The human in the wilderness

"Between every two pine trees there is a door leading to a new way of life." - John Muir



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Abstract

The present theoretical thesis seeks to elucidate how pre-existing theoretical perspectives and empirical research account for nature's impact on psychological well-being. Psychological well-being is understood based on Carol Ryff's multifaceted and complex concept associated with eudaimonic aspects of optimal human development and flourish. Based on a critical realist approach theoretical perspective were critically and carefully selected to elucidate on the research aim on the three ontological layer in order to attain a comprehensive understanding of nature's impact on psychological well-being. Initially, the human-nature relationship was elaborated on from different historical perspectives including an evolutionary approach, ecopsychology, environmental psychology and Cronon's critical approach. These constitute the foundation of the following theoretical examination. In this section environmentally focused theories were found to account for biological, cognitive and developmental aspects of nature's psychological benefits. Despite limitations in their explanatory abilities due to simple essentialist explanations. To further explore these limitations, subjective aspects of ecopsychology were examined, including nature connectedness and transpersonal dimensions. An important missing account on positive-negative implication in psychological well-being were identified through the review of the literature and showed significance in further understand nature impact on psychological well-being. Through a final discussion of different conceptualizations of respectively psychological well-being and nature, important ontological and epistemological implications were identified and following discussed. The relationship between nature and human psychological well-being is a nuanced field that calls for more than one level of understanding and approach of interpretation. In conclusion nature seems to involve experiences of cognitive restoration and stress recovery. On the other hand the encounter with nature also involve a deep sensory, embodied, emotional and spiritual experiences deepening the subjective connection between human and nature. A connection that facilitates overall psychological well-being. Finally, nature can be understood as a socially constructed phenomenon, in which societal, cultural, economic and subjective aspects play an important role in how nature is perceived and experienced, how individuals prefer nature differently, but also how some people have limited access to nature. All these aspects have an impact on how we can understand the impact that nature has on psychological well-being.

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1.0 Introduction

"Nature holds the key to our aesthetic, intellectual, cognitive and even spiritual satisfaction" Edward Wilson wrote (Walton, 2021, p. 6f). Nature is associated with a potentially powerful and profound impact on our psychological well-being, and plays an important role in influencing overall psychological well-being, providing numerous essential tangible and intangible benefits. Psychological well-being is a multifaceted concept that includes positive emotions and life satisfaction as well as a sense of meaning and potential for flourishing (Ryff 1995, p. 100). From the act of simply being in nature or to actively engaging with it, we are constantly receiving psychological benefits that can greatly influence our mental health. Since ancient times nature has been used to treat psychological disorders and illnesses. And today nature based interventions are widely applied in the work with various disorders such as depression, stress, anxiety and post-traumatic stress disorder (Bettmann et al., 2022). Nature based interventions are highly associated with greater feelings of social connectedness, lower sense of loneliness and isolation (Duvall & Kaplan, 2014). Many people seek nature either to just be in nature, to find peace and tranquility, or to go on adventurous and challenging travels through nature in order to learn, find meaning and facilitate personal growth.

In recent years researchers within the field of psychology have been increasingly drawn towards understanding the human-nature relationship and its impact on psychological well-being. And a significant body of literature supports the intuitive idea that being in natural environments is beneficial for psychological health and well-being. Nature offers an expansive, dynamic, and aesthetically pleasing environment that has been found to stimulate people both mentally and emotionally, facilitating personal growth and flourishing. Even a temporary respite in a green environment can help reduce stress levels (Ulrich, 1993), increase positive emotions (Ballew & Omoto, 2018), and even restore cognitive capacity (Kaplan, 1995). The natural environment provides an opportunity for reflection and awareness, a sense of connection and purpose as well as cultivating an open and curious attitude towards life experiences (Pretty et al., 2013). Ultimately, nature can provide us with an escape from our day to day worries and a chance to reconnect with our authentic selves through significant nature experiences. Being in nature can provide a sense of connectedness with something

greater than ourselves as well as offer the opportunity to commune with the beauty and serenity of natural environments (Naor & Mayseless, 2021; Brymer et al., 2021).

Psychological well-being is a multifaceted and complex psychological phenomenon that can be conceptualized from many perspectives. Neither does nature have an unequivocal impact on psychological well-being, and different theorists have therefore tried to account for nature's impact on psychological well-being based on different psychological perspectives. This thesis therefore aims to explore the question: *How can we understand nature's impact on psychological well-being?*

1.1 Clarification of concepts

1.1.1 Nature

Nature is understood to be a naturalistic environment with a dominance of natural elements and absence of humans and human-manufactured elements. Often nature and wilderness is used synonymously, and strongly expresses the opposite compared to human constructed natural urban settings. Nature is often associated with untouched landscapes rather than with built environments. It includes the world of sand and rock, oceans, deserts, woods, mountains and the diverse manifestations of plant and animal life (Wohlwill, 1983, p. 7). Rossman and Ulehla (1977) find that psychological benefits from natural settings are more likely to occur in wilderness areas, and the more remote the better (Rossman & Ulehla, 1977, p. 64).

Samantha Walton has a different understanding of nature and argues that nature occurs in many forms and can be defined differently for each individual. Her book *Everybody Needs Beauty* (2021) is divided into chapters that each describe different nature contexts. She describes waters, mountains, forests, gardens and parks, which all represent the different facets of nature. Walton argues that humans themselves attribute their own perceptions of what characterizes a given natural context. In her interpretation of nature she challenges the widely held view on nature as an untouched wilderness. What is interesting about Walton's considerations is that it identifies an established understanding of nature, which does not necessarily reflect nature for what it is entirely (Walton, 2021, p. 4f). In this current thesis nature will be understood as an area outside urban environments, and encompasses the total biological scope of Earth that is not manufactured by humans. That is to say there will not be a focus on urbanized nature as parks and gardens.

1.1.2 Psychological well-being

Current research on well-being derives from two general perspectives: The hedonic approach and the eudaimonic approach to well-being. Hedonic well-being refers to a personal sense of happiness and life satisfaction and defines well-being in terms of pleasure and absence of pain. Eudaimonic well-being refers to meaning and self-realization and defines well-being in terms of the degree to which it is fully functioning for example as having skills and resources necessary to live an autonomous, purposeful and satisfactory life (Ryan & Deci, 2001, p. 143; Walton, 2021, p. 12f). Huta and Ryan (2010) argues that individuals that experience high hedonic and eudaimonic well-being tend to experience the greatest amount of overall well-being and are considered to be flourishing. There are various ways to evaluate the emotional continuum in human experience, but most of the research within the field of nature and hedonic well-being apply assessment of subjective well-being. Subjective well-being consists of three components including life satisfaction, presence of positive emotions and absence of negative emotions and are together often summarized as happiness (Ryan & Deci, 2001, p. 144). There have been considerable debates about whether subjective well-being adequately defines well-being. Ryff and Singer (1998) criticize hedonic well-being for lack of focus on social activities, goals and achievements that evidently promote well-being (Ryan & Deci, 2001, p. 144).

According to Carol Ryff (1995) being psychological well does not only refer to being free of mental distress or physical suffering. Therefore she developed a lifespan theory of human flourishing and well-being, where well-being is defined as not simply an attainment of pleasure, but as "the striving for perfection that represents the realization of one's true potential" (Ryff 1995, p. 100; Ryan & Deci, 2001, p. 146). In order to include other relevant aspects of well-being Ryff (1989) synthesized ideas from the personality theories of Maslow, Jung, Rogers, Allport, Erikson, Bühler, Birren, Neugarten, and Jahoda, she constructed a multidimensional approach and measure of eudaimonic well-being called psychological well-being (Ryff, 1995, p. 99f). *Psychological well-being* includes six distinct aspects that define well-being theoretically and

operationally as well as specify what promotes emotional and physical health (Ryan & Deci, 2001, p. 146; Ryff, 1995, p. 101)

- Self-acceptance refers to holding positive attitudes towards oneself and accepting multiple aspects of the self, including good and bad qualities (Ryff, 1989, p. 1071).
- Positive relations refers to the importance of maintaining warm and trusting interpersonal relations. People who have this ability have strong feelings of empathy and affection for all human beings and will be capable of greater love, deeper friendship and more complete identification with others (Ryff, 1989, p. 1071).
- 3) Autonomy refers to a feeling of self-determining and independence. One might have an internal locus of evaluation, whereby one does not need to receive approval from others. One does not cling to collective fears and beliefs providing one with a sense of freedom from norms of everyday life (Ryff, 1989, p. 1071).
- 4) Environmental mastery is the ability to creatively choose or create environments suitable to physical and psychological conditions. Active participation in and mastery of the environment are important ingredients in positive psychological functioning and result in feelings of confidence (Ryff, 1989, p. 1071).
- 5) Mental health and well-being are defined to include beliefs that give the *sense of purpose and meaning in life*. This includes a clear comprehension of life's purpose, a sense of directness, and intentionality (Ryff, 1989, p. 1071).
- 6) Psychological well-being does not only require prior achieved goals, but also continued potential to *personal growth*. The need to actualize oneself and realize one's potential is central to well-being. Openness to experience and confronting new tasks and challenges is a key component to a fully functioning person, and is necessary for an individual to continually develop (Ruff, 1989, p. 1071).

An understanding of the two general concepts of well-being (hedonic and eudaimonic well-being) is important in order to understand how the literature conceptualizes and operationalizes well-being in different ways. The thesis will encompass different

theories that apply either hedonic or eudaimonic views on well-being or an integration of both. Overall the thesis will focus on a multidimensional concept of well-being in order to comprehensively approach it as a complex psychological phenomenon and the variety of impact and significance nature might have on well-being. Therefore the thesis will understand well-being based on Ryff's concept of *psychological well-being*.

1.2 How can we elucidate on a broad field like this?

According to Bertelsen (2001) research can be placed within a pragmatic and a theoretical knowledge of interest. With a *pragmatic knowledge of interest* one is concerned with taking part in the concrete practice. With a *theoretical knowledge of interest* one is interested in understanding and explaining a phenomenon from a theoretical account (Bertelsen, 2001, p. 2). This thesis works with a theoretical knowledge interest and is carried out within a broad psychological theoretical framework in which the aim is to understand the impact of nature on psychological well-being through diverse theories. The research question is explored in a review, synthesis and discussion of different theoretical perspectives and empirical literature which account for nature's impact on psychological well-being. This is done in order to gain a new or better understanding of the psychological phenomenon both theoretically or conceptually (Dammeyer & Bøttcher, 2022, pp. 34-36). Due to the research question's aim at getting a broad understanding of psychological well-being, nature and their relationship, I find that a theoretical thesis would be best suited.

1.2.1 Critical realism

The thesis works within a critical realistic framework. *Critical realism* relies on the scientific theoretical belief that there is more than one version of the reality, and therefore works with a deep ontology, where the reality is differentiated in three ontological layers (Howitt & Cramer, 2011, p. 428). The layers include a *transfactual layer*, consisting of established natural laws, a *factual layer*, consisting of events or phenomena independent of observations, and a *perceptual layer*, including human experience and interpretation. As all three layers are a part of the reality, it is important to include them all in order to form an understanding of the reality (Wad, 2012, p. 383f). This is done by critically applying different theories and empirical findings in order to understand the different ways in which nature can impact psychological well-being. The understanding of nature, psychological well-being and their relationship varies across research, and it is therefore important to be critical of the theories' ontological and epistemological approaches. Based on a critical realistic framework, this thesis attempts to form an adequate understanding of nature's impact on psychological wellbeing. This is possible through the work with a theoretically eclectic approach in order to illuminate the formulation of the problem from different theoretical and empirical angles

1.2.2 Theoretical eclecticism

Psychology consists of various paradigms and theoretical perspectives that are interested in the same phenomenon. And these can have similar yet fundamentally different interpretations of a phenomenon. According to Bertelsen (2001) this theoretical ambiguity can be considered as a sign of scientific health, where the researcher is not seduced by a simple and reductionist explanation to a phenomenon, and it is an expression of the complexity of psychology. It is essential to maintain a holistic understanding of a psychological phenomenon by coordinating different theoretical areas. Bertelsen argues that different psychological understandings might complement each other, as they illuminate different aspects of a psychological phenomenon and are strengthened rather than weakened by having different or even conflicting views (Bertelsen, 2001, pp. 3-5).

When different fields, theories and types of knowledge are selected and put together it can be described as *eclecticism*. *Theoretical eclecticism* is a conceptual approach where different theories are taken into account in the study of a phenomenon. This approach seeks to combine and integrate different theories in order to provide an indepth, nuanced description of a subject field (Sonne-Ragans, 2019, p. 40f). When working eclectic, different concepts, ideas, explanations, models and theories are selected and understood in the light of each other in order to obtain a comprehensive understanding of a phenomenon. Eclecticism is characterized by a combination and integration of knowledge from theories with different perspectives or ontologies. There exists a pluralistic worldview within this approach as well as an assumption that all theories and perspectives are valid, that science is incomplete and that reality never can be described adequately by a single theoretical perspective. This approach is oriented towards creating coherent categories of understanding for rich and complementary insights into a phenomenon (Sonne-Ragans, 2019, p. 40). With eclecticism one does not necessarily seek to achieve a perfect unified theory, but rather a complex and multifaceted framework and context to understand the examined phenomenon (Sonne-Ragans, 2019, pp. 40, 49). With eclecticism one aims for a critically reflective approach to the applied perspectives and theories (Sonne-Ragans, 2019, p. 49f). This thesis thus aims to investigate how different theoretical perspectives account for the impact that nature has on psychological well-being as well as clarify the basis for the compilation of the central theories by discussing similarities and differences in the applied theoretical perspectives (Sonne-Ragans, 2019, p. 40).

The process of seeking an understanding and explanations of a phenomenon can be defined as an abductive approach. *Abduction* begins with observations fostering a wonder, which is sought to be elucidated through previous and already existing theories and knowledge. With abduction one seeks the best explanation or description of a phenomenon providing the best understanding (Brinkmann, 2012, pp. 70, 83f). Abduction is combined with eclecticism both by pitting different understandings of nature's influence on psychological well-being against each other and by trying to combine and summarize explanations using different theories.

