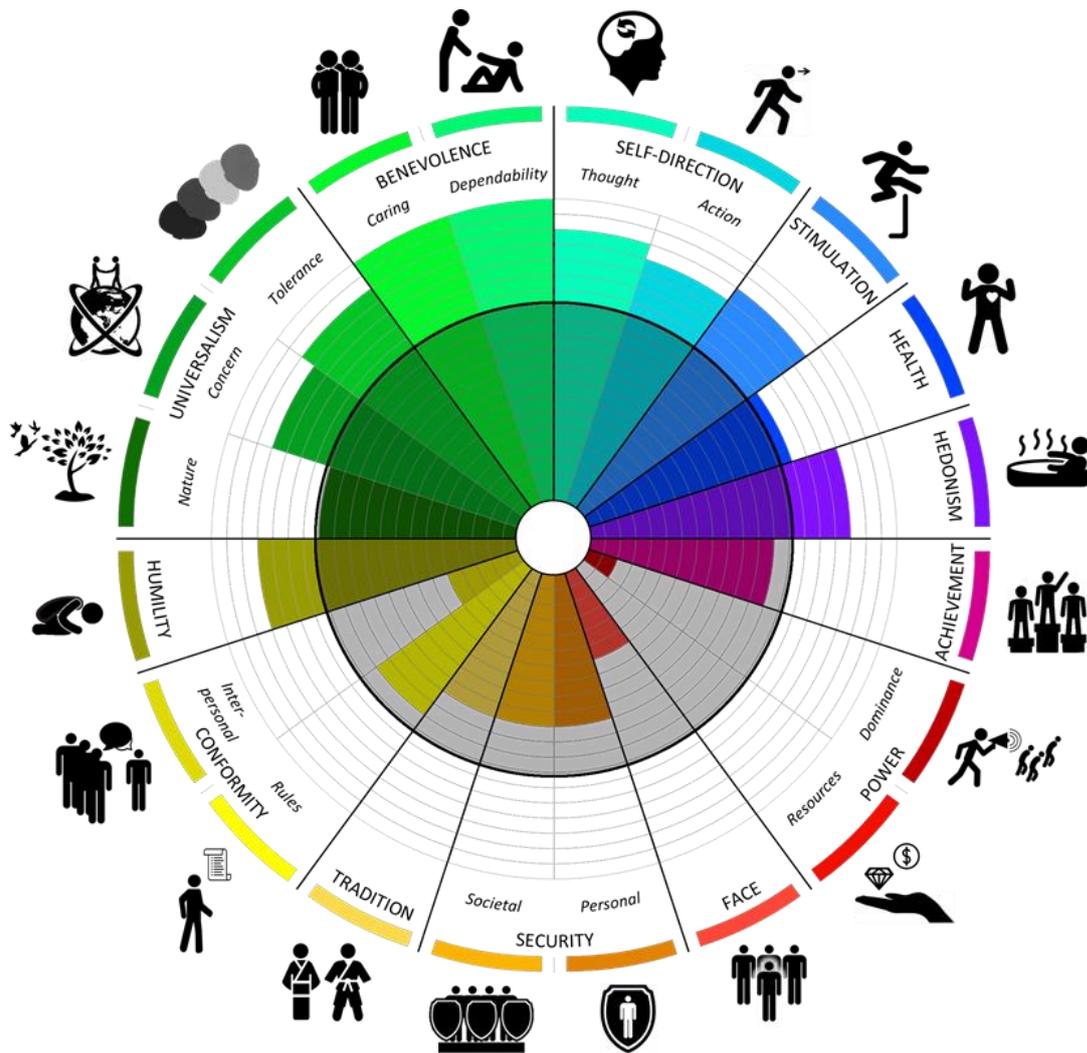


Figure 60: Example of a values profile

The integration of the explanations is **inspired by the SACS Values Assessment** (SACS Consulting, 2020), which also explains the universal continuum of human values by Schwartz to their test participants. It is believed that an explanation of the scientific base of the visualization is important to participants as they thus see the validity of the applied instruments and individual visualizations.

4.4.4.4. Reflexion about and definition of the participants' personal values priorities (in Core Values Sprint)

In the workshop, the participants are asked to reflect on their personal values and to define them. Their visualized personal values priorities serve as an orientation, which they receive as a result of the questionnaire (**PVQ-RR**, Schwartz & Butenko, 2014) in

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the ValuesFinder (see Figure 63). Prior to providing the results, a blanc values profile is provided, which uses the structure of the universal continuum of human values (based on Hebllich & Terzidis, 2016 and Schwartz & Butenko, 2014) (Figure 61).



Figure 61: Blanc values profile

They are asked to reflect on their personal values priorities by themselves and to draw their priorities onto the paper with the blanc values profile by filling out the respective sun bursts (see Figure 62). Each participant has 10 minutes for this exercise.

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Figure 62: Blanc values profile filled in by hand

After a brief discussion on their experience with the exercise, they receive their results from the ValuesFinder (see Figure 63).

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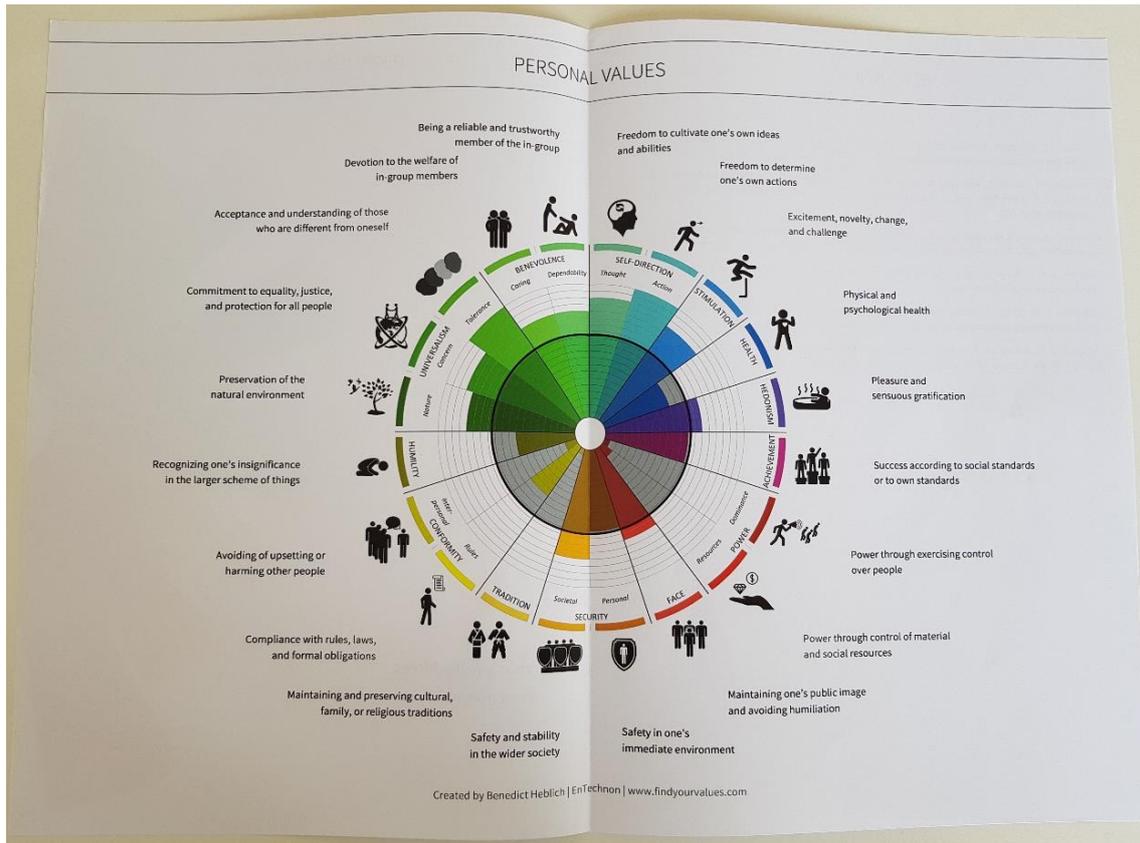


Figure 63: Computer generated values profile based on the PVQ-RR (Schwartz & Butenko, 2014)

Based on the filled chart as well as their results from the personal evaluation, the participants are asked to identify and then define their five most important personal values. They are instructed to write each of them on a post-it (see Figure 64).

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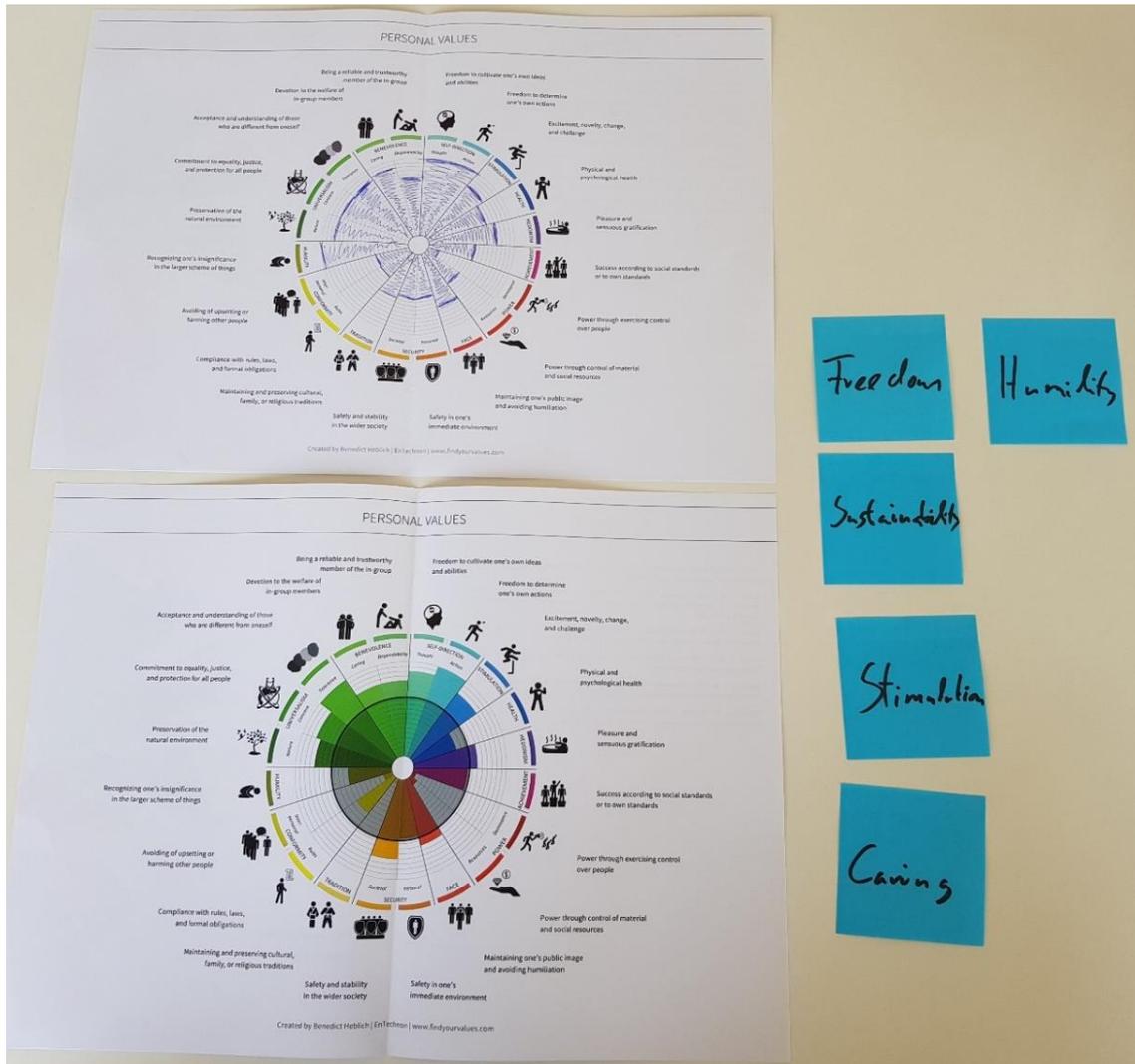


Figure 64: Result of the Core Values Sprint

With regard to the existing self-assessment tools **Personal Values Assessment** (PVA, Leuty & Hansen, 2013) and the **SACS Values Assessment** (SACS Consulting, 2020), it is believed that defining one's personal values according to the refined human continuum of human values by Schwartz (Schwartz et al., 2012; Cieciuch et al., 2014) serves as an effective starting point to gain more clarity about personal values. One should note that the use of a blank values profile in combination with the results from the ValuesFinder reflects an **own idea**.

4.4.4.5. Discussion and definition of the participants' personal values priorities on the team level (in Team Core Values Sprint)

As work is done with developing or existing entrepreneurial teams in the workshops, when aiming at fostering clarity about personal values, teams are included in our

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target group. In the workshop, teams are instructed to **discuss and define their team core values**. Each team member is asked to present his or her top 5 personal values (based on Schwartz, 2012) to the team by not only listing but also explaining each personal value in a sentence (see Figure 65).



Figure 65: Personal values on brown paper as the base for defining the team core values

Afterward, the team has to cluster all presented values into five values clusters, which consist of values with a similar motivational direction. Furthermore, they are asked to find a summary term for each cluster, for instance, the values of integrity, self-direction, freedom, resources and achievement are potential summary terms. The five summary terms build the five team core values, which all team members agree on as guiding principles for their actions (see Figure 66).

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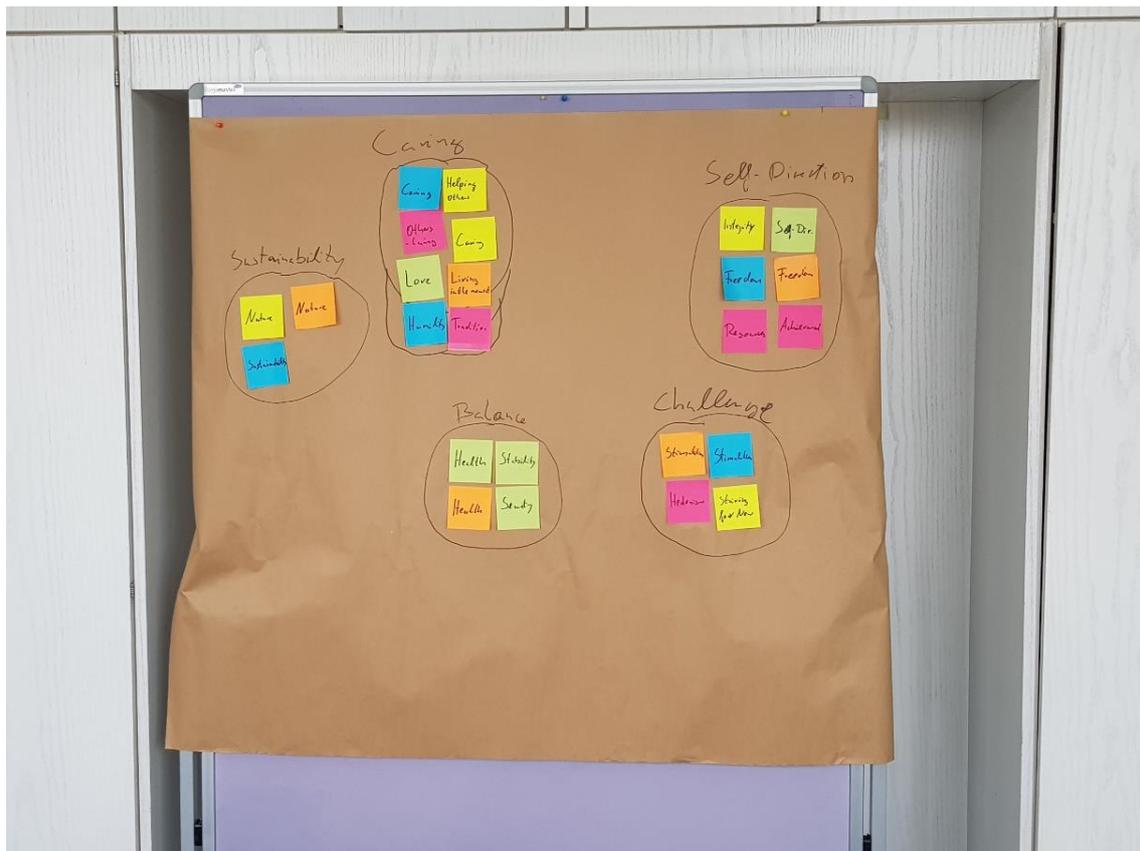


Figure 66: Personal values clustered to five team core values

At the end of the exercise, the five team core values are transferred to the corporate ideology canvas by each team (see Figure 67).

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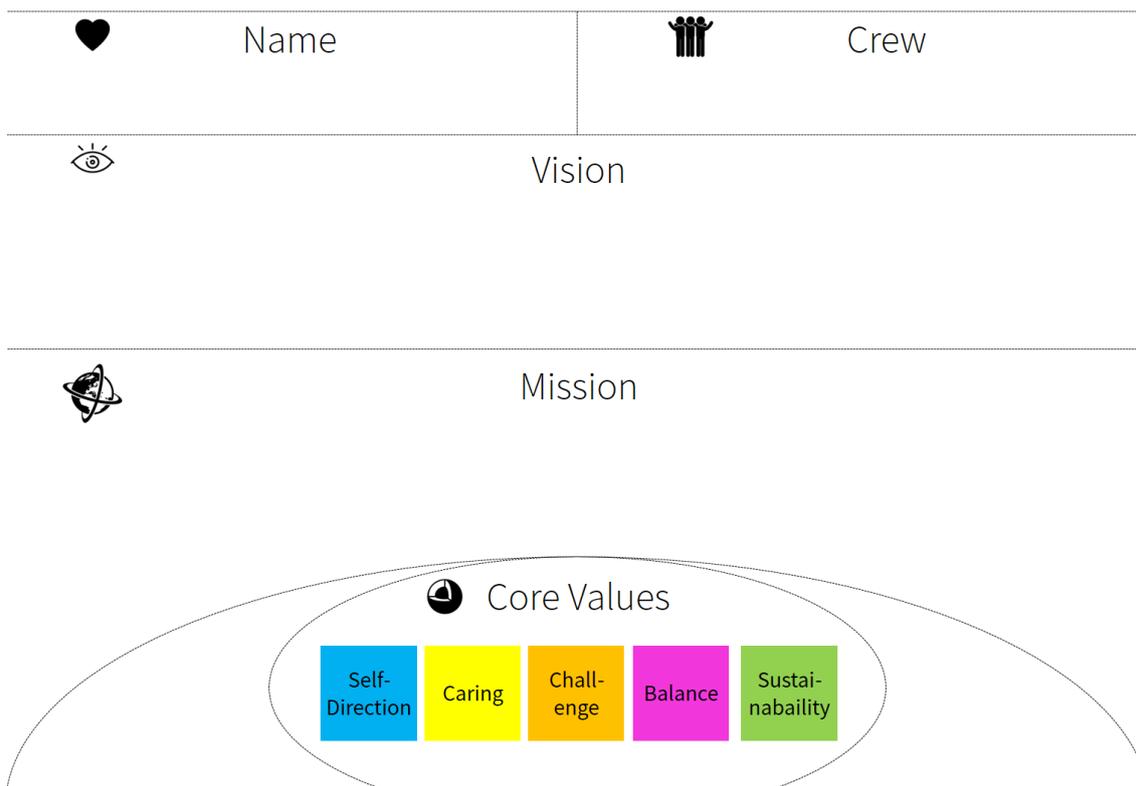


Figure 67: Corporate ideology canvas with core values

Two additional aspects in the canvas, mission and vision, serve to foster autonomy of goals and are further described in chapter 4.4.10).

With regard to the existing self-assessment tools **Personal Values Assessment** (PVA, Leuty & Hansen, 2013) **and SACS values assessment** (SACS Consulting, 2020), It is believed that defining team core values based on the refined human continuum of human values by Schwartz (Schwartz et al., 2012; Ciecuch et al., 2014) also serves as an effective starting point to gain more clarity about personal values on the team level. However, the referring clustering process represents an **own idea**. It is argued that clustering joined values as a team helps to develop team core values that integrate the personal values of all team members.

4.4.5. Sub-intervention for mindfulness in iteration 1 (ValuesFinder)

4.4.5.1. Reflexion about one's degree of mindfulness (in Questionnaire)

The first sub-intervention on mindfulness consists of the questions that participants have to answer about their degree of mindfulness. The same list of questions is also used in study 1 to measure mindfulness: the **Mindfulness Attention Awareness Scale**

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(MAAS, Brown & Ryan, 2003), which corresponds to a 15-items scale that measures mindfulness on the dispositional and on the state level (Schultz & Ryan, 2015). It originates from the scope of SDT by Brown & Ryan (2003). Participants are asked to answer how frequently or infrequently they currently have each experience (e.g., item 6: “I forget a person’s name almost as soon as I’ve been told it for the first time.”). They answer on a Likert scale from 1 (almost always) to 6 (almost never). To calculate a person’s mindfulness, the mean of the 15 items is computed. Higher scores reflect higher levels of mindfulness (Brown & Ryan, 2003).

As previously argued concerning the use of the PVQ-RR (Schwartz et al., 2012; Ciecuch et al., 2014), in the psychological context, especially in therapy, questions themselves are often seen as interventions (e.g. Adams, 1997; McGee et al., 2005). Although the literature focuses on the therapeutic context, participants’ informal feedback is received that the questions of the questionnaire themselves already lead to insights. Thus, based on Adams (1997) and McGee et al. (2005) it is argued that the questions about mindfulness can already lead to a reflection about one’s degree of mindfulness, which can enhance mindfulness. These reflections also appear in informal feedback conversations with participants. For instance, after reading item 6 (see above), some participants question their occasional inability to focus on the name of somebody else when they are introducing themselves to each other.

4.4.5.2. Visualization of one’s degree of mindfulness (in Personal Evaluation)

Based on the answers to the items of the **Mindfulness Awareness Attention Scale** (MAAS, Brown & Ryan, 2003), each participant receives a **visualization of his or her degree of mindfulness**. The visualization is made with a bar chart in Microsoft Excel (see Figure 68).

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Figure 68: Visualization of participants' degree of mindfulness

The integration of such a visualization represents an **own idea**. It is claimed that the visualization of one's degree of mindfulness based on a scientific scale helps to understand one's status quo and further motivates to work on one's mindfulness.

4.4.5.3. Explanation of mindfulness and its importance (in Personal Evaluation)

At first, **mindfulness** (Figure 69) is explained. mindfulness is described as pre-reflexive skill that helps to be aware in the present moment and to be able to observe internal and external processes as non-judgemental as possible. It is not thoughts or cognition, but rather the space between them that sets the context where they occur (**based on Brown & Ryan, 2003; Schultz & Ryan, 2015**).

MINDFULNESS PRACTICE
“POLISHING THE MIRROR“

Mindfulness is the prereflexive skill to be aware in the present and to be able to observe internal and external processes as non-judgemental as possible. Results from science and practice indicate that mindfulness is an important prerequisite for one to realize the personal values and to be in the presence. In our digitalized and thus often hectic world, mindfulness is a skill that gets reduced more and more.

Figure 69: Explanation of what mindfulness is

Furthermore, a Zen metaphor is drawn that shall help to better understand the **nature of mindfulness and its importance** (based on Schultz & Ryan, 2015): exercising mindfulness is compared to polishing the mirror (see Figure 70). Whereas the mirror represents the continuum through which we see the world and ourselves. The more one practices mindfulness, the more one polishes the mirror.

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If you depict mindfulness, one could say that strengthening your mindfulness is like „polishing the mirror“ through which you can look at yourself and at your environment. The more mindful you are the sharper the picture gets. An individual that is low in mindfulness will have problems to realize the personal values, even after intense self-reflection because the portrait he or she is looking at is blurred. Your mindfulness can be trained and improved like a muscle. Therefore, I recommend you the following routine:

Figure 70: Metaphor about the importance of mindfulness

The routine mentioned in this description (see Figure 70) is explained in the next chapter (see chapter 4.4.5.4). Exercising mindfulness leads to a clearer view of the world and ourselves. Less distortions or conceptual thoughts will blur our view. However, each of us may find some cracks in the mirror while polishing it. They may stay our whole life and can hardly be repaired. But we become aware of them and integrate them in our consciousness. When we look at the world and ourselves through a polished and not blurred mirror, we gain more clarity about what really is. Even if a crack in the mirror hinders us to exactly see what is, we realize the existence of that crack and do not confound the crack with the truth that would lie behind a crackled reflection (Schultz & Ryan, 2015).

The integration of the explanation and the metaphor reflects an **own idea**. It is believed that a definition of mindfulness in combination with a metaphor works best to help participants to understand the construct mindfulness and the value of practicing mindfulness.

4.4.5.4. “Polishing the mirror” exercise (in Personal Evaluation and Action Plan)

The participants are provided with a self-applicable practice that can help to foster mindfulness. The practice is described under the title “**polishing the mirror**” (see Figure 71).

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Go to a quiet place, e.g. your room or a peaceful place in nature. Sit down in a comfortable position, close your eyes and focus your attention for at least ten minutes on the movement of your breath. Conduct this routine at least once a week.

You will realize that it is not easy to focus your attention on something in the present moment. Your attention will drift away from your breath and you start e.g. to think about challenges or problems in the future. However, try to gently focus your attention during the whole exercise on your breath. If you sharpen this skill, it will happen more frequently to you that you „observe“ your thoughts subconsciously in everyday situations. Thus, you start understanding more about yourself and get more clarity about your personal values.

Figure 71: Mindfulness exercise

The instructions derive from a script from Mindfulness based cognitive therapy (MBCT, Segal et al., 2002), which was developed from MBSR (Kabat-Zinn, 2013). It is a classical **mindful breathing exercise**. Participants are asked to sit down at a quiet place, e.g. their room or a peaceful place in nature. They shall close their eyes and focus their attention for at least 10 minutes on the movement of their breath. It is pointed out to them that it may be very hard to focus on something in the present moment. Thoughts or other distractions may come up and draw away the attention from the breath. However, they are advised to accept that wandering of their mind without resistance in a non-judgmental manner and to gently move their attention back to their breath. This process embodies the central aspects of mindfulness practice: intentionally paying attention to experiences in the present moment with an attitude of acceptance (Kabat-Zinn, 1994; Shapiro et al., 2006; cited by Feldman et al., 2010).

As argued in chapter 4.2.1.3, mindful breathing appears to be an effective meditation technique (e.g. Carmody & Baer, 2008; Mrazek et al., 2012). Furthermore, it can be **effectively learned and used by participants without prior training in meditation**, because it is a concentration meditation. Based on the stage model of meditation training from the Zen scholar, concentration meditation is the type of meditation that students should start with (**based on Brown & Ryan, 2004**). Thus, it is argued that mindful breathing can be learned and used by individuals independent of their prior level of mindfulness. Therefore, the described self-applicable practice is integrated into this intervention.

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4.4.6. Additional sub-intervention for mindfulness in iteration 2 (Core Values Workshop)

4.4.6.1. Explanation and discussion of mindfulness and its importance (In mindfulness challenge)

Mindfulness is not discussed in a written form in the personal evaluation and action plan, rather it is explained and directly discussed with participants at the end of the workshop. However, the explanations and metaphor are the same as in the ValuesFinder (see chapter 4.4.5). To conclude an open discussion is held with participants about what mindfulness is and how it may positively impact an entrepreneur's work.

The integration of the explanation, the discussion, and the metaphor reflect an **own idea**. It is believed that a definition of mindfulness in combination with a metaphor works best to help participants to understand the construct mindfulness and the value of practicing it. Furthermore, it is believed that a sequential discussion deepens understanding.

4.4.6.2. “Polishing the mirror” exercise (in Mindfulness challenge)

As the last part of the workshop, the “**polishing the mirror exercise**” is explained, which is **based on mindful breathing**, to the participants (Segal et al., 2002; Kabat-Zinn, 2013). The exercise of the ValuesFinder (see chapter 4.4.5.4) is not discussed in the workshop, it is directly introduced and explained in the workshop. The same explanations are used and this turns the exercise into homework, which they are advised to perform at least once within the next 7 days.

As argued in the context of the ValuesFinder (see chapter 4.4.5.4), the phrase “polishing the mirror exercise” is used as a reference to the mindful breathing exercise, which is a concentration meditation. These types of meditation appear to be effective in fostering mindfulness and can be **effectively learned and used by participants without prior training in meditation**. Therefore, the described self-applicable practice is integrated as a homework exercise into the intervention.

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4.4.7. Sub-intervention for intrinsic values orientation in iteration 1 (ValuesFinder)

4.4.7.1. Reflexion about one's degree of intrinsic values orientation

The first sub-intervention on intrinsic values orientation consists of the questions that the participants have to answer about their **personal values priorities** (PVQ-RR, Schwartz et al., 2012; Cieciuch et al., 2014). The instrument is introduced in chapter 4.4.3.5.

As previously argued concerning the use of the PVQ-RR (Schwartz et al., 2012; Cieciuch et al., 2014), questions are often already perceived as interventions (e.g. Adams, 1997; McGee et al., 2005). Based on the mechanism of **emotional feedback (based on Schwartz, 2007; Heckhausen & Heckhausen, 2010)**, the questions are used and interpreted as a sub-intervention to foster intrinsic values orientation. It is argued that by answering questions about personal values priorities, participants may already feel the difference between their rather intrinsic and their rather extrinsic values. Thus, answering the questions about personal values priorities may foster intrinsic values orientation. Participants may realize that some of their personal values do not lead to positive emotional feedback, which in turn could motivate them to question their rather extrinsic values during the process.

4.4.7.2. Explanation and visualization (in Personal Evaluation and Action Plan)

In the ValuesFinder, it is explained that there is a body of research that indicates that certain personal values are more related to personal well-being than other personal values. Those personal values are called intrinsic values (see chapter 2.7.4). This distinction is also shown in the visualization of the refined continuum of human values (see Figure 72 based on Hebllich & Terzidis, 2016; Schwartz & Butenko, 2014). Further explanation is given that a reason for this relation could be that intrinsic values are rather independent of the judgment of others. In contrast, extrinsic values tend to make oneself dependent on the judgment of others.

