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FROM INTENTIONAL AWARENESS TO ENVIRONMENTAL ACTION: THE RELATIONSHIP BETWEEN MINDFUNESS AND PRO-ENVIRONMENTAL BEHAVIORS.

A Thesis Presented

by

NISCHAL NEUPANE

Submitted to the Graduate School of the
University of Massachusetts Amherst in partial fulfillment
of the requirements for the degree of

MASTER OF SCIENCE

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Environmental Conservation

FROM INTENTIONAL AWARENESS TO ENVIRONMENTAL ACTION: THE RELATIONSHIP BETWEEN MINDFULNESS AND PRO-ENVIRONMENTAL BEHAVIORS

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Approved as to style and content by:

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ABSTRACT

FROM INTENTIONAL AWARENESS TO ENVIRONMENTAL ACTION: THE RELATIONSHIP BETWEEN MINDFULNESS AND PRO-ENVIRONMENTAL BEHAVIORS

SEPTEMBER 2020

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Directed by Prof. Ezra Markowitz

Mindfulness is defined as the 'awareness that arises through paying attention to the present moment, on purpose, non-judgmentally'. Despite ample empirical evidence of its efficacy in inducing positive behavior change, almost no work has investigated the viability of using mindfulness-based interventions (MBIs) to promote pro-environmental behavior. Some recent studies have demonstrated consistent correlational relationships between mindfulness levels and pro-environmental attitudes (e.g., connectedness to nature), intentions, and some pro-environmental behaviors (e.g., recycling, "green" purchasing decisions), but no past work has explicitly examined mindfulness in the context of energy saving behaviors. Results from both quantitative and qualitative research conducted as part of this project add to existing evidence of a link between engagement in mindfulness practices and pro-environmental engagement, including, but not limited to, household energy use behaviors. Results from a couple of quantitative studies that were a part of this project show that dispositional facets Observe and Non-React were significant predictors of self-reported household energy behaviors, along with frequent

engagement with mindfulness practices such as meditation, yoga, and breathing exercises.

The results from the qualitative study present mindfulness to be a complex, multidimensional concept that is understood and experienced differently by different people. Unlike usually value-neutral academic and corporate conceptualizations, long-term practitioners who engage with the concept report their practice to have strong ethical dimensions. Engagement with mindfulness as a practice impacts practitioners' perceived connectedness to nature and supports their environmental behaviors. The study provides conceptual models that attempt to explain the relationship between mindfulness practice, connectedness to nature, and pro-environmental behaviors. Results from these studies suggest the possibility that mindfulness-based interventions could provide a novel approach to improving environmental behaviors though further research is needed to determine whether this is indeed the case. Implications and limitations of the study are discussed.

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CHAPTER 1

MINDFULNESS AND ENVIRONMENTAL BEHAVIORS:
CONCEPTUALIZATIONS AND CONTENTIONS

1.1 Introduction

Over the past decade, the concept of "mindfulness" has received an immense amount of interest from the scientific community. Research about the concept has grown considerably; an April 19, 2018 Harvard Gazette article reported that the number of randomized controlled trials- 'a gold standard for clinical studies'- involving mindfulness jumped from 1 in the period from 1995–1997, to 11 from 2004–2006, and to 216 between 2013–2015. The American Mindfulness Research Association (AMRA), a stalwart in mindfulness research, recently announced that the number of academic journal articles published with the term "mindfulness" reached 842 in 2018; there were just 10 such articles published in the year 2000. Since its introduction to the West through Jon Kabat Zinn's mindfulness based stress reduction (MBSR) program in the late 1970s, the term has garnered significant attention in the fields of psychology, psychiatry, neuroscience, and medicine (Van Dam et al., 2017).

The buzz around mindfulness isn't just located within academia, however. Urban centres in the US are lined with businesses that promise mindful products and experiences. Most bookshops have aisles dedicated to mindfulness and well-being related reads. Celebrities feature mindfulness in their talk shows; for example, Oprah recently conducted an interview with Jon Kabat Zinn to discuss mindfulness and meditation ("How to make your morning", 2019). A 2012 study conducted by the National Center for

Complementary and Integrative Health reported that 8% of US adults engaged in meditation; that number has almost certainly grown in the last few years. Even corporations such as Aetna and Google have adopted mindfulness to reduce employee stress and increase productivity. Many educational institutions around the country have their own dedicated mindfulness centers, and it is slowly becoming an integral part of most education programs. The state funded National Health Service in the UK endorses it; it is now available to the public in the UK as a standard psychotherapy (Coyne, 2015). Mindfulness has even found its way into people's cell phones. Apps such as 'Headspace' and 'Calm' teach people to meditate in subway carriages and train station benches during their commutes. Headspace now boasts over a million subscribers, is valued at 320 million USD and generates revenue of more than 100 million USD/year. Calm, another mindfulness based application, is even worth more, valued at 1 billion USD.