1.3 Structure of the thesis

In the research question there is an assumption that nature plays an important role in human psychological well-being. In order to elaborate on this, the thesis will be divided into two theoretical sections. 2.0 How can we understand the relationship between human and nature? will primarily deal with the historical foundation of perspectives within psychology trying to grasp how we can understand the human-nature relationship. 3.0 How does nature impact psychological well-being? will include a review and synthesis of theories and empirical studies accounting for different understandings of nature's impact on human psychological well-being. This section will be closed with a synthesis of the included theories. Lastly, these sections will discharge into a discussion on how psychological well-being, nature and their relationship are understood differently, and what epistemological implications this might have.

These elements will therefore form the structure of the thesis:

- 1. An introductory part including the thesis' methodological framework
- 2. How can we understand the relationship between human and nature?
- 3. How does nature impact psychological well-being?
- 4. A discussion of different understandings of psychological well-being, nature and their relationship, and what epistemological implications this might have
- 5. An overall conclusion of the thesis

2.0 How can we understand the relationship between human and nature?

First and foremost it might be relevant to understand the human-nature relationship, because this relationship might have an impact on the human psyche. Following section will first present the biophilia hypothesis as an evolutionary understanding of the human-nature relationship. Then ecopsychology and environmental psychology will be presented as two major branches of psychology that focus on the relationship between human beings and their natural environment. However, they approach this relationship from slightly different perspectives. Lastly Cronon's critical implication on nature as a human constructed concept will be accounted for.

2.1 Biophilia

Edward Wilson emphasizes that humans have an inherent tendency to focus on and connect with other living things, and that human organisms are drawn to and stimulated by nature. In his notorious work *Biophilia* (1986) Wilson defined this as the *biophilia hypothesis* (Wilson, 1986, p. 1). He describes the relationship between nature and the human psyche as constituted by an inherent, emotional attachment to all living organisms. He emphasizes that human well-being is complemented by the natural environment's ability to restore psychological health in the face of everyday hardship (Wilson, 1993, p. 31). This assumption is based on the evolutionary theory that humans originate from nature and have evolved physically and psychologically from evolutionary principles of natural selection and adaptation to the environment (Wilson, 1993, p. 33f). Despite the inherent evolutionary relationship between human and nature, Kellert also believed that culture and subjective experiences can be constitutive of biophilia (Kellert, 1997, p. 46; Capaldi et a., 2014, p. 2). This idea is supported by

a study finding that individuals who are higher in nature connectedness recall spending more time in nature during their childhood compared to those who do not feel as connected to nature (Tam, 2013). Inborn or cultivated, the physical and psychological disconnection from the natural environment in which we evolved can have detrimental impact on our emotional well-being as exposure to nature is associated with decreased happiness (Capaldi et al., 2014, p. 1; Berman et al., 2008, 2012; Nisbet et al., 2011).

The biophilia hypothesis proposes that individuals who are more connected to the natural world might have greater evolutionary advantages. Even though not all aspects of nature are beneficial and life supporting (Capaldi et al., 2014, p. 1). For example, Ulrich (1993) reviews instances of *biophobia*, where people conversely might express fear and disgust towards certain natural settings and wild organisms as a biological preparedness (Ulrich, 1993, pp. 76f; Capaldi et al., 2014, p. 1). In this case the body will react to biophobic stimulus with stress and the sympathetic nervous system will be activated (Ulrich, 1993, p. 80). Evolutionary this reaction can be useful and necessary in some circumstances, if one has to flee from danger in nature (Ulrich, 1993, p. 74f). But this might have an impact on human's connection or disconnection with nature today, and some people might instinctively consider some natural environments as frightening and even stay away from nature (Ulrich, 1993, p. 77).

2.2 Ecopsychology

Ecopsychology is a field within psychology which goal is to combine ecology and psychology into a sophisticated psychological approach in order to understand human's connection to the natural world and how individuals' psychological states are affected by this connection (Fisher, 2013, p. 4; Brymer et al., 2021, p. 396).

The approach was explicitly developed in the 1990s predominately with the work of Theodore Roszak with his important work *Voices of the Earth* (1992). The pioneering ecopsychologist Roszak believes that there is a madness involved in the urban industrial society that has to do with a lack of balance and integration with the natural environment. He argues that we need to recapture the sense of being embedded in nature and being in a condition of reciprocity with nature. Roszak suggests that at the deepest level of the unconscious mind humans find an unconscious ecology that connects us intimately companionably with the natural world around us (Fisher, 2013, p. 4).

Ecopsychologists critically respond to modern society and human's missing connection to the natural world. They advocate for the importance of a reconnection as well as a reawakening and development of this relationship including self-identity, body, emotion and soul renewed by direct and immediate contact with the natural world (Davis & Canty, 2013, pp. 597-599). This inclusive sense of self is termed *ecological self* (Bragg, 1996, 95). Ecopsychologists believe in a non-duality between human and nature (Davis & Canty, 2013, p. 603).

Ecopsychology is a nuanced and multi-perceptual approach that emphasizes the embodied human-nature relationship as the appropriate scale of analysis for understanding how nature might facilitate psychological well-being (Brymer et al., 2021, p. 396; Brymer et al., 2014). This approach proposes that well-being is enhanced through immersion in a rich embodied, haptic, auditory, visual, emotional interaction with the natural world (Ballew & Omoto, 2018). Instead of focusing on forms of nature, ecopsychology recognizes that a functional relationship with nature facilitates important processes supporting psychological well-being (Brymer et al., 2021, p. 396). Ecopsychologists increasingly recognized and integrated the healing properties of direct contact with the natural world in an increasingly practical ecopsychological approach, in which the aim was to deepen the connection between human and nature through ecotherapeutic practices (David & Canty, 2013, p. 598). Thereby ecopsychology becomes less defined by its countercultural, abstract and romanticized stance but develops into a more self-reflective, pluralistic and pragmatic approach with a stronger focus on research and therapy (David & Canty, 2013, p. 599f; Doherty, 2009). This movement towards a more comprehensive research and practice based approach satisfies past concerns about the mystical and spiritual flavor of early ecopsychologists as Roszak (David & Canty, 2013, p. 600).

In 2009 the psychological journal *Ecopsychology* was established in order to provide a scholarly research and inquiry that places psychology and mental health in an ecological context. The journal recognizes the significant connection between human well-being, culture and earth health with a focus on showing that modern man and society cannot be separated from the intimate human connection with the natural world. That human beings need the connection with nature to be mentally well (Davis & Canty, 2013, p. 599; Ecopsychology, n.d.). The growing focus on research within ecopsychology formed a comprehensive basis for a broad field of ecopsychological practices such as ecotherapy aiming to engage nature as a therapeutic and developmental resource in order to promote a deeper relationship to the natural world. Ecotherapy is a therapeutic treatment which involves practices in nature such as wilderness therapy, outdoor adventure therapy, nature-based intervention (Davis & Canty, 2013, p. 603).

Roszak was criticized for his romanticized, quasi-religious and explicit spiritual discourse and rhetoric in his presentation of ecopsychology (Reser, 1995, p. 241f). But according to Davis and Canty (2013) the transpersonalism of ecopsychology is still a highly important aspect of ecopsychology's ecocentrism (Davis & Canty, 2013, p. 600). This transpersonal aspect accounts for the spiritual and transcendent aspects of significant human experiences in nature that might give rise to a deeper understanding of various aspects of psychological well-being. In Andy Fisher's radical ecopsychology spirituality is considered to be virtually synonymous with the reunion of human and the natural world and necessary for encountering the depths of the human-nature relation (Davis & Canty, 2013, p. 604).

2.3 Environmental psychology

Environmental psychology emerged during the 1960s as a result of scientific and societal concerns. Environmental psychology is the study of how people interact with their physical environment, and how the environment impacts their thoughts, feelings, and behaviors, namely the question of quality of life has always been present. It examines the ways in which the sociophysical environment, natural and built, and its influence on human well-being, cognition, and behavior (Stokols & Altman, 1987, p. 1; Fleury-Bahi, Pol & Navarro, 2017, p. 1). This field of psychology investigates various aspects of the environment, including the relationship between people and nature, the effects of architectural design on mood and behavior, the impact of noise and air pollution on human health, the role of urban spaces in fostering social interactions, and the psychological consequences of overcrowding or isolation (Fleury-Bahi, Pol & Navarro, 2017, p. 1f).

Environmental psychologists employ a range of scientific research methods, including surveys, experiments, and observations, to gain insights into how individuals perceive

and respond to their surroundings. Examples of theories within environmental psychology are Attention Restoration Theory, Stress-reduction Theory and Nature Deficit Disorder, which conduct research from cognitive and biological psychological approaches. Their findings can offer knowledge about psychological beneficial environments and contribute to the development of interventions that can facilitate human well-being (Walton, 2021, p. 56). Overall, environmental psychology aims to bridge the gap between human behavior and the physical environment, with the goal of creating healthier, more sustainable, and more enjoyable spaces for individuals to live, work, and interact (Fleury-Bahi, Pol & Navarro, 2017, p. 1f)

2.4 Rethinking the human place in nature

William Cronon argues in his book *Uncommon Ground: Rethinking the Human Place in Nature* (1995) that nature in modern times has been conceptualized in an idealized and unnatural way by humans (Cronon, 1995, p. 78). He emphasizes that nature experiences often are associated with *escapism*, that refers to an attempt to forget and escape immediate surroundings or everyday life (Cambridge Dictionary, 2022). When talking about human's connection to nature and the benefits of nature experiences, statements like "we must return to nature" and that "wilderness is our natural habitat" often resonate (Cronon, 1995, p. 76). But Cronon ironically points out that the western culture modifies nature according to their own preferences and interests, for example he mentions wood cutting in order to establish paths for hiking in the forest (Cronon, 1995, p. 77). He argues that the concept of nature is not nearly as natural as people usually assume (Cronos, 1996, p. 47). That western culture has conceptualized nature in an unnatural way by removing nature's true self in advantage of their own constructed concept that is not necessarily consistent with what is meant about nature (Cronon, 1995, p. 76).

As a critique of the Western glorification of nature Cronon emphasizes that 250 years ago people didn't search for the idealized "wilderness experience". This indicates that the human-nature relationship is relatively new (Cronon, 1995, p. 70). In general he questions urban human's need to go back to nature:

...to the extent that we live in an urban-industrial civilization, but at the same time pretend to ourselves that our real homes are in the wilderness, to just that extent we give ourselves permission to evade responsibility for the lives we actually lead. We inhabit civilization while holding some part of ourselves – what we imagine to be the most precious part – aloof from its entanglements. We work our nine-to-five jobs in its institutions, we eat its food, we drive its cars (not least to reach the wilderness), [...] all the while pretending that these things are not an essential part of who we are (Cronon, 1995, p. 79).

With his quotation Cronon argues that it seems contradictory that humans living in urban cities claim that they must return to nature. He argues that we should not idealize nature in such a way that we prevent ourselves from recognizing the sacred in our everyday lives and landscapes. Nature should fully be a part of urban lives, and that people should attend as much in their backyards as in remote wilderness areas (Cronon, 1996, pp. 48, 55). Nature is not only to be found in wilderness, "...nature is all around us, if only we have the eyes to see it" (Cronon, 1995, p. 84)

Cronon strongly believes in the idea of environmental justice, which is the notion that everyone, regardless of race or socioeconomic class, should have equal access to the resources of a natural environment. He argues that what is generally defined as "the real wilderness experience" primarily serves as a recreational space for those who can afford the time to enjoy it (Cronon, 1996, p. 48). He claims that there is a group of elitist urban tourists in nature who are defining the concept of being in nature and outdoor leisure activities in wilderness that are not available for everyone (Cronon, 1995, p. 77).

Cronon offers provocative insights into how people's perspectives shape an idealized definition on what nature is and influence their interactions with nature (Cronon, 1995, p. 77). His view on the human-nature relationship and the concept of nature aligns with Walton's idea of nature as a phenomenon that cannot be limited to a single context, but rather consist of different contexts to which people ascribe different meanings (Walton, 2021). And together they challenge the general idea about what nature is and that mainly remote wilderness can have benefits for psychological well-being (Rossman & Ulehla, 1977, p. 64).

2.5 Partial conclusion

In an attempt to explore why modern humans sometimes feel the need to find back to nature the biophilia hypothesis was included. The biophilia hypothesis suggests that humans have an innate connection and preference for nature due to our evolutionary history. Kellert (1997) takes the theory a step further and advocates that culture and personal experiences as co-constitutive factors.

Environmental focused psychologies expand on the biophilia hypothesis by exploring the psychological benefits of the natural environment by focusing their research on the relationship between individuals and their physical environment. Environmental psychology examines how built environments and natural surroundings impact human behavior and well-being. It explores how different environmental factors, such as lighting, noise, and aesthetics, influence human mood, productivity, and overall life satisfaction (Fleury-Bahi et al., 2017, p. 1). The research approach mainly relies on scientific research methods, including surveys, experiments, and observations, to gain insights into how individuals perceive and respond to their surroundings cognitively or biologically.

Ecopsychology, on the other hand, is a more interdisciplinary field that combines psychology, ecology, and studies on human's connection with nature. It explores the relationship between humans and the natural environment, examining the psychological, emotional and somehow spiritual connections between individuals and nature (Brymer et al., 2021, p. 396). Ecopsychology examines how our disconnection from nature can lead to psychological distress and explores the potential therapeutic benefits of reconnecting with the natural world. With its intrinsic and ecocentric focus on developing a sustainable and mutually beneficial relationship between humans and the environment (Fisher, 2013, p. 4).

In summary, while environmental psychology examines the impact of the physical environment on individuals, ecopsychology explores the psychological and emotional connections between humans and the natural environment, aiming to promote a more ecocentric and harmonious relationship with nature (Davis & Canty, 2013, p. 603).