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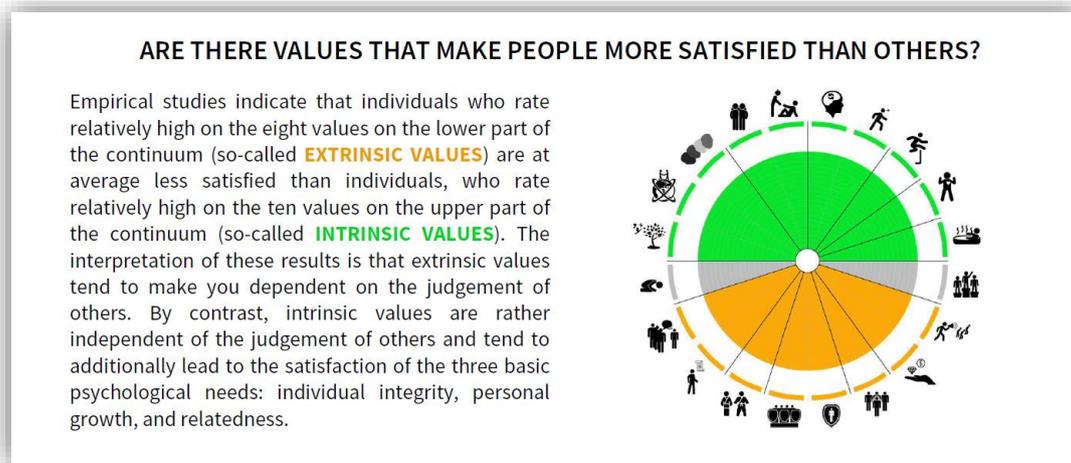


Figure 72: Explanation of intrinsic and extrinsic values

The integration of the explanations of positive effects is **inspired by the website of the Values in Action Assessment** (e.g. VIA institute on character, 2020), whose authors also use explanations for their self-assessment. It is argued that the explanations of positive effects motivate participants to dig deep and discover and pursue their intrinsic values.

4.4.7.3. “Carve out your core of personal values” exercise (in Personal Evaluation and Action Plan)

It is argued that the sub-intervention **“Carve out your core of personal values – What makes your heart sing?”**, which is introduced as a sub-intervention to foster clarity about personal values in chapter 4.4.3.10, is not only a practice to get more clarity about personal values, but also enhances intrinsic values orientation. **Based on Schwartz’s characterization of personal values as being inextricably linked to emotions** (Schwartz, 2007) and the conceptualization of intrinsic life goals by Grouzet et al. (2005) as having a stronger relation to well-being than extrinsic values, the applied emotional feedback mechanism is argued to be effective in getting to the intrinsic core of personal values.

Thus, inspired by the **Personal Values Assessment** by Leuty & Hansen (2013), which asks participants to rank personal values, It is integrated as a self-applicable practice for the participants.

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4.4.8. Additional sub-interventions for intrinsic values orientation in iteration 1 (ValuesFinder)

4.4.8.1. *Explanation, visualization, and discussion of intrinsic values orientation (in Core Values Sprint)*

Intrinsic values orientation is not discussed in written form in the ValuesFinder, rather directly explained and discussed is the concept of intrinsic values orientation with participants via a Microsoft PowerPoint slide. The concept is based on the visualization in the universal continuum of human values (see Figure 73). Intrinsic values are values that tend to be intrinsically satisfying due to their stronger connection to the three psychological needs, whereas extrinsic values often lack such a connection. Thus, pursuing intrinsic values tends to lead to higher levels of satisfaction than pursuing extrinsic values (Kasser & Ryan, 1993, 1996, 2001).

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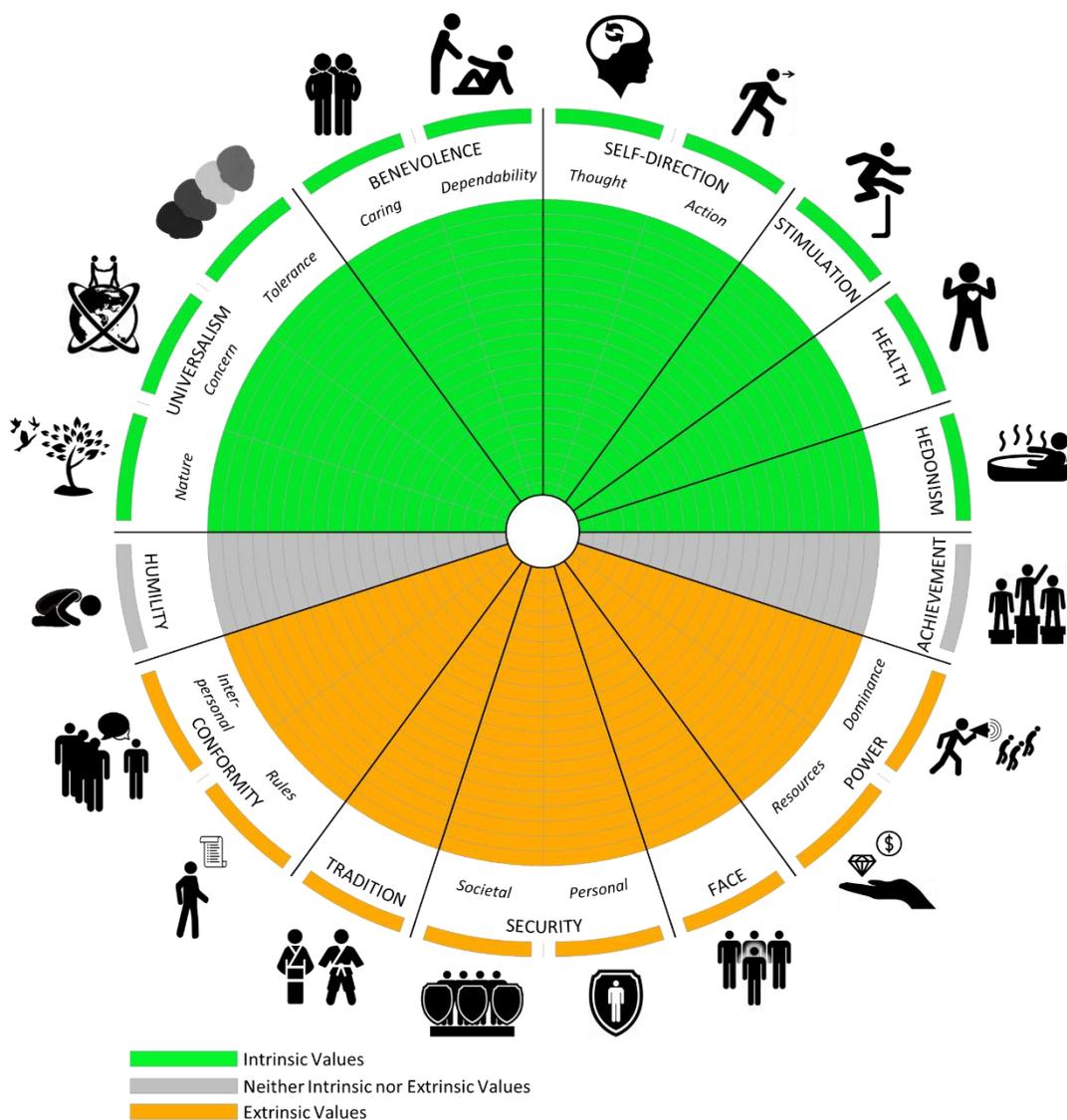


Figure 73: Refined universal continuum of human values by Schwartz (Schwartz et al., 2012; Cieciuch et al., 2014) in the adapted version by Hebllich & Terzidis (2016)

The integration of this sub-intervention is **inspired by the website of the Values in Action Assessment** (e.g. Values institute on character, 2020), whose authors also use explanations and visualizations for their self-assessment. It is argued that the direct explanations, visualizations, and discussion in the workshop yield greater benefits.

4.4.8.2. “Carve out your core of personal values” exercise (in Core Values Sprint)

In the workshop, participants are asked to look at their personal values profile and to evaluate whether they have a rather intrinsic or rather extrinsic values orientation.

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They are advised to use emotional feedback to get to the intrinsic core of their personal values. Whereas positive emotional feedback when reading their personal values' description indicates that they touch their core of personal values. This is oriented on the "Carve out your core of personal values" exercise, which is explained and scientifically validated in chapter 4.4.7.3.

Thus, inspired by the Personal Values Assessment by Leuty & Hansen, (2013), which asks participants to rank personal values, it is integrated as a practice to refine the personal values based on emotional feedback.

4.4.9. Sub-interventions for autonomy of goals in iteration 1 (VALUES FINDER)

4.4.9.1. Reflexion about one's degree of autonomy of goals (in Questionnaire)

Two scientific questionnaires are used, which are also used in study 1, to trigger a **reflexive process** in participants concerning their personal goals. Based on Werner et al. (2016), participants are asked to list three personal goals. As personal goals in the context of work are at the center of interest, the **construct of personal strivings** by Emmons (1986) is adapted and the question formulated in the following way: "Please describe three things that you have explicitly or implicitly planned for your future career. In the following, those plans are called 'goals'". The goal description serves as basis to ask questions about the autonomy of goals. Following each goal's description, participants are asked questions in order to measure the goal's degree of autonomy. Therefore, the four questions developed in the scope of SDT to assess an external, introjected, identified and intrinsic reason for the goal pursuit (e.g., intrinsic reason: "I pursue goal 1 because of the fun and enjoyment that it provides me.") are integrated (Sheldon & Elliot, 1999; Sheldon, 2014). Participants answer on a Likert scale from 1 (strongly disagree) to 6 (strongly agree). In line with Sheldon & Elliot (1999), a score of relative autonomy is calculated by averaging the intrinsic and identified reason with the reverse of the introjected and external scores over all three goals. Higher scores reflect higher levels of goal autonomy (Sheldon & Elliot, 1999).

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As previously argued concerning the use of the PVQ-RR (Schwartz et al., 2012; Ciecuch et al., 2014), questions themselves are often seen as interventions (e.g. Adams, 1997; McGee et al., 2005). It is argued that asking for three personal goals and raising questions concerning one's degree of autonomy lead to a reflection about how much the current goals fit one's personality, which may lead to adaptations that foster autonomy of goals.

4.4.9.2. Visualization of one's degree of autonomy of goals (in Personal Evaluation and Action Plan)

Two important constructs in the context of autonomy of goals are personal values and authentic interests as integrated respectively intrinsic reasons for goal pursuit. As the interventions strongly focus on personal values, personal values are also focused on in the context of autonomy of goals. Thus, there is a **visualization** for the degree to which the goals derive from personal values **based on the instrument of Sheldon (2014)** with bar charts in Microsoft Excel (see Figure 74). Whereas only unfilled bars represent the minimum value of 1 and 10 filled bars the maximum value of 6. The personal values-goal fit for all three personal goals is visualized.

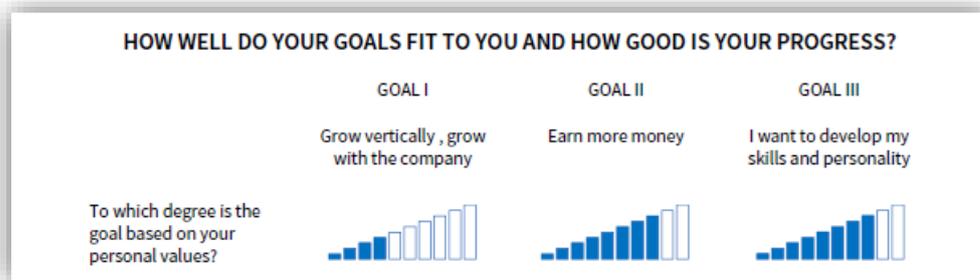


Figure 74: Visualization of one's degree of autonomy of goals

The integration of such a visualization is an **own idea**. It is argued that the visualization of one's degree of autonomy of goals based on a scientific scale helps to understand one's own status quo and further motivates to work on one's goals to increase autonomy of goals.

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4.4.9.3. “Burning yes of gentle no” exercise (in Personal Evaluation and Action Plan)

Participants are provided with a **self-applicable practices** that can help to achieve higher autonomy of goals. The practice is explained under the title “**Burning yes or gentle no – The trick of the green sea turtle**” (see Figure 75). In this exercise, story telling is used in order to explain the positive effects of autonomy of goals. The story is based on “The Why café” by John Strelecky, Leeb, & Lemke (2006). It emphasizes how autonomy of goals can help to gently say no to things that do not fit to the personal values and to firmly say yes to those things that fit. As a self-applicable practice, participants are asked to look at their current personal goals and their personal values-goal fit based on the visualization provided (see Figure 75). They shall question themselves which of the goals can be intrinsically confirmed with a burning yes and which of them can be dropped with a gentle no.

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BURNING YES OR GENTLE NO
“THE TRICK OF THE GREEN SEA TURTLE“

Clarity about your personal values can help you to channel your energy on things that are truly important to you. There is a beautiful story which illustrates these positive effects very well. The story is from the book “The Why Are You Here Cafe: A new way of finding meaning in your life and your work”. Since I read this story, it lives vividly in me and that is why I want to share this story with you. In this book, a woman describes, what she has learned about life from a green sea turtle.

The woman tells that she has been on a two-week vacation two years ago at the eastern coast of Australia. Every morning she went to a reef near the beach for snorkelling. At the second last day of vacation, she was snorkelling pretty early in the morning. She looked at the colourful fishes and listened to them nibbling the reef. After some minutes, she spotted a beautiful green sea turtle, which was swimming below her away from the reef to the open sea. She was immediately fascinated by the calm movement of the marine reptile. The woman began to follow the turtle. However, after some minutes she realized that she was not able to keep pace with the green sea turtle. Frustrated and exhausted she began to swim back to the beach. She asked herself, why she was not able to keep pace with a turtle. In the evening, she took the decision to go out early to the reef at the next morning, which was her last day of vacation, in order to find a green sea turtle again and to understand how the marine reptile was able to be faster than her. At the next morning, the ocean was glittering beautifully in the morning sun. The woman went to the reef again, determined to discover „the trick of the green sea turtle“. Indeed, she was lucky. After some minutes, she spotted a green sea turtle again swimming into the open sea. She immediately started following the marine reptile and observed it very accurately. Like the day before, the woman was not able to keep pace with the turtle and had to swim back to the beach. Back at the beach, the woman slowly walked out of the water.

But this time, there was no frustration in her face, but a big and bright smile. She had found out, why she was not able to keep pace with the green sea turtle. While she was all the time making her swimming strikes at the surface of the water no matter from which direction the waves were coming, the turtle only flipped its fins at certain points of time. When the water was swapping out of the reef in the direction of the open sea, the green sea turtle made some strong strikes with all its power. However, when the water was moving in the opposite direction, the turtle didn't invest energy in swimming against it, but turned its fins 90 degree against the stream to hold only hold its position.

The story of the green sea turtle illustrates, how clarity about personal values can help us to channel our energy. The clearer we are about what is important to us, the better we can decide whether the waves around us are going the direction we do want to go or we do not want to go. If we realize that a task fits to our values, we can seize it with a “burning yes” and start taking this wave with all the power we have. However, if we realize the task does not fit to our values, we should be brave and should try to avoid this task with a „gentle no“ and by this hold our position and save energy.

Question yourself, whether your goals and your behaviour is based on your personal values. As a supporting tool you can use the visualization in chapter „values in action“. Focus your energy on values-based goals and avoid wasting it on goals that are not important to you. Say „Burning Yes“ and give your best at goals that fit to you. Say „Gentle No“ and save energy at goals that do not fit to you.

Figure 75: Burning Yes of Gentle No exercise

The integration of the story and the self-applicable practice corresponds to an **own idea**. It is argued that the story motivates to work on one's goals in order to increase autonomy of goals. Furthermore, the exercise directly helps to bring this motivation into practice given the three personal goals.

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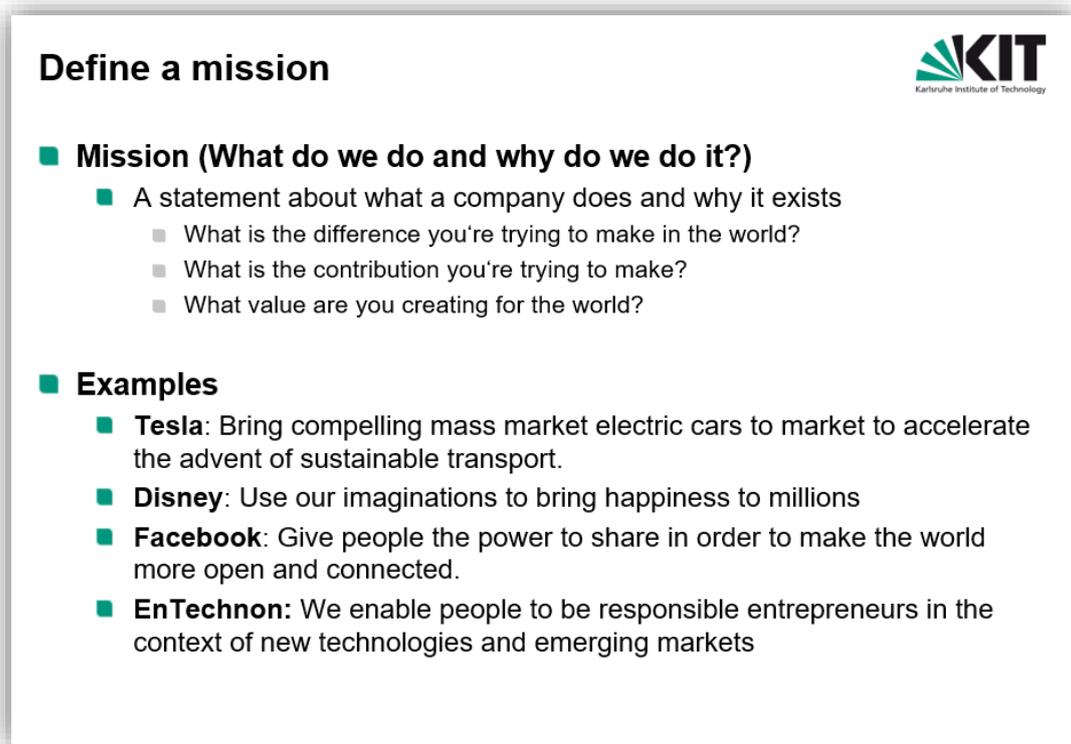
4.4.10. Additional sub-intervention for autonomy of goals in iteration 2 (Core Values Workshop)

4.4.10.1. Discussion and definition of a values-based mission (In Mission Quest)

Following the discussion and the definition of the team core values, the team is asked to discuss and define a mission based on their team core values. In accordance with the concept of autonomy of goals (Sheldon & Elliot, 1999), it is believed that defining a mission based on the team core values is an effective way to strengthen autonomy of goals on the team or company level. By having a values-based mission as guiding instrument, goals and actions will be better aligned with the team core values.

This conceptualization of a mission is based on Pearce (1982) and Collins & Porras (1996). Pearce (1982) states that a company's mission should describe what a company does and why. Entrepreneurs would often base their mission on fundamental elements such as aspirations and beliefs. This is seen to be deeply interwoven with the concept of personal values, because personal values are a trans-situational type of aspirations and are based on the belief system of person (Schwartz, 2007, p. 712). This study's definition of a mission is also seen to be deeply interwoven with what Collins & Porras (1996) describe as a company's core ideology. The core ideology consists of the company's personal values and the company's purpose. Thus, the core ideology strongly focuses on why the company exists. Derived from this study's conceptualization of a team mission, participants are asked what their company does and why. In addition, guiding questions and examples of company missions are used to help participants define their mission (see Figure 76).

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Define a mission

■ Mission (What do we do and why do we do it?)

- A statement about what a company does and why it exists
 - What is the difference you're trying to make in the world?
 - What is the contribution you're trying to make?
 - What value are you creating for the world?

■ Examples

- **Tesla:** Bring compelling mass market electric cars to market to accelerate the advent of sustainable transport.
- **Disney:** Use our imaginations to bring happiness to millions
- **Facebook:** Give people the power to share in order to make the world more open and connected.
- **EnTechnon:** We enable people to be responsible entrepreneurs in the context of new technologies and emerging markets

Figure 76: Power Point Slide on mission

The company's mission is transferred by the teams to the corporate ideology canvas (see Figure 77).

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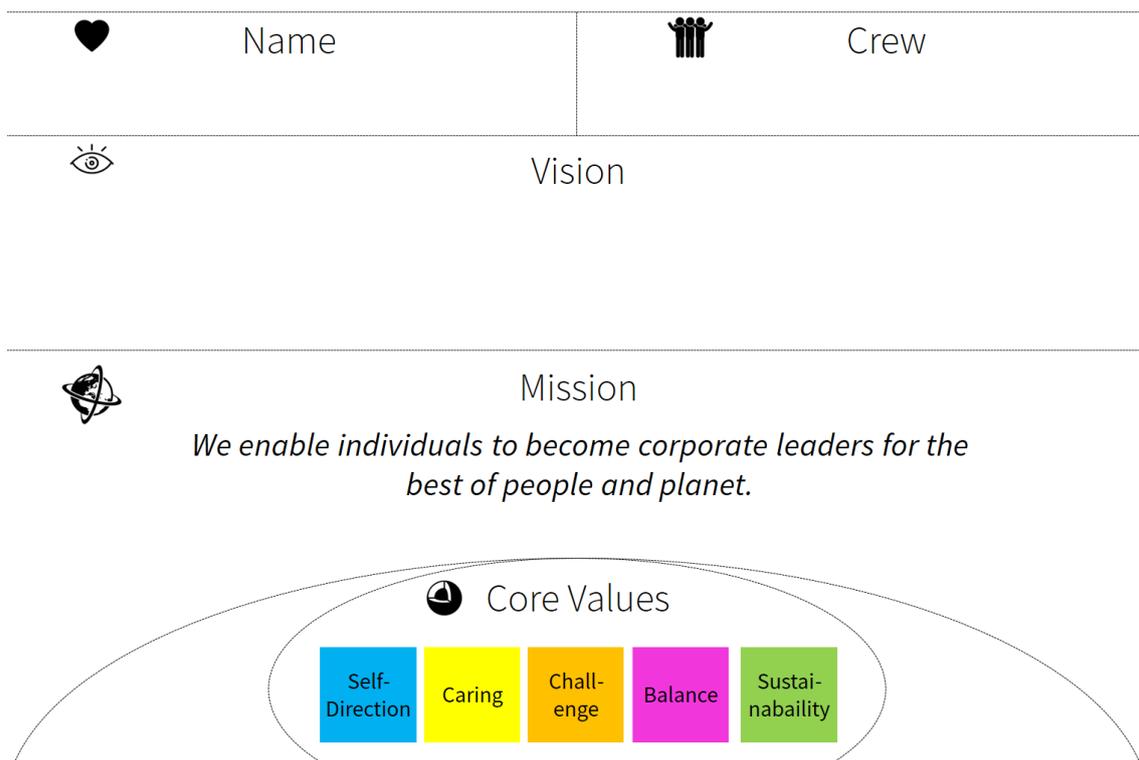


Figure 77: Corporate ideology canvas with core values and mission

The integration of the discussion and the definition of a values-based mission represents our **own idea**. It is argued that a mission serves as a central trans-situational goal of a company respectively a team. Aligning this highly strategical goal with the team core values promises to strongly and sustainably foster autonomy of goals.

4.4.10.2. Discussion and definition of a values-based vision (In Vision Quest)

After the discussion and the definition of a mission, the team is asked to discuss and define a vision based on their team core values. In accordance with the concept of autonomy of goals (Sheldon & Elliot, 1999), it is believed that defining a vision based on the team core values is an effective way to strengthen autonomy of goals on the team or company level. By having a values-based picture of the envisioned future, the team can better align goals and actions with the team core values.

This concept of vision is based on the conceptualization of a vision **by Collins & Porras (1996)**, who describe vision as the combination of core ideology and envisioned future (see Figure 78). As the purpose and values of the company have have been already

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covered in a company's mission, this study's conceptualization of vision focuses on "envisioned future" (see Figure 78).

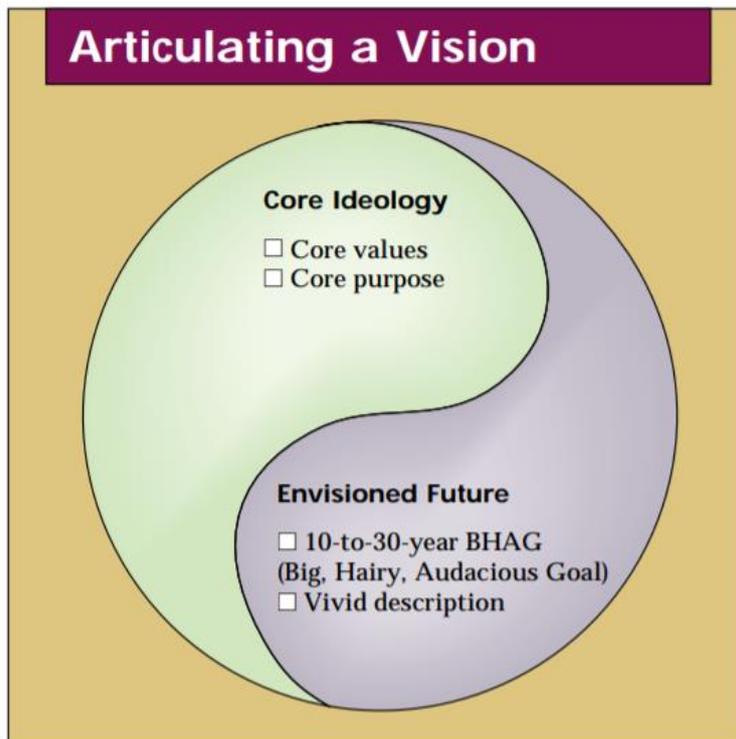
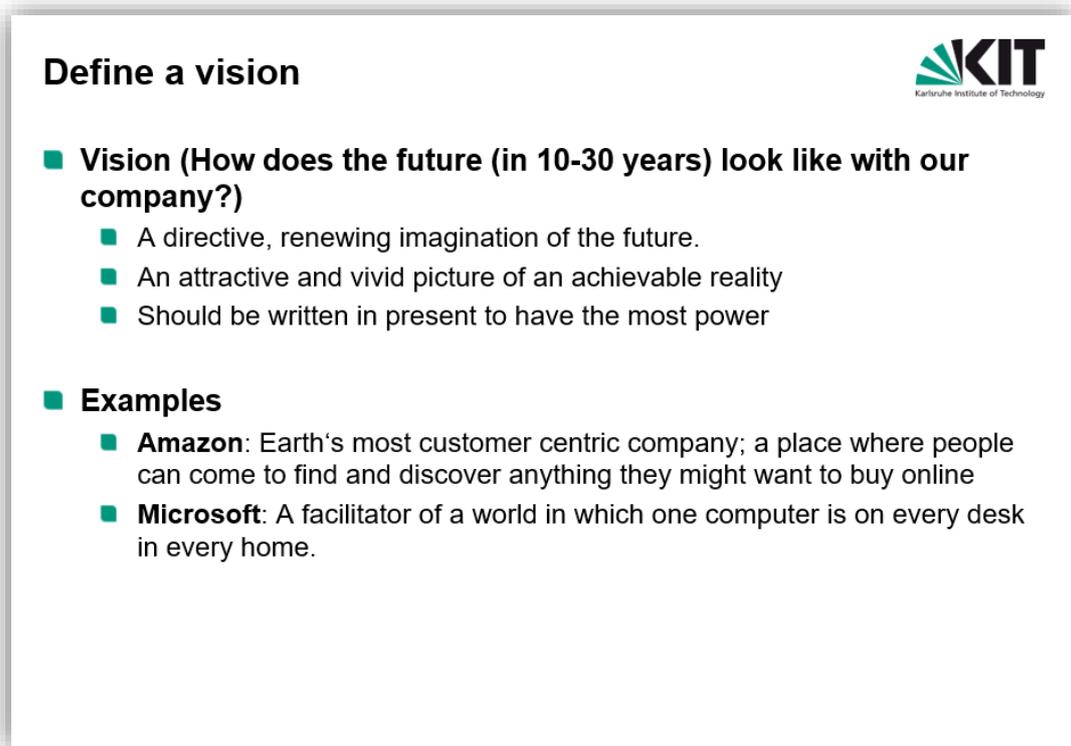


Figure 78: Articulating Vision

Thus, participants are asked to vividly describe how the future would look like with their company (in 10 to 30 years). Again guiding questions and examples of company visions are provided on a PowerPoint slide (see Figure 79).

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Define a vision

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- **Vision (How does the future (in 10-30 years) look like with our company?)**
 - A directive, renewing imagination of the future.
 - An attractive and vivid picture of an achievable reality
 - Should be written in present to have the most power
- **Examples**
 - **Amazon:** Earth's most customer centric company; a place where people can come to find and discover anything they might want to buy online
 - **Microsoft:** A facilitator of a world in which one computer is on every desk in every home.

Figure 79: Power Point Slide on Vision

The company's vision is transferred by the team to the corporate ideology canvas (see Figure 80).

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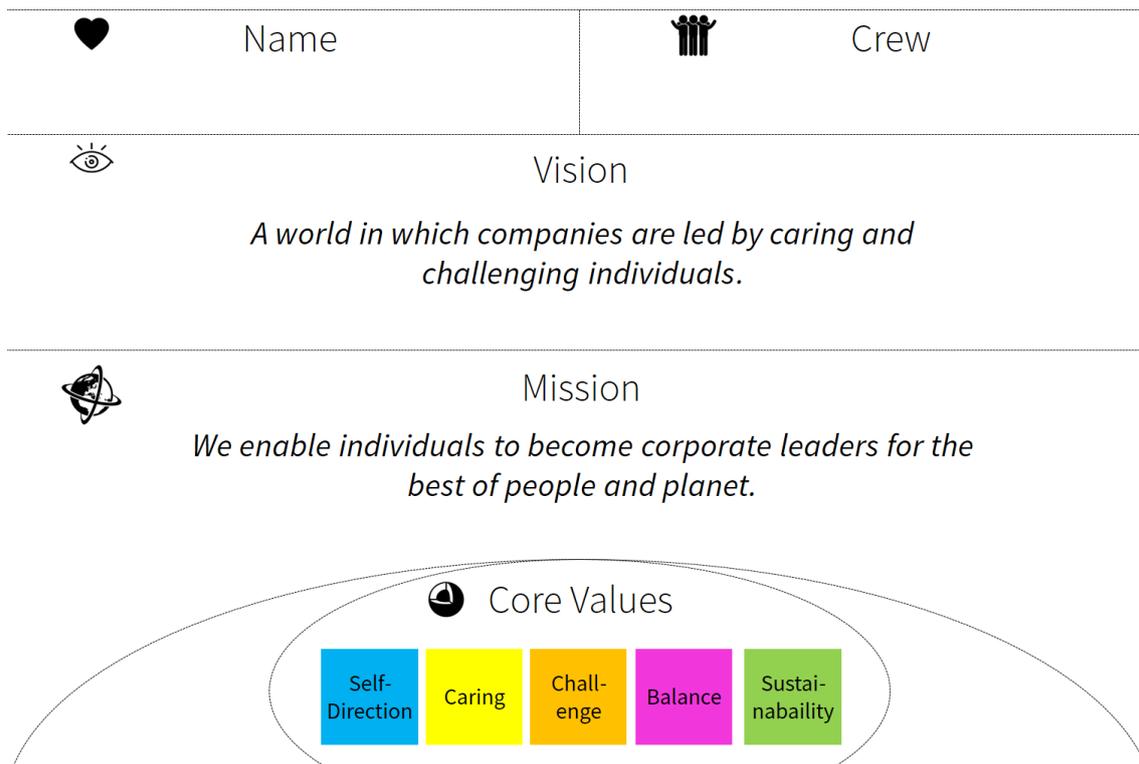


Figure 80: Corporate ideology canvas with core values, mission, and vision

Similar to the sub-intervention addressing the values-based mission, the integration of the discussion and the definition of a values-based vision reflects an **own idea**. It is argued that a vision also represents a central trans-situational goal of a company respectively a team. Aligning this highly strategical goal with the team core values promises to strongly and sustainably foster autonomy of goals.