The same level of enthusiasm for mindfulness is not yet present in the environmental domain, however. Although environmentalists, both in academia and the professional world, seem to be generally aware of mindfulness, the conversation around the concept is nascent and limited to pondering its potential in the context of promoting pro-environmental behaviors. Although a few recent studies have established positive, significant relationships between mindfulness and pro-environmental attitudes, beliefs, concerns and self-reported behavior (see below), there have only been a handful of careful experimental and observational studies that have attempted to examine whether mindfulness based interventions (MBIs) could, in fact, be used for the purpose of environmental behavior regulation. The findings from my project, articulated in the next

four chapters, contribute to the sparse knowledge about the nature of the relationship between mindfulness and environmental behaviors and do so specifically in the context of household energy behaviors.

1.2 Mindfulness: Conceptualizations and controversies

Mindfulness is an Eastern concept. Although influenced by Hindu practices of quiet contemplation and prayers, mindfulness as it is understood in the contemporary world was molded and articulated within the Buddhist traditions. The concept is fundamental to the Buddhist religious framework; it is its 'heart' (Kabat Zinn, 2003). Right mindfulness (*samma sati*) features as the seventh factor in an integrated ten-factored path of intellectual, ethical, meditative, and wisdom training requirement on the eightfold path of the *Dhamma* (Kang and Whittingham, 2010). *Dhamma,* as explicated by the Buddha (Sanskrit Dharma), is a body of principles and practices that direct practitioners towards happiness and the famed spiritual liberation- '*Nibbana'*, crudely understood as freedom from suffering from the travails of the endless cycle of life and death- the *samsara.*

The cultivation of 'Right Mindfulness' is the foundational step for this Nibbanic liberation across all diverse Buddhist traditions. The concept, however, doesn't stand in isolation in any of these traditions, as it is not the sole notion/practice that leads people out of suffering. Right mindfulness is nestled between 'right effort' and 'right concentration' in the broader ' larger conceptual and practice based ethical framework oriented towards *nonharming*', (Grossman, 2015) that is the '*Dhamma*'. This broader framework, also often known as the *Dhammapada*, is based on Buddha's noble eightfold

path, which implores practitioners to cultivate the following practices: right view, right resolve, right speech, right conduct, right livelihood, right effort, right mindfulness and right concentration (loose translation of *samadhi*). Right mindfulness, in the Buddhist canons, interacts with all the other path factors and is 'not simply a receptive acceptance of wrong and right views.' Instead, in its canonical sense of "keeping something in mind", it means remembering to abandon the factors of the wrong path, and to enter and remain in the factors of the 'right path' (Thanisarro, 2013).

Although no single authoritative account of mindfulness exists (Dunne, 2015), what needs to be noted is that all Buddhist traditions stress the cultivation of 'right mindfulness' (*samma sati*), and that it exists in opposition to 'wrong mindfulness' (*miccha sati*). The quality of mindfulness is characterized by the existence of wholesome intentions and positive mental qualities that are defined by the values of kindness, compassion, and empathy. Within the Buddhist tradition, this right mindfulness is an intentional, investigative practice that inherently involves cognitive, attitudinal, affective, and even social and ethical dimensions (Grossman, 2011) that aids practitioners in the path that alleviates suffering through practices that calm and purify the mind, open the heart and refine attention and action (Kabat Zinn, 2003). Right mindfulness, along with the other eight factors, aids practitioners in understanding the true nature of being, evaluating the wholesomeness of their thoughts and feelings, and most importantly cultivating wholesome skills to ameliorate their own and others' suffering (Bodhi, 2011).

Mindfulness within the sciences, in contrast, tends to be defined through a secular lens. Scholars of contemporary psychology primarily embraced the notion as an approach that helps regulate attention, increase awareness, and consequently respond to mental processes that contribute to emotional distress and maladaptive behavior (Lau et al., 2006). Mindfulness within the sciences, hence, is bereft of its intended objective of attaining spiritual freedom on the path of the *Dhamma*. This conceptual translocation of a concept embedded in a socio-historical and religious context and a moral framework, to a secular, and I argue an amoral one, has allowed for multiple interpretations of the concept within the sciences. Although the western scientific world is not close to a universally agreed upon definition of mindfulness, there are a few definitions/conceptualizations of the notion that are more frequently used than others.

The most popular and frequently used conceptualization comes from Jon Kabat Zinn, who is attributed with bringing mindfulness into the western sciences. He defines mindfulness as 'paying attention in a particular way: on purpose, in the present moment, and non-judgmentally (Kabat Zinn, 2003). According to Kabat Zinn, mindfulness is a particular way of paying attention; it is a way of looking deeply into oneself in the spirit of self-inquiry and self-understanding (Kabat-Zinn, 1990). Bishop and colleagues (2004) define mindfulness as a sum of two constructs: self regulation of attention and attitudinal orientation. 'Self-regulation of attention' is concerned with maintaining focus on the present moment, whereas the construct of attitudinal orientation describes practitioners' ability to be curious and accepting of the experiences in that present moment, as opposed to reacting to these mental/sensual events. According to the Bishop and colleagues, when

being mindful, "thoughts and feelings are observed as events in the mind, without over-identifying with them and without reacting to them in an automatic, habitual pattern of reactivity" (Bishop et al., 2004, p 32).