Cronon's work on environmental history and the shifting perceptions of nature is also relevant to the discussion on the human-nature relationship. He argues that our understanding of and relationship with nature is not static but shaped by cultural, social, and economic factors. Cronon challenges the elitist, idealized and romanticized view of a remote wilderness and urges for a more nuanced understanding of nature. Cronon's criticism of the established view of what nature is, emphasizes that one should adhere to the fact that nature can be understood as an ambiguous phenomenon, and that human's relationship with nature cannot be reduced to a specified entity.

3.0 How does nature impact psychological well-being?

Following section will include different theories accounting for the impact that nature might have on psychological well-being. In the section Attention Restoration Theory and Stress-reduction Theory will be elaborated on. In addition to the aspect of stress, the theoretical and practical research on Japanese forest bathing will be taken into account as an example of a useful practice. Nature Deficit Disorder will be included as a developmental psychological perspective on nature's impact on children's development. These theories fall into the tradition of environmental psychology and have roots in cognitive, biological and evolutionary psychology. The theories are often applied in order to explain the positive impact that nature has on hedonic aspects of well-being such as affect and cognition function (Walton, 2021, p. 56). Furthermore theories and research from ecopsychology will be included, such as Nature connection theories and transpersonal dimensions of nature experiences, in order to account for further eudaimonic aspects of psychological well-being. Additionally an untouched field of research on positive-negative dialectics in psychological well-being will be taken into account, as none of the above described theories address this important aspect in relation to nature experiences and their impact on psychological well-being.

3.1 Restoring attention in nature

Attention Restoration Theory (ART) suggests that spending time in nature can help to restore our mental resources and improve our ability to concentrate. The theory was developed by Rachel and Stephen Kaplan in the late 1980s and is based on the idea that stimuli from our modern urban environment require too much of our directed attention, such as traffic, work, and technology. This constant demand for focus can lead

to cognitive fatigue, decreased concentration, and mental exhaustion (Kaplan & Kaplan, 1989, p. 178). Based on their research Kaplan and Kaplan argue that natural settings can reduce cognitive fatigue caused by everyday activities in distracting urban environments and thus facilitate cognitive restoration (Kaplan & Kaplan, 1989; Kaplan & Talbot, 1983).

ART is theoretically anchored in William James' interpretation of voluntary attention and involuntary attention (Kaplan & Kaplan, 1989, p. 179). Voluntary attention is forced attention to something that is not particularly interesting and requires a good deal of effort. By voluntarily directing one's attention towards something humans are able to focus on one thing and at the same time ignore distractions from the environment that might be disruptive for cognitive performance. This directed attention plays an important role in cognitive and emotional functioning (Berman et al., 2008, 1207), but does not have an endless capacity (Kaplan, 1995, p. 169). When directing one's attention a great deal of effort is devoted to avoid distractions. Longer periods of directed attention can result in directed attention fatigue, where one might find it difficult to complete cognitive tasks and is easily distracted as well as experiencing negative feelings and lack of motivation towards daily tasks (Kaplan (Kaplan, 1989, p. 180). Therefore directed attention fatigue can be considered a form of cognitive inhibition (Wells, 2000, p. 782). Opposite involuntary attention refers to attention that requires no cognitive effort at all, and occurs when something is interesting or exciting (Kaplan & Kaplan, 1989, p. 179). This type of attention can be understood as a form of effortless concentration that occurs involuntarily, thus unintentionally, and where the environment moderate the attention (Berman et al., 2008, p. 1207). Voluntary attention can be considered as a top-down control of attention, which is necessary to suppress distracting stimuli. Involuntary attention can be considered as a bottom-up control of attention, in which sweet and fascinating features of nature are captured, creating the framework for a possible restorative effect from the environment (Berman et al., 2008, p. 1207; Kaplan, 1995, p. 169). According to Kaplan (1995) involuntary attention has a restorative effect on directed attention fatigue, if it happens in the right environment (Kaplan, 1995, p. 172).

Kaplan and Kaplan (1989) argue that there are four components of a restorative experience that each seems to be related to a wilderness setting (Kaplan & Kaplan, 1989, pp. 186-195). First, being away is an important component, because escaping nonpreferred experiences with noise, crowds, distraction, stress and pressure is important in order to take a rest from effortful, fatiguing tasks and distracted attention. Wilderness is a preferable destination for these extended restorative opportunities (Kaplan, 1995, p. 174; Kaplan & Kaplan, 1989, p. 189f). Second, wilderness is an ideal setting for what Kaplan calls soft fascination. Soft fascination is attention held by smooth and calming stimuli for example towards the rising sun, streaming rivers and voluminous waterfalls or soft sounds of the forest. A soft effortless fascination that allows the human to function without using all their capacity of attention and provide opportunities for reflection and introspection to occur. Fascinating stimulus calls forth involuntary attention, and in this sense facilitates the possibility for restoring directed attention which is susceptible to everyday stress and pressure (Kaplan, 1995 p. 172; Kaplan & Kaplan, 1989, p. 192f). Third, a restorative environment has to provide an experience of extent and coherence. According to Kaplan wilderness has a large scope for exploration and contemplation and yet in some ways feels familiar to the individual. Wilderness in some ways matches an intuition of the way things ought to be and the way things truly are beneath the surface layers of culture and civilization (Kaplan, 1995, p. 174; Kaplan & Kaplan, 1989, p. 190f). Fourth, there has to be some sort of compati*bility* between the individual and the environment, which means that the individual will experience a personal meaning when being in the environment and that the individual can fit the demands of environment (Kaplan, 1995, pp. 172; Kaplan & Kaplan, 1989, p. 193f).

According to Kaplan, natural environments modestly invoke involuntary attention that will allow the directed attention to restore itself. This happens on behalf of an environment where directed attention is minimized, and that attention is typically captured in a bottom-up fashion by the environmental features themselves, and therefore does not require a great deal of cognitive effort (Kaplan, 1995, 172). The logic of the theory is therefore that the individual might perform better on cognitive tasks depending on directed attention after interacting with nature holding these restorative properties (Berman et al., 2008).

In order to clarify increased attention as a result of nature exposure, it is relevant to consider what cognitive functions are involved in the process. Stevenson, Schilhab and

Bentson (2018) therefore conducted a systematic review on the attention processes that are improved when the human is exposed to natural environments (Stevenson et al., 2018, p. 229). They find that working memory, attentional control and cognitive flexibility improves are nature exposure (Stevenson et al., 2018, p. 254). *Working memory* is important for maintaining and managing important information in order to complete cognitive tasks. This cognitive capacity is central in various forms of cognitive processing (Matlin & Framer, 2017, p. 121). *Attentional control* refers to the ability to focus on one thing and at the same time ignore distractions that might occur (Stevenson, 2018, p. 242). *Cognitive flexibility* allows one to vary between different cognitive capacities within a task (Stevenson et al., 2018, p. 252).

Nature therefore can be understood as an environment that has an impact on different cognitive functions as information processing, attention, concentration and overview during tasks as well as increased emotional functioning (Stevenson et al., 2018; Kaplan, 1995; Berman et al., 2008). Despite relevant findings, ART merely relates to a simpler understanding of nature as a restorative environment that is beneficial for cognitive and emotional functioning.

3.1.1 Limitations

With ART, the Kaplans offer a theoretical take on how nature can work as a setting with given features that might facilitate restoration of attention and a sense of cognitive improvement. However one might question these four requisite characteristics that have to be available before a natural setting can be experienced as restorative. During real nature experiences, it is up to individuals themselves to decide if these characteristics are present. But how can one be sure that these characteristics are available and if they meet the criteria for a restorative setting? It might be considered whether some people will even be able to experience nature as prescribed. The characteristics of a restorative environment will be loosely defined by individuals them-selves, rather than what nature has to offer in itself. And therefore ART has been criticized by researchers for its vague terminology (Walton, 2021, p. 132). However it can be considered that ART provides one possible understanding of nature as a setting with specific characteristics that can facilitate human experiences. ART therefore rationally accounts for nature as a beneficial environment for psychological cognition, but that physical presence in nature is not necessarily enough. If the goal is to use involuntary attention and

reduce directed attention fatigue, it is required that the criteria for a restorative environment is met.

3.2 Affective response to nature

Ulrich, Simons, Losito, Fiorito, Miles & Zelson (1991) was among the first researchers to conceptualize the stress relieving effects that nature can have on humans from an evolutionary perspective that laid ground for the Stress Reduction Theory. Their studies explored psychological and physiological benefits from spending time in nature (Ulrich et al., 1991; Bratman, 2015). In their research stress was conceptualized from a biological point of view:

[...] "the process by which an individual responds psychologically, physiological, and often with behaviors, to a situation that challenges or threatens wellbeing. The psychological component includes cognitive appraisal of the situation, emotions such as fear, anger, and sadness, and coping responses."

(Ulrich et al., 1991, p. 202)

Ulrich et al. (1991) lean towards an evolutionary perspective, including the biophilia hypothesis, in which humans are understood as biologically predisposed to respond positively to natural environments that are favorable for survival and ongoing wellbeing (Ulrich et al., 1991, p. 205). The *Stress Reduction Theory* (SRT) emphasizes that humans adaptively seek safe and calming natural settings after being exposed to negative emotional responses in order to recover and regenerate energy for survival. This behavior explains the stress reducing relation between human and nature (Ulrich et al., 1991, p. 208f).

In order to examine biological responses to respectively stressful and calming environments, Ulrich et al. (1991) designed a study where 120 participants (60 males and 60 females) first were exposed to a stressful and violent video clip about industrial injuries. The method was replicated from another well-known study on stress by Richard Lazarus. According to Ulrich et al. (1991) the video clip allegedly will generate considerable psychological stress (Ulrich et al., 1991, p. 210). Afterwards the participants were randomly shown a new video clip, of which two were calming nature videos from forestry environments with vegetation and water, and four other videos from

urban environments with either traffic or shopping centers (Ulrich et al., 1991, p. 210). The study showed that the participants exposed to videos with natural stimuli recovered more effectively from the stress responses from the unpleasant video than those exposed to videos with urban stimuli. The study showed that heart rate decelerated quicker, sympathetic input to the nervous system was reduced, and that the parasympathetic nervous system was activated to a greater extent in the participants exposed to nature videos (Ulrich et al., 1991, p. 117f).

Additionally Ulrich et al. (1991) applied self-rating scales in an attempt to capture subjective experiences of stressful and calming stimuli. Participants reported less aggression and higher positive affect when exposed to nature videos than participants exposed to urban videos (Ulrich et al., 1991, p. 220).

SRT thus understands nature as a stress relieving environment that both has an impact on physiological stress but also the psychological and emotional experience of stress. Despite relevant findings, SRT merely relates to a simpler understanding of hedonic well-being.

3.2.1 Limitations

It may seem tautological that Ulrich et al. (1991) sympathize with the idea that nature is both stress-inducing and stress-reducing depending on how nature unfolds. The SRT does not sufficiently explain why nature is more effective in reducing stress than other quiet environments. One might say that a relaxing movie night at home can be as calming as a relaxing walk in nature can be stress relieving.

Methodologically one might question the ecological validity of the theory, because of the fact that the research is not conducted in a real world natural environment, but instead in front of a computer. The theory does not conceptualize the full range of a nature experience and largely overlook the inherently multi-dimensional, interactive and multi-sensorial complexity of nature experiences (Brymer et al., 2021 p. 39f5; Brymer et al. 2014). These aspects might be too complex and difficult, maybe even impossible to simulate through a computer screen. Markwell and Gladwin's study (2020) supports the critique of Ulrich's study on nature's stress reducing abilities through computer simulated natural stimuli. They advocate that real natural

environments compared to virtual naturalistic stimuli are more effective (Markwell & Gladwin, 2020, p. 251). I find this notion in itself interesting because the whole 'back to nature' debate is about relocating people's awareness from the stressful digital and technological urbanized environment towards the natural world. Despite this critique Shinrin-yoku, an evidence-based Japanese practice, supports SRT by measuring decreased cortisol level, increased activity in the parasympathetic nervous system and increased positive feelings and emotions as a result of being in contact with forest stimuli (Li, 2019, p. 45).

STR has been and still is a dominant theory within environmental psychology investigating human's biophilic relationship with nature and its stress-reducing effects. Even though SRT assesses participants' subjective experiences of stress, the majority of the theory relies on nomothetic measures of stress. Nevertheless the theory is challenged by the debate about whether stress should be studied both subjectively and objectively. However subjective feelings associated with stress should not be normative, and nomothetic measures may not be adequate to study subjective experiences with stress. According to Birk (2021) stress research should also rely on subjective perceptions of stress. In the 1955s and 1960s Lazarus and colleagues found a discrepancy between participant's subjective perception of stress and the external stress stimuli they were exposed to (Birk, 2021, p. 258). The discrepancy may be an indication that there are some important subjective assessment elements that to some extent challenges the nomothetic findings in the research.

3.2.2 Shinrin-yoku and cortisol-level

Shinrin-yoku, the Japanese forest bathing tradition, might be relevant to mention in relation to SRT. Shinrin-yoku involves immersing oneself in nature and connecting with the surroundings, particularly in the forest. The practice focuses on mindfully and intentionally spending time in a forest in order to foster multisensory experiences with healing benefits. Shinrin-yoku evidently is said to be able to strengthen the parasympathetic nervous system, reduce cortisol levels and suppress the sympathetic nervous system as well as increase positive feelings and emotions (Li, 2019, p. 45; Markwell & Gladwin, 2020, p. 248). In other words can Shinrin-yoku counteract some of the physiological factors that are activated during stress. In a study of cortisol level before and after Japanese forest therapy Ochiai et al. (2015) found that both cortisol and blood

pressure is reduced in the participants after four hours of practice (Ochiai et al., 2015, p. 2539). Cortisol is a stress-hormone that is released when an individual is experiencing stress or anxiety. Increased levels of cortisol cause an increase in blood pressure. When the stressful stimuli is gone the cortisol level and blood pressure will reach its normal again (Li, 2019, p. 43f). Li argues that there are more stressful stimuli during everyday activities in urban environments which will affect the general level of cortisol of humans (Li, 2019, p. 44).