The filled corporate ideology canvas (see Figure 80) is the final result of the whole workshop block (additional sub-interventions in iterations 2). It shows the team core values, team mission, and team vision.

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4.4.11. Final Intervention with all sub-interventions

The final result of the two iterations is a **four-hours workshop module on self-development for entrepreneurs**. The workshop module aims at directly fostering the independent variables clarity about personal values, mindfulness, intrinsic values orientation, and autonomy of goals in order to indirectly foster the dependent variables individual efficacy, individual well-being, and collective well-being. Figure 81 and Figure 82 show all interventions and sub-interventions of the Core Values Workshop as well as the connection to the four independent variables. In summary, the Core Values Workshop uses the self-assessment and development tool developed in iteration 1, which is called ValuesFinder, as a starting point to help the entrepreneurs to define their personal core values.

Participants access the **website**, complete the **questionnaire** and receive their **personal evaluation and action plan** in the workshop. This process is referred to as the **core values sprint**. In the core values sprint, each participant defines his or her top five personal values. In this context, not all results and suggested practices in the written personal evaluation and action plan are discussed (see grey layered sub-interventions in Figure 81 and Figure 82). However, all of them are integrated in the sub-interventions of the workshop in some way. E.g. the written explanations about the visualization of personal values are not directly discussed in the workshop, but they are substituted by the explanation and the discussion of the universal continuum of human values by Schwartz and its visualization (see Figure 81) in the Microsoft PowerPoint presentation. Based on the personal core values, the entrepreneurial teams launch the **team core values sprint**. During the team core values sprint, the teams start to cluster all their personal values in an attempt to find subsuming values for those clusters. Finally, they agree on a set of five team core values. Based on the team core values, the teams enter the **mission quest**. In the mission quest, the teams are asked to describe what their company does and why. Especially the answer to the “why” represents the connection to the team core values. The process is supported by examples from practice. After the definition of the team mission, the teams conduct the **vision quest**. In the vision quest, the teams envision how the future would look

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like with their company. In particular, they discuss and define a vision statement that vividly describes the future of their company. The results are documented using the corporate ideology canvas (see Figure 80). Finally, the teams participate in the **mindfulness challenge**, in which they are taught a self-applicable practice that is related to mindful breathing exercises. Figure 81 and Figure 82 show all sub-interventions with the respective **scientific base**. Similar to the description of each sub-intervention, they are distinguished into the scientific base for the used **content** and the scientific base for the **reason of integration**.

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Iteration 2 (**CORE VALUES WORKSHOP**)

Iteration 1 (**VALUES FINDER**)

INTERVENTION COMPONENTS AND GENERAL FUNCTIONS							
WEBSITE	QUESTIONNAIRE	PERSONAL EVALUATION AND ACTION PLAN	CORE VALUES SPRINT	TEAM CORE VALUES SPRINT	MISSION QUEST	VISION QUEST	MINDFULNESS CHALLENGE
 Motivation to participate and explanations	 Reflexion	 Visualization of personal results	 Explanation, reflexion and definition of personal values	 Discussion and definition of team core values	 Discussion and definition of a mission	 Discussion and definition of a vision	 Mindfulness Training
SUB-INTERVENTIONS FOR CLARITY ABOUT PERSONAL VALUES							
<p>Motivational video slider to get more clarity about personal values <i>Jung, 1973, p. 33</i> <i>Own idea</i></p> <p>Motivational video to get more clarity about personal values <i>Kasser & Ryan, 1993, 1996, 2001; Trompetter, 2014</i> <i>Niemiec, 2013</i> <i>FindYourValues, 2017</i></p> <p>Explanations of what personal values are and why having clarity about personal values is important <i>Schwartz, 2012; Kasser & Ryan, 1993, 1996, 2001; Trompetter, 2014</i> <i>VIA institute on character, 2020</i></p> <p>Explanation of the scientific base of our test to motivate people get more clarity about personal values <i>Own idea</i> <i>VIA institute on character, 2020</i></p>	<p>Reflexion about personal values priorities <i>PVQ-RR, Schwartz et al., 2012; Cieciuch et al., 2014</i> <i>Adam, 1997; McGee et al., 2005</i></p> <p>Reflexion about one's degree of clarity about personal values <i>VLS, Trompetter, 2014</i> <i>Adam, 1997; McGee, et al., 2005</i></p>	<p>Visualization of personal priorities <i>Based on Hebllich & Terzidis, 2016 and Schwartz & Butenko, 2014</i> <i>SACS Consulting, 2020</i></p> <p>Visualization of one's degree of clarity about personal values <i>VLS, Trompetter, 2014</i> <i>Own idea</i></p> <p>Explanations to the visualizations <i>Schwartz et al., 2012; Cieciuch et al., 2014; Schwartz, 2012; Kasser & Ryan, 1993, 1996, 2001; Trompetter, 2014</i> <i>Own idea</i></p> <p>Self-applicable practice "Carve out your core of personal values" <i>Schwartz, 2007</i> <i>Leuty & Hansen, 2012</i></p>	<p>Explanation and discussion of personal values <i>Schwartz, 2007</i> <i>Own idea</i></p> <p>Explanation and discussion about the positive effects of having clarity about personal values <i>e.g. Smith et al., 2011; Sheldon & Elliot, 1999; Collins & Porras, 2005; Mackey & Sisodia, 2013</i> <i>VIA institute on character, 2020</i></p> <p>Explanation and discussion of the refined universal continuum of human values by Schwartz and of its visualization <i>Based on Hebllich & Terzidis, 2016; Schwartz & Butenko, 2014</i> <i>SACS Consulting, 2020</i></p> <p>Reflexion about and definition of the participants' personal values priorities <i>Based on Hebllich & Terzidis, 2016; Schwartz & Butenko, 2014</i> <i>Own idea</i></p>	<p>Discussion and definition of the participants' personal values priorities on the team level <i>Schwartz, 2012</i> <i>Own idea</i></p>			

Figure 81: Intervention components and general functions with referring literature (part 1)

SUB-INTERVENTIONS FOR MINDFULNESS

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	<p>Reflexion about one's degree of mindfulness <i>MAAS, Brown & Ryan, 2003</i> <i>Adam, 1997; McGee et al., 2005</i></p>	<p>Visualization of one's degree of mindfulness <i>MAAS, Brown & Ryan, 2003</i> <i>Own idea</i></p> <p>Explanation of mindfulness and its importance <i>Brown & Ryan, 2003; Schultz & Ryan, 2015</i> <i>Own idea</i></p> <p>Self-applicable practice "Polishing the mirror" exercise <i>Segal et al., 2002; Kabat-Zinn, 2013</i> <i>Brown & Ryan, 2004</i></p>					<p>Explanation and discussion of mindfulness and its importance <i>Brown & Ryan, 2003; Schultz & Ryan, 2015</i> <i>Own idea</i></p> <p>Self-applicable practice "Polishing the mirror" exercise <i>Segal et al., 2002; Kabat-Zinn, 2013</i> <i>Brown & Ryan, 2004</i></p>
SUB-INTERVENTIONS FOR INTRINSIC VALUES ORIENTATION							
	<p>Reflexion about one's degree of intrinsic values orientation <i>PVQ-RR, Schwartz et al., 2012; Cieciuch et al., 2014</i> <i>Adam, 1997; McGee et al., 2005; Schwartz, 2007; Heckhausen & Heckhausen, 2010</i></p>	<p>Explanation and visualization of intrinsic values orientation <i>Based on Hebllich & Terzidis, 2016; Schwartz & Butenko, 2014</i> <i>VIA institute on character, 2020</i></p> <p>Self-applicable practice "Carve out your core of personal values" <i>Schwartz, 2007; Grouzet et al., 2005</i> <i>Leuty & Hansen, 2012</i></p>	<p>Explanation, visualization and discussion of intrinsic values orientation <i>Kasser & Ryan, 1993, 1996, 2001</i> <i>VIA institute on character, 2020</i></p> <p>Self-applicable practice "Carve out your core of personal values" <i>Schwartz, 2007; Grouzet et al., 2005</i> <i>Leuty & Hansen, 2012</i></p>				
SUB-INTERVENTIONS FOR AUTONOMY OF GOALS							
	<p>Reflexion about one's degree of autonomy of goals <i>Emmons, 1986; Sheldon & Elliot, 1999; Sheldon, 2014</i> <i>Adam, 1997; McGee et al., 2005</i></p>	<p>Visualization of one's degree of autonomy of goals <i>Sheldon, 2014</i> <i>Own idea</i></p> <p>Self-applicable practice "Burning yes or gentle no" exercise <i>Strelecky et al., 2006</i> <i>Own idea</i></p>				<p>Discussion and definition of a values-based mission <i>Pearce, 1982; Collins & Porras, 1996</i> <i>Own idea</i></p>	<p>Discussion and definition of a values-based vision <i>Collins & Porras, 1996</i> <i>Own idea</i></p>

Figure 82: Intervention components and general functions with referring literature (part 2)

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4.5. Design and development of the evaluation characteristics

This is conformed with the ISO standard 9126, which is a recommended standard for the evaluation of design science artifacts (Venable et al., 2016). It proposes the evaluation characteristics functionality, reliability, usability, efficiency, maintainability, and portability. In this study, the evaluation characteristics **functionality, efficiency, usability, and portability are used**. The characteristic maintainability is excluded for two reasons: first, a focus is set on a user-oriented approach of evaluation. Second, standard web technologies and Microsoft Offices applications are used that are by design developed in a way that they are maintainable. The reliability of the used questions in the ValuesFinder are perceived as given due to the fact that they are all based on scientific scales. However, one could ask for the reliability of the website (accessibility) or the process of filling in the questionnaire via Google forms. It is accepted that such a reliability measure may be valuable and thus can be perceived as a limitation of the evaluation.

4.5.1. Functionality

In the evaluation dimension functionality, measurements are made to see whether the interventions fulfil the proposed functions. In this case, the proposed function is the enhancement of the **directly manipulated variables** mindfulness, clarity about personal values, intrinsic values orientation, and autonomy of goals, which are **indirectly enhancing the variables** that were subsumed under individual and global efficacy and health.

One could consider using the scales from study 1 as pre- and post-measurement. However, multiple reasons speak against such an action. First of all, some of the scales can be interpreted as an intervention by themselves given the items lead, for instance, to a reflection about personal values priorities, which may enhance clarity about personal values (see chapter 4.4.3.5). Moreover, there is the expectation that the workshop does not foster all four independent variables (clarity about personal values, mindfulness, intrinsic values orientation, and autonomy of goals) to the same degree of efficacy. What is meant by that is the fact that participants may directly improve some variables through the workshop (e.g. clarity about personal values). For

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other variables such as mindfulness, the level of mastery might not have changed yet and only does due to an independent motivation during the mindfulness challenge. Thus, it is believed that it is important to also grasp motivational aspects concerning the change of the variables. Therefore, the evaluation consists of a post evaluation with separate items, which are close to the items from existing scales, but also register different layers of efficacy.

4.5.1.1. Directly manipulated constructs

To measure the positive effects of the interventions on the directly manipulated variables (see Figure 83), there is an attempt to capture **three layers** of possible efficacy. The layers originate from five expert interviews, in which possibilities of measuring different layers of efficacy are discussed, with four of the five experts being researchers and one expert having a business background coupled with experience in conducting scientifically sound customer surveys. At the first layer of efficacy, measurements are made to see whether the interventions are perceived as **support** to influence the variables in a positive way (e.g. “The ‘experience’ helps me to get more clarity about my personal values”). At the second layer, the participant is asked whether the interventions have **motivated** the participant to improve with regard to the respective variable (e.g. “Through the ‘experience’ I am motivated to get more clarity about personal values”). At the third layer, it is checked to see whether the intervention already had a **positive influence** on the respective variable (e.g. “Through the ‘experience’ I got more clarity about my personal values.”).

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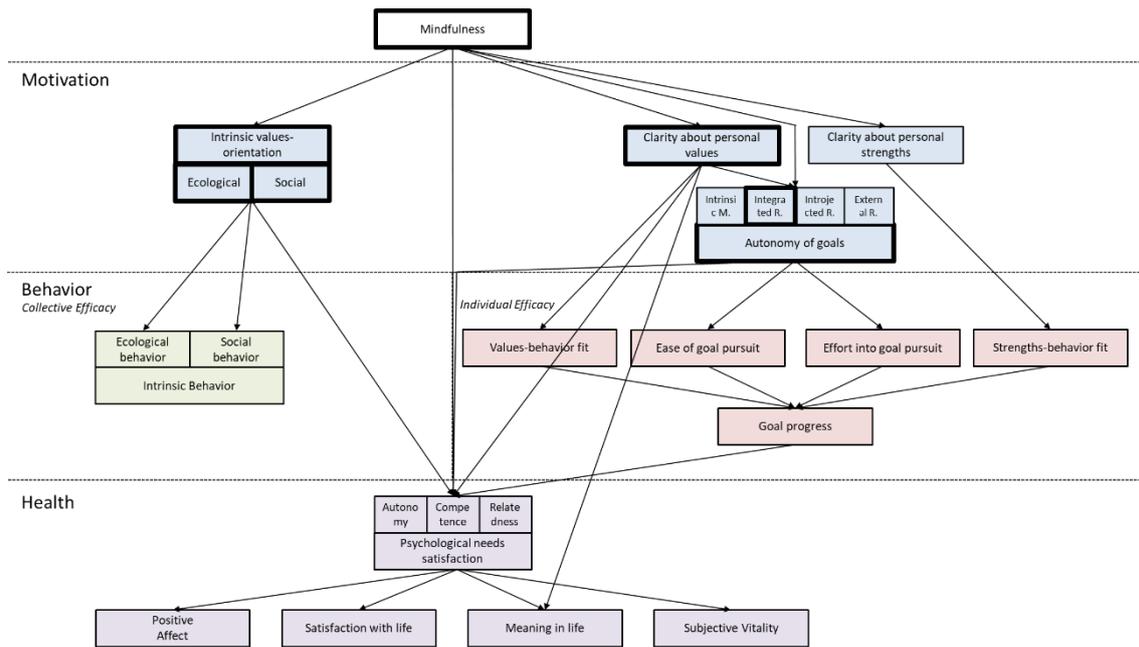


Figure 83: Causal model of healthy and effective self-regulation with directly manipulated variables highlighted

4.5.1.1.1. Mindfulness

The questions addressing the three layers of efficacy for mindfulness are inspired by the **Mindfulness Attention Awareness Scale (MAAS, Brown & Ryan, 2003)**, which is also used in study 1. MAAS is a 15-items scale that measures mindfulness on the dispositional and on the state level (Schultz & Ryan, 2015). Developed by Brown & Ryan (2003), it originates from the scope of SDT. For this purpose, participants are asked to answer on a Likert-Scale from 1 (Strongly Disagree) to 7 (Strongly Agree) how much they agree or disagree with the following statements:

Question for efficacy layer 1: *“The ‘experience’ helps me to live more attentively in the here and now instead of thinking about events in the past or future.”*

Question for efficacy layer 2: *“Through the ‘experience’ I am motivated to live with more attention in the here and now.”*

Question for efficacy layer 3: *“Through the ‘experience’ I live more attentively in the here and now.”*

The following paragraph introduces the questions and explains the term “experience” to the participants: “In the following, the term ‘experience’ refers to all the experiences

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you have had with the personality test. This may include, but is not limited to the website, the motivational video, the questions of the personality test, the personal evaluation as well as workshops with us.” With the subsuming term “experience” the questions are used for iteration one as well as for iteration two.

4.5.1.1.2. Clarity about personal values

The questions for the three layers for clarity about personal values are inspired by the **Valued living scale (VLS, Trompetter, 2014)**, which is also used in study 1. The valued living scale measures “the recognition and knowledge of personal values as well as undertaking behavioral actions congruent with these values” (Trompetter, 2014, p. 74). For this purpose, participants are asked to answer on a Likert-Scale from 1 (Strongly Disagree) to 7 (Strongly Agree) how much they agree or disagree with the following statements:

Question for layer 1: *“The ‘experience’ helps me to get more clarity about my personal values.”*

Question for layer 2: *“Through the ‘experience’ I am motivated to get more clarity about my personal values.”*

Question for layer 3: *“Through the ‘experience’ I got more clarity about my personal values.”*

4.5.1.1.3. Intrinsic values orientation

For intrinsic values orientation, only the third layer is used, as is concluded based on expert interviews that layers one and two are unsuited for questions concerning a motivational variable such as intrinsic values orientation. For instance, asking whether one is now motivated to perceive it as important to live in harmony with nature is rather meaningless from our perspective. Therefore, focus is placed on the third layer of efficacy. The questions posed concerning intrinsic values orientation are based on the **Portraits Values Questionnaire Revised (PVQ-RR, Schwartz & Butenko, 2014)**, which also occurs in study 1. The questionnaire is used to measure personal values in the refined universal continuum of human values by Shalom Schwartz (Schwartz et al., 2012; Cieciuch et al., 2014). Focus is only placed on two

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dimensions of intrinsic values orientation to keep the number of items as small as possible. The dimensions “universalism concern” and “universalism nature” are measured as the particular interest is in understanding whether the personality test can have a positive effect on collective efficacy on the motivational level. For this purpose, participants are asked to answer on a Likert-Scale from 1 (Strongly Disagree) to 7 (Strongly Agree) how much they agree or disagree with the following statements:

Question for layer 3 (universalism-nature): *“The ‘experience’ made me realize that it is important to me to live in harmony with nature.”*

Question for layer 3 (universalism-concern): *“The ‘experience’ made me realize that it is important to me to live in harmony with people all over the world.”*

4.5.1.1.4. Autonomy of goals

For autonomy of goals the questions are built upon the relative autonomy index (Sheldon & Elliot, 1999; Sheldon, 2014). However, as the interventions rather focus on values than on interests, it is only asked whether the intervention helped to set goals with integrated reasons (because they are important to oneself). Thus, there is a partial depiction with regards to the most relevant facets of the relative autonomy index in this study.

Question for layer 1: *“The ‘experience’ helps me to set goals that are personally important to me.”*

Question for layer 2: *“Through the ‘experience’ I am motivated to set goals that are personally important to me.”*

Question for layer 3: *“Through the ‘experience’ I have set goals that are personally important to me.”*

4.5.1.2. Indirectly manipulated constructs

For the indirectly manipulated variables (see Figure 84), it is expected that participants perceive the interventions as helpful to progress on the variables. E.g. the definition of their personal goals (in the questionnaire) as well as the respective visualizations (in the personal evaluation and the action plan) may be seen as a

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valuable process to work on personal goals achievement. However, there is no expectation that the the workshop will directly lead to the achievement of the goals (layer 3 of efficacy). It is expected to be a rather indirect effect at the end of the causal chain (see Figure 84) that unfolds in the long term. Because of the expected indirect causality, only the first level of efficacy is measured.

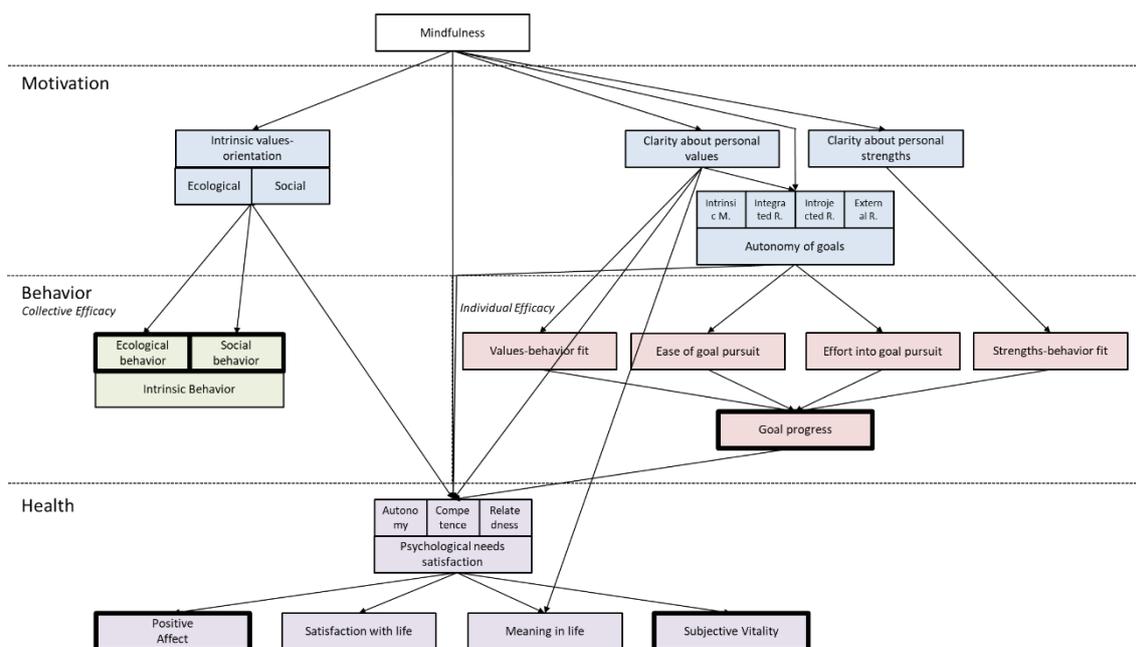


Figure 84: Causal model of healthy and effective self-regulation with indirectly manipulated variables highlighted

4.5.1.2.1. Individual Efficacy

For individual efficacy, the focus is on the most representative item by using the outcome variable goal progress. The question is based on the respective item of **Sheldon & Elliot (1999)**, which is also used in study 1. It is adapted to the first layer of efficacy.

Question for layer 1: *“The ‘experience’ helps me to achieve my personal goals.”*

4.5.1.2.2. Collective Efficacy

For collective efficacy, the questions are based on the **Everyday Behavior Questionnaire (EBQ, Butenko & Schwartz, 2013)**. It is a measurement instrument by Butenko & Schwartz (2013) to measure the 19 personal values in the universal continuum of human values on the level of behavior. Each dimension of behavior represents the realization of a personal value through action. Each dimension of

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behavior is measured with four items. One question is included for the universalistic behavior “nature” as a representation for ecological friendly behavior and one question for the universalistic behavior “concern” as a representation for social behavior. Similar to study 1, both behavior dimensions are recognized as suitable representatives for global efficacy. Both questions are adapted to fit to the first level of efficacy:

Question for layer 1 (intrinsic behavior-universalism nature): *“The ‘experience’ helps me to live in harmony with nature.”*

Question for layer 1 (intrinsic behavior-universalism concern): *“The ‘experience’ helps me to live in harmony with people all over the world.”*

4.5.1.2.3. Health

For health, an attempt is made to identify and use the most important items. The argument is made to take an item that represents the dimension of psychological well-being (Meaning in life and Subjective Vitality) and an item that represents the dimension of subjective well-being (Positive Affect and Satisfaction with life). Both are seen as an outcome of psychological needs satisfaction (Ryan et al., 2008). For subjective well-being, an item is developed that is inspired by the **scale for positive and negative experience (SPANE, Diener et al., 2009)**, whereas for psychological well-being, an item is developed that is inspired by the **subjective vitality scale (Ryan & Frederick, 1997)**. both items are adapted in a way that they fit the first level of efficacy:

Question for Layer one (Positive Affect): *“The ‘experience’ helps me to experience more positive emotions.”*

Question for Layer one (Subjective Vitality): *“The ‘experience’ helps me experience the feeling of aliveness more often.”*

As a reaction to feedback from participants that clarity about what causes positive emotions and feelings of aliveness may be a more specific outcome that leads to the more frequent experience of those emotions, two additional items are introduced.

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These items might better capture the indirect effect of the intervention on health variables:

Additional question for Layer one (Positive Affect): *“The ‘experience’ has given me more clarity about what causes positive emotions in me.”*

Additional question for Layer one (Subjective Vitality): *“The ‘experience’ has given me more clarity about what makes me feel alive and vital.”*

4.5.1.2.4. Overall functionality

In addition to the efficacy-measurements for the single dimensions in the causal model of healthy and effective self-regulation, one question for each layer of efficacy is created that could represent the overall functionality of the ValuesFinder. Based on SDT as well as our personal experience, the belief is that healthy and effective self-regulation is characterized by a process of getting closer to the authentic (true) self. It is about getting beneath the crust of introjected and external motivators as well as beneath extrinsic values and thus activate an intrinsic energy that fosters effectiveness and health (own idea). Therefore, a measurement instrument is added for the overall efficacy that refers to getting closer to the true self. The wording is based on the **Authenticity Scale (Wood, Linley, Maltby, Baliousis, & Joseph, 2008)**.

Question for layer 1: *“The ‘experience’ helps me to get closer to my true self.”*

Question for layer 2: *“Through the ‘experience’ I am motivated to come closer to my true self.”*

Question for layer 3: *“Through the ‘experience’ I have come closer to my true self.”*

4.5.2. Efficiency

Unlike the functionality items, which are all based on a respective scientific scale, the efficiency items are self-developed given the lack of existing scientific scales that suit this intervention. As a result, the items are developed, reviewed and refined together with the five experts mentioned above. To measure efficiency from a user-oriented perspective, the time efficiency of the questionnaire as well as the time efficiency of the creation of the results are measured. Therefore, two items are designed.

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For the first item, participants are asked to rate on a scale from 1 (Strongly Disagree) to 7 (Strongly Agree) how much the following statement applies to them:

“The time required to fill out the survey is justified for me.”

For the second item, participants are asked to rate the following aspects of the personality test on a scale from 1 (very bad) to 7 (very good):

“Waiting time until you got the results.”

4.5.3. Usability

Unlike the functionality items, which are all based on referring scientific scale, the usability items are also self developed. Only one scientific scale is considered suitable for a facet of the intended usability measurements (Reichheld, 2003). The remaining items are developed, reviewed and refined together with the five experts.

To measure usability from a user-oriented perspective, the usability of the questionnaire is measured, the Personal Evaluation and the Action Plan, the website, and the motivational video. Furthermore, the net promoter score (Reichheld, 2003) is used to have an indicator for the overall usability of the interventions.

To measure the **usability of the questionnaire**, participants are asked to rate the following aspects of the personality test on a scale from 1 (very bad) to 7 (very good):

“Understandability of the questions”

“Usability of the survey”

Furthermore, how valuable and enjoyable the process of taking the survey is measured. Therefore, participants are asked to rate on a scale from 1 (strongly disagree) to 7 (strongly agree) how much they agree with the following statements:

“Already the process of filling out the survey was valuable to me”

“Already the process of filling out the survey was fun”

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To measure the **usability of the Personal Evaluation and Action Plan**, participants are asked to rate the following aspects of the personality test on a scale from 1 (very bad) to 7 (very good):

“Understandability of the results”

“Visualization of the results”

Furthermore, how valuable and enjoyable the process of filling out the survey is measured. Therefore, participants are asked to rate on a scale from 1 (strongly disagree) to 7 (strongly agree), how much they agree with the following statements:

“The results of the personality test were valuable to me”

“I enjoyed finding something out about myself through the results of the personality test”

To measure the **usability of the website**, participants are asked to rate the following aspects of the personality test on a scale from 1 (very bad) to 7 (very good):

“Website on which the personality test is offered (findyourvalues.com)”

To measure the **usability of the motivational video**, participants are asked to rate the following aspects of the personality test on a scale from 1 (very bad) to 7 (very good):

“Motivational video for the personality test”

Motivated by our experts, the **net promoter score (Reichheld, 2003) is also used**, which is a well-established key indicator for usability testing (Sasmito & Nishom, 2019).

Therefore, participants are asked to answer the following question on a scale from 0 (extremely unlikely) to 10 (extremely likely):

“How likely is it that you recommend the ‘experience’ to a friend or colleague?”

To compute the net promoter score, the following widely used formula based on Reichheld (2003) is used:

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Net Promoter Score = Promoters (in percent to all answers) – Detractors (in percent to all answers)

Whereas detractors include participants that answer in the range from 0 to 6, promoters include participants that answer in the range from 9 or 10. Participants that answer with 7 or 8 are labelled as indifferents. As an orientation for the resulting number, the median net promoter score of more than 200 companies in 28 industries (based on 130.000 customer surveys) is 16 %. However, most enthusiastic customer referrals (e.g. Ebay and Amazon) receive scores around 75 percent (Reichheld, 2003).

4.5.4. Portability

Foidl & Felderer (2016) point out that Google Analytics could be used as a tool to measure the frequency of use of a website. As **Google Analytics** also measures which device was used to access a website (mobile phones, desktop, or tablet) as well as the average session duration (average time a person is on the website), it is argued that these metrics can be used to indicate whether the ValuesFinder (interventions from iteration 1) is portable. It indicates portability, if participants do not merely access the website via a desktop computer, but also via tablets and mobile phones with a similar session duration.

4.5.5. Identification of the target population (aspiring and practicing entrepreneurs)

Beyond the design and development of the evaluation characteristics of the ISO standard 9126 as well as beyond the use of the standard demographic questions (age, gender, place of living), further items are designed and developed to identify the target population of aspiring and practicing entrepreneurs.

4.5.5.1. Aspiring Entrepreneurs

To measure whether a participant can be characterized as an aspiring entrepreneur, the last item of the **entrepreneurial intention scale (Liñán & Chen, 2009)** is used. Therefore, participants are asked to rate on a scale from 1 (Strongly Disagree) to 7 (Strongly Agree) how much they agree with the following statement:

“I have the firm intention to start a firm some day.”