Langer and Moldoveanu (2007) use a distinctively novel approach to conceptualize mindfulness; they describe it as the process of drawing novel distinctions. "Langerian mindfulness" intentionally veers away from its Eastern origins by distancing itself away from meditative or similar practices, and defines mindfulness as a construct that is antipodean to mindlessness- the automatic pilot mode of being (Bargh, 1999). Mindfulness, then, becomes a cognitive process that enhances people's sensitivity to one's surroundings allowing them to perceive their surroundings differently and allowing for formation of "new categories for structuring perception." They claim that actively, intentionally perceiving every experience as a new one, regardless of its importance, pushes people to live more mindful lives. Langer's mindfulness has been quite aptly described as psychology's "own mindfulness" or a notion of mindfulness that is "indigenous to disciplinary psychology" (Lee, 2019).

These varyingly worded conceptualizations have a few foundational similarities; they all place onus on intentionally being in the present moment and cultivation of an attitude of non-judgemental acceptance of thoughts and emotions felt during that moment. Of note is the focus on neutral observation and the lack of any kind of intentional evaluation of the quality of the experience during the practice. Mindfulness in the sciences isn't preceded

by evaluative descriptors such as bad or good and, as mentioned before, either comes with a neutral, or in the case of Langerian mindfulness, an explicitly positive connotation.

Quite predictably, these widely used conceptualizations have also been the source of fervent contention within the academic realm. Quaglia and colleagues (2015) take issue with the aforementioned 'scientific' definitions of mindfulness for their overemphasis on the ambiguous construct of 'acceptance'. This overemphasis, in their opinion, serves to instill in practitioners what Bishop and colleagues (2004) call the diffusion/disidentification from discursive thought, i.e., a complete dissociation from what we understand as 'thinking', which albeit unintentionally, vilifies the presence of thoughts during meditation practices. This dissociation undermines the integral role of cognitive processes of thinking and evaluation that are paramount to the canonical, Eastern, 'truer' conceptualizations of mindfulness. Traditional mindfulness practices, such as the Vipassana practice, require practitioners to evaluate the quality of thoughts that come into the stream of consciousness as healthy or unhealthy, or wise or unwise in addition to just being aware about them (Quaglia et al., 2015).

Grossman (2015) adds to the problematization by claiming that the psychological, secular rendition of the concept trivializes the otherwise deeper, richer concept of mindfulness. According to him, existing academic definitions undermine the complexity, centrality and challenges of fostering and maintaining attitudes of patience, openness, lack of prejudice, tolerance, and kindness, all very integral elements of mindfulness; instead, they supplant

the importance of the aforementioned attitudes by replacing them with vague/neutral terms like 'acceptance' and 'non-judgement' .

Grossman (2015) presents a slightly different and perhaps a more nuanced conceptualization of mindfulness, when he describes mindfulness as an "act of unbiased, openhearted, equanimous experience of perceptible events and processes as they unfold from moment to moment (i.e., sensations, perceptions, thoughts [including memories], emotions, imagery, as well as any other mental context we may be aware of at any moment)." This definition allows for a mindfulness not based on non-judgmentality, but on equanimity, and not just a neutral awareness of the mental landscape, but to the fostering of specific intentions and values towards ourselves and others, such as kindness, compassion, generosity and equanimity (Grossman, 2013, 2015).

Chambers and colleagues (2009) conceptualize mindfulness to be a product of a systematic practice that involves cultivation of awareness and nonreactivity that privileges volitional and intentional responses, as opposed to habitual reactions to individuals' lived experiences. This conceptualization allows for mindfulness to move beyond just the cultivation of non-judgmental awareness of the present moment and, instead, to incorporate a concept/state that serves as a catalyst, designed to induce an intentional awareness that puts impetus on evaluation and eventually alignment of practitioners' thoughts, attitudes, concerns and their self-ascribed identities with their actions.

Another, different conceptualization of mindfulness comes from Mindfulness Based Cognitive Therapy cofounder John Teasdale. He defines mindfulness as the only "mode of mind" (Kabat-Zinn, 1990) that facilitates emotional processing and therapeutic change. The mode is characterized by "metacognitive awareness" (Teasdale, 1999), 'the deep, intuitive, experiential understanding (or insight) that thoughts and emotions are passing mental events, and not the reality about the self, the world and the future'. Teasdale (1999) established the habitual 'doing mode' in contrast to the mindful 'being mode', marked by problem-solving and achievement-oriented thinking characteristic of usual everyday activity (Bostanov et al, 2018).

Almost all of the conceptualizations, with their strengths and flaws, are attempts to streamline the vagueness that is inherent in the concept of mindfulness. Mindfulness is a complicated term to pin down, and the numerous conceptualizations do not help with a definitive articulation. Yet, it is not hard to see that the various concepts mindfulness can be colloquially understood as-- a disposition, a skill to be practiced, a framework, or simply meditation-- also contribute to the various contentions about how the word is conceptualized. Broadly speaking, at least within the psychological and clinical sciences, mindfulness is generally used to describe 1) a mental trait or a state; 2) a cognitive process acquired through training through various activities; and 3) a soteriological or spiritual framework (Lutz et al., 2015).