Shinrin-yoku is based on nomothetic measures of physiological factors such as cortisol level, blood pressure, sleep, immune system etc. This approach might be due to the fact that Li has a background with biological and medical expertise and education, and therefore chooses to deal with the human psyche from a biological perspective. Reduction in cortisol level after the forest bathing practice is a nomothetic measurement and carries most of the explanatory force of Shinrin-yoku as a natural miracle cure to psychological health and well-being. Meanwhile one might question this narrow and simplified understanding of nature's impact on psychological well-being. Psychological well-being cannot be limited to being mere biological processes, why researchers could benefit from applying qualitative and experience-based approaches along with nomothetic measurements.

Walton (2021) also emphasizes that nomothetic measurements should not stand alone, as these are not the sufficient truth behind the complexity of psychological well-being (Walton, 2021, p. 13). She criticizes Shinrin-yoku for being grounded in nomothetic measures, which almost makes the practice appear with exclusively positive psychological benefits. In her book she describes her own experience with the practice in Finland, where she almost felt forced to go through the healing effect of the practice in order to achieve well-being. She felt minimal space for her own feelings during the experience. There seems to be little space for the individual's lifeworld and feelings during the practice, and it is expected that the participants should be able to settle into the forest with all senses regardless of individual preferences, mood or thoughts (Walton, 2021, pp. 100f). Shinrin-yoku is presented as a guided walk through the forest, but maybe there might be danger that it for some individuals becomes a forced experience. Therefore subjective preferences could be valuable to take into account during research in order to further develop the practice.

Markwell & Gladwin (2020) takes the research further and includes participants' subjective experiences of the Shinrin-yoku practice, and in this way adds an essential dimension to the research in forest bathing. They wished to explore participants' subjective experiences with Shinrin-yoku during a two week program. They conducted three measurements: With Positive and Negative Affect Schedule they measured participants' current emotional experience, with Warwick-Edinburgh Mental Well-being Scale they measured participants' experience over the past 2 weeks retrospectively, and with Perceived Stress Scale they measured participants' perceived stress (Markwell & Gladwin, 2020, 248f). At the end of the 2 week program, they conducted an open-ended questionnaire in a semi structured interview to explore the participants' experiences. Participants described how their senses were more present during the session. They found that participants felt peace, quiet and calm, relaxed and enhanced well-being. They felt that the sessions gave them a clear head, time out and focus. In the end they felt that time was flying and that they had the desire to continue (Markwell & Gladwin, 2020, p. 150f). With this subjective account this study supports Li's nomothetic measures. It succeeds in showing that concentrated embodied and sensory presence in nature might have an important impact on reduced perceived stress but also fosters experiences of deep immersion and connection with nature fostering tranquility and self-reflection (Markwell & Gladwin, 2020).

3.3 Nature and development

Richard Louv was one of the first researchers on nature and well-being to focus on developmental factors and consequences of being disconnected from nature. He presented his theory of Nature Deficit Disorder in his book *The Last Child in the Woods* (2013). *Nature Deficit Disorder* (NDD) sheds light on the increasing separation between children and nature, and which consequences this might have. According to Louv, NDD is not an official diagnosis, but rather an environmental discourse that addresses child-nature alienation promoting activism and reformation (Driessnack, 2009, p. 73). According to NDD, children who spend less time in nature may develop both physical and psychological problems. There might be a risk to children's concept and perception of community, self-confidence and the ability to discern both danger and beauty (Louv, 2013, p. 212). Louv draws upon widely supported claims when he argues that contact with nature is therapeutic, relaxing, restorative, emotionally as well

as physically beneficial and he encourages adults to connect with nature alongside their children (Dickinson, 2013, p. 4). Based on ART, Louv argues that nature in particular may be useful as a therapy for ADHD/ADD - he calls it "nature's Ritalin" (Louv, 2013, pp. 174, 184;). He presumes that nature's restorative facilities cognitively support children with ADHD/ADD (Louv, 2013, p. 179).

Louv draws upon the developmental psychologist Erik Erikson who describes that children need to establish a self beyond adult control nearby home in hideouts, build forts or other special places. Erikson's developmental theory is also incorporated in Ryff's understanding of psychological well-being as an important factor in personal growth across lifespan (Ryff, 1995, p. 99). Additionally Kellert describes how experiencing nearby nature is significant for children's cognitive maturation including developing abilities of analysis, synthesis and evaluation. He argues that no other place than nature offers this degree of consistent but varied chance for critical thinking and problem solving (Louv, 2013, p. 213). Exploration in natural environments nurture and encourage focused learning and reflective practice, curiosity and engagement in children (Pretty et al., 2009).

In a study Driessnack (2009) investigated nature's impact on children's cognitive functions and find, that nature particularly might impact children's executive functions (Dreissnack, 2009, p. 73). Executive functions are broadly defined as cognitive functions that allow one to regulate behavior and enable one to complete a cognitive task without being distracted. This gives one the opportunity to complete tasks, follow rules as well as plan and complete long-term goals (Felver, 2013, p. 945). According to Diamond (2013) executive functions are critical for many skills that are important for success in modern society (Diamond, 2013, p. 155). In pre-school children work with keeping focus, being aware of irrelevant or inappropriate responses and thinking flexible. Development of these abilities are significant for further development and maturation of prefrontal cortex and executive functions. Children develop the ability to manage complex cognitive tasks, including working memory, inhibition, planning, flexible use of strategies, self-awareness and self-correcting behavior (Berk, 2013, p. 282). Additionally research shows that play and motorically activities during playtime are significant for children's development, including executive functions (Shaheen, 2014, pp. 182-186). Based on this point nature can be seen as a suitable environment facilitating children's play. In nature children to a greater extent are able to play with higher motorically activity, unfold creatively and have enhanced chances for critical thinking and problem solving, compared to indoor play or play with technology (Louv, 2013).

In accordance with ART it can be argued that nature plays a significant role in both restoring cognition including working memory, attentional control and cognitive flexibility but also in developing children's cognitive functions when they are allowed to move and play in nature. This gives a further perspective that nature is shown to have a positive influence on executive functions that are essential for children's psychological development in a modern society.

3.3.1 Limitations

There is a general agreement that there exists a disconnection and alienation between children and nature, and that it is problematic that too many children are cut off from experiences in nature (Dickinson, 2013, p. 3f). There is clear evidence that children's disconnection from nature might have detrimental impacts on physical and mental health, but there is no clear consensus on how much nature contact is necessary for children or how to attain it. The NDD concept is a useful framework for discussion about the importance of nature exposure, but it should not be uncritically accepted as a scientific basis for policy solutions or a comprehensive answer to the problem of nature-deficit. NDD has been widely criticized by researchers, clinicians, and educators who see it as an oversimplification of the complex relationship between children and nature. Some have argued that the term itself is problematic, as it pathologizes modern children and implies a singular cause for children's psychological problems (Dickinson, 2013, p. 1f). Dickinson (2013) argues that the lack of cultural examination might cause a problematic environmental discourse that can obscure and mistreat the problem (Dickinson, 2013, p. 1f). Just like Cronon Dickinson (2013) is criticizing Louv for idealizing nature experiences through white middle-upper class peoples narratives of childhood memories in nature and automatically takes on a race/class politics (Dickinson, 2013, p. 7f). Dickinson (2013) argues that spending time in nature requires money, time, transportation and can be difficult for some children to access (Dickinson, 2013, p. 8). Thus NDD can be criticized for its focus on a "disorder" and as a

result create a stigma which might have negative implications for individuals who are unable to access nature or spend time in nature.

Dickson warns against a focus on the cure to NDD as an outward entity "nature". Instead Dickinson emphasizes that a path of an inward self-assessment "with nature" and meaningful experiences in nature is the key to solving social and environmental problems of which nature-deficit disorder is a symptom. Dickinson argues that we need to recognize that there is a fall-from-nature narrative that is rather inaccurate and incomplete (Dickson, 2013, p. 15f).

3.4 Nature connectedness

Research evidently shows that psychological well-being is strongly associated with a sense of connectedness with nature (Cervinka et al., 2012; Howell et al., 2011). Nature connectedness is a measurable psychological construct that captures the relationship between people and nature as well as an individual's sense of relationship with the natural world and how this impacts their psychological well-being (Cervinka et al., 2012, p. 1145). The theory goes further than the biophilia hypothesis and emphasizes that an individual's subjective connection to nature varies along a continuum and encompasses individual differences that can be thought of as traits relatively stable across time and situations (Capaldi et al., 2014, p. 2; Mayer & Frantz, 2004). Although his theoretical foundation is based on the biophilia hypothesis, Kellert argues that culture and subjective experiences in nature can be constitutive of an individual's connection to nature, which also emphasizes the subjective character of nature connection. (Kellert, 1997, p. 46).

The theory aims to bring the less research oriented ecopsychology into the research oriented realm of psychology, in order to develop a fruitful collaboration of empirical approaches and ecopsychological perspectives. The substantial empirical work might add substance, persuasiveness and clarity to the arguments made by ecopsychologists that aspects of modern lifestyles relate to our feeling of connection to nature, and that this connection impacts psychological well-being (Mayer & Frantz, 2004, p. 513).

Nature connectedness includes three commonly used measures in research: The Connectedness to Nature Scale (CNS), the Nature Relatedness (NR) scale, and the Inclusion of Nature with Self (INS) (Pritchard et al., 2020, p. 1148). The scales are used to measure individual perceived connection to nature, and on behalf of research emphasizes the importance of connectedness with nature for psychological well-being. Nature connectedness should be understood beyond simply being in contact with nature but rather as an integration of nature into the self-concept (Brymer et al., 2021, p. 405). Schultz (2002) has discussed connectedness to nature more directly as "the extent to which an individual includes nature within his/hers cognitive representation of self." (Schultz 2002, p. 67).

In a meta-analysis Capaldi, Dopko and Zelenski (2014) explore the relationship between nature connectedness and happiness. Based on 30 samples they find a significant effect suggesting that individuals who feel highly connected to nature to greater extent experience happiness. They argue that those who are more connected to nature tend to experience more vitality, positive affect and life satisfaction compared to those who are less connected to nature (Capaldi et al., 2014, p. 1). Nisbet et al. (2011) explores nature relatedness as a contributor to well-being, where well-being was assessed in a variety of ways (emotional experience, sense of satisfaction, vitality and eudaimonic aspects of psychological well-being). Nature relatedness is correlated with positive affect, vitality, autonomy, personal growth, meaning and life satisfaction and conversely unrelated with negative affect (Nisbet et al., 2011, p. 316).

Pritchard et al. (2020) seeks to explore the role of nature connectedness in eudaimonic well-being, and hypothesize that this relation is stronger than with hedonic well-being (Pritchard et al., 2020, p. 1145). They found that NC was associated with all aspects of psychological well-being, where especially personal growth appeared to have a significantly stronger relationship with NC. This finding emphasizes that a strong relationship with nature may have an important role in all aspects of psychological well-being but especially personal growth (Prichard et al., 2020, p. 1161). According to Ryff, personal growth is one of the nearest subscales to eudaimonic well-being because it is concerned with self-realization as well as Maslow's concept of self-actualization and self-transcendence (Ryff & Singer, 2008; Prichard et al., 2020, p. 1161).

Positive relations is an aspect of psychological well-being, and not many studies are accounting for this aspect. But there are studies of nature connectedness and social well-being showing that there is a positive connection between these two aspects

(Howell et al., 2011). Howell et al., (2011) study whether nature connectedness is associated with a comprehensive conceptualization of well-being including measures of emotional, psychological and social well-being (Howell et al., 2011, p. 167). Emotional well-being is assessed by ratings of positive affect and overall life satisfaction, psychological well-being is assessed by ratings of psychological well-being including self-acceptance, positive relations, personal growth, purpose in life, environmental mastery, and autonomy, and social well-being is assessed by ratings of social acceptance, social actualization, social contribution, social coherence, and social integration (Howell et a., 2011, p. 167). They find that nature connectedness is correlated positively with both psychological well-being and social well-being (Howell et al., 2011, p. 168). This finding suggests that psychological well-being, and especially positive relations, are associated with being closely connected to nature. And that people who are connected to nature might experience flourishing in their public, social lives (Howell et al., 2011, p. 170). Other findings also suggest that contact with nature has a positive effect on social well-being and additionally on prosocial behavior e.g. how people behave towards each other (Ballew & Omoto, 2018, p. 33; Weinstein et al., 2009).

3.5 Transcendence and psychological well-being

The eudaimonic approach to well-being emphasizes that some aspects of psychological well-being are associated with self-actualization and self-transcendence (Ryff & Singer, 2008). Transcendent experiences in nature are recognized as psychologically and important when studying nature's impact on psychological well-being (Kaplan & Talbot, 1983, p. 195; Davis & Canty, 2013; Brymer et al., 2021).

Davis and Canty (2013) believe that ecopsychology has an underlying transpersonal aspect that is very important in order to understand the significance of the humannature relation. They believe that humans and nature are a part of a transpersonal whole, and deepening this relation might promote self-transcendence, self-realization and optimal human growth (Davis & Canty, 2013, p. 598). Fredrickson & Anderson (1999) as well believe that spirituality, as being the individual's inner experience beyond present connect, is the key to understanding the emotions and meanings that exist between human and nature (Fredrickson & Anderson, 1999; Bethelmy & Correliza, 2019. p. 1). Various researchers have recognized that the human-nature relationship is associated with significant spiritual experiences that are characterized by feelings of transcendence (Fredrickson & Anderson, 1999; Bethelmy & Corraliza, 2019; Trugwell et al., 2014; Williams & Harvey, 2001). *Transcendence* describes in abstract sense experiences beyond a normal or human consciousness, often the divine or nature is ascribed transcendence in relation to the reality experienced by humans (Oxford Learner's Dictionary, 2022). A transcendent experience is characterized by moments of extreme happiness, feelings of lightness and freedom, a sense of total absorption, timelessness and harmony with the whole world (Williams & Harvey, 2001, p. 249; Fredrickson & Anderson, 1999; Ballew & Omoto, 2018, p. 31f). Brymer et al. (2021) argue that an affordance for psychological well-being consists of spiritual experiences from an embodied absorbed immersion in nature (Brymer et al., 2021, p. 396).