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As the question asks for a “firm intention”, it is declared that all participants who rate a 5 (Agree Slightly), 6 (Agree), or 7 (Strongly Agree) as aspiring entrepreneurs.

4.5.5.2. Practicing Entrepreneurs

To measure whether a participant can be characterized as a practicing entrepreneur, two additional questions are developed together with the five experts.

For the first question, participants have to answer with “yes” or “no”:

“Have you already founded a company in the past?”

By the second question, they are asked:

“To which of the groups in this list do you belong?”

They can choose from a list that includes “pupil”, “student”, “apprentice”, “employed for wages”, “self-employed”, “pensioner”, “unemployed (no student, pupil or apprentice)”, “housemaker”, and “working for military service or alternative (community) service”.

Only those individuals, who answer the first question with “yes” and select “self-employed” as an answer to the second question, are further considered. Both questions are seen as a solid indicator of whether a participant is a practicing entrepreneur. Furthermore, individuals who can be characterized as both aspiring entrepreneurs and practicing entrepreneurs are labelled as practicing entrepreneurs in the study.

4.5.6. Overview of all items and instruments

The following Table 16 provides an overview of the used items and instruments.

4. STUDY 2: EMPIRICAL DEVELOPMENT AND TESTING OF INTERVENTIONS TO FOSTER HEALTHY AND EFFECTIVE SELF-REGULATION IN ENTREPRENEURS

FUNCTIONALITY		
ITEM	VARIABLE (+LAYER)	SCIENTIFIC BASE
The 'experience' helps me to live more attentively in the here and now instead of thinking about events in the past or future.	Mindfulness (supportive)	MAAS, Brown & Ryan, 2003
Through the 'experience' I am motivated to live with more attention in the here and now.	Mindfulness (motivational)	MAAS, Brown & Ryan, 2003
Through the 'experience' I live more attentively in the here and now.	Mindfulness (actional)	MAAS, Brown & Ryan, 2003
The 'experience' helps me to get more clarity about my personal values.	Clarity about personal values (supportive)	Trompetter, 2014
Through the 'experience' I am motivated to get more clarity about my personal values.	Clarity about personal values (motivational)	Trompetter, 2014
Through the 'experience' I got more clarity about my personal values.	Clarity about personal values (actional)	Trompetter, 2014
The 'experience' made me realize that it is important to me to live in harmony with nature.	Intrinsic values orientation_Nature (actional)	PVQ-RR, Schwartz & Butenko, 2014
The 'experience' made me realize that it is important to me to live in harmony with people all over the world.	Intrinsic values orientation_Concern (actional)	PVQ-RR, Schwartz & Butenko, 2014
The 'experience' helps me to set goals that are personally important to me.	Autonomy of goals (supportive)	Sheldon & Elliot, 1999; Sheldon, 2014
Through the 'experience' I am motivated to set goals that are personally important to me.	Autonomy of goals (motivational)	Sheldon & Elliot, 1999; Sheldon, 2014
Through the 'experience' I have set goals that are personally important to me.	Autonomy of goals (actional)	Sheldon & Elliot, 1999; Sheldon, 2014
The 'experience' helps me to achieve my personal goals.	Ind_Efficiency (supportive)	Sheldon & Elliot, 1999
The 'experience' helps me to live in harmony with nature.	Collective Efficiency_Nature (actional)	EBQ, Butenko & Schwartz, 2013
The 'experience' helps me to live in harmony with people all over the world.	Collective Efficiency_Concern (actional)	EBQ, Butenko & Schwartz, 2013
The 'experience' helps me experience more positive emotions.	Health_Positive Emotions (supportive I)	SPANE, Diener et al., 2009
The 'experience' has given me more clarity about what causes positive emotions in me.	Health_Positive Emotions (supportive II)	SPANE, Diener et al., 2009
The 'experience' helps me experience the feeling of aliveness more often.	Health_Vitality (supportive I)	SVS, Ryan & Frederick, 1997
The 'experience' has given me more clarity about what makes me feel alive and vital.	Health_Vitality (supportive II)	SVS, Ryan & Frederick, 1997
The 'experience' helps me to get closer to my true self.	Overall functionality (supportive)	AS, Wood et al., 2008
Through the 'experience' I am motivated to come closer to my true self.	Overall functionality (motivational)	AS, Wood et al., 2008
Through the 'experience' I have come closer to my true self.	Overall functionality (actional)	AS, Wood et al., 2008
EFFICIENCY		
ITEM	VARIABLE (+LAYER)	SCIENTIFIC BASE
Waiting time until you got the results.	Efficacy_Results	Expert interviews
The time required to fill out the survey was justified for me.	Efficacy_Process	Expert interviews
USABILITY		
ITEM	VARIABLE (+LAYER)	SCIENTIFIC BASE
Understandability of the questions	Usability_survey_understandability	Expert interviews
Usability of the survey	Usability_survey	Expert interviews

4. STUDY 2: EMPIRICAL DEVELOPMENT AND TESTING OF INTERVENTIONS TO FOSTER HEALTHY AND EFFECTIVE SELF-REGULATION IN ENTREPRENEURS

Understandability of the results	Usability_results_understandability	Expert interviews
Visualization of the results	Usability_results_visuals	Expert interviews
Website on which the personality test is offered (findyourvalues.com)	Usability_website	Expert interviews
Motivational video for the personality test	Usability_motivational video	Expert interviews
Already the process of filling out the survey was fun.	Usability_survey_fun	Expert interviews
I enjoyed finding something out about myself through the results of the personality test.	Usability_results_fun	Expert interviews
Already the process of filling out the survey was valuable to me.	Usability_survey_value	Expert interviews
The results of the personality test were valuable to me.	Usability_results_value	Expert interviews
How likely is it that you would recommend the "experience" to a friend or colleague?	Usability_Net Promoter Score	Reichheld, 2003

PORTABILITY

ITEM	VARIABLE (+LAYER)	SCIENTIFIC BASE
Google Analytics Tracking	Portability_Devices	Foidl & Felderer, 2016

IDENTIFICATION OF THE TARGET GROUP

ITEM	VARIABLE (+LAYER)	SCIENTIFIC BASE
I have the firm intention to start a firm some day. (Answer "Slightly agree", "Agree", or "Strongly Agree")	Aspiring entrepreneur	Liñán & Chen, 2009
Have you already founded a company in the past? (Answer "yes")	Practicing Entrepreneur	Expert interview
To which of the groups in this list do you belong? (Answer "self-employed")		

Table 16: Used items and instruments

4.6. Demonstration

4.6.1. Procedure

Two cross-sectional studies are conducted in the form of non-controlled field experiments with post evaluation. The first experiment tests the intervention from iteration one (ValuesFinder). Participants from experiment 1 go through the steps that are highlighted in Figure 85. They access the website via a recommendation or search on the Internet for terms such as self-development tools and click on the website. They read through the motivational material provided, conduct the questionnaire, and after a few days, they receive their personal evaluation and action plan. Finally, after an additional two weeks, they are asked to provide feedback via the evaluation items in the form of an online feedback questionnaire.

4. STUDY 2: EMPIRICAL DEVELOPMENT AND TESTING OF INTERVENTIONS TO FOSTER HEALTHY AND EFFECTIVE SELF-REGULATION IN ENTREPRENEURS

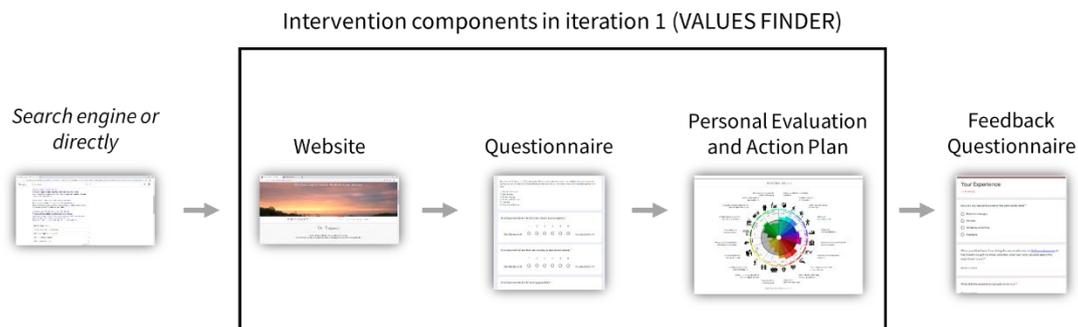


Figure 85: Process of the Values Finder

The second field experiment tests the intervention from iteration two (Core Values Workshop). Participants from experiment 2 go through the steps that are highlighted in Figure 86. They sign in for an entrepreneurship training at the institute, either as aspiring or as practicing entrepreneurs. Then, their results are jointly discussed and practices are exercised based on the ValuesFinder as a mandatory part of the training. However, participants do not get the results online, but in the workshop. In the workshop, their results are delved into deeper and thereafter, exercise practices together based on the ValuesFinder to foster mindfulness, clarity about personal values, intrinsic values orientation, and autonomy of goals. Furthermore, they are asked as a team to discuss and define the team core values as well as a team mission and a team vision. Two weeks after the workshop, a digitalized feedback questionnaire is sent to them.

4. STUDY 2: EMPIRICAL DEVELOPMENT AND TESTING OF INTERVENTIONS TO FOSTER HEALTHY AND EFFECTIVE SELF-REGULATION IN ENTREPRENEURS

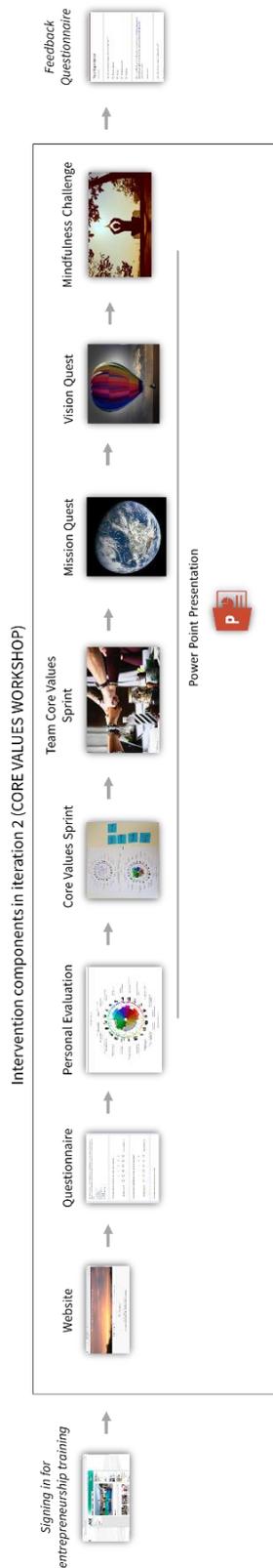


Figure 86: Process of the Core Values Workshop

4. STUDY 2: EMPIRICAL DEVELOPMENT AND TESTING OF INTERVENTIONS TO FOSTER HEALTHY AND EFFECTIVE SELF-REGULATION IN ENTREPRENEURS

4.6.2. Sample

4.6.2.1. Sample in Iteration 1

During iteration 1, evaluation formulas were sent to 854 participants and 123 completed evaluations (89 in English, 34 in German) were received, which corresponds to a response rate of 12.88 %. From those 123 evaluations, only 55 met the criterias of aspiring or practicing entrepreneurs. From those 55 participants, 10 participants (18 percent) used the German version of the questionnaire, whereas 45 participants (82 percent) used the English version of the questionnaire. 44 participants (80 percent) can be characterized as aspiring entrepreneurs. 11 (20 %) participants can be characterized as practicing entrepreneurs. 31 participants (56 %) were male and 24 participants (44 %) were female. Table 17 and Figure 87 show the range of age of the participants. Most participants were between 16 and 40 years old (70.9 %).

Range of age	Frequency	percentage	Cumulated percentage
11-15	0	0.0	0.0
16-20	4	7.3	7.3
21-25	8	14.5	21.8
26-30	11	20.0	41.8
31-35	9	16.4	58.2
36-40	7	12.7	70.9
41-45	6	10.9	81.8
46-50	4	7.3	89.1
51-55	3	5.5	94.5
56-60	3	5.5	100.0
61-65	0	0.0	100.0
71-75	0	0.0	100.0
81-85	0	0.0	100.0
Overall	55	100.0	

Table 17: Participant's range of age in iteration 1

4. STUDY 2: EMPIRICAL DEVELOPMENT AND TESTING OF INTERVENTIONS TO FOSTER HEALTHY AND EFFECTIVE SELF-REGULATION IN ENTREPRENEURS

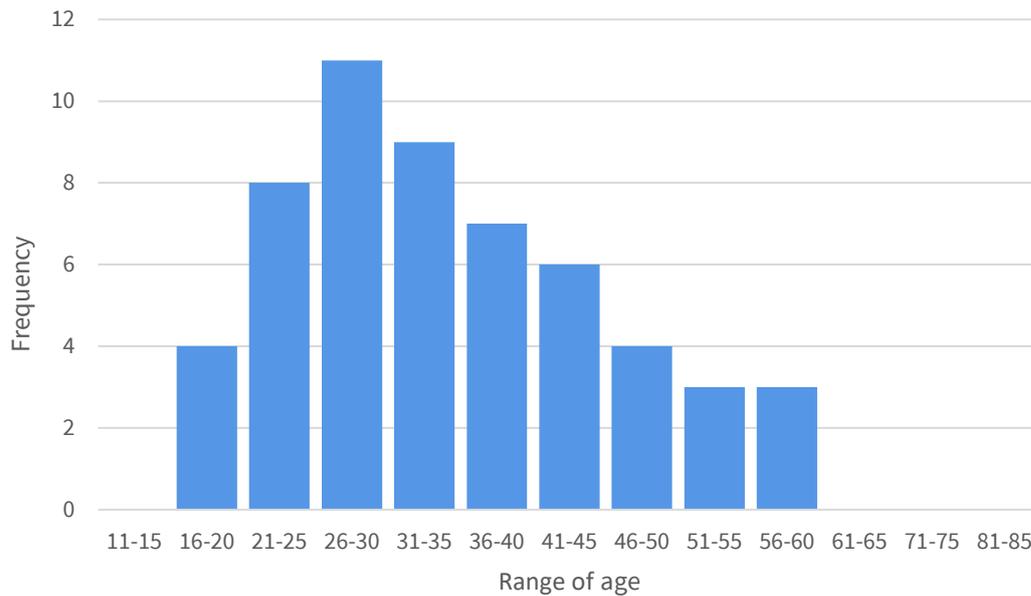


Figure 87: Participant's range of age in iteration 1, histogram

Participants lived in countries all over the world (see Table 18). However, a large group of participants was either from Germany (21.8 %) or the United States (12.7 %).

Place of living	frequency	percentage
Australia	1	1.8
Belgium	1	1.8
Canada	2	3.6
Croatia	1	1.8
Finland	1	1.8
France	2	3.6
Germany	12	21.8
Greece	1	1.8
India	2	3.6
Ireland	1	1.8
Italy	1	1.8
Malaysia	1	1.8

4. STUDY 2: EMPIRICAL DEVELOPMENT AND TESTING OF INTERVENTIONS TO FOSTER HEALTHY AND EFFECTIVE SELF-REGULATION IN ENTREPRENEURS

Morocco	1	1.8
Nigeria	1	1.8
Norway	1	1.8
Philippines	1	1.8
Poland	1	1.8
Portugal	1	1.8
Romania	2	3.6
Rwanda	1	1.8
Serbia	1	1.8
Singapore	2	3.6
Slovenia	1	1.8
South Africa	1	1.8
Spain	1	1.8
Trinidad and Tobago	1	1.8
Tunisia	1	1.8
Turkey	1	1.8
Uganda	1	1.8
United Kingdom	3	5.5
United States	7	12.7
Overall	55	100.0

Table 18: Participant's place of living in iteration 1

Concerning the type of employment, most participants were self-employed (18; 32.7 %), followed by participants, who were employed for wages (17; 30.9 %) and participants who were unemployed (10; 18.2 %) (see Table 19).

Type of employment	frequency	percentage
Apprentice	0	0.0
Employed for wages	17	30.9

4. STUDY 2: EMPIRICAL DEVELOPMENT AND TESTING OF INTERVENTIONS TO FOSTER HEALTHY AND EFFECTIVE SELF-REGULATION IN ENTREPRENEURS

Housemaker	1	1.8
Pensioner	0	0.0
Pupil	1	1.8
Self-employed	18	32.7
Student	8	14.5
Unemployed (no student, pupil or apprentice)	10	18.2
Working for military service or alternative (community) service	0	0.0
Other	0	0.0
Overall	55	100.0

Table 19: Participant's type of employment in iteration 1

In sum, the sample population consists of 55 aspiring and practicing entrepreneurs. Most participants were between 16 and 40 years old (70.9 %) and their current type of employment was either student (14.5 %) or self-employed (32.7 %). A large proportion of participants lives in Germany (21.8 %) or in the United States (12.7 %).

4.6.2.2. Sample in Iteration 2

In iteration 2, evaluation formulas were sent to 26 participants of the workshops. From those participants, 13 completed evaluation formulas (2 in English, 11 in German) were received, which corresponds to a response rate of 50 %. As all of the participants attended the Core Values Workshop in the scope of an entrepreneurial business workshop, all participants are perceived as aspiring entrepreneurs. However, one of the participants was already a practicing entrepreneur. Therefore, the sample consists of 1 practicing entrepreneur and 12 aspiring entrepreneurs. 10 participants (77 %) were male and 3 participants (23 %) were female. Table 20 and Figure 88 show the range of age of the participants in iteration 2. Most participants were between 16 and 25 years old (76,9 %).

Range of age	frequency	percentage	Cumulated percentage
11-15	0	0.0	0.0

4. STUDY 2: EMPIRICAL DEVELOPMENT AND TESTING OF INTERVENTIONS TO FOSTER HEALTHY AND EFFECTIVE SELF-REGULATION IN ENTREPRENEURS

16-20	1	7.7	7.7
21-25	9	69.2	76.9
26-30	2	15.4	92.3
31-35	0	0.0	92.3
36-40	1	7.7	100.0
Overall	13	100.0	

Table 20: Participant's range of age in iteration 2

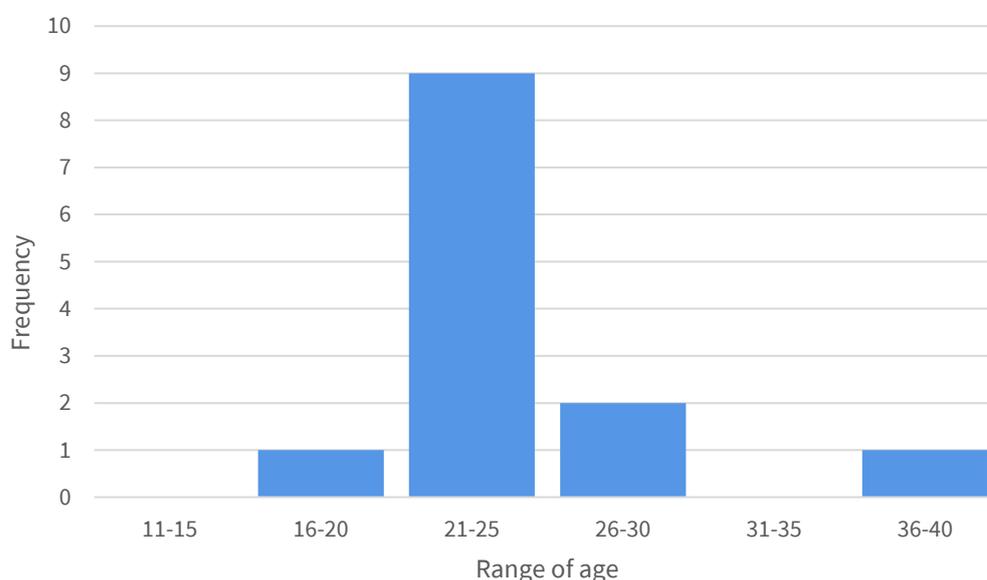


Figure 88: Participant's range of age in iteration 2, histogram

Twelve participants (92 %) lived in Germany. One participant (8 %) lived in Nigeria. Eleven participants (85 %) were students. Two participants (15 %) were self-employed.

4.7. Evaluation

In the following section, the distribution (in %) of the answers is presented in a **bar chart** as well as in a **box plot**. A box plot is a way to illustrate numerical data through boxes and lines that are extending from those boxes (whiskers). There are different types of box plots. This variant of the box plot is based on McGill, Tukey, Wayne, & Larsen (1978). Figure 89 provides an overview of the five values the box plots from the study represent.

4. STUDY 2: EMPIRICAL DEVELOPMENT AND TESTING OF INTERVENTIONS TO FOSTER HEALTHY AND EFFECTIVE SELF-REGULATION IN ENTREPRENEURS

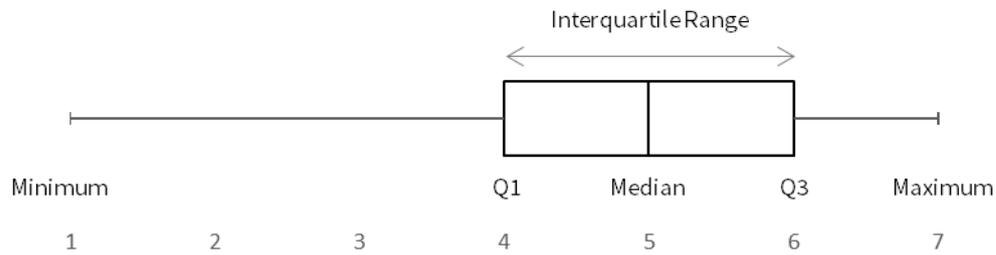


Figure 89: Interpretation of box plots

The lower end of the bottom whisker represents the lowest data point (minimum). The upper end of the top whisker corresponds to the largest data point (maximum). The line in the middle of the two boxes represents the middle value of the data set (Median). The left border of the left box corresponds to the 25th percentile (Q1), which describes the data point, compared to which 25 % of all data points are lower. The right border of the right box (Q3) represents the 75th percentile (Q3), which describes the data point, compared to which 75 % of all data points are higher. The interquartile range is the range from Q1 to Q3. It encompasses the middle 50 % of data points (McGill et al., 1978).

The main focus of the evaluation is to analyze whether the interventions chosen have positive effects on the referring evaluation characteristics. As there is no control group, the significance of the means is statistically tested based on the chosen increments of the Likert-scale. A **one-sample t-test (right-sided) is used for both iterations**. For iteration 2, the informative values derived from this method is weakened because not all constructs may be normally distributed and $N \leq 30$. Nevertheless, it is argued that the results from iteration 2 can still be used as effect indicators. The null hypothesis is statistically tested such that the interventions had no positive effects. In consideration of the chosen increments of the Likert-scale, the following hypotheses are derived:

$$H_0 : \text{Mean} \leq 4; H_1 : \text{Mean} > 4$$

4. STUDY 2: EMPIRICAL DEVELOPMENT AND TESTING OF INTERVENTIONS TO FOSTER HEALTHY AND EFFECTIVE SELF-REGULATION IN ENTREPRENEURS

The value 4 represents either “Neither Disagree Nor Agree” (e.g. for functionality items) or “Neither Bad Nor Good” (e.g. for usability items), and thus serves as a consistent separator between the degrees of positive effects and the remaining incrementals of the Likert-scale. A mean that is significantly higher than 4 can be interpreted as a statistically validated rejection of the null hypothesis. For functionality items, this indicates that the intervention has a significant positive impact on the referring construct. For usability items, it indicates that the referring construct is significantly positive. In the following results, besides the box plots and bar charts, we present the means and the **p-values** to the respective tests.

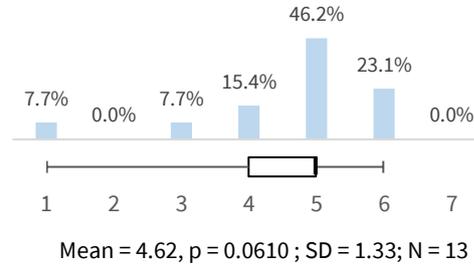
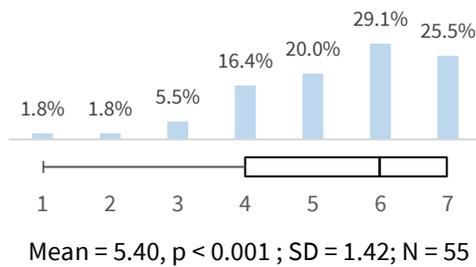
4.7.1. Functionality

For all functionality items, participants were asked to rate on a scale from 1 (Strongly Disagree) to 7 (Strongly Agree) how much the following statements apply to them.

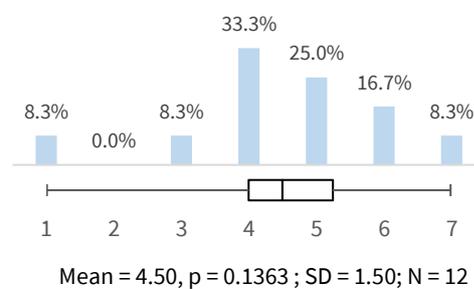
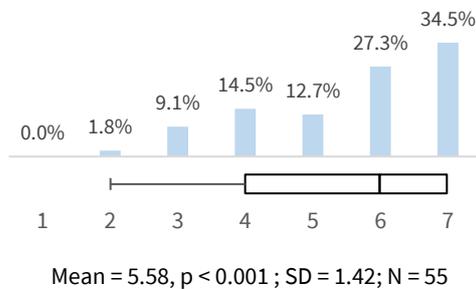
4. STUDY 2: EMPIRICAL DEVELOPMENT AND TESTING OF INTERVENTIONS TO FOSTER HEALTHY AND EFFECTIVE SELF-REGULATION IN ENTREPRENEURS

4.7.1.1. Mindfulness

Iteration 1
The "experience" helps me to live more attentively in the here and now instead of thinking about events in the past or future.



Through the "experience" I am motivated to live with more attention in the here and now.



Through the "experience" I live more attentively in the here and now.

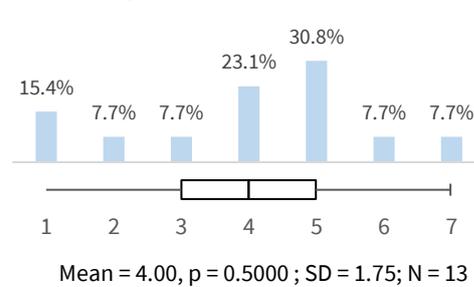
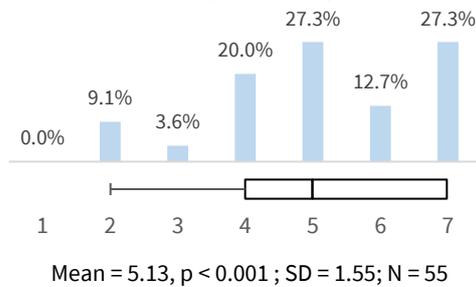
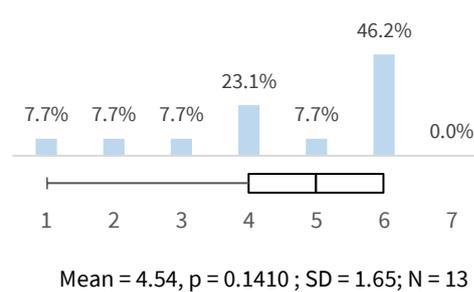
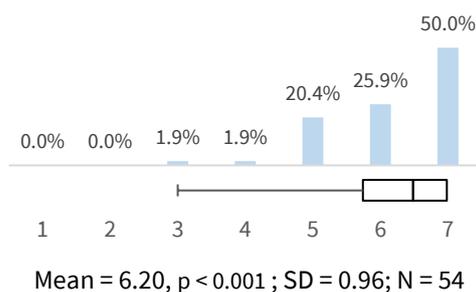


Table 21: Results for mindfulness

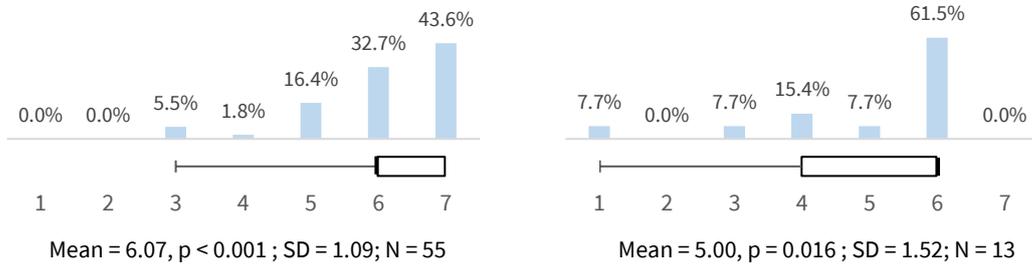
4.7.1.2. Clarity about personal values

Iteration 1
The "experience" helps me to get more clarity about my personal values.



4. STUDY 2: EMPIRICAL DEVELOPMENT AND TESTING OF INTERVENTIONS TO FOSTER HEALTHY AND EFFECTIVE SELF-REGULATION IN ENTREPRENEURS

Through the "experience" I am motivated to get more clarity about my personal values.



Through the "experience" I got more clarity about my personal values.

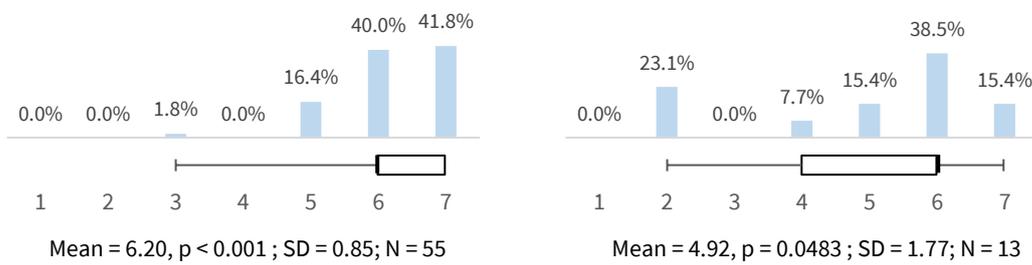


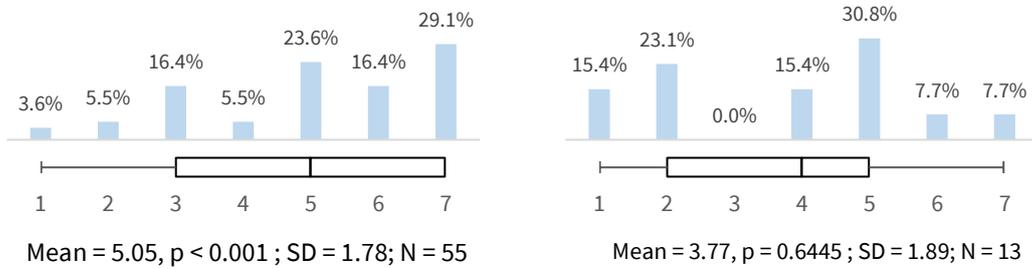
Table 22: Results for clarity about personal values

4.7.1.3. Intrinsic values orientation

Iteration 1

Iteration 2

The "experience" made me realize that it is important to me to live in harmony with nature.