1.3 The traits and state of mindfulness

Mindfulness is often conceptualized as a disposition and a trait, namely, as one's predisposition to be mindful and present in daily life (Baer et al, 2006). Everybody is mindful to a certain degree (Kabat Zinn,2003). Mindfulness, when conceptualized as a trait, is a more permanent and stable feature of an individual's personality, but is subject to undulations during engagement with various activities during daily life. Mindfulness levels, then, can also be conceptualized as a state- a more temporary, fleeting state of higher awareness that can be achieved through mindfulness-based activities such as meditation, yoga, breathing exercises, etc. (Lau et al., 2006). Ivtzan and Hart (2016) conceptualize state mindfulness as an active mode of conscious awareness characterized by requiring effort to bring about a state of heightened involvement and wakefulness in which an individual experiences the present moment and all internal and external events that are occurring.

It is a common assumption within the psychological literature (as well as Eastern traditions) that individuals can cultivate trait mindfulness through repeated evocations of state mindfulness through various mindfulness based activities (Davidson, 2010; Vago and Silbersweig, 2012). A recent study conducted by Kiken and colleagues (2015) corroborated that position with empirical evidence through findings that showed individuals with greater rates of increase in state mindfulness reported increased levels of trait mindfulness and decreased levels of psychological distress with time.

1.4 Mindfulness as a skill

Mindfulness is also quite frequently and prominently conceptualized as a cognitive skill or a process that is cultivated through varying activities. Kabat Zinn's conceptualization of mindfulness being a 'particular way of paying attention' alludes to mindfulness as a skill that has to be learnt. Their conceptualization mirrors Buddhist conceptualizations that describe mindfulness as a skill or capacity that is developed through rigorous and long-term practices (Gunaratna, 2002). Lutz and colleagues (2015) point out that conceptualizations in this vein have contributed to an understanding of mindfulness being fundamentally understood as something that is present-centered and non-judgmental.

1.5 Mindfulness as a framework

Mindfulness in its most original and elemental understanding is a constituent of the soteriological Buddhism framework, but is also broadly used as a proxy to describe 'a Buddhist practitioner's commitment to a way of life and a stance toward experience that extends beyond any particular set of meditation techniques' (Lutz et al., 2015). Within the nonacademic laypeople universe and, in some instances, even within the sciences, mindfulness is conceptualized as an 'umbrella term for the collection of practices and personal values' (Lutz et al., 2015) that enable practitioners to aspire to and live a better quality of life. The secular mindfulness framework has some parallels with the Buddhist framework in regards to the values and attitudes it privileges, but differs drastically in regards to the end goal of the practice; practitioners who subscribe to the Buddhist framework work towards Nibbanic liberation, while people who subscribe to the secular mindfulness have more humble objectives of living better, simpler lives.

Still another conceptualization of mindfulness is one that seems to have been borne out of exasperation in trying to define the term. Bostanov and colleagues (2018) begin their paper by acknowledging mindfulness to be a 'notoriously elusive' concept to define and present what they deem a 'simple and inclusive definition': 'Mindfulness is what is practiced in mindful meditation.' They emphasize that their definition doesn't undermine mindfulness as something practiced through daily life beyond meditation, but as a way to "utilize the fact that formal meditation provides an excellent opportunity to measure mindfulness in a controlled lab setting"(Bostanov et al, 2018, p 2). This definition could be modified somewhat and articulated as follows: 'mindfulness is what is practiced in mindful practice'. This conceptualization allows for multiple interpretations of the concept and holds each practitioner responsible to define and articulate the practice as they see fit. This conceptualization, however, brings forth a new challenge as well, namely, it introduces a subjectivity that makes it more difficult to make general claims about the impact of "mindfulness" beyond particular contexts in which it is being studied. Although some of the qualitative work included in this thesis attempts to uncover how long term practitioners conceptualize mindfulness, being able to present a case for a new operational definition of the concept that has eluded so many is out of the scope of this project. For the quantitative empirical components of this project, therefore I follow existing trends within the environmental psychology literature and conceptualize mindfulness as a trait, whereas during the qualitative phase, I attempt to understand how long term practitioners conceptualize and engage with mindfulness on their own terms.

1.6 Mindfulness Activities: Cultivating and Sustaining Mindfulness

Despite the raging debate about the different conceptualizations of mindfulness, there seems to be a consensus about the fact that mindfulness can be cultivated and enhanced through a variety of practices. Traditional strands of Buddhism prescribe meditation techniques of Samatha and Vipassana for the cultivation of mindfulness (Bodhi, 2011). During Samatha meditation, the practitioner picks an object, such as the breath, as the focus of attention and monitors if their attention remains on the object, so as to attain 'concentration'. During Vipassana, practitioners attempt to regulate attention in such a way that attention is used to observe the transitory nature of experiences, such as thoughts, feelings, emotions from moment to moment so that they attain what scholars call the 'metacognitive insight' into the nature of things (Kuan, 2012).