Across cultures transcendent experiences have a special association with nature, and natural environments are widely recognized as triggers of transcendent experiences (Maslow, 1962, p. 10; Bethelmy & Corraliza, 2019; Hoffman, & Muramoto, 2007; McDonald et al., 2009). Influential researchers of transcendent experiences, including Abraham Maslow, have observed that natural environments are closely related to transcendent experiences (Williams & Harvey, 2001, p. 249). Maslow's study on peak experiences offers one perspective to understand the deep and powerful experiences that humans can have while being in nature. *Peak experiences* are moments characterized by sharpened senses, clarity of thoughts, feelings of pure happiness without feeling any doubt, inhibition, tension and weakness. Peak experiences are strongly associated with moments of hedonic well-being, but also involve higher dimensions of being, a sense of cohesion and belongingness, meaningful insight, clarity and authentic knowledge of the self that can reveal new ways to deal with personal desires or challenges (Maslow, 1962, p. 9; Naor and Mayseless, 2020, p. 876f).

In a qualitative study McDonald et al. (2009) explore participants' peak experiences in nature. Participants' descriptions of their significant nature experiences were contained with important insight and extraordinary emotions that participants rarely experience in their everyday lives. They reported that during the peak experiences or shortly after they experienced a heightened awareness and deeper understanding of their life and self and therefore perceived them to be highly significant to their current life situation and future. Participants' descriptions of their peak experiences were often encapsulated in a mystical and metaphorical language, which might be a way for the individuals to metaphorically connect their lives with the nature, and in this sense the embodied interaction with nature providing them with a deeper understanding of their life (McDonald et al. 2009, p. 15f). In relation to this, climbing mountains often has been used in metaphors, as a means of transcending to a new experience or way of being, gaining new perspectives and overcoming personal challenges as the mounting peak is reached (Hébert, 2014, p. 33).

The transpersonal aspect of ecopsychology provides an understanding of some of the transcendent dimensions of experience in nature, which go beyond the more common emotional experiences such as joy. It is shown that the feeling of awe, which is associated with transcendence, is often experienced in nature. It is seen to have an importance for aspects of psychological being, especially insight and perspective into one's life as part of a larger meaningful connection with the natural world and beyond can lead to personal development (Silvia et al. 2015). Awe are a higher order experience and can be defined as "an emotional response to perceptually vast stimuli that overwhelm current mental structures, yet facilitate attempts as accommodation." (Shiota et al. 2007, p. 944). It might be possible to believe that the sense of awe, felt when being in close connection with nature, could lead to an expansion of individuals' psychological structures as well as an expanded self-awareness that might lead to personal growth. And that the significance that the connection to nature has on eudaimonic aspects as meaning and purpose in life is in accordance with the idea of personal growth during accommodation with new experiences in nature.

Transcendent nature experiences refer to the profound and meaningful connections that individuals can have with nature, where they feel extraordinary emotions and a sense of interconnectedness. These experiences involve a sense of going beyond one-self and can have significant impacts on psychological well-being. These significant experiences might provide individuals with strong positive emotions and insight in life facilitating a sense of meaning and personal growth. This is consistent with Fredrick-son's *Broaden-and-build theory of positive emotions* that emphasizes that positive emotions expands one's awareness and encourages new, exploratory thoughts and actions, which over time can build useful skills and psychological resources. When

individuals' mindset are broadened and personal resources are consequential built, positive emotions such as joy, happiness, love, contentment, over time can facilitate personal growth and flourish (Fredrickson, 2008, p. 451).

3.6 Positive-Negative dialectics in psychological well-being

Within the field of positive psychology, the majority of researchers have been focusing on the relation between psychological well-being and positive emotions and experiences. But there has been a development on this focus, where amongst others Lomas and Ivtzan (2016) discuss a second wave of positive psychology, in which they explore the positive-negative dialectics as an important aspect of psychological well-being (Lomas & Ivtzan, 2016). I therefore find it important to explore nature's impact on psychological well-being further by taking literature into account that goes beyond a focus on well-being as a distinction between positive and negative affect and experience (Ryff, 1989, p. 1969).

Lomas and Ivtzan (2016) argue that negative processes like anxiety in some cases paradoxically may be conducive to well-being and flourishing (Lomas and Ivtzan, 2016, p. 1753f). First, they argue that it can be difficult to categorize emotions as positive or negative because such an appraisal is contextually-dependent. Second, they argue that many emotion states are 'co-valanced' involving complex intertwined shades. Third, they argue that psychological well-being in itself fundamentally involves "inevitable dialectics between positive and negative aspects of living" (Ryff and Singer, 2003, according to Lomas & Ivtzan 2016, p. 1755). Keyes (2007) proposes that well-being and ill-being are two separate dimensions that function together. And well-being is not equal with an absence of ill-being, and distress is not necessarily incompatible with well-being (Lomas & Ivtzan, 2016). In a study on eudaimonic and hedonic happiness Delle Fave et al. (2011) found that harmony and balance of opposite elements into a whole was an important self-rated psychological component of happiness (Delle Fave et al., 2011, p. 199). King (2001) believes that flourishing is not about being invulnerable to the vicissitudes of life, but it is about appreciating and embracing the complex and ambivalent nature of life (King 2001, p. 53f, according to Lomas & Ivtzan, 2016, p. 1756). This emphasizes that well-being fundamentally involves a 'dynamic harmonization' of dichotomous emotional states (Lomas & Ivtzan, 2016, p. 1755f).

According to Ulrich's evolutionary theory on biophobia humans sometimes view nature as a frightening environment which in some cases will make some people stay away from nature (Ulrich, 1993, p. 77). The theory indicates that human experiences in nature in fact might involve negative emotions, and that these in some ways might impact psychological well-being. Indeed wilderness holds naturally and harmonically dichotomies that can evoke different experiences and feelings in individuals. Wilderness can be beautiful and ugly, terrifying and pleasant, it can be experienced as harsh and complicated or simple, evoke fear and panic or tranquility and peace (Kaplan & Talbot, 1983, p. 163). The implicated theories primarily present different understandings of positive feelings and experiences in nature that have psychological benefits. But what about the emotionally and physically challenging experiences that might occur while being in nature? What impact do they have on psychological well-being?

In a phenomenological study Naor and Mayseless (2020) explore transformative experiences in nature. In their study, participants describe hardship and dissonance as an integral to their significant nature experience, which involved both negative and positive emotionally laden experiences. Through their complex experiences of emotional interplay, the participants metaphorically connect their lives with nature and in this sense the embodied interaction with nature provides them with a deeper understanding of themselves and their life. As a result the participants become aware of their limitations and challenges and many of them try to embed the regained insight and understanding of themselves in an attempt to change or solve their personal issues. Naor & Mayseless (2021) suggest that nature can be considered as a concrete and experiential environment that can reflect and embody lifelong significant and challenging personal issues (Naor & Mayseless, 2021, p. 874). This duality is in accordance with current conceptions with positive psychology emphasizing that flourishing and personal growth involve a complex and dynamic interplay of the positive and negative (Lomas & Ivtzan, 2016; Ryff, 1989).

Similarly Brymer et al. (2021) argue that experiences enhancing well-being not only are limited to positive emotions and experiences. In their study they find that an integration of experiences of discomfort and fear in nature might enhance well-being, because the participants learn to become comfortable with challenging emotions and overcome personal limitations (Brymer et al. 2021, p. 406f). Even though the
confrontation can evoke dissonance in the individuals. This dissonance can be understood as a striving or motivation to find balance in emotional issues or cope with personal issues (Naor & Mayseless, 2020, p. 881).

It is arguable that the above mentioned might have an important impact on various aspects of psychological well-being including enhanced self-acceptance as a result of an ongoing reflection upon one's strengths and limitations and an accept of these, as well as increase in autonomy due to a desire for and the courage to challenge established beliefs about oneself and view of the world. This as well can develop a sense of purpose as a result of a clear understanding of desires and wishes with a certain degree of directness and intentionality. Personal growth as well includes appreciating and embracing the complex and ambivalent experiences of life.

In a qualitative study of lived wilderness experiences Fredrickson and Anderson (1999) find that despite physical challenges during participants reported wilderness experiences many described experiences of reawakening to their physical capabilities and a renewed sense of their bodies. Several participants found that by overcoming the uncertainties they had about their abilities, they experienced being more fully engaged in the challenges they met and they were left with a sense of deep accomplishment, which enhanced their perceived self-acceptance (Fredrickson & Anderson, 1999, p. 33). This emphasizes that tough and demanding experiences in wilderness and hence a desire to master the environment might contribute to aspects of psychological wellbeing including mastery of the environment and as a result of that feelings of confidence, autonomy and personal growth emerge.

Kaplan and Talbot (1983) argue that outdoor programs and wilderness experiences can make individuals experience greater sense of competence, relatedness and participation as well as less helplessness. This may be connected with an increased sense of environmental mastery. According to Ryff, active participation in and mastery of a given environment are important ingredients in positive psychological functioning and result in feelings of confidence (Ryff, 1989, p. 1071). However, according to Kaplan and Talbot (1983), this environmental mastery should not be confused with increased sense of control, as they in their wilderness study find, that rather than struggle to control the wilderness, participants rather adapt and perceive the wilderness as safe as long as they respond appropriately to the environment (Kaplan & Talbot, 1983, p. 194). From this perspective psychological and physical adjustment and a sense of mastery of the surroundings plays an important role while being in nature in order to feel comfortable, safe and in this way feeling autonomous.

In other research areas there are examples of research on nature based interventions with veterans with post-traumatic stress. Research shows that a gradual exposure to perceived threatening and anxious experiences improve the veterans' well-being, and they become more self-confident during stressful situations (Westlund, 2015; Bettmann et al., 2019). In a longitudinal study of a 1-year nature-based intervention, Gelkoft et al. (2013) found that the veterans learned to cope with feelings and thoughts in challenging situations when they were gradually exposed to stressful and anxious situations. Hereby they experienced an increase in perceived control over their illness which enhanced their overall well-being (Gelkopf et al., 2013). These studies show that there is evidence that challenging and sometimes negative experiences in nature can facilitate important aspects of psychological well-being, even in people with serious psychological problems.

3.7 Synthesis of theories

This section will include a synthesis of the applied theories in order to clarify how they account for nature's impact on psychological well-being differently. The synthesis involves an integration of the various theoretical perspectives and viewpoints in order to draw connections between the theories and present a comprehensive and nuanced understanding of the research question.

3.7.1 Environmental focused theories

Throughout the literature on nature and human well-being ART, SRT and NDD is presented as evidence that humans have a biologically, cognitive and developmental connection to nature. The three theories support the biophilia hypothesis about humans having an innate need to be in nature, as they establish that humans are attracted to nature's emotionally comfortable, restoring and stress relieving capacities. The three theories constitute a trinity explaining that people who live in urbanized environments in particular are missing out on the psychological benefits that especially those people are in need of. These theories have been able to provide cognitive, biological and evolutionary evidence that modern humans are able to utilize nature in order to improve well-being. This improved well-being can explicitly be seen in terms of increased positive affect and and improve cognitive functioning, but might to some extent also impact other aspects of psychological well-being (Kaplan & Talbot, 1983, pp. 169f, 178).

Based on ART and SRT, NDD gives a theoretical perspective on the cognitive consequences that the missing connection with nature might have on especially children. They emphasize that there should be a greater focus on children's involvement in nature as an important part of their psychological development. NDD emphasizes that children, and especially children with ADHD/ADD, will benefit from having free access to nature in their everyday lives. In general being in nature will be beneficial for human's cognitive capacity, that is necessary to be able to function in a modern society. Additionally it is assumed that an early and nurtured relationship with nature coconstitute children's nature connectedness and thereby gives oppotunities for enhanced psychological well-being and environmental attitudes (Collado, Staats & Corraliza, 2013, p. 41; Collado, Staats, Corraliza & Hartig, 2017, p. 134f).

In their theoretical interpretations, ART and SRT differ in important ways. The Kaplans' framework deals with restoration from directed attention fatigue, where Ulrich in contrast focuses on psychophysiological restoration from stress (Hartig, 1993, p. 30). Ulrich's model emphasizes that human's initial response to nature is affective rather than cognitive, as the Kaplans' framework assumes (Hartig et al., 1991, p. 6). Stress as well is understood differently, as ART understands stress in terms of directed attention fatigue from everyday tasks, and Ulrich understands stress as a biologically response to dangerous stimuli (Kaplan & Kaplan, 1989, p. 178f). Ulrich is more concerned with emotional, mental and physiological components of responses to taxing or threatening stimuli, whereas Kaplan is concerned with attention-based deficits arising from taxing everyday activities (Hartig et al., 1991, p. 6). In this case SRT assumes that restoration derives from reduction in arousal rather than replenishment of attentional capacity (Hartig et al., 1991, p. 6). So to speak there exists a disagreement on whether the cognitive process or biological change first appears in the meeting with nature. However, it can be argued that the two theories do not necessarily exclude each other but instead on a coexisting basis both contribute to understanding why nature can be beneficial for humans. Whether it is involuntary attention or stress relieving sensory impressions of nature that are fundamental for nature's positive impact on well-being are of less importance in this thesis.

Ulrich and Kaplan have in common that they work within an environmental psychological perspective, and mainly work with the ontology that nature's impact on wellbeing is a reality that can be measured and defined as being a universally applicable phenomenon. They strive to find evidence that nature is biologically and cognitively beneficial for human well-being. Ulrich with a focus on an evolutionary and biological understanding of the positive impact that nature has on stress and Kaplan with a cognitive focus on attention restoration in order to define established guidelines for a restorative environment. The argument for applying these theories is primarily based on their influential work in detecting the positive reactions that people experience in contact with nature. Kaplan goes beyond this and defines specific characteristics that an environment must include before it can be defined as a restorative environment.