The "experience" made me realize that it is important to me to live in harmony with people all over the world.

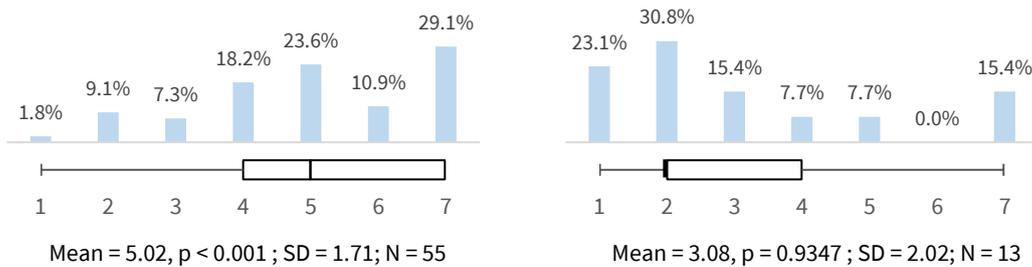
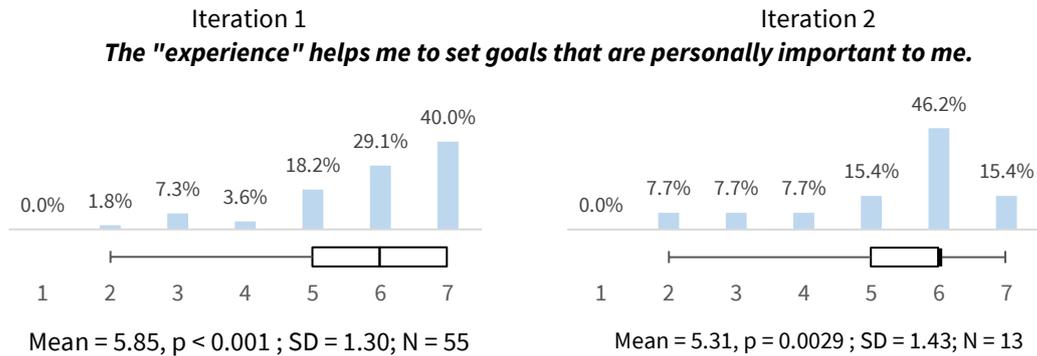


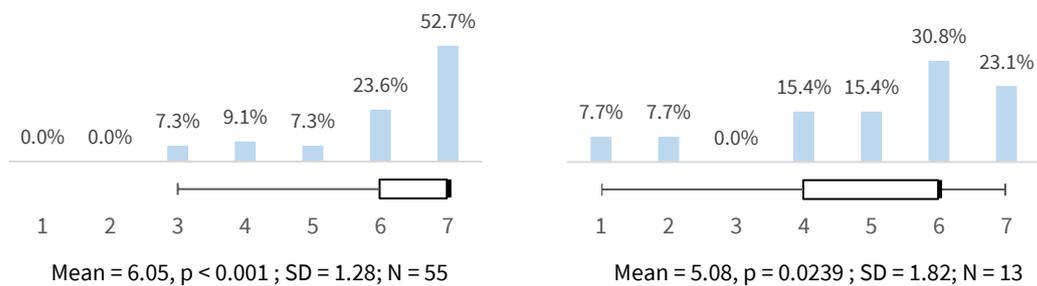
Table 23: Results for intrinsic values orientation

4. STUDY 2: EMPIRICAL DEVELOPMENT AND TESTING OF INTERVENTIONS TO FOSTER HEALTHY AND EFFECTIVE SELF-REGULATION IN ENTREPRENEURS

4.7.1.4. *Autonomy of goals*



Through the "experience" I am motivated to set goals that are personally important to me.



Through the "experience" I have set goals that are personally important to me.

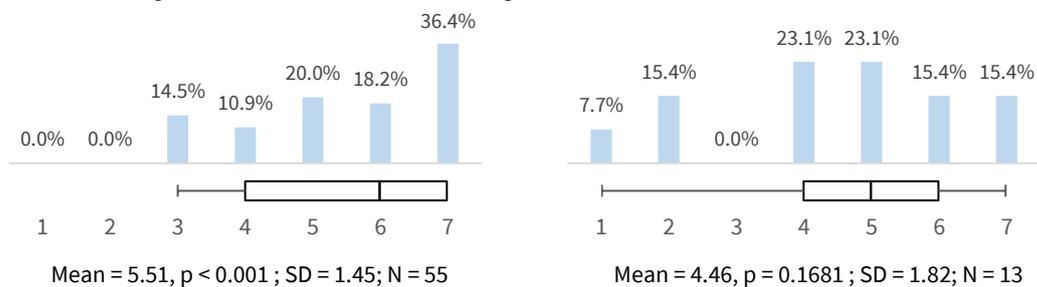


Table 24: Results for autonomy of goals

4.7.1.5. *Individual Efficacy*

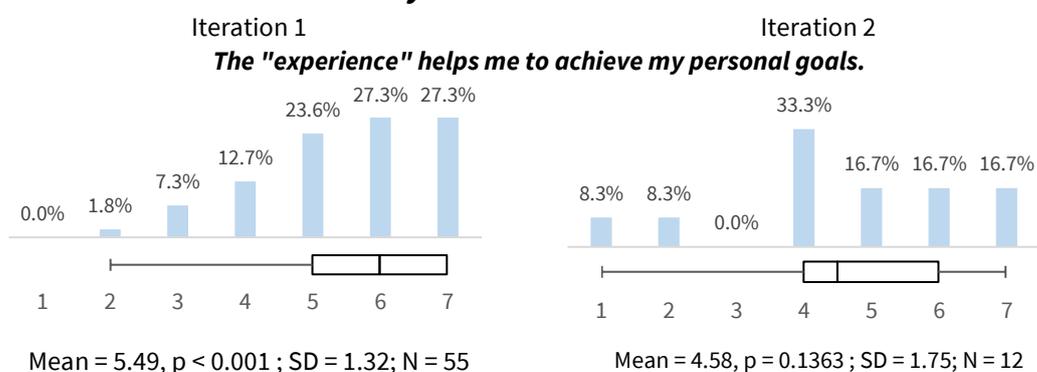


Table 25: Results for individual efficacy

4. STUDY 2: EMPIRICAL DEVELOPMENT AND TESTING OF INTERVENTIONS TO FOSTER HEALTHY AND EFFECTIVE SELF-REGULATION IN ENTREPRENEURS

4.7.1.6. Collective Efficacy

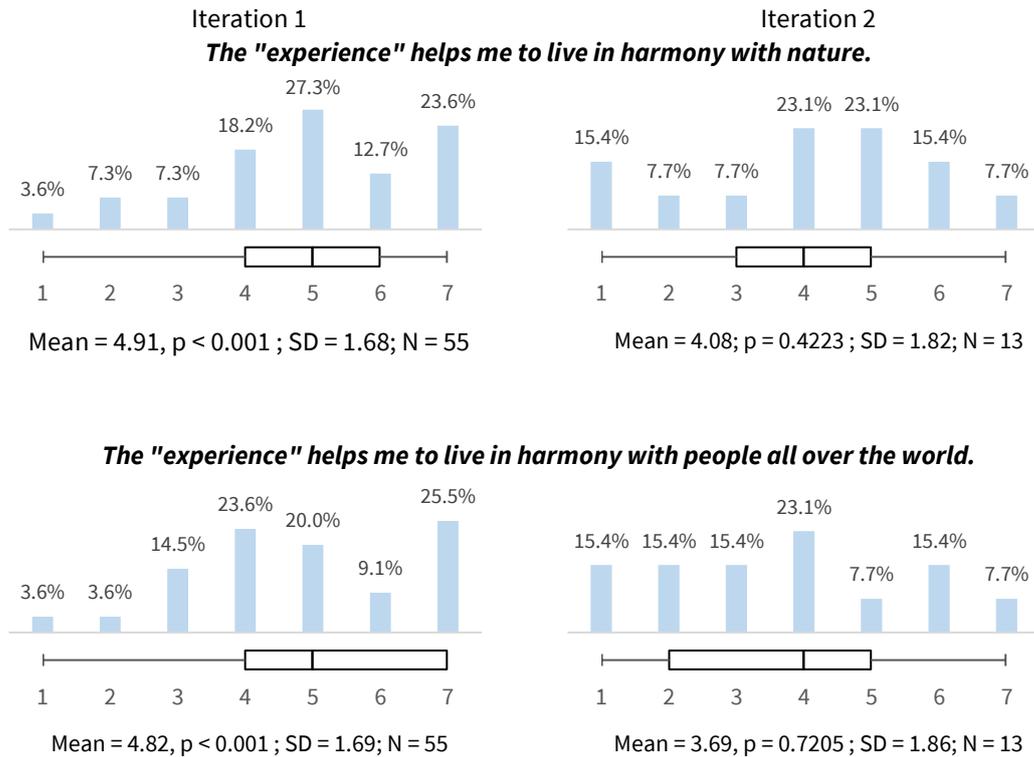


Table 26: Results for collective efficacy

4.7.1.7. Positive Emotions (as a facet of Health)

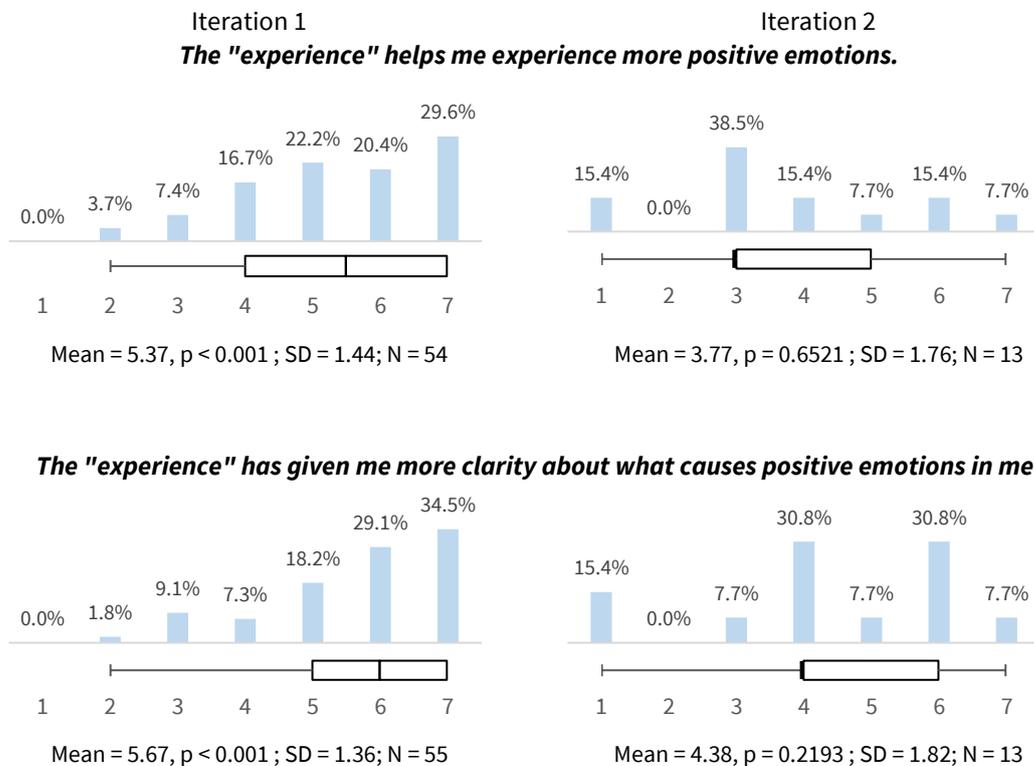


Table 27: Results for positive emotions

4. STUDY 2: EMPIRICAL DEVELOPMENT AND TESTING OF INTERVENTIONS TO FOSTER HEALTHY AND EFFECTIVE SELF-REGULATION IN ENTREPRENEURS

4.7.1.8. Vitality (as a facet of Health)

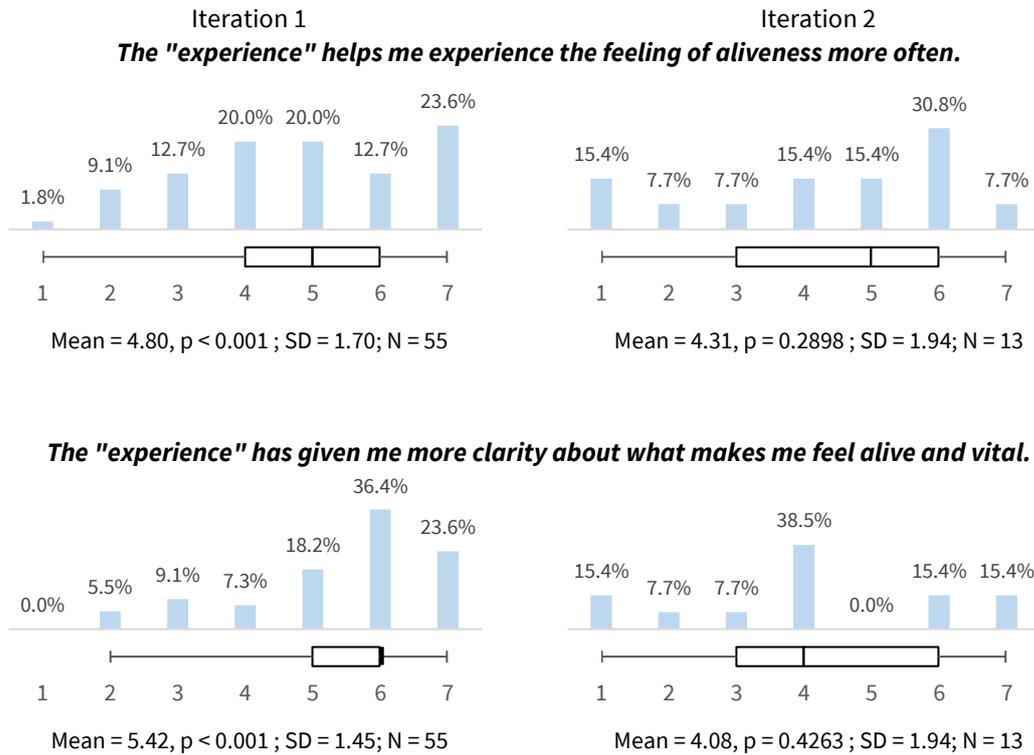
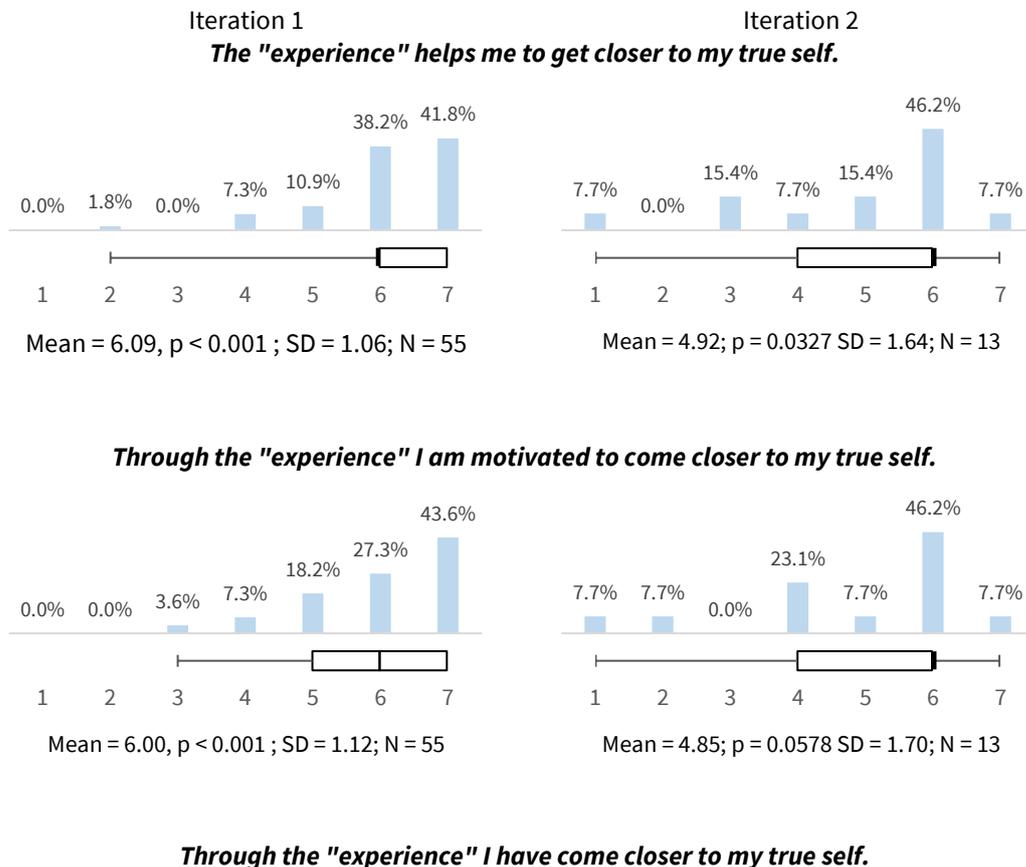
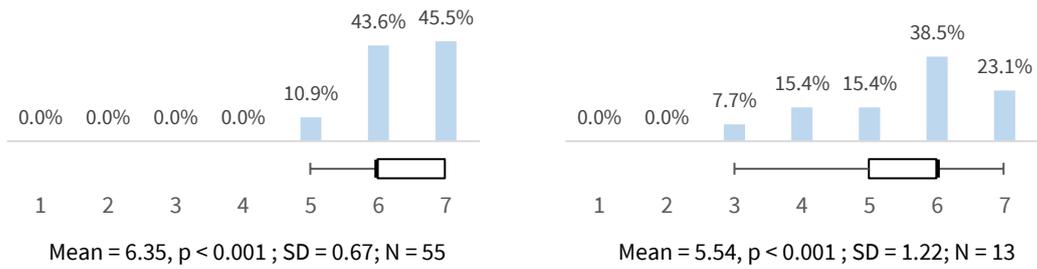


Table 28: Results for vitality

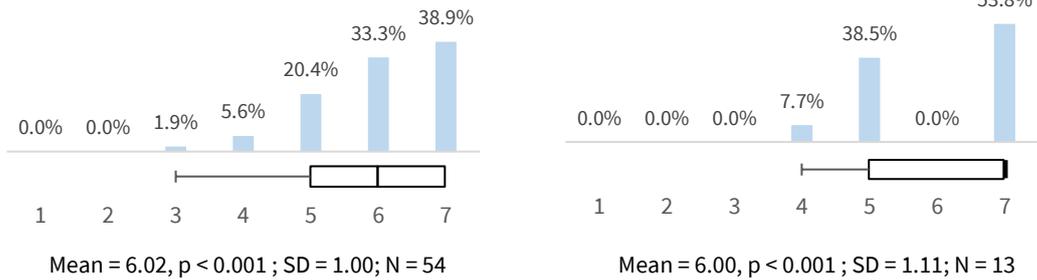
4.7.1.9. Overall functionality (Authenticity)



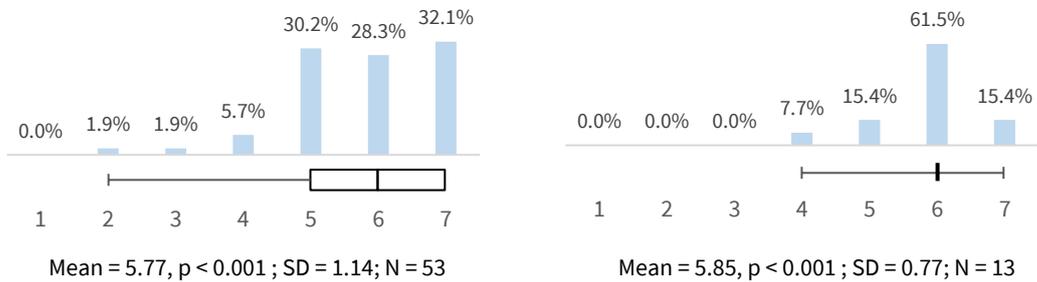
4. STUDY 2: EMPIRICAL DEVELOPMENT AND TESTING OF INTERVENTIONS TO FOSTER HEALTHY AND EFFECTIVE SELF-REGULATION IN ENTREPRENEURS



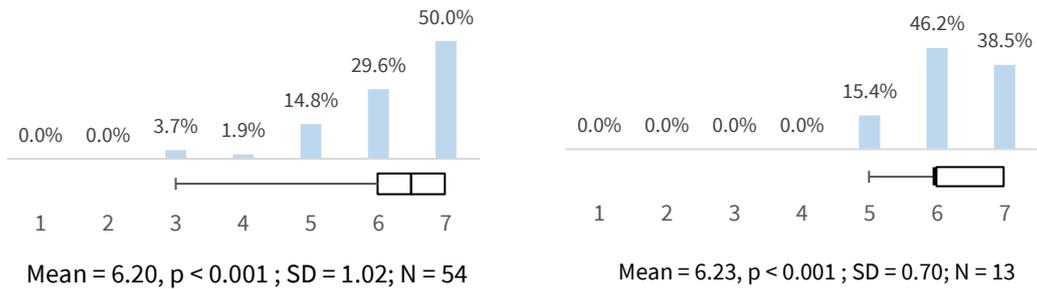
Usability of the survey



Understandability of the results



Visualization of the results



Website on which the personality test is offered (findyourvalues.com)



4. STUDY 2: EMPIRICAL DEVELOPMENT AND TESTING OF INTERVENTIONS TO FOSTER HEALTHY AND EFFECTIVE SELF-REGULATION IN ENTREPRENEURS

Mean = 6.13, $p < 0.001$; SD = 0.96; N = 55

Mean = 6.17, $p < 0.001$; SD = 1.07; N = 12

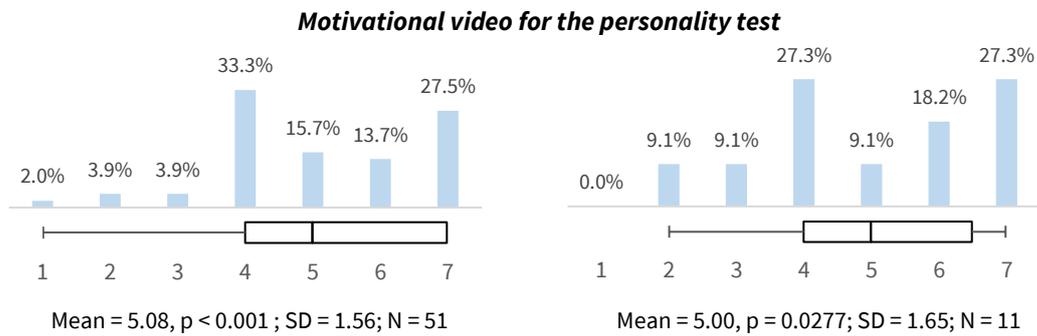
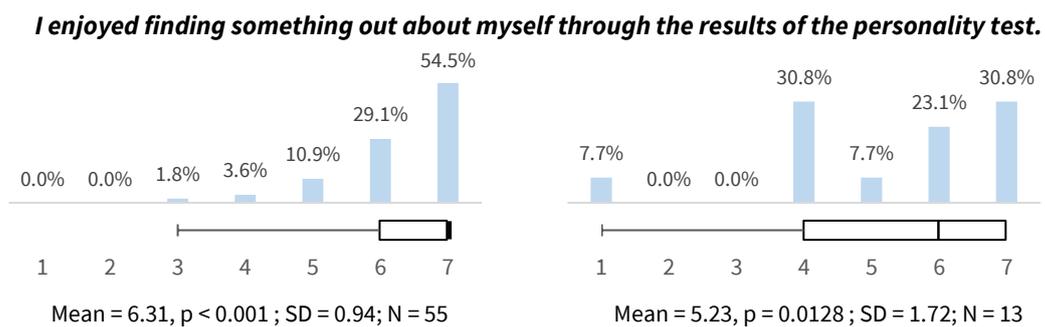
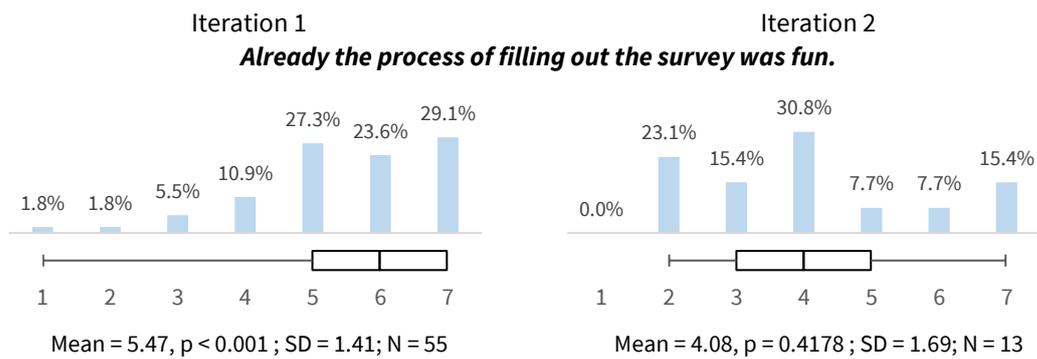


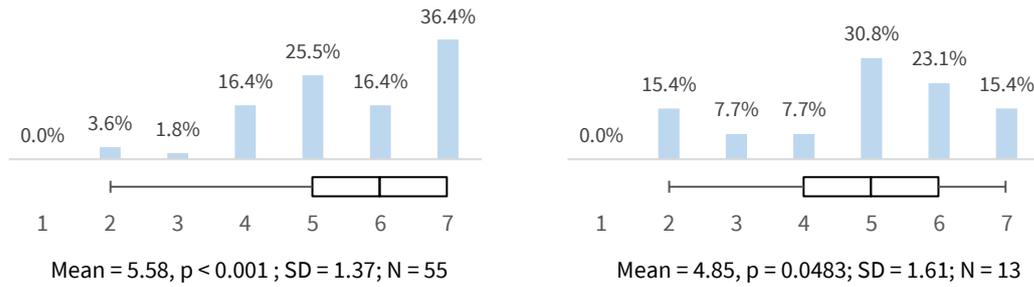
Table 31: Results for usability part 1

For the following items, we asked participants to rate on a scale from 1 (Strongly Disagree) to 7 (Strongly Agree) how much the following statements apply to them.



Already the process of filling out the survey was valuable to me.

4. STUDY 2: EMPIRICAL DEVELOPMENT AND TESTING OF INTERVENTIONS TO FOSTER HEALTHY AND EFFECTIVE SELF-REGULATION IN ENTREPRENEURS



The results of the personality test were valuable to me.

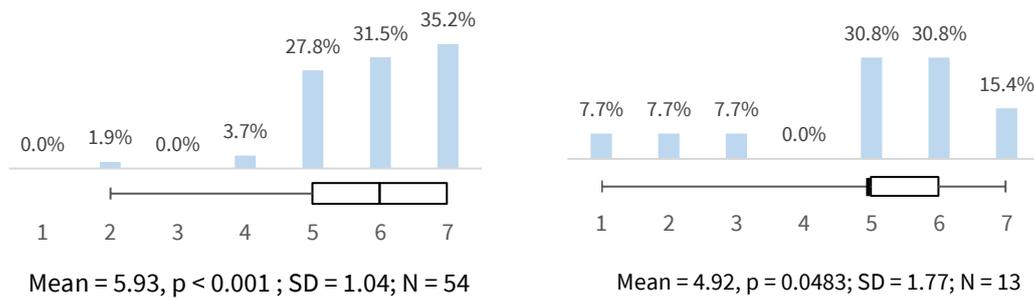


Table 32: Results for usability part 2

For the following item (base for the net promoter score (NPS)), participants are asked to answer on a scale from 0 (Extremely unlikely) to 10 (Extremely likely)

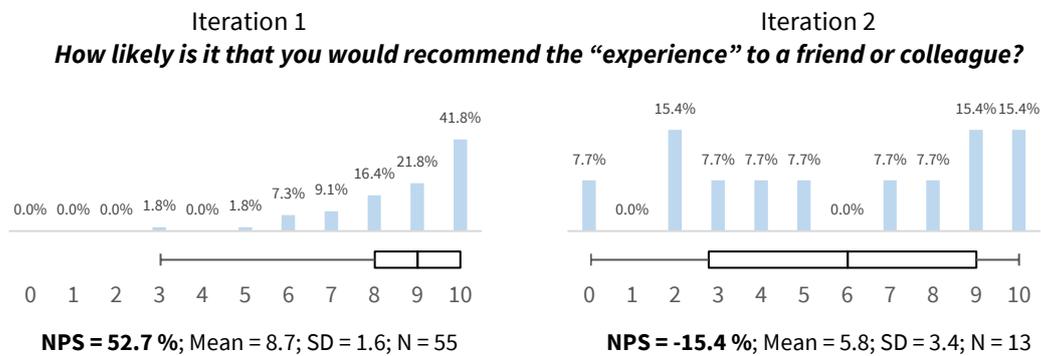


Table 33: Results for the net promoter score

4. STUDY 2: EMPIRICAL DEVELOPMENT AND TESTING OF INTERVENTIONS TO FOSTER HEALTHY AND EFFECTIVE SELF-REGULATION IN ENTREPRENEURS

4.7.4. Portability

As stated in chapter “design and development of the evaluation characteristics”, a presentation is made for the characteristic portability the distribution of the devices that were used when conducting the Values Finder as well as the respective average session duration (see Table 34).