There exist multiple other variations and techniques of meditation in various parts of the world. One of the more widely practiced meditation techniques is called the loving-kindness meditation. This form of meditation was also derived from ancient Buddhist practices and claims to evoke positive emotions and to increase positive feelings of warmth and caring for self and others (Johnson et al., 2009). All these mindfulness cultivating activities, again, are embedded in a broader network, and are supposed to be continued throughout life, beyond the time spent sitting on the cushion (during meditation practice).

In all Buddhist traditions, mindfulness is the foundational step for the aforementioned Nibbanic liberation. The objective of these practices when embedded in the Buddhist framework is straightforward: to escape the cyclical nature of *Samsara*. The escape from

samsara, and the attainment of enlightenment is possible when practitioners achieve *'panna'* or wisdom. Cultivation of right mindfulness aids in the cultivation of other wholesome qualities and the achievement of this freedom.

The mindfulness cultivation practices adopted within the sciences and clinical settings are usually similar, though they seem to be unencumbered by conversations about ethics or spirituality. Meditation techniques derived from traditional Samatha and Vipassana techniques form the core of various mindfulness-based interventions such as MBSR, MBCT etc. (Schwartz, 2019). Yoga is another prominent mindfulness cultivating activity; a recent study conducted by Cox and Mcmahon (2019) provided evidence of increased trait mindfulness levels in 379 participants of a 16 weeklong yoga course at a university.

The objectives of the mindfulness practices outside of Buddhism then become specifically tied to the broader framework that they are embedded in. For example, the primary objective of mindfulness practices that are embedded within MBSR becomes reducing stress, while during Mindfulness Based Couples Therapy, the objective of the practice becomes helping couples work through their marital conflicts. These functional operationalizations of mindfulness, despite their divorce from the religious and moral framework, do serve to facilitate a greater awareness of thoughts, increased attention, non-judgmentality, and acceptance of mental phenomenon, and have largely been proven to be effective in meeting their intended objectives.

There are, however, concerns around this objective shift from 'being mindful to attain Nibbana' to 'being mindful to reduce stress/repair relationships'. People do not necessarily need to engage with notions of universal kindness or compassion to be less stressful, or to mend their relationships. Mindfulness based practices in the West appear to largely undercut an integral aspect of mindfulness- the cultivation of 'wholesome' attitudes such as kindness, compassion or empathy by replacing them with valuable but slightly diluted ideas such as 'letting go' and attitudes such as 'non-judgmentality' (Grossman, 2015). This tendency seems to have worried scholars such as Kabat Zinn (2003) and Grossman (2011) who have recently written precautionary pieces warning against the oversimplification of the concept and have prescribed the need for the reevaluation of extant conceptualizations of mindfulness to allow for more contextuality and historical basis.

1.7 Measuring Mindfulness

Instruments available for gauging mindfulness within the sciences generally assess dispositional or trait mindfulness. Given the lack of uniformity in existing conceptualizations and operationalizations of mindfulness, these instruments have important conceptual differences. The 15-item Mindful Attention Awareness Scale (MAAS; Brown and Ryan, 2003) was one of the first mindfulness instruments that was widely disseminated. It was designed to measure a very specific aspect of mindfulness, namely, present-centred attention-awareness or 'acting with awareness' in everyday experiences. It has been deemed to be unidimensional and not sufficiently comprehensive as a result (Coffey and Hartman, 2008). Other instruments that attempt to measure trait

mindfulness such as the Kentucky Inventory of Mindfulness Skills, the Toronto Mindfulness scale, and the Southampton Mindfulness Scale, have been developed and validated but face criticism for their construct validity (Park et al, 2013).

One of the most highly rated instruments by scholars (Park et al., 2013) is the Five facet Mindfulness Questionnaire (FFMQ). The original FFMQ is an instrument that was constructed after a factor analytic study of five independently developed mindfulness questionnaires. The factor- analysis yielded five facets: observing, describing, acting with awareness, non-judging of inner experience, and non-reactivity to inner experience (Baer et al., 2006)

The items use a 5 point Likert Scale (1- Almost never true, 5- Almost always true) to measure the aforementioned facets and are derived from the original 39 item scale. The FFMQ has been considered to be valid and reliable by other researchers and scores on the measure were found to be highly correlated with other related constructs such as openness to experience, emotional intelligence, and self compassion (Baer et al., 2006). A short form of the FFMQ, the FFMQ 18, was developed through the application of the Partial Credit Rasch Model and has been psychometrically validated to be used as a global short measure of mindfulness and its facets (Medvedev et al., 2018).

There has been significant discussion within the literature regarding deficiencies of existing measures of mindfulness and even with the notion of measuring dispositional mindfulness at all. Critical reviews have prescribed caution during the use of existing

instruments, citing the absence of qualitative evaluations and external checks to support

construct validity of the instruments (Park et al., 2013). There have been concerns about

mindfulness measures not actually measuring mindfulness, but instead capturing some

other construct such as 'attentiveness' (Van Dam et al., 2010). There are other

interesting, but troubling concerns as well; in one instance, the mindfulness measure used

found that experienced meditators were less 'mindful' than binge drinkers (Leigh et al.,

2005).