3.7.2 Nature connectedness and transcendence

Nature connectedness refers to an individual's sense of connection with and appreciation for the natural world. It is the emotional and cognitive bond that people experience with nature. People who have a high level of nature connectedness often have a deep appreciation for the beauty and diversity of the natural world. They may feel a sense of peace and calm when surrounded by nature, and they may prioritize spending time in natural settings. Nature connectedness offers a more research and practice oriented approach to ecopsychology. In contrast to the environmental focused theories, the theory explicitly emphasizes that a subjective focus on individuals' connections with nature is important, and that a singular focus on biological and cognitive impacts from nature is limited in order to understand nature's impact on psychological well-being. Research shows that nature connectedness is associated with a variety of positive outcomes for individuals' psychological well-being such as enhanced positive affect, vitality, autonomy, personal growth, meaning and life satisfaction, as well as positive relation and prosocial behavior (Nisbet et al., 2011, p. 316). In relation to development of nature connectedness, Kellert (1997) emphasizes that various factors can influence an individual's nature connectedness, including personal experiences in nature, cultural and societal norms (Kellert, 1997, p. 46). NDD's emphasis on children's increased access to nature and supporting them in getting out in nature becomes even more important with Kellert's argument.

Additionally a transpersonal account was made in order to go beyond the more commonly identified emotions in nature experiences, and explore psychological well-being in terms of how spiritual and transcendent experiences in nature might have an impact on eudaimonic aspects. Significant experiences in nature are often said to trigger feelings of cohesion, belongingness and meaningful insight in one's own life (Maslow, 1962). Ecopsychologists believe that a deep connection with nature might promote self-transcendence, self-realization and optimal human growth, which according to Ryff & Singer is closely related to human psychological flourishing and well-being (Ryan & Deci, 2001, p. 146). If an individual is high in nature connectedness there seems to be an increased possibility of experiencing transcendence in the meeting with nature. These transcendent experiences to great extent connect the individuals with self-realization and self-actualization that can facilitate personal growth (Tam, 2013). This is not to say that individuals with lower nature connectedness cannot experience transcendent experiences.

In relation to the last point, every human can experience what Kaplan terms soft fascination. Soft fascination is when one's attention is effortlessly pointed towards smooth and calming stimuli such as the sunrise, whistling trees or the lapping waves. Soft fascination provides the opportunity to reflect and introspect (Kaplan & Talbot, 1983, pp. 176-179). These experiences in nature can be understood closely to transcendent feelings, including peak experiences. Peak experiences are moments of extreme states of consciousness and increased sensory acuity that arises from the sensory awareness (Naor et al., 2020, p. 870). The rich and simple sensory information from the natural environment triggers a sense of being absorbed in the surrounding with all senses which engages the present-centered awareness of being immersed in the moment (Brymer et al., 2021). I will therefore argue that transcendent experiences, in addition to promoting individual insight and deep connection with the surroundings, might also relieve important cognitive functions such as directed attention. This cognitive perception that is unique to wilderness experiences can therefore be understood as an important aspect of effective cognitive functioning, self-awareness and personal growth (Naor & Mayseless, 2020, p. 866). But according to Maslow such experiences are purely subjective and occur rather spontaneously. These experiences cannot as such be resolved into characteristics, but rather one can say that they often are seen to be triggered in nature (Maslow, 1962, p. 12).

Transcendent experiences are often private and spontaneous experiences, but to some extent Shinrin-yoku can be seen as a practice that can facilitate transcendent experiences in nature. The very aim of Shinrin-yoku is to guide the participants through a multisensory immersion with nature fostering feelings of serenity and deep connections with nature and oneself. This experience promotes heightened sensory awareness and an embodied absorption in the surroundings that might create a deep experience of harmony and becoming one with the natural world (Fredrickson & Anderson, 1999; Brymer et al., 2021).

3.7.3 A missing account

When reviewing the literature I found it interesting that the theories mainly focus on nature experiences as positive experiences, and that these positive experiences generally are taken as the only reason that nature has beneficial impacts on human psychological well-being. But in fact challenging or even negative psychological and physical experiences in nature can be assumed to have a great impact on various aspects of psychological well-being. Namely Lomas & Ivtzan (2016) can be credited for their argument that eudaimonic well-being does not simply involve positive emotions and pleasant experiences, but rather involves a dynamic harmonization of dichotomous emotional states. There are no well-defined theories on nature and psychological wellbeing with an explicit focus on this aspect. In fact SRT and Ulrich's theory on biophobia directly opposes this assumption, and conflicts with the argument that stressful and difficult environments can challenge individuals in a way so they experience increased environmental mastery, autonomy and on behalf of that personal growth. Therefore different empirical studies were taken into account in order to explore this aspect better.

Negative experiences in nature can offer an opportunity for individuals to face their fears and overcome anxieties, even though it can evoke dissonance. Engaging in activities that may initially be uncomfortable or intimidating can help individuals build confidence and develop courage, autonomy and environmental mastery. When faced

with these challenges or difficulties in nature individuals may learn to adapt and solve practical or personal issues. These experiences can strengthen an individual's sense of environmental mastery, autonomy, self-acceptance and thereby facilitate personal growth. Challenging situations in nature might also force the individual to self-reflect to reassess capabilities and values, which can result in a deeper understanding of oneself and give rise to personal development. Additionally, negative experiences can strengthen individuals' connection with nature and foster a sense of awe, respect and humility. Facing challenges and adversities can deepen one's understanding of the power and unpredictability of nature, leading to a greater sense of connectedness and a desire to protect and appreciate it. The experience of discomfort or danger in nature, may also develop a deeper sense of gratitude and a heightened appreciation for the beauty, calmness, and therapeutic effects that nature also can offer (Naor & Mayseless, 2021; Fredrickson & Anderson, 1999).

3.8 Partial conclusion

The theories offer different perspectives and explanations of nature's impact on psychological well-being. Explanations that extend from the biological and cognitive impact, which can be measured and defined as universal and general influences on hedonic aspects of well-being, to understanding the human relationship with nature as a subjective entity that can vary from person to person and have a great influence on several eudaimonic aspects of well-being. With a perspective on individuals' subjective encounter with nature, it can also be seen that decidedly mystical and spiritual experiences can arise that can create transcendent experiences with important significance for the individual's uplifted actualized well-being and flourishing. These significant experiences can be seen to emerge from the vast embodied and multisensory stimuli from nature, which satisfy soft fascination. Furthermore, nature experiences should not only be understood on a level of positive emotions and experiences, but rather on a continuum of the positive and negative which can be assumed to have a great significance for many aspects of eudaimonic well-being.

Differences between the theories do not exclude them from each other, but add different dimensions of explanation, which together provide a greater overall understanding. Since psychological well-being is a complex and multifaceted phenomenon, it also requires a holistic theoretical understanding. This is also the cornerstone of critical realism, that reality can be understood as existing on different ontological layers. The theoretically eclectic approach has therefore shown its full advantage with its main purpose of applying different and opposing psychological perspectives in a critically connected understanding of the problem formulation.

4.0 Discussion

Based on the above review and synthesis of applied theory, it is clear that there are several different ways in which one can view human's relationship with nature and its impact on psychological well-being. Even though this interconnection of various theories provides a comprehensive view of the psychological problem. However, in order to reach an overall understanding it is relevant to discuss essential ontological and epistemological implications that have emerged throughout the assignment. Thus, the following implication is up for discussion: *Different conceptualizations and operationalization of well-being*, *Different understanding of nature*, *Ontological differences in understanding the human-nature relationship*, and *Epistemological implications*.

4.1 Different conceptualizations and operationalizations of well-being

In the introductory under *1.1.2 Psychological well-being* the complexity and various understandings of well-being was established. The thesis mainly explores the multidimensional concept of psychological well-being which is closely associated with eudaimonic well-being. Psychological well-being is a multifaceted concept consisting of various interconnected aspects. This multifaceted approach to well-being gives rise to a broad and more comprehensive understanding of the field by applying a broader theoretical and empirical field. Even though this choice was made it is acknowledged that there exists other theoretical conceptualizations of well-being with relevance for the field. It is also worth noting that because of the complexity of psychological wellbeing it is often assessed by using multiple measures or as a combination of different conceptualizations. Some of the literature included have applied multiple measures in order to capture the many plausible direct impacts of nature on health and well-Being (Heilmayer & Miller, 2021, p. 30; Cervinka et al., 2011, p. 382; Howell et al., 2011). Different concepts sometimes call for different methods of operationalization, which is why the literature ends up studying very different concepts of well-being in rather

different ways. It can be discussed whether this can have an impact on the overall understanding of the research question.

Both ART and SRT operationalize psychological well-being based on the degree of stress and cognitive functions. ART and SRT have been applied in order to explain some of the most important affective and cognitive benefits of nature, but fail to identify other important mechanisms through which nature has a positive impact on overall psychological well-being. When environmental studies like ART and SRT focus their research on subjective or psychological well-being, they mainly support a positive relationship between nature enhanced cognitive function and positive emotions (Olivos & Clayton, 2017, p. 114f). These theories do not explicitly explore other aspects of psychological well-being, but account for important aspects of mental health associated with psychological well-being, such as positive emotions, decreased stress, restoration in cognitive aspects that might improve various aspects of psychological wellbeing. According to Fredricksons' Broaden-and-build theory of positive emotions, positive emotions broaden individuals' mindsets and build consequential personal resources, stable positive emotional states, and over time individuals transform for the better that will enable them to survive, thrive and even flourish (Fredrickson, 2008, p. 451). This theory provides one explanation for why enhanced positive emotions from contact with nature over a longer time can result in enhanced psychological well-being including personal growth and flourish. Based on Fredrickson's theory, this means that continuous contact with nature will create a greater ratio of positive emotions in the individual, which implicitly can facilitate enhanced eudaimonic well-being.

NDD accounts for how especially children might improve cognitively, including executive functions, through enhanced contact with nature. Also this theory focuses their research on well-being through a cognitive lens. Despite the theory's narrow approach to well-being they evidently show that a greater access to nature can create a solid fundament for focused learning, reflective practice and curiosity as well as engagement, autonomy, accomplishment, personal growth and enhanced positive emotions (Louv, 2013; Pretty et al., 2009; Markwell & Gladwin, 2020).

In other studies where well-being is more directly studied, it varies whether the researchers attend a hedonic or eudaimonic view on well-being. Research on hedonic well-being mainly focuses on whether individuals experience positive or negative emotions and life satisfaction which can be operationalized in different ways.

Eudaimonic well-being as Ryff's concept of psychological well-being offers a multifaceted understanding of well-being which includes various aspects of human life and psyche, that can outline a more dynamic and complex understanding of how an individual experiences psychological well-being (Ryan & Deci, 2001, p. 143). According to Huta and Ryan (2010) hedonic and eudaimonic well-being tend to be positively correlated and influence one another which implies that they are distinct and overlapping concepts (Huta & Ryan, 2010). Walton (2021) emphasizes that practitioners in the field of nature and well-being tend to understand well-being from both perspectives as something that is personal, spiritual and social all at once (Walton, 2021, p. 13).

Since I have chosen to focus my research question on psychological well-being, I will also argue that subjective well-being and related assessments cannot accommodate all aspects of it. Especially with the aspect of a dialectical relationship between positive and negative emotion and experience, which assumable is an important aspect of the importance of nature for psychological well-being. I found it difficult to reach a satisfactory explanatory foundation without applying theories based on a eudaimonic understanding of well-being. Despite that it is also important to note that different conceptualizations of well-being are not mutually exclusive and can overlap in various ways. And I am left with the feeling that, based on the various theoretical approaches, even though they varied in hedonic and eudaimonic focus on well-being, I have achieved a broad and adequate understanding of the influence nature can have on the various aspects of psychological well-being.

4.1.1 Variations in psychological well-being

Psychological well-being is subjective and individuals and cultures may prioritize and emphasize different aspects of well-being. It is not a simple contingent concept, and it is found to vary across personality, lifespan and culture. Ryff and colleagues examined the relations of personality traits to their multiple dimensions of psychological wellbeing and found that extraversion, conscientiousness, and low neuroticism were related to the eudaimonic dimensions of self-acceptance, mastery, and life purpose; openness to experience was linked to personal growth; agreeableness and extraversion were related to positive relationships; and low neuroticism was related to autonomy (Schmutte & Ryff, 1997, according to Ryan & Deci, 2001, p. 149f). They also investigated age differences and found that individual's conceptions of psychological wellbeing change with age, and that different components of well-being vary with age (Ryan & Deci, p. 158). According to Ryff, Psychological well-being is therefore defined as a lifespan theory taking into account that aspects of psychological well-being might differentiate with both age and personality.

Regarding cultural variations in well-being, Christopher (1999) argues that definitions of well-being are inherently culturally rooted and that their well-being can't be assessed value-free. He criticizes current western measures of well-being for constituting well-being from within the Western psychological tradition that are predicated on individualistic presuppositions. According to him all understandings of well-being are essentially subjective and based on individual judgements about what one perceives to imply well-being (Christopher, 1999, p. 77f). When conducting research on psychological well-being it is an important implication to what extent which factors, fostering individual well-being, can be aligned or made congruent with factors facilitating well-being on a collective level (Ryan & Deci, 2001, p. 161).

With this discussion in mind it is important when studying psychological well-being and nature experiences it is important to always include consideration on subjective aspects such as personality, age and culture.

4.2 Different understandings of nature

The ontological question of what *nature* is has important epistemological implications, because various definitions of nature have been used to establish the foundation for the truth about nature's impact on psychological well-being (Deremitt, 2002, p. 778). According to Raymond Williams, a literary critic, the word *nature* "[...] is perhaps the most complex in the [English] language". He distinguishes the meaning of *nature* from three specific but intertwined understandings (Deremitt, 2002, p. 777). The understanding of nature will be discussed through an essentialist and a social constructivist point of view in order to discuss the different theories' understanding of nature and its impact on psychological well-being either as an essentialist understanding of a real and biological phenomenon or as socially constructed.

(i) *The essential quality and character of something* (Williams, 1985, p. 156). Nature can be understood as the essence of something. For example "It is in our nature to seek nature when we are tired and stressed" refers to an essentialist understanding of a real and innate trait, that is unambiguous and unalterable. The essence can be explored and established through science. This understanding of nature is associated with the first layer of the critical realisms' deep ontology, that there exists a real essence of things. Conversely, a dominating argument towards essentialism is the social constructivist assumption that the reality is socially created and changeable. Social constructivism will argue that the nature of things is not an essential quality but rather is contingent and socially constructed (Deremitt, 2002, p. 777). In this sense it can be discussed whether humans have biophilic traits, or if nature's benefits on psychological wellbeing is simply a belief that stems from a consensual opinion among people.