Device	User	User in percent	Average session duration
Desktop Computer	422	49.4	1 minute and 28 seconds
Mobile Phone	408	47.8	22 seconds
Tablet	24	2.8	24 seconds
All	854	100	55 seconds

Table 34: Results for portability

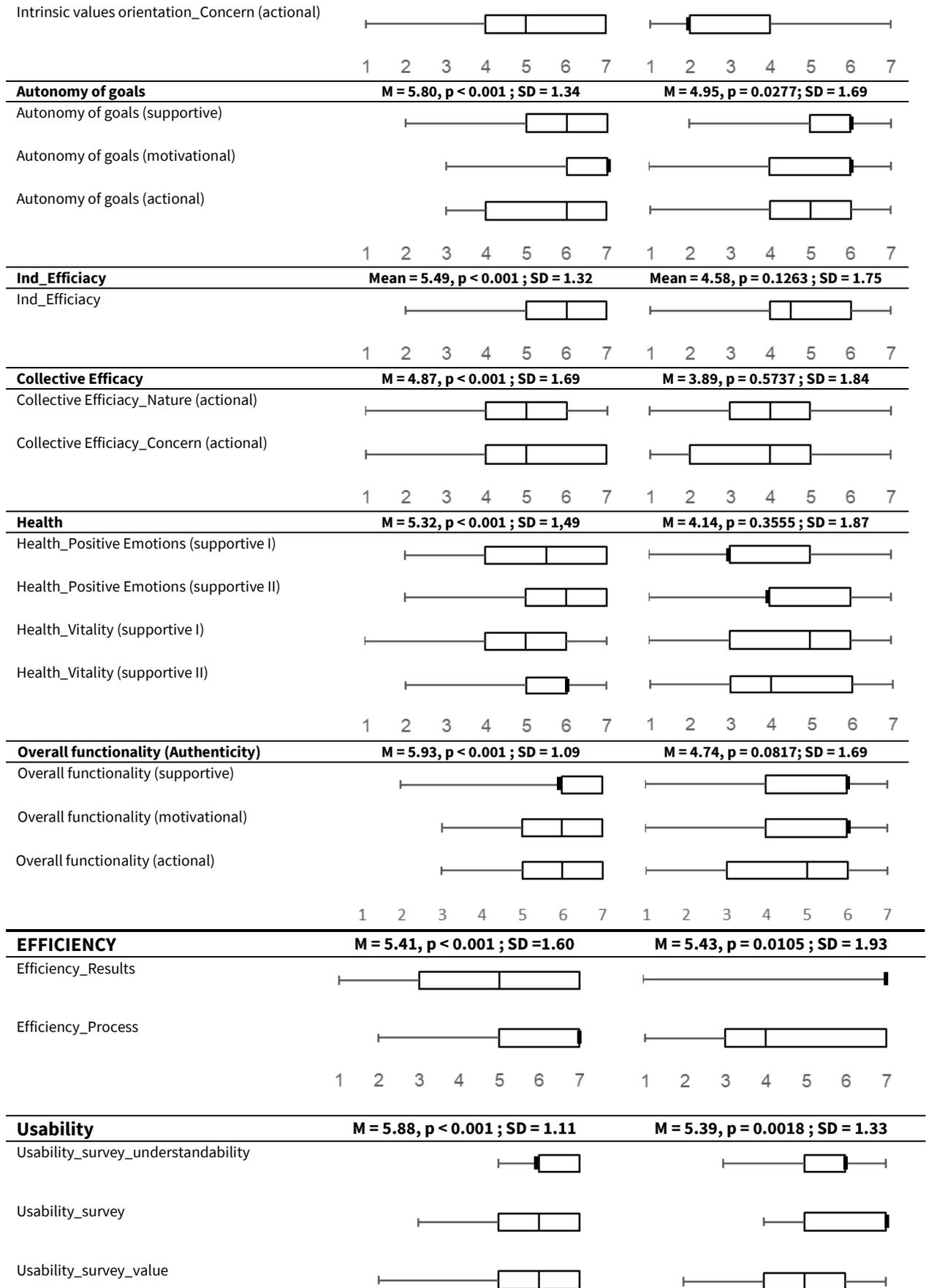
4.7.5. Overviews

In the following, aggregated overviews of the results are provided. The purpose of those aggregated representations is to better understand and interpret the results.

The following overview (Table 35) aggregates the results on the level of the evaluation characteristics as well as on the level of the categories of the evaluation characteristics. It shows the overall and single means and standard deviations of the items. Furthermore, it illustrates the box plots for all items.

Evaluation Characteristic	Iteration 1 (IT 1)	Iteration 2 (IT 2)
FUNCTIONALITY	M = 5.50, p < 0.001 ; SD = 1.39	M = 4.4, p = 0.2064 ; SD = 1.75
Mindfulness	M = 5.37, p < 0.001 ; SD = 1.46	M = 4.37, p = 0.1776 ; SD = 1.53
Mindfulness (supportive)		
Mindfulness (motivational)		
Mindfulness (actional)		
	1 2 3 4 5 6 7	1 2 3 4 5 6 7
Clarity about personal values	M = 6.16, p < 0.001 ; SD = 0.97	M = 4.82, p = 0.0482 ; SD = 1.65
Clarity about personal values (supportive)		
Clarity about personal values (motivational)		
Clarity about personal values (actional)		
	1 2 3 4 5 6 7	1 2 3 4 5 6 7
Intrinsic values orientation	M = 5.04, p < 0.001 ; SD = 1.75	M = 3.43, p = 0.8497 ; SD = 1.96
Intrinsic values orientation_Nature (actional)		

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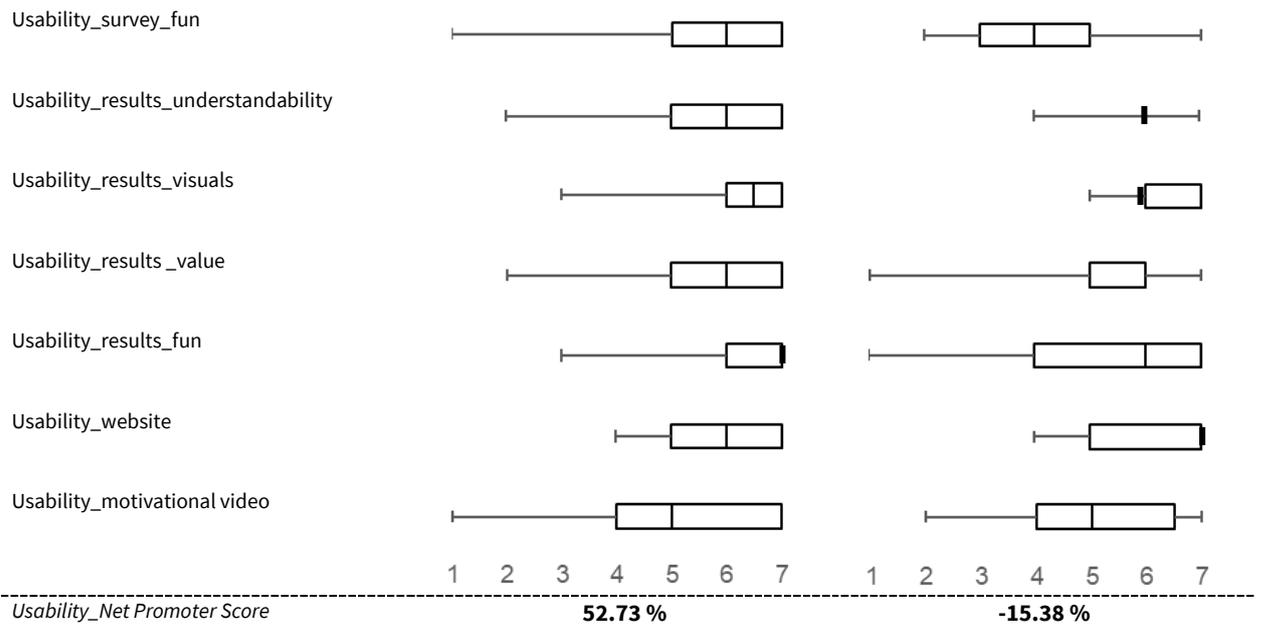


Table 35: Overview about results on the level of evaluation characteristics and referring categories

In addition to the significance levels the means of all items are ranked in descending order (except the net promoter score) for both iterations in Table 36.

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Variable (+Layer)	Mean (I1)	SD (I1)	Variable (+Layer)	Mean (I2)	SD (I2)
Usability_survey_understandability	6.35***	0.67	Efficiency_Results	6.23***	1.72
Usability_results_fun	6.31***	0.94	Usability_results_visuals	6.23***	0.70
Clarity about personal values (supportive)	6.20***	0.96	Usability_website	6.17***	1.07
Usability_results_visuals	6.20***	1.02	Usability_survey	6.00***	1.11
Clarity about personal values (actional)	6.20***	0.85	Usability_results_understandability	5.85***	0.77
Usability_website	6.13***	0.96	Usability_survey_understandability	5.54***	1.22
Overall functionality (supportive)	6.09***	1.06	Autonomy of goals (supportive)	5.31**	1.43
Clarity about personal values (motivational)	6.07***	1.09	Usability_results_fun	5.23*	1.72
Autonomy of goals (motivational)	6.05***	1.28	Autonomy of goals (motivational)	5.08*	1.82
Usability_survey	6.02***	1.00	Clarity about personal values (motivational)	5.00*	1.52
Efficiency_Process	6.02***	1.27	Usability_motivational video	5.00*	1.65
Overall functionality (motivational)	6.00***	1.12	Clarity about personal values (actional)	4.92*	1.77
Usability_results_value	5.93***	1.04	Overall functionality (supportive)	4.92*	1.64
Autonomy of goals (supportive)	5.85***	1.30	Usability_results_value	4.92*	1.77
Usability_results_understandability	5.77***	1.14	Overall functionality (motivational)	4.85*	1.70
Overall functionality (actional)	5.71***	1.10	Usability_survey_value	4.85*	1.61
Health_Positive Emotions (supportive II)	5.67***	1.36	Mindfulness (supportive)	4.62	1.33
Mindfulness (motivational)	5.58***	1.42	Efficiency_Process	4.62	2.13
Usability_survey_value	5.58***	1.37	Ind_Efficiency (supportive)	4.58	1.75
Autonomy of goals (actional)	5.51***	1.45	Clarity about personal values (supportive)	4.54	1.65
Ind_Efficiency (supportive)	5.49***	1.32	Mindfulness (motivational)	4.50	1.50
Usability_survey_fun	5.47***	1.41	Autonomy of goals (actional)	4.46	1.82
Health_Vitality (supportive II)	5.42***	1.45	Overall functionality (actional)	4.46	1.74
Mindfulness (supportive)	5.40***	1.42	Health_Positive Emotions (supportive II)	4.38	1.82
Health_Positive Emotions (supportive I)	5.37***	1.44	Health_Vitality (supportive I)	4.31	1.94
Mindfulness (actional)	5.13***	1.55	Collective Efficiency_Nature (actional)	4.08	1.82
Usability_motivational video	5.08***	1.56	Health_Vitality (supportive II)	4.08	1.94
Intrinsic values orientation_Nature (actional)	5.05***	1.78	Usability_survey_fun	4.08	1.69
Intrinsic values orientation_Concern (actional)	5.02***	1.71	Mindfulness (actional)	4.00	1.75
Collective Efficiency_Nature (actional)	4.91***	1.68	Intrinsic values orientation_Nature (actional)	3.77	1.89
Collective Efficiency_Concern (actional)	4.82***	1.69	Health_Positive Emotions (supportive I)	3.77	1.76
Health_Vitality (supportive I)	4.80***	1.70	Collective Efficiency_Concern (actional)	3.69	1.86
Efficiency_Results	4.80**	1.94	Intrinsic values orientation_Concern (actional)	3.08	2.02

Table 36: Means and standard deviations of all items in descending order referring to the means; * := $p < 0.05$, ** := $p < 0.01$, *** := $p < 0.001$

The table uses the colors to represent the positivity of the means (see Table 37). Combined with the significance levels, we build the foundation to interpret the results.

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Interpretation	Mean range	Underlying Likert Scale
 Highly positive mean	$6 < \text{Mean}$	7 := Strongly Agree (or Very Good)
 Positive mean	$5 < \text{Mean} \leq 6$	6 := Agree (or Good)
 Weakly positive mean	$4 < \text{Mean} \leq 5$	5 := Agree Slightly (or Rather Good)
 No positive mean	$\text{Mean} \leq 4$	4 := Neither Disagree Nor Agree (or Neither Bad Nor Good)
 No assertion		3 := Disagree Slightly (or Rather Bad)
		2 := Disagree (or Bad)
		1 := Strongly Disagree (or Very Bad)

Table 37: Strengths of effect independent of the significance levels

With Figure 90, the intention is to connect the results with the causal model of healthy and effective self-regulation. The illustration shows the causal model of healthy and effective self-regulation and illustrates the strength of effect of the interventions and their significance level. In particular, it contains the directly and indirectly manipulated construct of the interventions and indicates with colored squares how strong the positive effects of the interventions are on the constructs. Moreover, the illustration indicates the significance level (p-value). The upper square represents layer 1 of efficacy, the middle square layer 2 of efficacy, and the bottom square layer 3 of efficacy. The unmeasured layers of efficacy are represented through grey squares.

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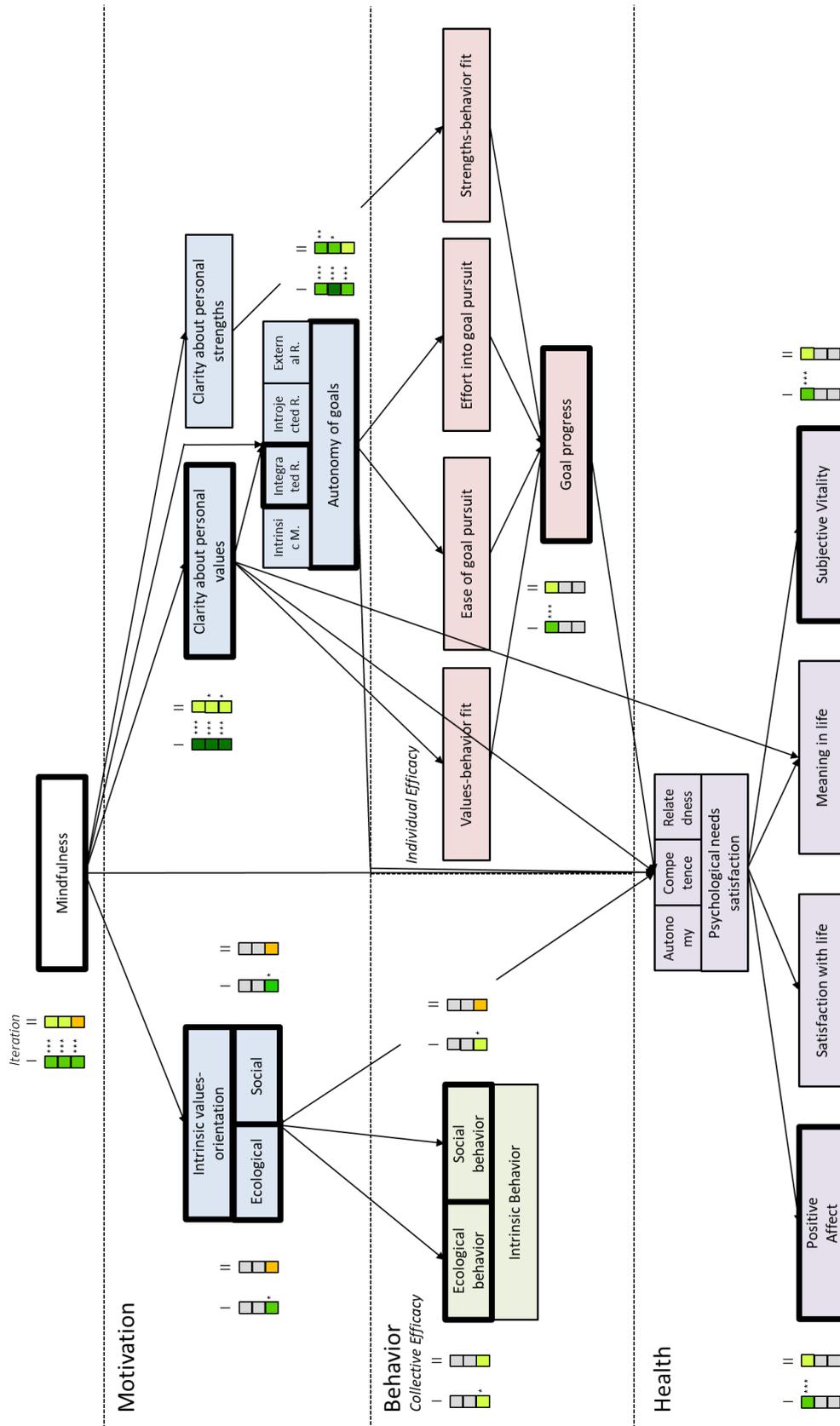


Figure 90: Strength of effect on the constructs in the causal model of healthy and effective self-regulation; * := $p < 0.05$, ** := $p < 0.01$, *** := $p < 0.001$

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4.8. Discussion

For the discussion, the following structure is used: Firstly, the **general tendencies** of the results of iteration 1 (Values Finder) and iteration 2 (Core Values Workshop) are discussed. Secondly, the specific results of **each evaluation characteristic is discussed. All parts of the discussion** include the following components: **summary of results, limitations, contributions to former research** as identified in chapter 4.2, and an **outlook** on how future studies could further research the respective variable.

4.8.1. General tendencies

The interventions from **iteration 1** were shown to be effective for all evaluation characteristics (Functionality Mean = 5.50***; Efficiency Mean = 5.41***; Usability Mean = 5.88***) as well as all respective constructs (see Table 36 and Table 37). The **highest means** show that the usability of the survey was rated as very good. In particular, the questions of the survey were perceived as easy to understand (Mean = 6.35***). Furthermore, participants indicate that they experience fun when learning something about themselves through the results of the Values Finder (Mean = 6.31***) and rate the visualizations of the results as very positive (Mean = 6.30***). Besides, the Values Finder is experienced as helpful to gain clarity about personal values (Mean = 6.16***) as well as an experience that already leads to more clarity about personal values (Mean = 6.20***). For those items, the spread is also very low (all SD's ≤ 1.02). The **lowest means** show that participants experience the waiting time until they received the results as least positive (Mean = 4.80***). Furthermore, intrinsic values orientation for both facets as well as intrinsic behavior for both facets were rated relatively low (all four Means ≤ 5.05). Also, participants gave most health variables and mindfulness (actional) a relatively low rating. However, except for Health_vitality (supportive I), they are all above 5 and statistically significant on a high level ($p < 0.001$). Given these results, the conclusion is that the **Values Finder** is a **functional, usable, and efficient** instrument to foster healthy and effective self-regulation. In summary, the Values Finder interventions appear to be statistically significant for all evaluation characteristics ($p < 0.001$). Thus, **H₀ can be rejected for all construct**. Concerning functionality, the instrument has an **especially strong impact on clarity**

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about personal values. The impact on mindfulness, intrinsic values orientation, intrinsic behavior, and health are less strong, however, still highly significant ($p < 0.001$). Furthermore, the average waiting for the results, which is two weeks, is experienced as suboptimal. Thus, generating and sending results faster is a clear recommendation for future actions.

In **Iteration 2**, not all evaluation characteristics are found to be effective (Functionality Mean = 4.4, $p = 0.2064$; Efficiency Mean = 5.4*; Usability Mean = 5.4**) (see Table 36 and Table 37). The **highest means** show in contrast to iteration 1, that the time until participants receive their results has been positively evaluated (Mean = 6.23***). This is not counterintuitive the results are generated and visualized for the workshop participants in an average time of four days, which is much faster than the process of iteration 1. Furthermore, usability was rated as very good, in particular, the understandability and visualization of the results (Mean = 5.85***; Mean = 6.23***). Moreover, the usability of the survey and the website are rated as relatively good (Mean = 6.00***; Mean = 6.17***). However, for the efficiency of the results, the spread was relatively wide ($SD = 1.72$), which indicates that even with a relatively short evaluation time, some participants still experience four days as too long. In contrast to iteration 1, no functionality items are among the top five means in iteration 2. Concerning functionality, iteration 2 was shown to be most effective concerning autonomy of goals (Mean = 4.95*) and clarity about personal values ($M = 4.82^*$). The highest three functionality items are autonomy of goals (supportive) (Mean = 5.31**), autonomy of goals (motivational) (Mean = 5.08*), and clarity about personal values (motivational) (Mean = 5.00*). These results indicate that the Core Values Workshop has a stronger effect on the autonomy of goals than on clarity about personal values. This could be especially due to the intervention components mission quest and vision quest, which focus on autonomy of goals and are only integrated in iteration 2. In accordance with iteration 1, the **lowest means** indicate that intrinsic values orientation for both facets as well as intrinsic behavior for both facets are rated as relatively low (all four means $\leq 4,08$ and insignificant). Again, the effects on the health variables and mindfulness (actional) also appear to be relatively low (all means $\leq 4,38$

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and insignificant). In conclusion, these results support the impression that the **Core Values Workshop** is a **functional, usable, and efficient** instrument to foster healthy and effective self-regulation. However, the Core Values Workshop has weaker means in comparison to iteration 1, which led to the statistical result that **H₀ cannot be rejected for all constructs**. Thus, the following can be inferred for iteration 2: The Core Values Workshop does not have significantly positive effects concerning all evaluation characteristics. A **significant impact on autonomy of goals** was statistically shown, which is followed by the significant effects **on clarity about personal values**. The **effects on mindfulness, intrinsic values orientation, intrinsic behavior, and health are not significant** ($p < 0.05$).

This study has several **limitations**, which partially signal why the means and significance levels of the Core Values Workshop are lower than those of the Values Finder. One limitation is the **small sample size** of the Core Values Workshop ($N = 13$). Thus, statistical significance is less likely to be achieved as results incorporate a higher risk of not being representative. Furthermore, the objective impact in the Core Values Workshop may be the same as in the Values Finder but is experienced differently by the participants in the workshop context. As participants of the workshop attend in a 3-days business planning for founder workshop, whereas the four-hours workshop block only represents the first part of the workshop, the impact may feel less significant, because a lot of other topics (e.g. business modeling and pitching) are also covered. In the following, this potential effect is referred to as the “**focus bias**”. Other limitations are the **low response rates** (12.88 % / 50 %) and the **self-selection bias** (Heckman, 1990), which may lead to different types of samples. In iteration 1, participants voluntarily visit the website and conduct the Values Finder. Thus, the sample from iteration 1 may be more open and positive toward the personality development topics than the sample from iteration 2. Another limitation is that the field experiment was conducted **without a control group**. Thus, the significance of the results is bound to the interpretation of the increments of the Likert scale. Another weakness of this study is that **not all feedback items are validated scientific items**. However, most of them are based on scientifically sound scales and all items are

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developed in the conceptual scope of the ISO 9126 standard, which is a recommended standard for the evaluation of design science artifacts (Venable et al., 2016). Another limitation is that the results may underlie the **common method bias** (Conway & Lance, 2010). The variables, that were hypothesized to directly or indirectly manipulate are all measured with quantitative items.

Derived from the discussed results and the presented limitations, the conclusion is that the Values Finder and the Core Values Workshop can be described as functional, usable, and efficient instruments to foster healthy and effective self-regulation with aspiring and practicing entrepreneurs. Although the Core Values Workshop was shown to be less effective, it is argued following the limitations, that the results were likely weakened by the small sample size, the self-selection bias, and the fact that the workshop block was only a four-hour block followed by two and half days of business modeling and pitching. Overall, the interpretation of the results is an **indication that the causal model of healthy and effective self-regulation as developed in study 1 has a high degree of validity**. In reference to problem identification, the conclusion is that, on balance, there it has been succeeded in developing a **comprehensive, but precise intervention** that fosters healthy and effective self-regulation in aspiring and practicing entrepreneurs. The intervention could not only contribute to the **individual health and efficacy of the entrepreneurs**, but also to **economic growth** as well as to **socially and ecologically sustainable development**. It **closes the gap** between simple self-assessments (e.g. VLS, PVA, VIA) and compound therapeutical interventions (like MBSR; ACT, MBCT) by creating a self-applicable tool embedded in a workshop block. Thus, this intervention could be used to follow the suggestions of the World Bank (Campos et al., 2017) to **use psychology-based interventions with entrepreneurs**. In particular, it could support them in their challenge of leading themselves through the journey of business venturing healthily and effectively, which is seen as a particularly hard challenge for them (see Baron et al., 2016; D'Intino et al., 2007; O'Shea et al., 2017).

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To foster the efficacy of the Core Values Workshop in the future, the plan is to focus on the introduction of the personality development topics more strongly. This could encourage participants to be more open towards those topics, even in a business context. Furthermore, there will be integration of the content of our workshop block in the rather business-orientated blocks, e.g. through stronger integration of the values-based mission and vision in the workshop blocks on business modeling and pitching. The integration may lead to stronger real and experienced effects for participants. Besides, a bigger sample size and a control group should be used to further test the significance of the interventions.

4.8.2. Functionality

4.8.2.1. Mindfulness

For mindfulness, the interventions in iteration 1 were rated with significantly high means (Overall Mindfulness Mean = 5.37*** | Mean (layer 1) = 5.40***; Mean (layer 2) = 5.58***; Mean (layer 3) = 5.13***; see Table 21 and Table 35). However, for iteration 2 the means were lower (Overall Mindfulness Mean = 4.37 | Mean (layer 1) = 4.62; Mean (layer 2) = 4.50; Mean (layer 3) = 4.00; all p-values > 0.05; see Table 21 and Table 35). Therefore, the conclusion is that concerning mindfulness, **H₀ can be rejected for the Values Finder but not for the Core Values Workshop**. This infers that the **Values Finder succeeds in fostering mindfulness, but the Core Values Workshop might not**. The mindful breathing exercise is perceived as the central element from the interventions on mindfulness in both iterations (see chapter 4.4.5.4). Looking at the results from iteration 1, the mindful breathing exercise (based on Segal et al., 2002) appears to be an effective self-applicable practice in the context of entrepreneurs to foster mindfulness. This supports studies that test mindful breathing exercises as an effective meditation technique to foster mindfulness (e.g. Carmody & Baer, 2008; Mrazek et al., 2012). Furthermore, the results indicate that concentration meditation is self-applicable and an effective type of meditation to start with as described by Brown & Ryan (2004). However, the question arises why it appears to be less effective in the workshop setting. One possible reason is that the focus of the workshop may be stronger on the topic of getting to the core of personal values. In the workshop, work

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is done with reflective processes (see Table 14). Although the mindful breathing exercise is given as homework at the end of the workshop and is also described in the personal evaluation and action plan, participants may be more strongly impacted on the rational level than on the development of the pre-reflexive skills that are ascribed to mindfulness. Referring to the general **limitations**, three other reasons may explain the low means in iteration 2. Firstly, the small sample size in the workshop makes it less likely to reach statistical significance. Secondly, through the self-selection bias, participants of the Core Values Workshop may be more open to business topics compared to personality development topics. Thirdly, by having a stronger focus on business topics in the workshop set up, the effects of the four-hours workshop block may be weakened through the shifting focus of the following sessions, also referred to as the “focus bias”. Another limitation, which particularly applies to the interventions on mindfulness, is that the exercise of mindful breathing is only explained to the participants of the Core Values Workshop, however, it is not jointly conducted. Therefore, whether participants practice the exercise is not under control.

Based on the discussed results and limitations, it is argued that this study indicates the **efficacy of a mindful breathing exercise** to foster mindfulness with aspiring and practicing entrepreneurs. However, particularly if the intervention is a workshop block that is followed by more business-oriented blocks, there may be a stronger need to introduce the personality development topics to the target group. Furthermore, a necessity is seen to conduct the exercise together with participants. In reference to problem identification, Kelly & Dorian (2017) propose that entrepreneurs either use Mindfulness-Based Stress Reduction (MBSR) by John Kabat-Zinn (2013) or a meditation app to foster mindfulness and in turn further develop their opportunity recognition and evaluation abilities. Thus, it is argued that intervention could be used as effective **complementation to MBSR or to a meditation app**. The ValuesFinder and/or Core Values Workshop could be used as a starting point to motivate aspiring and practicing entrepreneurs to become more mindful while providing a suitable practice. This process could be accompanied by an app or potentially lead to additional interest and participation in MBSR. Future studies could work on refining

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the Core Values Workshop. In addition, stronger integration of the mindful breathing exercises could be tested. It may not be enough to give the exercise as homework. A direct application of the mindful breathing exercise during the workshop could be tested.

4.8.2.2. Clarity about personal values

For clarity about personal values, the interventions in iteration 1 have the highest means among all functionality items (Overall Mean for clarity about personal values = 6.6***; Mean (layer 1) = 6.20***; Mean (layer 2) = 6.07***; Mean (layer 3) = 6.20***; see Table 21 and Table 35) and a low standard deviation (For all layers between SD = 0.8 and SD = 1.1). For iteration two, the means are also relatively high among the functionality items. However, the absolute values are rather low (Overall Mean for clarity about personal values = 4.82*; Mean (layer 1) = 4.54, Mean (layer 2) = 5.00*, Mean (layer 3) = 4.92* and the standard deviation higher (For all layers between SD = 1.5 and SD = 1.8). Therefore, the conclusion concerning clarity about personal values is that **H₀ can be rejected for the Values Finder and the Core Values Workshop (except for layer 2)**. This infers that the **Values Finder and the Core Values Workshop succeed in fostering clarity about personal values**. For both iterations, it was expected that clarity about personal values (all layers) should be rated relatively high in comparison to other functionality items as the focus of many intervention components is on fostering clarity about personal values. As a result, the respective means are indeed relatively high for both iterations. Nevertheless, the absolute difference between the means is surprising. However, referring to the general **limitations**, the weaker results in iteration 2 could be again due to the self-selection bias, the small sample size, and the focus bias. It is perceived that these general limitations are the main reason for the lower ratings in iteration 2. However, it would be good to also question the intervention elements that are specific for iteration 2. In iteration 1, participants have as much time as they need to concentrate on instructions of the ValuesFinder (iteration 1) and reflect on their personal values. In the scope of the Core Values Workshop, participants only have around 20 minutes to complete their values profile and derive their top 5 personal values. The following steps, namely team core values

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sprint, team mission, and team vision shift focus towards fostering autonomy of goals. Participants may need more time and more exercises to work on their personal values.

From this point of view, the central element of the interventions on clarity about personal values is the use of the refined universal continuum of human values (based on Schwartz et al., 2012; Cieciuch et al., 2014). It serves as a basis for defining the personal values in iteration 1 and iteration 2. Furthermore, it is used to define the team core values, the team mission, and the team vision in iteration 2. Based on the results from iteration 1 (highly positive means) and iteration 2 (weakly positive means) as well as the given explanations on why the rating for iteration 2 could be lower, it is argued that the **refined universal continuum of human values can be used effectively as a model to define personal values with aspiring and practicing entrepreneurs**. In reference to problem identification, it is seen that the Values Finder as well as the Core Values Workshop with the central element of the refined universal continuum of human values (Schwartz et al., 2012; Cieciuch et al., 2014) as state of the art instruments to support aspiring and practicing entrepreneurs in getting clarity about their personal values. Both instruments **close the gap between simple values assessments** such as the Personal Values Assessment (PVA, Leuty & Hansen, 2013) or the Valued Living Questionnaire (VLQ, Wilson et al., 2010) **and compound therapeutical programs** such as the Acceptance and Commitment Therapy (ACT, Hayes et al., 1999). They use state of the art measurement tools (e.g. PVQ-RR, Schwartz et al., 2012; Cieciuch et al., 2014), appropriate visualizations, and recommended practices to aspiring and practicing entrepreneurs. For future workshops, the intention is to give participants more time to reflect on their personal values. Furthermore, the aspiration is to better integrate the topic of personal values into the following workshop blocks on business modeling and pitching.