1.7 The efficacy of mindfulness

Within the sciences, a plethora of research, especially in the cognitive and behavioral

sciences, has firmly established mindfulness as a viable and effective tool for behavior

change. Several empirical studies in the medical, psychological and organizational

literature have confirmed the benefits of mindfulness and engagement with mindfulness

based activities on an individual's attitudes and behaviors (e.g., Baer et al., 2006; Barber

and Deale, 2014; Greenberg et al., 2012; Shapiro et al., 2012). Multiple other studies

have shown the benefits of mindfulness in improving emotional regulation (Garland et

al., 2011), mental health (Solhaug et al., 2019) and wellbeing (Lundwall, 2019) .

Mindfulness has also been shown to be effective in improving creativity (Capurso et al.,

2016) and working memory capacity (Mrazek et al., 2013). A recent meta-analysis that

examined the impact it had on clinical symptoms of psychiatric disorders reported that

mindfulness based interventions exhibited the most consistent efficacy in treating

depression, pain conditions, smoking, and addictive disorders (Goldberg et al., 2018).

Mindfulness based interventions and techniques have also been shown to be effective within the education domain. Studies have shown that practicing mindfulness increases the wellbeing of students, increases their reflexive and learning capacities, and helps them become more equanimous, kind and compassionate (Schwind et al., 2017). Mindfulness based interventions have been especially effective in improving student behavior in classrooms when they have been implemented in integration with existing traditional behavioral interventions. A recent review reported that since 2005, multiple programs have collectively shown a range of cognitive, social, and psychological benefits to students. These improvements manifest in academic skills, emotional regulation, self-reported improvements in stress, fatigue, and anxiety (Meiklejohn, 2012).

Various studies within the criminal justice domain have demonstrated the efficacy of mindfulness-based interventions in curbing aggressive behavior in occupants and prisoners in various correctional facilities around the country. A study showed decreased recidivism rates in prisoners who had been subjected to a mindfulness-based intervention in Monroe Prison Complex in the state of Washington (Suarez et al., 2014). At a Massachusetts Department of Corrections Prison, for example, prisoners reported highly significant pre- to post- course improvements in widely accepted self-report measures of hostility, self-esteem, and mood disturbance (Samuelson et al., 2007).

These positive findings need to be taken with a grain of salt, however. Although popular media and some scholars have strongly touted mindfulness as a panacea for the human condition, there have been contrarian studies that have come out to claim that the effects

of mindfulness might not be as pronounced or entirely positive as they are often believed to be. A recent meta analytic study reviewed the impacts of mindfulness based interventions and found that while effective in treating anxiety, depression, and pain, the interventions were not superior to other extant treatment options such as drugs, exercise, and other behavioral therapies (Goyal et al., 2014). The issue is not just about relative superiority over extant interventions as well; mindfulness and interventions based around the concept have also been found to be outright detrimental in some cases. A plethora of observational studies and case studies have reported that mindfulness based treatment options have contributed to psychosis, mania, depersonalization, anxiety, panic, traumatic memory reexperiencing, and other forms of clinical deterioration (Van Dam et al., 2017). The same authors prescribe not falling for the assumption that there are none, or minimal adverse effects associated with meditation (Turner et al., 2011) because those assumptions are based on a lack of research rather than substantive evidence.

1.8 Mindfulness mechanisms

Although research showing the impacts and the efficacy of mindfulness has proliferated within the sciences, there still seems to be a palpable gap in the literature because of the lack of knowledge about how mindfulness actually works. A variety of proposed models, most of them theoretical and yet to be validated, have attempted to investigate the mechanisms of this elusive concept, but like all things mindfulness-related, there doesn't seem to be an agreed upon model that can explain how it actually works. Carmody and colleagues (2009) put it best when they said, "It is still not clear how observing one's present moment experience nonjudgmentally and non-reactively is beneficial" and go on

to suggest that self-focused attention "emphasizes experiential awareness of present moment details and is nonjudgmental and nonreactive", which then consequently may exert beneficial effects (Carmody et al., 2009).

One of the earlier, comprehensive theoretical models, proposed by Shapiro and colleagues (2006), identifies three core 'axioms' of mindfulness: Intention, attention and attitude. They clarify that these are not three disparate processes, but are interwoven aspects of one cyclical process. According to their model, mindfulness practice, through the three processes, leads to a fundamental shift in the relationship to experience, which they call "reperceiving." The reperceiving, then, leads to changes in self-regulation, values clarification, cognitive and behavioral flexibility, and exposure. The change in these variables consequently result in 'salutogenic outcomes'. Carmody and colleagues (2009) conducted a study to empirically validate that model and found that 'reperceiving' did not actually mediate the relationship between mindfulness and the aforementioned four variables among participants in a MBSR program. They didn't completely disregard the model, however, and pointed out the methodological difficulties surrounding measures of mediating and consequent variables and suggested that further studies that are more methodologically and theoretically robust might need to pursue the verification of this particular model.