(ii) *The inherent force which directs either the world or human beings or both* (Williams, 1985, p. 156). Nature is associated with the emergence of universal and scientifically predictable laws that are governing the behavior of everything. In this sense it can be discussed whether there is a biological or normative force that drives the natural properties or traits mentioned in (i). There is debate about whether or not nature is an essential necessity that makes us persistently feel the need to seek nature, or if it is socially constructed perceptions that maintain the idea that humans must seek nature for the purpose of enhanced psychological well-being (Deremitt, 2002, p. 777).

(iii) *The material world itself, taken as including or not including human beings* (Williams, 1985, p. 156). Nature can be understood as the external material world around us. In this sense nature is associated with reality and totality in contrast to imaginary or conceptualism. To this assumption there is a debate of whether civilized humans are placed within or outside the material world. This is illustrated by the example that native Americans often are represented as being a part of the wilderness, placed under natural laws, that coexist with a primitive existence. However, civilized people have developed a relationship with nature, in which they dominate and govern external natural environments. This can refer to human's use of nature as a useful therapeutic tool to enhance psychological well-being and health in a population. This notion points towards a dualism that parts the waters in relation to understanding human's relationship with nature. On one hand some hold the anthropocentric assumption that humans are separated from the natural world and alone possess intrinsic value. In contrast some believe that the individual is a part of nature, either with an ecocentric assumption that everything is connected, and therefore we cannot talk about individuals out of context (Goralnik & Nelson, 2012). Williams emphasizes that humans are a part of nature because we are co-creators of nature as a social construct (Deremitt, 2002, p. 778).

4.2.1 The human-nature relation as a biophilic trait or a social construct

William's first interpretation of nature deals with the discussion on whether it is important to examine the essence of biophilic tendencies in humans, as an essentialist approach would assume, or as social constructivism would assume it to be important to explore the contexts through which ontological understanding of the natural traits arise. Align with essentialism, the realism paradigm acknowledges the ontology that there exists a reality that is knowable for human knowledge, but that knowledge can only be accessed through scientific research (Howitt & Cramer, 2011, p. 300; Deremitt, 2002, p. 777). Social constructivism also acknowledges that there is a reality, but they focus on how this reality is constructed by human's knowledge, perception and experiences (Howitt & Cramer, 2011, p. 428; Deremitt, 2002, p. 777).

Social constructivism can explain how people's perception and knowledge of nature impacts their relationship with nature and in this sense also impacts their psychological well-being. Research on nature experiences across individuals provides us with thick descriptions that can facilitate an understanding of socially constructed understandings of nature and how individuals perceive nature to enhance aspects of psychological well-being. But on the other hand there are some limitations, because social constructivism makes it difficult to establish concrete evidence about nature's psychological benefits, other than describing that there is a social consensus that nature is good for us. Conversely, an essentialist approach to uncover the truth about nature's impact on psychological well-being apart from human experiences only provides a simplified and one-sided explanation. But it can also be argued that an essentialist approach provides unambiguous explanations that are easily understood and generalizable. (Flick, 2018, p. 5).

Theories like ART and SRT heavily rely on a more essentialist and realism perspective trying to uncover the truth about nature's impact on the human, as well as established and general characteristics of a beneficial natural environment. Although this scientific theoretical belief provides unambiguous propositions that are easily understood, these theories provide a simplified and unvarnished view of the nature behind the relationship between nature and human psychological well-being. If we assume that all human beings are biophilic by nature, and that all human beings will experience cognitive restoration, stress-relief and positive emotions in contact with nature, we will get a clear answer to the fact that nature has an impact on well-being. But only to a limited extent. In turn, we still need to find answers to why some people find it stress-relieving to hike in the forest or achieve great insight and purpose when climbing a mountain, while others experience the opposite in the same context. Psychological well-being is much more than just cognitive capacity, positive emotions and absence of stress. Subjective aspects of psychological well-being such as life purpose and personal growth can be somehow impossible to establish as being essential to all humans who are in contact with nature.

4.2.2. Nature's impact on humans as a biological force or a socially constructed idea

In order to better understand this complex, individual understanding, it may be worth looking at the ontology behind the construction and maintenance of the relationship between nature and human psychological well-being. According to Williams' second understanding of nature, the inherent force which directs the world and human beings can be understood as a complex and dynamic interplay of various normative factors such as social structures, cultural values, political discourses, as well as individual agency (Deremitt, 2002, p. 777). According to this understanding, the concept of nature is not only inherently given but is continuously created through cultural and social processes and discourses. Therefore the force of nature can be understood as a social construct influenced by the ideas, values, and beliefs of a particular culture and society. This perspective recognizes that different cultures and historical periods have different understandings and representations of nature and are constitutive both of how we use nature but also implicitly how nature impacts us. From this understanding it can be argued that the biological force alone can't define and explain human's relationship with nature and the impact it has on psychological well-being. On the other hand, it is

perhaps to a greater extent a matter of a normative force, through which individuals experience a relationship with nature in different ways, and thus socially constructed perceptions that maintain the idea that nature is beneficial for psychological well-being. In this sense it can be discussed if biological approaches to some extent become limited, as they cannot shed light on normative constructions and understandings of nature and how the individual person experiences this. This ontological understanding of human's relationship with nature presents an epistemological need to examine individual experiences of nature in order to assess how psychological benefits of nature are experienced by individuals and thus also collectively.

As an example of this, especially one historical and societal event has had a relevant impact on people's approach to nature and the social understanding of its impact on psychological well-being: The corona pandemic. In a Swedish study of outdoor recreation during the pandemic, Hansen, Beery, Fredman and Wolf-Watz (2023) found an increase in outdoor recreation in Sweden since the pandemic outbreak. In their regional study, more than 50% of the survey respondents stated that they visited nature more frequently during weekdays, and 45% also increased their time outdoors during weekends and holidays. During an open-ended questionnaire the respondent described that they felt more calm in nature and were able to escape the city. They experienced that nature offered a space free from stress and anxiety as well as recovery and re-energizing (Hansen et al., 2023, p. 1478-80). Health aspects may have gained more importance during the pandemic, which may have created a social consensus that nature provides health benefits. Respondents reported that their lifestyles changed, and that the outdoors became a part of this lifestyle. Many of them referred to this new lifestyle as a "hype" indicating a trend that has been initiated and fueled by social forces promoting the importance of nature and outdoor activities (Hansen et al., 2023, p. 1479f). Health aspects may have gained more importance during the pandemic, which may have created a social consensus that nature provides health benefits, and as a result outdoor recreation increased on a societal level.

Cronon also believes that humans' understanding of nature is socially constructed. He criticizes the fact that psychologically beneficial natural environments are often associated with wild and remote areas far away from urban civilization (Cronon, 1995). Various researchers as well take on this rather narrow understanding of nature

(Rossman & Ulehla, 1977), and as a consequence they lack to acknowledge existing individual nature preferences (Cronon, 1995; Walton, 2021). These normative understandings of what real nature is have epistemological implications, because they are constitutive of a consensus about which natural preferences people have collectively, but also which specific environment is most correct to explore in research. For instance, not to forget the title of this very thesis: *The human in Wilderness*. When I started to write this thesis I consistently thought that remote wilderness areas would be the most beneficial kind of nature. Some of the literature supported my belief, but I quickly found that other parts of the literature were very skeptical of this notion, and that nature cannot be narrowed down to one universal context. If one thinks that it is possible to narrow nature down to one simple context, one also risks to miss important individual and cultural variations in nature preferences, that might be important to understand how nature impacts individuals' psychological well-being (Walton, 2021, p. 4f).

As an example ART implies that there are specific nature contexts that involve better conditions for cognitive recovery than others. The theory emphasizes that a beneficial and restorative natural environment should be a remote wilderness area away from societies in order to facilitate the sense of being away. At the same time they argue that wilderness to a greater extent provides soft fascinating, characterized by silent sunrises, streaming rivers, mountain scenery, voluminous waterfalls or soft sounds of leaves in the breeze that requires being far away from society and permits a more reflective mode (Kaplan & Kaplan, 1989, p. 192). This general and established view on a restorative environment can be seen to co-created the social and general understanding and definition of a beneficial natural environment, and generally that "real" nature is wilderness. SRT and research on Shinrin-yoku are supporting this understanding, by establishing biological and essential evidence for nature's impact on stress. These theories support an understanding of nature as something separate from ourselves, that we can escape to in order to get away from our civilized environments that are unbeneficial for psychological well-being. In this sense nature becomes something that humans can use as a tool to enhance psychological well-being, rather than something that we are phenomenologically and emotionally a part of (David & Canty, 2013, p. 597). This notion refers to Williams' third and last understanding and the discussion about

whether humans are a part of nature or apart from it, which will be elaborated on in *4.3 Ontological differences in the understanding of the human-nature relationship*.

It is possible that a remote wilderness area to a greater extent can set the frame for restorative, calming and stress-relieving experiences promoting individuals with transcendent experiences and deep insight than a city park crowded with people and noise from the streets. It is also conceivable that wilderness to a greater extent can promote individuals with challenging nature experiences that can increase several aspects of eudaimonic well-being. Whether it is wilderness in itself that possesses these characteristics, or whether the social consensus has created the framework, is not clear. But in the end it is clear that preferences for nature have individual and cultural variations and therefore cannot be established as a universally applicable phenomenon.

In conclusion, the complex and multifaceted understanding of nature and its relation to humans can be understood at such very different scientific levels with various theoretical explanations, making it difficult to establish one explanation for nature's impact on psychological well-being. This gives rise to a further discussion on different ontological understandings of the human-nature relations within the different scientific approaches. This discussion might as well have epistemological implications.

4.3 Ontological differences in understanding the human-nature relationship

On behalf of William's third conceptualization of nature and critique of the dualization, the thesis includes theories that understand the ontology of the human-nature relationship differently. Mainly the differentiation of ecopsychology and environmental psychology. In recent years environmental psychologists and ecopsychologists in particular have been influenced by the differentiation between intrinsic and instrumental values of nature and between ecocentrism and anthropocentrism (Bragg, 1996, p. 94; Goralnik & Nelson, 2012, p. 145).

The ontological understanding of nature in ecopsychology is rooted in the belief that humans are an integral part of nature's ecological systems. It rejects the traditional dualistic view that humans are separate from and superior to nature, instead emphasizing the inherent interconnectedness between humans and the natural environment (Puhakka, 2014, p. 12). From an ontological perspective, ecopsychology recognizes that humans not only depend on nature for physical resources like food and water but also for psychological nourishment and well-being. Nature is seen as a source of inspiration, restoration, and solace, providing opportunities for emotional connections, sensory engagement, and spiritual experiences (Brymer et al., 2021, p. 396). It is the centrality of a phenomenological and sensorial connection with the natural world and the aim of integrating practices that are based on the healing potential of direct contact with nature (David & Canty, 2013, p. 597). Ecopsychology is distinguished from environmentally focused psychologies by its view of an insisting fundamental interconnection between human and nature (Davis & Canty, 2013, p. 603). Thus, ecopsychologists recognize the interconnectedness and interdependence of humans and the natural world, in which nature is an essential source of psychological wholeness and healing as a part of an ecocentric relationship (Goralnik & Nelson, 2012, p. 151). They acknowledge the intrinsic value of nature, emphasizing that every living being and ecosystem has its own inherent worth, independent of its usefulness to humans (Goralnik & Nelson, 2012, p. 145). This recognition challenges the anthropocentric worldview that has led to the exploitation and degradation of nature, and instead promotes a sense of responsibility and stewardship towards nature and its diverse ecosystems (Fisher, 2002, according to Hibbard, p. 31).

Environmental psychology is concerned with an understanding of how individuals perceive and use their natural surroundings. It involves an investigation of the relationship between individuals and their surroundings and how these impact on human behavior and well-being (Fleury-Bahi, Pol & Navarro, 2017, p. 1). Despite their belief in the biophilia hypothesis, it can be argued that the ontological understanding of nature in environmental psychology is rather dualistic, which views humans as separate from nature. This perspective sees activities in the natural environment as a resource to be intentionally and instrumentally utilized for its psychological benefits (Knopf, 1983, p. 211). This ontological understanding to some extent refers to anthropocentrism, which places humans at the center of the natural world and views nature's value in terms of its usefulness to humans. This perspective might lead to a utilitarian approach to nature, with a focus on maximizing human benefits (Goralnik & Nelson, 2012, p. 145). Theories such as SRT, ART and NDD in general understand nature as an environment withholding stress-relieving and restorative facilities that might be available and beneficial for human cognition. This intentional and instrumental use of nature is criticized by ecopsychologists as a crisis in which humans have separated themselves and their identities from the natural world and thereby preview the natural world as a material resource for human consumption (Davis & Canty, 2013, p. 599). In contrast, the ecopsychological theories such as nature connectedness views humans as interconnected with nature, acknowledging the interdependence between humans and the natural environment. This perspective emphasizes the intrinsic value of nature and recognizes the importance of an ecopsychological balance which may enhance aspects of both hedonic and eudaimonic well-being. Where environmental psychological theories head theories are on the natural environment as a tool for enhanced health and well-being, than something that is a part of the human being's existence and identity (Bragg, 1996, p. 94f; Goralnik & Nelson, 2012, p. 151).

Even though ecopsychology aims to ontologically separate themselves from other environmental focused psychologies, with their holistic and interrelated approach to the human-nature relation, critics think that the ecological self might risk to be lost and replaced with the growing focus on a formal and practical approach to nature as a therapeutic tool within ecopsychology (Davis & Canty, 2013, p. 600). But according to Davis and Canty (2013) nature-based mindful practices are ecopsychological when they are properly grounded in the fundamental interconnection of human consciousness and nature, outdoor adventure and survival therapy are considered ecopsychological when they promote a deeper bond between the learner and the natural world. As long as the ecopsychological values are kept in mind, therapeutic practices will be able to expand in creative, coherent and useful ways (Davis & Canty, 2013, p. 603).