4.8.2.3. Intrinsic Values Orientation

For intrinsic values orientation, the interventions in iteration 1 were evaluated as being significantly effective (Overall intrinsic values orientation Mean = 5.04*** | Mean for nature = 5.05***; Mean for concern = 5.02***; see Table 21 and Table 35). However, for iteration two the interventions were rated as comparingly ineffective (Overall

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intrinsic values orientation Mean = 3.43 | Mean for nature = 3.77; Mean for concern = 3.08; all p-values > 0.05; see Table 21 and Table 35). Therefore, the conclusion concerning intrinsic values orientation is that **H₀ can be rejected for the Values Finder but not for the Core Values Workshop**. This infers that the **Values Finder succeeds in fostering intrinsic values orientation, but the Core Values Workshop might not**. A potential reason for the insignificance may again be the general **limitations** of the small sample size in the Core Values Workshop, the self-selection bias, and the focus bias. However, an additional potential explanation worth discussing is seen, which is rooted in the wording of the two items used to measure intrinsic values orientation (e.g. for nature: “The “experience” made me realize that it is important to me to live in harmony with nature”) and connected to the self-selection bias. Aspiring and practicing entrepreneurs, who attend a workshop that is mainly focused on business topics, may have more extrinsic values than those individuals, who independently choose to participate in the Values Finder. Thus, participants of the Values Finder may be already closer to their intrinsic values than participants of the Core Values Workshop.

In the scope of the directly manipulated variables, the interventions that aim to foster intrinsic values orientation relatively comprise the smallest part. The **“Carve out your core of personal values”-exercise** is the central element for both iterations, focusing on fostering intrinsic values orientation. It asks participants to use emotional feedback as a mechanism to sense the resonance to their intrinsic values (see chapter 4.4.7.3). However, especially in the workshop context, it is only shortly introduced by us and participants may not actively use it. Furthermore, such a non-rational, emotional work may need more introduction and time for conduction as it is probably new to most participants.

Based on the discussed results and limitations, this study indicates that **emotional feedback can be effectively used to foster intrinsic values orientation** with aspiring and practicing entrepreneurs. However, in the workshop context, there was no success in effectively using it. In reference to problem identification, the Values

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Finder in particular is seen as an effective instrument that provides participants with a self-applicable practice to foster intrinsic values orientation through emotional feedback with aspiring and practicing entrepreneurs. As the VIA assessment (Niemi, 2013, VIA institute on character, 2020) can be described as the only similar tool, which assesses character strengths that could be seen as related to intrinsic values, the Values Finder is seen as an innovative, cutting edge instrument to foster intrinsic values orientation. However, if used in the workshop context, the emotional feedback exercise should be well introduced and enough time should be scheduled. Future workshops are planned to test a deeper integration of the emotional feedback exercise.

4.8.2.4. Autonomy of goals

For autonomy of goals, the interventions in iteration 1 were rated as significantly effective (Overall Mean for autonomy of goals = 5.80***; Mean (layer 1) = 5.85***; Mean (layer 2) = 6.05***; Mean (layer 3) = 5.51***; see Table 21 and Table 35). The interventions in iteration 2 were also rated as significantly effective for most respective items (Overall Mean for autonomy of goals = 4.95*; Mean (layer 1) = 5.31**; Mean (layer 2) = 5.08*; Mean (layer 3) = 4.46; see Table 21 and Table 35). Therefore, the conclusion concerning autonomy of goals is that **H₀ can be rejected for the Values Finder and for the Core Values Workshop (except for layer 3)**. This infers that the **Values Finder and the Core Values Workshop succeed in fostering autonomy of goals**. Only the last layer of efficacy for autonomy of goals was found to be relatively weak for the Core Values Workshop. However, what stands out is that autonomy of goals is the most highly rated when comparing the functionality means of the Core Values Workshop. For the Values Finder, the highest functionality means are found for clarity about personal values, which indicates that the Core Values Workshop has a stronger focus on autonomy of goals and might be more effective in fostering autonomy of goals than the Values Finder, albeit the fact that it has lower means. Referring to the general **limitations**, the lower means in comparison to the Values Finder could be again due to the self-selection bias, the small sample size, and the focus bias. It is argued that these general limitations are the potential reason for the

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lower ratings in iteration 2. For those reasons, the assumption that the referring elements of the Core Values Workshop may be more effective than those of the Values Finder in fostering autonomy of goals. The central aspect of the Values Finder on autonomy of goals is the **“Burning yes of gentle no” exercise** (based on Strelecky et al., 2006). The mission quest (based on Pearce, 1982 and Collins & Porras, 1996) and the vision quest (based on Collins & Porras, 1996) are added to the core Values Workshop (see chapter 4.4.10). With regard to the test results in both iterations, the **“Burning yes of gentle no” exercise** appears to be an effective way to foster autonomy of goals. Moreover, **mission quest** and **vision quest** can also be described as **effective methods to foster autonomy of goals** in aspiring and practicing entrepreneurs given the test results of the Core Values Workshop on autonomy of goals.

In respect to the problem identification, in which it is stated that there are little research-based interventions that focus on autonomy of goals in the context of aspiring and practicing entrepreneurs, it is claimed that the Core Values Workshop in particular is an appropriate instrument to foster autonomy of goals in aspiring and practicing entrepreneurs. Future studies are encouraged to compare the Values Finder and the Core Values Workshop based on a larger sample size to distill the effects of the mission quest and vision quest in comparison to the “burning yes of gentle no” exercise.

4.8.2.5. Individual and collective efficacy

Concerning the indirectly manipulated variables, individual efficacy and collective efficacy, positive effects for the respective interventions in iteration 1 were found with statistical significance (Individual Efficacy Mean = 5.49***; Overall Collective Efficacy Mean = 4.87***, Nature Mean = 4.91***; Concern Mean = 4.82***; see Table 21 and Table 35). Whereas we did not find statistical support for the potential effects of the respective interventions in iteration 2 (Individual Efficacy Mean = 4.58; Overall Collective Efficacy Mean = 3.89; Nature Mean = 4.08, Concern Mean = 3.69; all p-values > 0.05; see Table 21 and Table 35). Therefore, the conclusion concerning individual and collective efficacy is that **H₀ can be rejected for the Values Finder but not for the**

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Core Values Workshop. This infers that the **Values Finder succeeds in fostering individual and collective efficacy, but the Core Values Workshop might not.** According to the general **limitations**, it is conceivable that the lower means and p-values of the Core Values Workshop in comparison to the Values Finder are to some extent a result of the self-selection bias, the small sample size, and the focus bias. These general limitations are perceived as potential causes of the lower ratings in iteration 2. The results show a tendency that both the Values Finder and the Core Values Workshop are more effective in fostering individual efficacy compared to collective efficacy. Looking at the causal model of healthy and effective self-regulation in the scope of SDT (see Figure 46), this tendency may be explained by the rated means of the preceding constructs. The interventions from iteration 1 and iteration 2 were both found to be significantly effective in fostering clarity about personal values and autonomy of goals, which are preceding constructs to the individual efficacy construct goal progress. Thus, by fostering those preceding variables, the interventions could indirectly foster goal progress (representing individual efficacy). However, the interventions from both iterations show the tendency to be less effective in fostering intrinsic values orientation, which is the preceding construct to collective efficacy. Thus, the proposed indirect effect from intrinsic values orientation on intrinsic behavior may still be present, but as the interventions do not have a strong effect on intrinsic values orientation, the impact on intrinsic behavior is only weak (iteration 1) or insignificant (iteration 2). Referring to the problem identification: the intention is to develop interventions that not only foster individual efficacy but also collective efficacy by motivating aspiring and practicing entrepreneurs to consider economic as well as social and ecological developments. Thus, working on the UN sustainable development goals shall be fostered. Looking at the results in combination with the limitations, it is argued that the **Values Finder is effective in fostering individual efficacy. The Core Values Workshop only shows a tendency to foster individual efficacy** which is argued to be mainly insignificant due to the limitations. The interventions underlying processes to foster individual efficacy is rooted in the causal chains between mindfulness (fostered through mindful breathing exercise (only

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effective in iteration 1)), clarity about personal values (fostered based on the universal continuum of human values), and autonomy of goals (fostered through e.g. team mission sprint). However, the **Values Finder and the Core Values Workshop showed a tendency to be less effective in fostering collective efficacy**. All in all, it is argued that the Values Finder and the Core Values Workshop can be **effective starting points to intrinsically motivate aspiring and practicing entrepreneurs to behave socially and ecologically sustainable**. Future workshops may test a stronger focus on emotional feedback exercises with aspiring and practicing entrepreneurs which can foster intrinsic values orientation. It is hypothesized based on the tested causal model of healthy and effective self-regulation (see study 1) that this could indirectly foster collectively effective behavior.

4.8.2.6. Health

For the indirectly manipulated variables that represent health (Positive Emotions and Subjective Vitality), the interventions from iteration 1 were found to be significantly effective (Overall Health Mean = 5.32***, Positive Emotions Mean = 5.52***, Subjective Vitality = 5.11***; see Table 21 and Table 35), while the interventions from iteration 2 only show a tendency towards effectiveness without statistical evidence (Health Mean = 4.14, Positive Emotions Mean = 4.08, Subjective Vitality = 4.20; all p-values > 0.05; see Table 21 and Table 35). Therefore, the conclusion concerning health is that **H₀ can be rejected for the Values Finder but not for the Core Values Workshop**. This infers that the **Values Finder succeeds in fostering health, but the Core Values Workshop might not**. However, referring to the general **limitations**, the weaker means of the Core Values Workshop in comparison to the Values Finder could again be due to the self-selection bias, the small sample size, and the focus bias. Thus, these general limitations could be partially responsible for the missing statistical significance in iteration 2. Based on the results and the stated limitations, The Values Finder can be considered as being effective in fostering health. In particular, effective in fostering facets of subjective well-being (such as positive emotions/affect by Diener et al., 2009) and psychological well-being (such as subjective vitality by Ryan & Frederick, 1997). Referring to problem identification, the need to develop interventions that help

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aspiring and practicing entrepreneurs with their challenge of healthy and effective self-regulation is identified. Based on this model of healthy and effective self-regulation, there is reason to assume that **by actively fostering mindfulness, clarity about personal values, autonomy of goals, and intrinsic values orientation, it indirectly fosters health, as shown for the Values Finder with statistical evidence.** Future studies are encouraged to further test the Core Values Workshop with a larger sample size of aspiring and practicing entrepreneurs to further test the effects on health.

4.8.2.7. Overall functionality (Authenticity)

As an additional indicator to rate the overall functionality of our interventions, the impact on the authenticity of the participants is measured. The effectiveness of the interventions from iteration 1 were found with statistical significance (Overall Authenticity Mean = 5.93*** | Mean (layer 1) = 6.09***; Mean (layer 2) = 6.00***; Mean (layer 3) = 5.71***; see Table 21 and Table 35). Whereas the interventions from iteration 2 only show a tendency towards effectiveness without statistical evidence (except for layer 1) (Overall Authenticity Mean = 4.74; $p = 0.0817$ | Mean (layer 1) = 4.92*; Mean (layer 2) = 4.85, $p = 0.0578$; Mean (layer 3) = 4.46, $p = 0.1549$; see Table 21 and Table 35). Therefore, it is concluded that concerning authenticity, **H_0 can be rejected for the Values Finder but not for the Core Values Workshop.** This infers that the **Values Finder succeeds in fostering authenticity, but the Core Values Workshop might not.** Referring to the general **limitations**, the lower means of the Core Values Workshop in comparison to the Values Finder could again be due to the self-selection bias, the small sample size, and the focus bias. These general limitations could be partially responsible for the lower means in iteration 2. Based on the results and the stated limitations, the **Values Finder can be considered as being effective in fostering authenticity, whereas the Core Values Workshop only shows tendencies to foster authenticity in participants.** Following the chapter about the design and development of the artifact, authenticity is seen as an overall functionality indicator beside all other functionality items that represent healthy and effective self-regulation in the scope of SDT. Thus, the proposal is to use these interventions if one intends to

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foster healthy and effective self-regulation, which is characterized by becoming more authentic. However, especially the Core Values Workshop in particular requires further testing with a larger sample size to validate the efficacy concerning authenticity.

4.8.3. Efficiency

Overall perceived efficiency was rated as significantly positive in both iterations (Overall Efficiency Mean = 5.41*** for iteration 1; Overall Efficiency Mean = 5.43* for iteration 2). Therefore, it is concluded that concerning efficiency **H₀ can be rejected for the Values Finder and the Core Values Workshop**. This infers that the **Values Finder and the Core Values Workshop are perceived as efficient instruments**. The first facet of efficiency evaluates the waiting time until participants got the written results of the Values Finder. For the Values Finder, this item was rated as worst in comparison to all other items (Mean Efficiency Results = 4.80**). For the Core Values Workshop, the opposite appeared to be the case as the item was rated as best in comparison to all other items (Mean Efficiency Results = 6.23***). This result is not unexpected, as individuals that only take the Values Finder have an average waiting time of two weeks until they get the results. Individuals who also participate in the Core Values Workshop have a much shorter average waiting time of four days. From the perspective of this study, this indicates that **for the Values Finder the average waiting time for results of two weeks may be too long for the average participant. For the Core Values Workshop, the waiting time for results of four days can be described as acceptable**. The second facet of efficiency evaluated whether the time required to complete the survey is justified. For the Values Finder, this item was rated as significantly positive (Mean Efficiency_process = 6.02***). For the Core Values Workshop, this item was rated lower (Mean Efficiency_process = 4.62, p = 0.1616). Referring to the general **limitations**, the lower means of the Core Values Workshop in comparison to the Values Finder for this item could again be due to the self-selection bias, the small sample size, and the focus bias. These general limitations could be partially responsible for the lower rating of this item in iteration 2. Based on the results and the stated limitations, the Values Finder and the Core Values Workshop can be considered as being perceived by participants as time-efficient with respect to the

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time required to complete the questions. Thus, **both interventions can be used as time-efficient methods to foster healthy and effective self-regulation in aspiring and practicing entrepreneurs.** Future studies may attempt to further reduce the waiting time for results especially for individuals who only take part in the Values Finder. Furthermore, the perceived efficiency of the Core Values Workshop needs further approval based on larger samples.

4.8.4. Usability

Overall perceived usability was rated as significantly positive in both iterations (Overall Usability Mean = 5.88*** for iteration 1; Overall Usability Mean = 5.39** for iteration 2). Therefore, it is concluded that concerning usability **H₀ can be rejected for the Values Finder and the Core Values Workshop.** This infers that the **Values Finder and the Core Values Workshop are perceived as usable instruments.** The **visualizations of the results achieved the highest average scores** in both iterations (Mean = 6.20*** for iteration 1; Mean = 6.23*** for iteration 2), followed by the usability of the website (Mean = 6.13*** for iteration 1; Mean = 6.17*** for iteration 2), and the understandability of the questions (Mean = 6.35*** in iteration 1; Mean = 5.54*** in iteration 2). In contrast, a relatively low score in both iterations was achieved by the motivational video (Mean = 5.08*** for iteration 1; Mean = 5.00* for iteration 2). Besides, the net promoter score was used as an additional rating to indicate the usability of our interventions. Interventions from iteration 1 achieved a net promoter score of 52.5 %, whereas interventions from iteration 2 received a substantially lower net promoter score of -15.4 %. Net promoter scores range from -100 % to +100 %. A net promoter score that is higher than 0 and lower than 50 % can be considered as good, while a net promoter score that is higher than 50 % can be considered as excellent. This assessment is based on a comparison of 400 companies in 28 industries, which had a median net promoter score of 16 % (Reichheld, 2003). Thus, the net promoter score of the Values Finder can be considered as excellent. In contrast, the net promoter score of the Core Values Workshop is not even considered as good. Referring to the general **limitations**, the lower means of the Core Values Workshop in comparison to the Values Finder for this item could again be due to the

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self-selection bias, the small sample size, and the focus bias. These general limitations could be particularly responsible for the lower rating of this item in iteration 2. Based on the results and the stated limitations, the **Values Finder and the Core Values Workshop can both be considered as not only functional and efficient instruments, but as instruments with high usability** that foster healthy and effective self-regulation in aspiring and practicing entrepreneurs. Nevertheless, the difference between the net promoter scores appears to be much higher than for the other usability scores. Future studies are encouraged to examine whether there are additional reasons that lead to such a high difference in the net promoter score. A larger sample size is recommended.

4.8.5. Portability

Portability was only evaluated in the context of the ValuesFinder. The results show that the ValuesFinder was not only used via a desktop computer (49.4 %) but also via portable devices such as mobile phones (47.8 %) and tablets (2.8 %). However, the session durations on mobile phones (22 seconds) and tablets (24 seconds) appeared to be shorter than those on desktop computers (1 minute and 28 seconds). It is assumed that this difference stands in relation to the average click sequence on the website. Most participants visit the main page of the website and click the button that starts the questionnaire. As the questionnaire is an external link, this leads to the end of the session duration. However, the same is not true for participants that use a desktop computer as a browser or a desktop app provides a link that opens the external page in a new tab. As the session stays open in the background, our results remain inconclusive. Nevertheless, the **results indicate a satisfying degree of portability of the ValuesFinder**. Future studies are encouraged to further analyze portability by measuring usability in relation to the devices that were used.

5. SUMMARY AND CONCLUSION

Starting with the **state-of-the-art** chapter, literature is presented that identifies aspiring and practicing entrepreneurs as individuals with a significant role in the economy. Research shows that they hold the potential to promote not only economic growth but also ecologically and socially sustainable development. Guidance on healthy and effective self-regulation was identified as a specific need for aspiring and practicing entrepreneurs. This need arises from the fact that aspiring and practicing entrepreneurs mostly have to lead themselves and are rarely led by others. Thus, the application of dysfunctional methods of self-regulation results in more negative consequences for them compared to other types of individuals. To meet the need for guidance on healthy and effective self-regulation, devotion was directed to motivational psychology. Self-determination theory was identified as an empirically developed meta-theory of human motivation that offers a profound scientific base to provide guidance on healthy and effective self-regulation.

In **study 1**, the knowledge base of self-determination theory was leveraged to empirically develop and test a causal model of healthy and effective self-regulation. Research in the scope of self-determination theory (especially Ryan et al., 2008; Schultz & Ryan, 2015) theoretically hypothesizes single elements and causations of a causal model but did not empirically develop and test it in an integrated way. To close this research gap for motivational psychology as well as to use the model to guide entrepreneurs, structural equation modeling was applied based on cross-sectional quantitative data with a large sample size ($N = 1,024$). The resulting model showed a good local and global fit. The results indicate that four psychological constructs are particularly important for healthy and effective self-regulation. These constructs are mindfulness, clarity about personal values, intrinsic values orientation, and autonomy of goals. Fostering these constructs can trigger causal chains that lead to individual efficacy, collective efficacy, and individual health.

In **study 2**, interventions were empirically developed and tested based on the results from study 1 to foster mindfulness, clarity about personal values, intrinsic values

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orientation, and autonomy of goals in entrepreneurs. It was done with two iterations of the design science research approach. Therefore, existing interventions were identified on these four constructs. Based on this refined knowledge base, new interventions were developed and tested. For both iterations, a non-controlled field experiment was used with post-measurement (N = 55 for iteration 1; N = 13 for iteration 2).

In **iteration 1**, stemming from the state-of-the-art interventions, there was empirical development and testing of interventions that can be described together as a self-assessment and action plan that is labelled as **Values Finder**. The core components are a website that explains and motivates for personal development, a research-based questionnaire that includes questions on all constructs, as well as an explanation and visualization of the personal results with self-applicable practices to further develop in form of a personal evaluation and action plan. The Values Finder was found to be efficient, usable, and functional based on the post-measurement (N = 55). Regarding **efficiency**, results indicate that participants experienced the questionnaire as time-efficient. However, results show the tendency that the waiting time until participants get the results (at average 2 weeks) was experienced as not optimal. In the matter of **usability**, results indicate that participants especially liked the visualizations in the personal evaluation and action plan, the website as well as that they perceived the questions as easy to understand and had fun learning something about themselves through the results. Besides, the results show the tendency that the motivational video on the website could be improved and that the process of completing the survey could be designed to be more enjoyable. Concerning **functionality**, the Values Finder is experienced as effective in fostering mindfulness, clarity about personal values, intrinsic values orientation, and autonomy of goals. Results show the tendency that the Values Finder is especially experienced as effective in fostering clarity about personal values. Furthermore, the Values Finder tends to trigger the causal effects that lead to individual efficacy, collective efficacy, and individual health.

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The four-hours **Core Values Workshop**, which is built around the Values Finder, represents the outcome of **iteration 2**. It is a workshop concept for aspiring and practicing entrepreneurs. It uses the elements of the Values Finder and adds the Core Values Sprint, the Team Core Values Sprint, the Mission Quest, the Vision Quest, and the Mindfulness Challenge. The Core Values Workshop was found to be efficient, usable but only partly functional based on the post-measurement (N = 13). Regarding **efficiency**, results indicate a well-rated waiting time until participants get the results, which is much shorter in the workshop context (at average 4 days). However, results show the tendency that the process of completing the survey is experienced as too long. In the matter of **usability**, results indicate that participants especially liked the visualizations in the personal evaluation and action plan, the website as well as that they found the questions and results easy to understand and had fun learning something about themselves through the results. Besides, in line with results from iteration 1, the results from iteration 2 show the tendency that the motivational video on the website could be improved and that the process of completing the survey could be redesigned to be more enjoyable. Concerning **functionality**, the Core Values Workshop is experienced as effective in fostering clarity about personal values, and autonomy of goals. For mindfulness and intrinsic values orientation, results indicate that the Core Values Workshop is not experienced as effective. Furthermore, the Core Values Workshop only shows a tendency to trigger the causal effects that lead to individual efficacy, collective efficacy, and individual health, whereas this tendency is not statistically significant. However, as argued in the detailed discussion, the Core Values Workshop may be effective in all evaluation characteristics if limitations like the self-selection bias, the small sample size, and the focus bias are worked on or eliminated.

All in all, the Values Finder as well as the Core Values Workshop are effective interventions to foster healthy and effective self-regulation in aspiring and practicing entrepreneurs. Moreover, fostering healthy and effective self-regulation in entrepreneurs based on SDT has not only a positive effect on the **individual efficacy and health** of those business venturing individuals but also yields the **potential to**

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promote ecologically and socially sustainable economic development. Thus contributing to the UN sustainable development goals (United Nations, 2015).

With regard to self-determination theory's understanding of healthy and effective self-regulation, the theory focuses on using mindfulness to get to the intrinsic core of personal motivation. This process may unfold the potential to authentically use one's energy, which leads to positive outcomes on the individual and societal level. Through the empirically developed and tested causal model of healthy and effective self-regulation from study 1 the underlying causal processes was partly uncovered. Furthermore, through the empirically developed and tested interventions from study 2, there was success in supporting these processes in aspiring and practicing entrepreneurs. Whereas central elements are a mindful breathing exercise, a visualization of personal values tendencies, as well as the structured elaboration of team core values, a team mission, and a team vision. Thus, the Values Finder and the Core Values Workshop can be seen as comprehensive, but precise interventions that touch the effectiveness of long intervention programs (like MBSR, ACT, MBCT) and intense one on one sessions (like based on GROW) embedded in the simplicity of a self-application tool (Values Finder) respectively a four-hour workshop (Core Values Workshop). Referring to the research motivating state of the art chapters, **this research meets the need for guidance on healthy and effective self-regulation for entrepreneurs** (Neck et al., 2013, O'Shea et al., 2017) with psychology-based interventions (Campos et al., 2017). Thereby, this work is seen as a facilitator for unfolding the potential of entrepreneurs, which can be particularly vital in overcoming the global challenges we are facing.

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This thesis is closed with a quote by the psychologist Carl Gustav Jung (1973, p. 33) that represents the approach to healthy and effective self-regulation well and that draws a vivid picture of the underlying philosophy of self-determination theory:

“Your vision will become clear only when you can look into your own heart.

Who looks outside, dreams; who looks inside, awakes”

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7. ATTACHMENTS

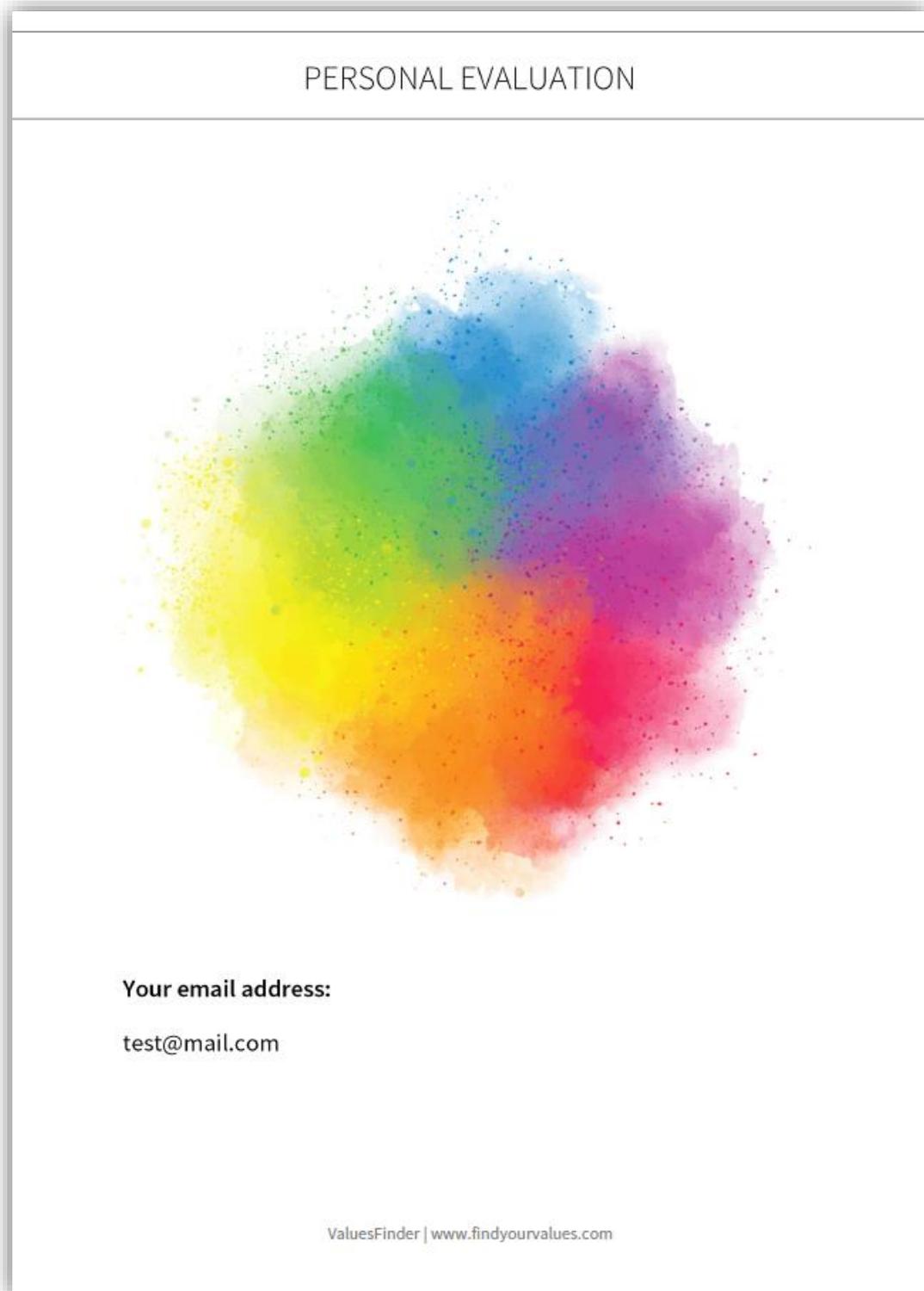
7.1. Abbreviations for analyzed countries

In the following, the abbreviations are presented for each analyzed country (Wennekers et al., 2005, p. 308):

United States (US), Russia (RU), South Africa (ZA), The Netherlands (NL), Belgium (BE), France (FR), Spain (ES), Hungary (HU), Italy (IT), Switzerland (SW), United Kingdom (UK), Denmark (DK), Sweden (SE), Norway (NO), Poland (PL), Germany (DE), Mexico (MX), Argentina (AR), Brazil (BR), Chile (CL), Australia (AU), New Zealand (NZ), Singapore (SG), Thailand (TH), Japan (JP), Korea (KR), China (CH), India (IN), Canada (CA), Ireland (IE), Iceland (IS), Finland (FI), Slovenia (SI), Hong Kong (HK), Taiwan (TW), Israel (IL).