Various other studies present the theory that mindfulness contributes to better salutary benefits through the phenomenon/process of emotion regulation. Individuals with relatively higher levels of mindfulness have been found more likely to observe,

understand and accept negative emotions, as opposed to avoiding or rejecting them

(Cheung and Ng, 2019). This mediating role of emotion regulation as a consequence of

intentional awareness through mindfulness also features prominently in a theoretical

model proposed by Holzel and colleagues (2011). The authors propose a comprehensive

model in which they posit that the processes of mindfulness--attention regulation, body

awareness, emotion regulation (achieved through reappraisal and extinction), and a

resultant shifting in perspective of self-interact synergistically with each other to generate

a mental state of 'enhanced self-regulation' in mindfulness practitioners. Karoly (1993)

describes self-regulation as a process that enables individuals to guide their goal-directed

activities by modulating thought, behavior, affect or attention through deliberate or

automated use of specific mechanisms. This 'self-regulatory' effect of mindfulness seems

to have some merit; Chatzisarantis and Hagger (2007), for example, found that, in the

context of physical health-related activities, mindfulness played an important role in

fostering self-regulation, and facilitated the bridging of the intention-action gap.

The "Mindfulness -to-Meaning" (MTM) theory, another relatively comprehensive

conceptual model, proposed by Garland and colleagues (2015) asserts that mindfulness

allows practitioners to achieve a metacognitive state of awareness through a 'decentering'

from stress appraisals. This metacognitive awareness-- an "awareness of awareness"--

apparently helps in broadening of attention to usually ignored facets of one's life and

facilitates a 'reappraisal' (an idea similar to reperceiving) of unfavorable circumstances

in life, which in turn reduces distress associated with those situations and promotes

positive emotions. MTM theorizes that mindfulness practices eventually deepen people's

capacities to make meanings out of their experiences- "or rather, a capacity to positively reappraise experiences of suffering and to amplify the affective experience related to natural rewards through savoring" (McConnell and Froeliger, 2015). This reframing of perspectives then continues to deepen and enrich as people prioritize pleasant, growth promoting or 'meaningful' experiences. The authors claim that this process of reappraisal consequently motivates values-driven behavior and engenders a deeper sense of purpose and self-actualization.

Lindsay and Creswell (2017) present what they characterize as a 'parsimonious and measurable' theory that outlines the mechanisms of mindfulness. According to the authors, the Monitoring and Acceptance Theory (MAT) describes the mechanisms of mindfulness in the context of cognition, affect, stress, and health. Their model assumes that two basic components of mindfulness (attention monitoring and acceptance) are pivotal in articulation of active mechanisms that distinguishes mindfulness from other available psychological interventions. They posit that the skill of 'attention monitoring' enhances one's awareness of one's lived experiences, which builds a metacognitive awareness in participants. This newfound awareness achieved through attention monitoring can however also increase affective reactivity. Learning 'acceptance' then is necessary to modulate and reduce that 'affective reactivity'. The interaction between these two components can be used to explain how mindfulness improves negative affectivity, stress and stress related outcomes.

Grabovac and colleagues (2011) are slightly critical of existing western psychology models in part due to the onus they put on the notion of awareness rather than of insight, which they claim is the primary transformative factor in the Buddhist tradition . They present a "Buddhist psychology" model, in which they propose that mindfulness practice, along with the ethical framework surrounding the practice, changes constructs and measures of acceptance, attention regulation, ethical practice and insight-attachment/aversion to feelings, which consequently leads to decreased mental proliferation and better wellbeing.

Most of these proposed models have yet to be tested for their reliability or validity. There is an inherent difficulty in the investigation of mindfulness; most of the constructs that these models present are difficult to measure and are mostly first-person experiences. Finding reliable measures to capture shifts in awareness, the onset of metacognitive awareness, or the reframing of perspectives are not easy tasks. Shapiro and colleagues (2006) propose longitudinal designs of mindfulness training to allow for identification of pathways of causality between practice and outcomes. The pathways might not be uniform or solitary, and they suggest larger sample sizes for simultaneous investigation of other possible pathways and mechanisms.

1.9 Mindfulness and the Environment

Research within the environmental domain has just begun to engage with the potential intersection between mindfulness and pro-environmental behaviors, attitudes and concerns. Most of the existing studies that have attempted to investigate the role of

mindfulness in the context of environmental intentions and behavior have been correlational studies that have established relations between the concept and self-reported pro-environmental intentions, attitudes, behavior and concern, and other constructs such as connectedness to nature, subjective wellbeing, etc. Experimental work, while increasing, is still sparse. Most of the existing experimental work relies on cross-sectional and self-reported data, although there have been a few studies that have attempted to collect longitudinal data. Very few studies go beyond conceptualizing mindfulness as a trait or a disposition and most of them use one of the many existing psychometric instruments to measure dispositional mindfulness levels.