The ontological difference between the essentialist nature and the constructed society form the basis for an ontological distinction between subjective understandings of the cultural and social world and the objective scientific knowledge of the natural world (Deremitt, 2002, p. 778). Researchers have found that some cultural groups are more likely to view humans as a part of nature (e.g. Menominee Native Americans) and to greater extent feel psychological closer to nature compared to other groups (e.g. European Americans) (e.g., Bang et al., 2007; Unsworth et al., 2012). This emphasizes that

cultural contexts and individual experiences might influence humans' evolved tendency to connect with nature, and that the human-nature relationship is not only based on an inborn inherent connection but is shaped and supported by culture and developmental factors. Nature connection theories advantageously point towards the humannature relationship on a subjective continuum. The biophilia hypothesis and cultural and individual variations in nature connectedness are not contradictory theories, but can together logically examine and explain the human-nature relationship (Capaldi et al., 2014, p. 2).

The notion about cultural and individual variations in nature connection to great extent supports Louv's claim about a greater focus on an increased connection between children and nature, and where a directed focus on social and cultural conditions in access to and contact with nature is important. Dickinson (2013) as well argues that children's contact with nature varies greatly by geography, culture and family background (Dickinson, 2013). For example Nancy Wells (2000) studies economic factors and nature's impact on child development. She argues that families with a high economy have better opportunities for living in areas with bigger and better natural environments (Wells, 2000, p. 776). In order to understand the consequences of this she conducted a longitudinal study, where 7-12 years old children move from areas with less nature to areas with more nature. After living in the nature area for a year the children showed significant cognitive improvements (Wells, 2000, p. 790). This study supports the idea that there are various important factors when studying an individual's connection with and access to nature. It can be discussed that societal factors have a great impact, and that people with better economies might have better access to nature and in that way benefit more from nature's positive effect. It is possible that an individual with a greater financial leeway to live with a big private garden might be more likely to feel relaxed than an individual who only has access to a crowded urban park (Walton, 2021, pp. 132, 159).

4.4 Epistemological implications

The theories that are applied to understand the impact that nature has on psychological well-being to some extent vary epistemologically from each other. It is therefore relevant to reflect on and discuss their different ways of accounting for the field of interest as well as identify and discuss possible epistemological challenges.

Within environmental psychology both SRT and ART have contributed to identifying the relevance of nature in psychological health and well-being as physiological positive feelings and cognitive functioning (Olivos & Clayton, 2017, p. 119f). In other words they have a focus on hedonic well-being rather than eudaimonic well-being. SRT mainly relies on nomothetic measures of affective aspects of psychological wellbeing, which includes biological measurements of blood pressure and cortisol. ART primarily focuses on participant performance on different cognitive tasks before and after they are exposed to nature stimuli in order to determine cognitive improvement that may occur as a result of being exposed to nature (Kaplan & Talbot, 1983, p. 169; Hartig et al., 1991, p. 8). ART aims to establish some general characteristics for what a natural environment should impact in order to be restorative. This traditional research in environmental psychology heavily relies upon numerical scales to express individuals' preference for a particular landscape. These studies have mainly focused on functional and visual components of a natural setting and have described various natural places merely in terms of their physical appearance (Kaplan & Kaplan, 1989; Ulrich, 1993). These preference scales are somewhat limited in capturing the more multi-faceted affective responses that individuals might have to particular landscapes (Fredrickson & Anderson, 1999, p. 22).

ART, SRT and NDD is mainly anchored in positivist and empiricist thinking, where a nomothetic approach constitutes the fundament for knowledge (Howitt & Cramer, 2011, p. 431). They consider and operationalize human psychological well-being instrumentally based on nomothetic measurements and observations through, biological measures of cortisol levels, blood pressure as well as cognitive tasks and survey questionnaires (Ulrich, 1993; Louv, 2013; Kaplan & Kaplan, 1989).

This is where environmental psychology differs epistemologically from ecopsychology with a quantitative research approach and a focus on biological and cognitivebehavioral psychology. The use of these theories are based on their influential work of the positive reactions humans experience in the encounter with nature as well as their strengths to evidently account for some positive benefits from nature. Combined with the biophilia hypothesis these theories have been able to provide cognitive, biological and evolutionary evidence that modern humans have an inherent need to be in contact with nature. Overall their applicability in relation to the thesis' research question have been limited to very specific biological and cognitive evidence, and they therefore only identify limited aspects of psychological well-being. Despite this, these approaches to reality lie within the transfactual layer of deep ontology and also constitute important aspects of the reality (Wad, 2012, p. 383).

In relation to my interest and understanding of psychological well-being as a complex concept that cannot be limited to cognitive or biological factors there seems to be missing some explanatory force in this empirically research approach. The goal with nomothetic research is to study a sufficient number of individuals in order to transfer this knowledge to reality aiming to identify physiological and cognitive patterns in experiences with nature across populations and establish general laws and psychological principles (Howitt & Cramer, 2011, p. 431). Based on this type of research the investigation of the relationship between nature and psychological well-being is limited to primarily dealing with well-being defined by positive affect, absence of stress and cognitive load. It can therefore be discussed if these theories on their own are adequate in describing the complex concept of well-being. But even though the theories mainly uncover nature's biological and cognitive benefits, it can be argued that this impact can improve aspects of psychological well-being in longer terms.

From a critical realistic approach, stress is not limited as a biological measurable entity, but also might be understood as a highly subjective entity. It is therefore naive to conclude that all individuals must have nature in their lives on the exact same terms. In that sense it can also be discussed if every individual living in cities feels overwhelmed and stressed by the urban environment without access to natural areas, and maybe they don't even like to be in nature. In this case it can be illogical to argue that they necessarily need nature as a stress-relieving medium. This gives rise to a valid point that psychological well-being must be considered as a subjective phenomenon, and that not all humans feel the psychological benefits of nature. At least not to the same degree as other individuals. In this case the application of SRT and ART can be criticized, because we on the basis of these theories generalize individuals' experiences of nature and claim that less stress and more cognitive surplus correspond to enhanced psychological well-being. In the light of ART it can also be discussed if what is experienced as soft fascination in nature by some individuals could be experienced as stress and anxiety provoking in other individuals. And that some general essentialist characteristics of a restorative environment are impossible to establish if we assume that nature experiences should be understood as subjective.

As stated there are several types of variables that may account for differences in the impact that nature has on psychological well-being, as well as differences in the strength or direction of this relation. Over the past years research on nature and psychological well-being have sustained an effort to address the possibility that there are systematic differences across individuals responses. Theories and research within nature connectedness and literature on transpersonal aspects within ecopsychology emphasize that humans are connected to nature through subjective and significant experiences facilitating an intense interconnection with their surroundings and a feeling of being a part of a bigger while (Davis & Canty, 2013, p. 604). Nature experiences and their significance for psychological well-being should therefore be understood from a deeper perceptual and subjective layer (Wad, 2012, p. 384). In order to provide a comprehensive understanding of the relationship between nature and individuals, we need to examine how nature is experienced by individuals. When talking about subjectivity it immediately becomes complicated to generalize and incorporate universal laws. It was briefly illustrated by Walton's anecdote with forest bathing in Finland. She emphasizes that emotions and experiences in nature are subjective, that these same magnitudes can only belong to the individual, and that it is impossible to calibrate between which emotions are right or wrong to experience in a certain natural context based on nomothetic measures (Walton, 2021, p. 101). Even though nature connection theories often apply nomothetic research designs including different measurement scales to operationalize different aspects of well-being they still aim to include a highly subjective focus. Thus nature connection theories are still able to detect an individual's connection to nature as a subjective entity.

Ecopsychology emphasizes an important transpersonal aspect of nature experiences, and Maslow's research on peak experiences in nature shows that purely subjective experiences of transcendence in nature might have a great impact on aspects of psychological well-being including meaningful life experiences fostering insight and personal growth. These aspects often take on an experience centered phenomenological research approach, that goes much further than nomothetic measures (Flick, 2018, p. 603). The capacity of transcendence might allow individuals to develop and express a

clear reflective subjectivity in which valuable information about nature experiences can be found. To access transcendent experience through a phenomenological approach might give access to knowledge on an individual's consciousness about their perception, intuition and imagination in an embodied connection to their lifeworld that might be highly valuable in the study of nature's impact on psychological well-being (Hébert, 2014, p. 33f).

It can also be discussed if the major focus on nomothetic measures partly are the reason why the research is missing out on the important focus on how both negative and positive experiences in nature can play an important role when studying nature experiences and psychological well-being. A small lacuna of research accounts for this important aspect (Naor & Mayseless, 2021; Fredrickson & Anderson, 1999), which strongly underlines that understanding of nature's psychological benefits currently is very limited to positive experiences. But through little research on the field, these complex nature experiences seem to promote more than just happiness and serenity, but also foster autonomy and environmental mastery as well as personal growth and flourishing. According to Lomas & Ivtzan (2016) this dyad of opposite emotional experiences are important aspects of psychological well-being (Lomas & Ivtzan, 2016). And qualitative methods capturing subjective experiences might be more comprehensive for this kind of research in order to capture the complex interplay of opposing emotions and their importance for the individual's experience of nature impact on psychological well-being.

In order to capture this experience centered and subjective dimension of human nature experience, a phenomenological epistemology might be relevant to reflect upon. A phenomenological approach could provide researchers with careful descriptions and analysis of how different individuals understand and experience nature and how they find it psychologically beneficial. Phenomenology is also relevant because of its focus on how individuals perceive the world through embodied lived experience (Flick, 2018, p. 603).

Furthermore, the debate about nomothetic measurements versus subjective descriptions leaves the field with an epistemological question about how we really can find knowledge about overall psychological well-being. And according to the research question it is difficult concretely to know whether the biological and cognitive measures and results can be considered to be valid indicators of nature's influence on human psychological well-being. The big question is whether it is possible to derive truth about nature's impact on psychological well-being based on nomothetic studies of cognition and biological factors. How can we know for sure that it is nature's aesthetic expression and soothing aura that provides human psychological well-being? Throughout the discussion there have been referred to social constructivist approaches to nature, emphasizing that humans have socially constructed and preconceived attitudes that nature is a stress-relieving and restorative environment providing one with psychological benefits, and that we based on this preconceived attitude experience nature's benefits? In other words, how can we know that it's not the socially constructed normative idea we have about nature that triggers biological processes and reactions which are commonly referred to as clear evidence for nature's healing effect rather than the biological effects themselves?

The main point is that there seems to exist some essential cognitive and biological effects on psychological well-being. But at the same time nature also seems to hold a general socially constructed idea about nature being beneficial for human beings, an idea that perhaps can create feelings of a deeper bond with nature that foster the feelings of the psychological benefits. These constructions of nature and well-being also encompass subjective implication such as cultural or personal preferences, that makes it even harder to establish anything universal about nature's impact on psychological well-being.

5.0 Conclusion

In the current thesis I have come around different perspectives that in different layers have accounted for how we can understand humans impact on psychological wellbeing. The examination of these perspectives has been based on a critical realist approach which argues that reality exists across different ontological layers. A theoretically eclectic approach was therefore assessed as relevant, with which the different theoretical perspectives and empirical literature could be applied in a dynamic and processual understanding of the research question. Carol Ryff's concept of psychological well-being includes six distinct but interconnected aspects associated with eudaimonic well-being. This concept understands well-being as closely related to selfactualization and flourishing. This multifaceted approach to well-being was chosen as it gives rise to a broad and comprehensive understanding of the field from many perspectives.

In the first section different historical and theoretical perspectives were included in order to elaborate on how these account for the human-nature relationship. The biophilia hypothesis understands the human-nature relationship as inherently and evolutionary definite. Ecopsychologists recognize the interconnectedness and interdependence of humans and the natural world, in which nature is an essential source of psychological wholeness and healing as a part of an ecocentric relationship. Environmental psychology is concerned with how natural environments impact human behavior, emotions and life satisfaction. This perspective sees activities in the nature as a resource to be intentionally and instrumentally utilized for its psychological benefits. Cronon challenges the common understanding and use of nature, and criticizes the socially constructed understanding of an idealized and romanticized wilderness. These overall perspective on the human-nature relationship are constitutive of further theoretical examination.

In second section different theories and empirical studies were reviewed and synthesized in order obtain an understanding of nature's impact on psychological well-being from different accounts. Environmental focused theories account for the positive impact that nature has on well-being in being stress-reducing, cognitive restorative and developmental beneficial, if the natural environment meets the requirements of either being safe or including the established restorative characteristics. However, it is important to emphasize that this level of understanding considers human as beings who simply respond biologically and cognitively to its surroundings. In this sense I have argued that if one orients solely on this limited account, it will lead to a simplistic understanding of nature's impact on psychological well-being. Therefore nature and psychological well-being should be considered as a multifaceted phenomenon that is influenced by a wide range of personal, social and cultural factors. An ecopsychological approach such as nature connectedness or a transpersonal perspective account for how individuals' connection to nature varies on a subjective continuum. This theory also explains that a high sense of connectedness correlates with various aspects of psychological well-being. Transcendent experiences in nature allow individuals to

experience deep insight in life fostering extreme feelings of happiness and sense of purpose. These experiences give access to valuable reflective and phenomenological knowledge about significant embodied and multisensory experiences in nature that seem to have great impact on psychological well-being. At the same time the notion of nature implicates normative, socially and culturally constructed discourses that also can be understood as having an impact on how humans understand and use nature. During the review of the literature a missing link was identified. Positive-negative dialectics has been identified as an important aspect of psychological well-being. The field lacks an emphasis on how negative and challenging experiences in nature may impact various aspects of psychological well-being.

Even though the different levels of understanding compensate and support each other, they belong to different scientific theoretical beliefs. For that reason, they can be said to disagree in both ontological understandings of the relationship between human and nature, as well as their epistemological understanding of how to find knowledge about this. Thus I will argue that the relationship between nature and human psychological well-being is a nuanced field that calls for more than one level of understanding and approach of interpretation.

6.0 References list

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6.1 Illustrations

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