7. ATTACHMENTS

7.2. Example of personal evaluation



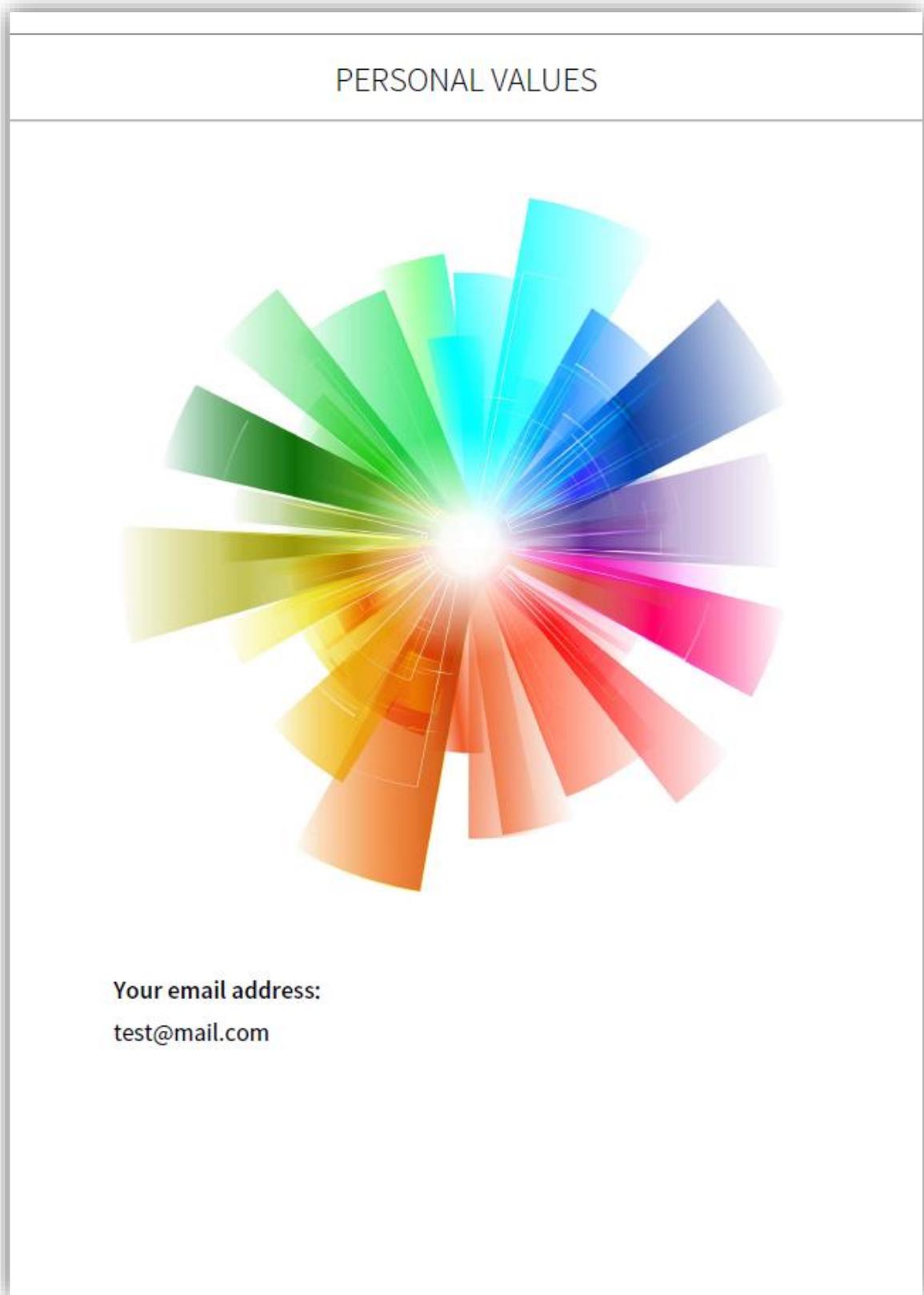
Attachment 1: Example of a personal evaluation, page 1

7. ATTACHMENTS

OVERVIEW	
●	PERSONAL VALUES Visualization and explanation of your personal values tendencies
●	VALUES IN ACTION Degree of fit of your goals and your behavior with your personal values
●	WELL-BEING Your current degree of well-being on different levels
●	ACTION PLAN Recommended actions to improve the measured variables
●	REFERENCES List of the included scientific literature

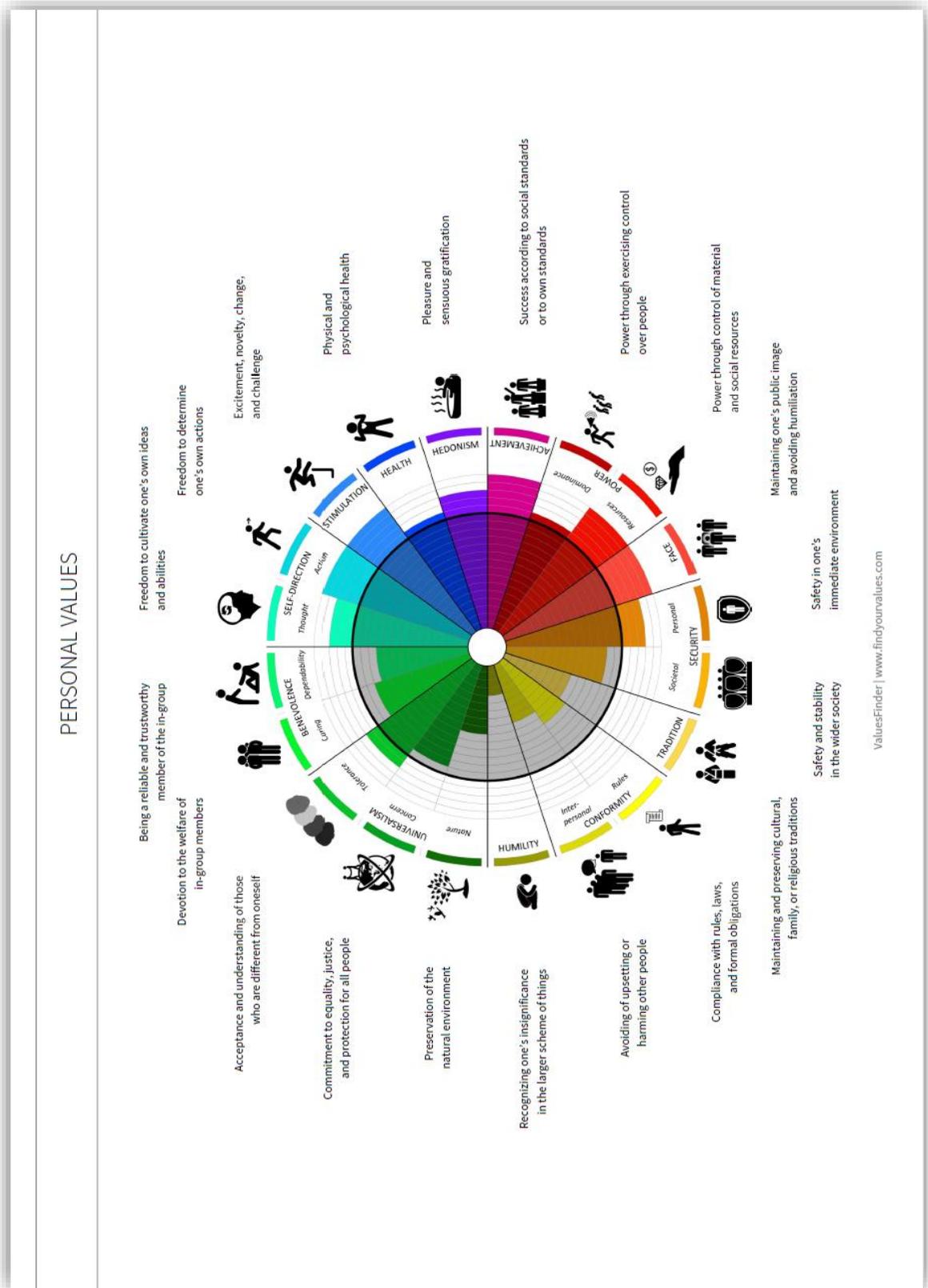
Attachment 2: Example of a personal evaluation, page 2

7. ATTACHMENTS



Attachment 3: Example of a personal evaluation, page 3

7. ATTACHMENTS



Attachment 4: Example of a personal evaluation, page 4

7. ATTACHMENTS

INFORMATION ABOUT THE VISUALIZATION

HOW CAN THE VISUALIZATION BE UNDERSTOOD?

The visualization illustrates your personal values tendencies. The border of the grey-layered circle represents your personal average. The coloured bars that go beyond the edge of the grey shaded circle indicate that the related values seem to be relatively important to you. Neighbouring values are rather compatible with each other. Whereas values which lay on the opposite sites of each other tend to lead to decision conflicts.

WHAT ARE PERSONAL VALUES?

Personal values influence what is important to you in life throughout different situations. They develop based on your subjective world view and are inextricably linked to your emotions. Personal values differ in their relative importance and can serve as guiding principles for your actions.

WHAT IS THE VALUE OF THE VISUALIZATION?

Scientific studies point out that we tend to be more engaged, successful, and tend to experience higher levels of well-being, if we base our actions on our personal values. Many individuals only have a low degree of clarity about what is important to them. However, results from science and practice indicate that this clarity is essential in order to act in congruence with the personal values. The visualization can serve you as a tool to reflect deeply and in a structured way about your personal values to define them. Use it to question yourself what is truly important to you to live a satisfied life.

ARE THERE VALUES THAT MAKE PEOPLE MORE SATISFIED THAN OTHERS?

Empirical studies indicate that individuals who rate relatively high on the eight values on the lower part of the continuum (so-called **EXTRINSIC VALUES**) are at average less satisfied than individuals, who rate relatively high on the ten values on the upper part of the continuum (so-called **INTRINSIC VALUES**). The interpretation of these results is that extrinsic values tend to make you dependent on the judgement of others. By contrast, intrinsic values are rather independent of the judgement of others and tend to additionally lead to the satisfaction of the three basic psychological needs: individual integrity, personal growth, and relatedness.



WHAT IS THE SCIENTIFIC BASE OF THE VISUALIZATION?

The visualization is based on a continuum of twenty values that was developed through intercultural studies by the researcher Shalom Schwartz and was augmented through own scientific studies. Based on your answers, your personal values tendencies were visualized in the continuum.

7. ATTACHMENTS



Attachment 6: Example of a personal evaluation, page 6

7. ATTACHMENTS

VALUES IN ACTION

HOW CLEAR ARE YOU ABOUT YOUR PERSONAL VALUES?



HOW WELL DO YOUR GOALS FIT TO YOU AND HOW GOOD IS YOUR PROGRESS?

	GOAL I Starting up a Kumihimo braiding jewellery business.	GOAL II Logo design business	GOAL III Health and fitness
To which degree is the goal based on your personal values?			
How easy and natural is it for you to work on this goal?			
How hard are you working to achieve this goal?			
How much progress are you making towards achieving this goal?			

TO WHICH DEGREE ARE YOUR ACTIONS BASED ON YOUR PERSONAL VALUES?



HOW ACTIVELY ARE YOU TAKING A STAND FOR OTHERS?

NATURE	HUMANS
	

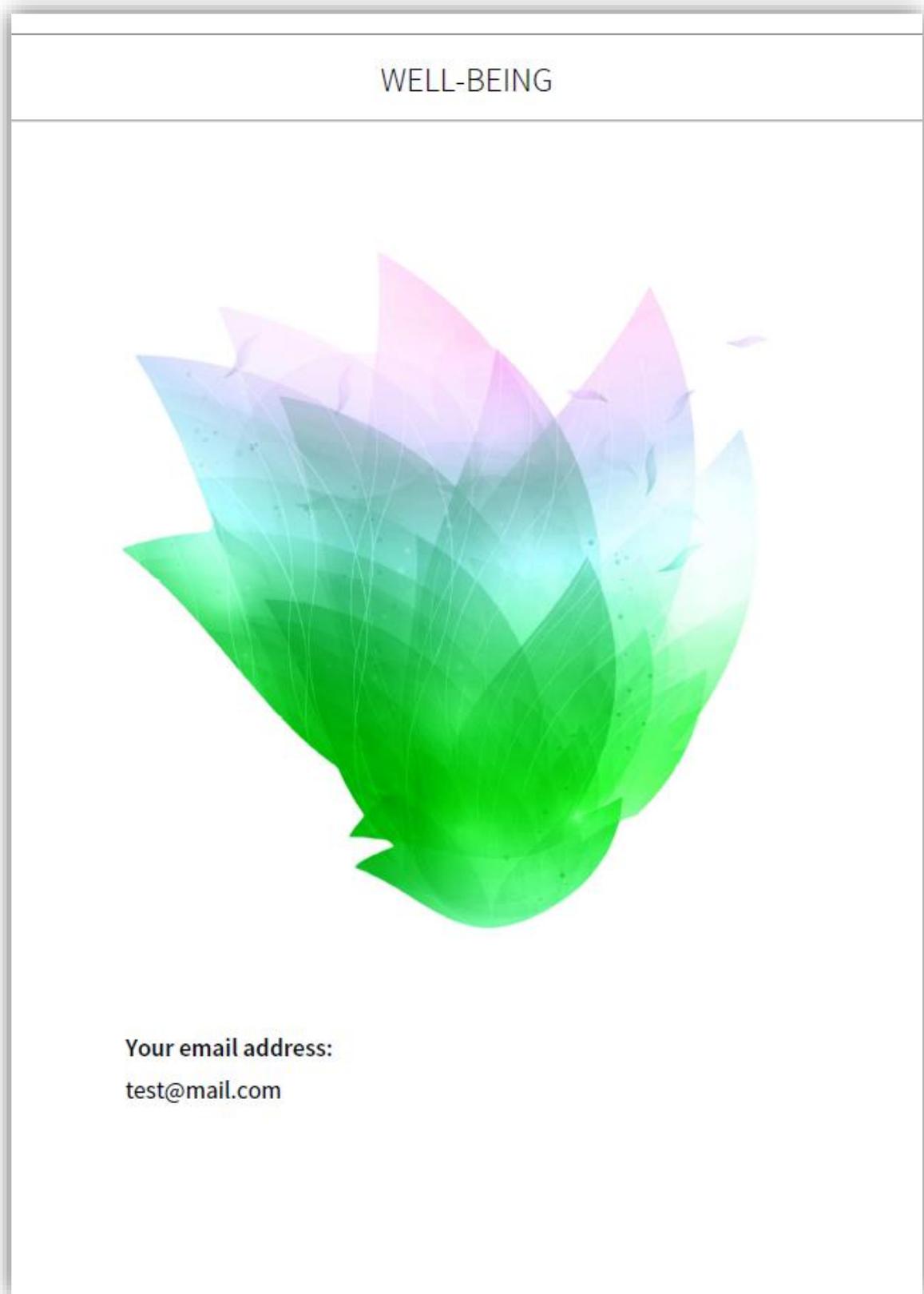
Attachment 7: Example of a personal evaluation, page 7

7. ATTACHMENTS

INFORMATION ABOUT THE VISUALIZATION
<p style="text-align: center;">HOW CAN THE VISUALIZATION BE UNDERSTOOD?</p> <p>The visualization illustrates how well your values are reflected in your action. As a first scale your clarity about your personal values is emphasized, which is one essential prerequisite for values based action. Subsequently the scales show how well your current goals and your behaviour reflect your personal values. The more bars are filled from left to right, the higher is the referring scale fulfilled.</p>
<p style="text-align: center;">WHAT IS THE VALUE OF THE VISUALIZATION?</p> <p>Scientific studies indicate that we tend to be more engaged, successful and satisfied, if we set goals that reflect our personal values and by that act in congruence with our authentic self. Ask yourself based on the visualization, whether your current goal and your behaviour reflect your personal values. Discard or adapt the goals which do not reflect your personal values or which do only reflect them to a low degree. Instead, try to focus your energy on goals that are important to you.</p>
<p style="text-align: center;">WHAT IS THE SCIENTIFIC BASE OF THE VISUALIZATION?</p> <p>The visualization is based on scientific studies from different researchers that work on the topic of personal values and goals. These studies were mainly conducted in the field of social psychology. They were augmented through own scientific studies and the relevant scales have been visualized. Based on your answers, your results have been visualized.</p>

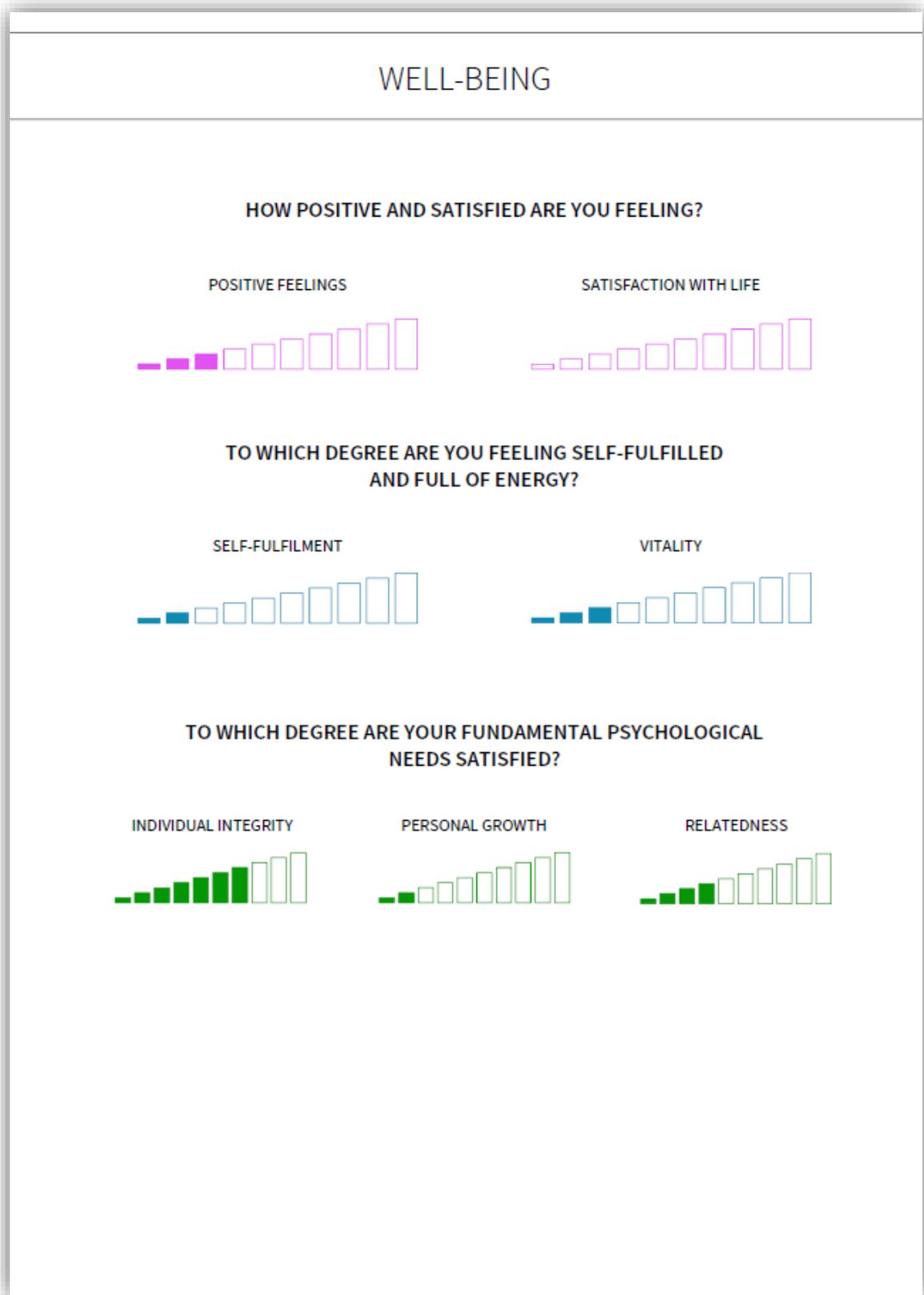
Attachment 8: Example of a personal evaluation, page 8

7. ATTACHMENTS



Attachment 9: Example of a personal evaluation, page 9

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Attachment 10: Example of a personal evaluation, page 10

7. ATTACHMENTS

INFORMATION ABOUT THE VISUALIZATION

HOW CAN THE VISUALIZATION BE UNDERSTOOD?

The visualization shows different scales of well-being which can serve as indicator about your current well-being. The psychological depth of well-being, increases top down with the different scales. The first two scales describe a rather superficial "feeling well". Vitality and self-fulfilment are good indicators that you accept yourself and that you are full of energy. The satisfaction of the three fundamental psychological needs represents one of the deepest types of inner well-being.

WHAT ARE FUNDAMENTAL PSYCHOLOGICAL NEEDS?

Scientific studies, especially in the field of motivational psychology, have identified three fundamental psychological needs, which tend to lead to well-being if they are satisfied. Individual integrity describes the need to act in congruence with the personal values and interests. Personal growth describes the need to improve the own skills through optimal challenges and to experience mastery of one's environment. Relatedness describes the need to feel as part of something bigger than oneself. E.g. to a community, friends, family, but also to religion or other spiritual activities.

WHAT IS THE VALUE OF THE VISUALIZATION?

Scientific studies point out that especially focusing on intrinsic values can lead to the satisfaction of the three fundamental psychological needs. Thus, these individuals often experience higher levels of well-being. Look at your continuum of personal values and question your motivation behind extrinsic values that you rated relatively high on. Those values are often motivated by anxiety and tend to make you dependent in the long term. Try to discover your intrinsic core of values and align your goals and actions with these values. If you manage to do so, you have good chances to sustainably enhance your level of well-being from the inside out.

WHAT IS THE SCIENTIFIC BASE OF THE VISUALIZATION?

The visualization is based on scientific studies by various researchers in the field of human happiness. In this context, especially work by Carol Ryff and Edward Diener about psychological and subjective well-being have been included. Besides, studies about the fundamental psychological needs in the scope of self-determination theory by Edward Deci and Richard Ryan have been included. Based on your answers, the relevant scales have been visualized.

Attachment 11: Example of a personal evaluation, page 11

7. ATTACHMENTS

ACTION PLAN

Your email address: test@mail.com

Attachment 12: Example of a personal evaluation, page 12

7. ATTACHMENTS

ACTION PLAN

MINDFULNESS PRACTICE “POLISHING THE MIRROR“

Mindfulness is the prereflexive skill to be aware in the present and to be able to observe internal and external processes as non-judgemental as possible. Results from science and practice indicate that mindfulness is an important prerequisite for one to realize the personal values. In our digitalized and thus often hectic world, mindfulness is a skill that gets reduced more and more.

YOUR MINDFULNESS



If you depict mindfulness, one could say that strengthening your mindfulness is like „polishing the mirror“ through which you can look at yourself and at your environment. The more mindful you are the sharper the picture gets. An individual that is low in mindfulness will have problems to realize the personal values, even after intense self-reflection because the portrait he or she is looking at is blurred. Your mindfulness can be trained and improved like a muscle. Therefore, I recommend you the following routine:

Go to quiet place, e.g. your room or a peaceful place in nature. Sit down in a comfortable position, close your eyes and focus your thoughts for at least ten minutes on the movement of your breath. Conduct this routine at least once a week.

You will realize that it is not easy to focus your thoughts on something in the present. Your thoughts will drift away from your breath and you start e.g. to think about challenges or problems in the future. However, try to focus your thoughts during the whole exercise on your breath. If you sharpen this skill, it will happen more frequently to you that you „observe“ your thoughts subconsciously in everyday situations. Thus, you start understanding more about yourself and get more clarity about your personal values.

CARVE OUT YOUR CORE OF PERSONAL VALUES “WHAT MAKES YOUR HEARTH SING?“

Ask yourself, what is truly important to you in life. The more clarity you get about your personal core of values, the rather you act in a way and the rather you are able to shape your environment in a way that fits to you and by that makes you happy.

Write down, with one term for each value, the five values that are most important to you. As a supporting tool you can use the visualization of your personal values and the distinction in intrinsic and extrinsic values from chapter “Personal Values”. After you have identified a term for each of your values, describe each value with one sentence in your own words. Question and refine your top five personal values regularly. One of the best indicators that you are close to your core of personal values are positive emotions when reading your description.

Attachment 13: Example of a personal evaluation, page 13

ACTION PLAN

BURNING YES OR GENTLE NO “THE TRICK OF THE GREEN SEA TURTLE“

Clarity about your personal values can help you to channel your energy on things that are truly important to you. There is a beautiful story which illustrates these positive effects very well. The story is from the book “The Why Are You Here Cafe: A new way of finding meaning in your life and your work”. Since I read this story, it lives vividly in me and that is why I want to share this story with you. In this book, a woman describes, what she has learned about life from a green sea turtle.

The woman tells that she has been on a two-week vacation two years ago at the eastern coast of Australia. Every morning she went to a reef near the beach for snorkelling. At the second last day of vacation, she was snorkelling pretty early in the morning. She looked at the colourful fishes and listened to them nibbling the reef. After some minutes, she spotted a beautiful green sea turtle, which was swimming below her away from the reef to the open sea. She was immediately fascinated by the calm movement of the marine reptile. The woman began to follow the turtle. However, after some minutes she realized that she was not able to keep pace with the green sea turtle. Frustrated and exhausted she began to swim back to the beach. She asked herself, why she was not able to keep pace with a turtle. In the evening, she took the decision to go out early to the reef at the next morning, which was her last day of vacation, in order to find a green sea turtle again and to understand how the marine reptile was able to be faster than her. At the next morning, the ocean was glittering beautifully in the morning sun. The woman went to the reef again, determined to discover „the trick of the green sea turtle“. Indeed, she was lucky. After some minutes, she spotted a green sea turtle again swimming into the open sea. She immediately started following the marine reptile and observed it very accurately. Like the day before, the woman was not able to keep pace with the turtle and had to swim back to the beach. Back at the beach, the woman slowly walked out of the water.

But this time, there was no frustration in her face, but a big and bright smile. She had found out, why she was not able to keep pace with the green sea turtle. While she was all the time making her swimming strikes at the surface of the water no matter from which direction the waves were coming, the turtle only flipped its fins at certain points of time. When the water was swapping out of the reef in the direction of the open sea, the green sea turtle made some strong strikes with all its power. However, when the water was moving in the opposite direction, the turtle didn't invest energy in swimming against it, but turned its fins 90 degree against the stream to hold only hold its position.

The story of the green sea turtle illustrates, how clarity about personal values can help us to channel our energy. The clearer we are about what is important to us, the better we can decide whether the waves around us are going the direction we do want to go or we do not want to go. If we realize that a task fits to our values, we can seize it with a “burning yes” and start taking this wave with all the power we have. However, if we realize the task does not fit to our values, we should be brave and should try to avoid this task with a „gentle no“ and by this hold our position and save energy.

Question yourself, whether your goals and your behaviour is based on your personal values. As a supporting tool you can use the visualization in chapter „values in action“. Focus your energy on values-based goals and avoid wasting it on goals that are not important to you. Say „Burning Yes“ and give your best at goals that fit to you. Say „Gentle No“ and save energy at goals that do not fit to you.

7. ATTACHMENTS

ACTION PLAN
<p style="text-align: center;">KEEP A JOURNAL <i>“ORGANIZING YOUR DAILY THOUGHTS“</i></p> <p>A routine that is rather common, but outstanding effective is keeping a journal (diary). Results from science and practice point out various positive effects. Journaling helps you to record moments which made you happy or unhappy and to reflect in structured way about the reasons why this emotion came up. Through this process of written iterative self-reflexion and thought-organization you can come closer to your core of personal values</p> <p>Answer yourself the following questions in written form each evening:</p> <ol style="list-style-type: none">1. What was good today?2. What was bad today?3. What would make tomorrow a great day?

Attachment 15: Example of a personal evaluation, page 15

7. ATTACHMENTS

ACTION PLAN
<p style="text-align: center;">SUMMARY</p> <p>MINDFULNESS PRACTICE</p> <p>Go to quiet place, e.g. your room or a peaceful place in nature. Sit down in a comfortable position, close your eyes and focus your thoughts for at least ten minutes on the movement of your breath. Conduct this routine at least once a week.</p> <p>CARVE OUT YOUR CORE OF PERSONAL VALUES</p> <p>Write down, with one term for each value, the five values that are most important to you. Use as a supporting tool the visualization of your personal values and the distinction in intrinsic and extrinsic values from chapter "Personal Values". After you have identified a term for each of your values, describe each value with one sentence in your own words. Question and refine your Top five personal values regularly. One of the best indicators that you are close to your core of personal values are positive emotions when reading your description.</p> <p>BURNING YES OR GENTLE NO</p> <p>Question yourself, whether your goals and your behaviour is based on your personal values. As a supporting tool you can use the visualization in chapter „values in action“. Focus your energy on values-based goals and avoid wasting it on goals that are not important to you. Say „Burning Yes“ and give your best at goals that fit to you. Say „Gentle No“ and save energy at goals that do not fit to you.</p> <p>KEEP A JOURNAL</p> <p>Answer yourself the following questions in written form each evening:</p> <ol style="list-style-type: none">1. What was good today?2. What was bad today?3. What would make tomorrow a great day? <p style="text-align: center;">„WHO LOOKS OUTSIDE, DREAMS; WHO LOOKS INSIDE, AWAKES!“</p> <p style="text-align: center;">- CARL GUSTAV JUNG</p>

Attachment 16: Example of a personal evaluation, page 16

7. ATTACHMENTS

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Attachment 17: Example of a personal evaluation, page 17

7. ATTACHMENTS

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ACTION PLAN

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I hope that I am able to support you with my work in getting more clarity about what is important to you and that I can encourage you to base your actions on that.

You can send enquiries for individual coachings, group workshops or questions concerning your personal evaluation via email (info@findyourvalues.de) or you can call me by phone (+49 151 21281131).

Best wishes

Benedict

ValuesFinder | www.findyourvalues.com

Attachment 18: Example of a personal evaluation, page 18

7.3. Declaration of Authorship

Benedict Hebllich

Eidesstattliche Versicherung

gemäß § 6 Abs. 1 Ziff. 4 der Promotionsordnung des Karlsruher
Instituts für Technologie für die Fakultät für Wirtschaftswissenschaften

1. Bei der eingereichten Dissertation zu dem Thema

*“How can entrepreneurs lead themselves?”
Empirical development and testing of interventions for healthy and effective self-
regulation in the context of entrepreneurship to trigger positive individual and
collective effects*

handelt es sich um meine eigenständig erbrachte Leistung.

2. Ich habe nur die angegebenen Quellen und Hilfsmittel benutzt und mich keiner unzulässigen Hilfe Dritter bedient. Insbesondere habe ich wörtlich oder sinngemäß aus anderen Werken übernommene Inhalte als solche kenntlich gemacht.

3. Die Arbeit oder Teile davon habe ich bislang nicht an einer Hochschule des In- oder Auslands als Bestandteil einer Prüfungs- oder Qualifikationsleistung vorgelegt.

4. Die Richtigkeit der vorstehenden Erklärungen bestätige ich.

5. Die Bedeutung der eidesstattlichen Versicherung und die strafrechtlichen Folgen einer unrichtigen oder unvollständigen eidesstattlichen Versicherung sind mir bekannt. Ich versichere an Eides statt, dass ich nach bestem Wissen die reine Wahrheit erklärt und nichts verschwiegen habe.

Unterschrift, Karlsruhe, den 30.06.2020

7. ATTACHMENTS

7.4. Publications in the scope of the dissertation

Study one is, in a condensed form, under consideration for publication in the Journal of Happiness Studies under the title “Living well: Empirically Derived Draft of a Causal Model of Healthy and Effective Self-Regulation in the Scope of Self-Determination Theory”.

Furthermore, the results of study one were presented on a poster at the Conference of Self Determination Theory in Egmond aan Zee, Netherlands on the 23th of May 2019.