Various studies have established mindfulness, primarily conceptualized as a disposition, to be correlated with pro-environmental intentions and self-reported environmental behaviors. Enhanced mindfulness levels allow (mindful) people to pay more attention to the reality at hand, including the environment and the world they occupy, which in turn may promote pro-environmental concern, that may translate to environmental behavior (Dutcher et al., 2007). Amel and colleagues (2009) worked with 100 visitors at a Midwestern sustainability expo and demonstrated that 'acting with awareness'-- one of the facets that makes up the construct of mindfulness-- was positively correlated with pro-environmental behaviors. A study by Panno and colleagues (2018) established a positive relationship between mindfulness and self-reported pro-environmental behavior as well and demonstrated that the relationship is mediated by the construct of Social Dominance Orientation. Mindfulness levels were also shown to significantly predict hotel guests' self-reported pro-environmental behaviors (Barber and Deale, 2013; Dharmesti et

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al., 2020) and environmental occupant behaviors in German households (Seyler and Mutl, 2019).

A study conducted by Brown and Kasser (2005) adds to that evidence about the relationship between mindfulness and pro-environmental behavior. Their study attempted to understand how mindfulness, intrinsic value orientations, and "voluntary simplicity" were related to subjective wellbeing (SWB) and ecologically responsible behavior (ERB). People with higher levels of SWB displayed higher levels of ERB and mindfulness and intrinsic values were associated with higher SWB and ERB. The researchers claimed that "… a mindful consideration of one's inner states and behavior along with a set of values oriented more toward intrinsic than extrinsic aims appear to simultaneously benefit both individual and ecological well-being" (Brown and Kasser, 2005, p.231). Mindfulness and subjective wellbeing are closely related and well-studied constructs; mindfulness has been shown to contribute to subjective wellbeing (Baer et al., 2008; Brown et al., 2009). A body of research has shown how subjective wellbeing, along with empathy and compassion and non-materialistic values are strongly associated with more sustainable behaviors (Ericson et al., 2016).

Jacob and colleagues' (2009) study is one of very few studies that has investigated the relationship between mindfulness as a practice and self-reported environmental behaviors. The study collected data from 829 practitioners- 'a sample of ecologically and spiritually aware people' from a spiritual organization in California and found that more frequent practice of meditation was positively correlated with self-reported sustainable

household behaviors and food practices. Their study established mindfulness meditation as a mediator that facilitated the relationship between Ecologically Sustainable Behavior and Subjective wellbeing.

Recent experimental studies have also bolstered existing evidence about the relationship between mindfulness and environmental constructs. A study that used Langer's conceptualization of mindfulness-i.e., mindfulness as a process of drawing novel distinctions, assigned 103 students to similar groups and reported that participants assigned to the mindfulness intervention group reported increased belief in climate change (Wang et al., 2019).

Another recent randomized control study conducted by Tang and colleagues (2017) put a total of 253 participants into 'mindful' and 'mindless' groups during four consecutive studies, and reported that participants in the mindful learning group reported greater levels of pro-environmental behavioral intentions compared to the control groups. The results of their second study, as reported in the same paper, go on to be a bit more intriguing; participants in the mindful learning group, when asked/directed to practice mindfulness with a focus on (their own) self, performed worse than the mindlessness group. When the participants were then asked to focus on 'humans' during their mindfulness learning, participants within the mindful group seemed to display more intentions for pro-environmental behaviors. During their third study, researchers 'induced mindsets' with a biospheric focus and participants within the mindfulness group exhibited higher intentions to behave more environmentally consciously. The study is

intriguing because it implies that the messaging surrounding mindfulness, or the context in which the practice of mindfulness is embedded, is important in shaping practitioners' intentions and attitudes.

Another pioneering longitudinal study has attempted to identify if mindfulness has a causal effect on people's knowledge, attitudes and behaviors. The study was conducted at the University of Madison in Wisconsin under what the project designers called the Mindfulness Climate Action program (Barett et al., 2016). MCA was an eight-week adult education program that aimed to integrate mindfulness practice with content about energy use, climate change and sustainability. The program was piloted with 16 people living in Madison, WI in the spring of 2017. The study reported no observable, significant changes in people's behaviors related to diet, energy and transportation choices due to their mindfulness intervention. The authors, however, were encouraged that the program was feasible and well received by all the participants and hence with concerted upgrades and tweaks perhaps paves a path for further studies that examine the role of mindfulness in altering environmental behaviors.

A recent 8-week long longitudinal study by Geiger and colleagues (2019) attempted to investigate the causal effects of mindfulness on sustainable consumption behaviors as well. The authors employed a sustainability-adapted mindfulness-based intervention on two samples of students and employees. Participants in the study in the mindfulness group reported increased mindfulness scores after the intervention, but didn't report improvements on sustainable consumption behaviors or related attitudes. The results of

the study raise doubts about the potential causal effects of mindfulness practice on consumption behaviors. The authors however reported that students within the sample reported better wellbeing scores, while both samples reported a decline in materialistic value orientations. The improvement in these 'behavior-distal' variables, in the authors' opinion, could influence consumption behaviors in the long run. They also emphasize the need for research that lasts beyond the 8 weeks popularized by MBSR, as they acknowledge changing habitual consumption patterns is a long-term process.

1.10 Mindfulness and Connectedness to Nature

One of the more persistent, prevalent threads of research in the mindfulness-nature nexus has focused on the relationship between mindfulness and connectedness to nature (CN). Various studies have confirmed that dispositional mindfulness levels are significantly correlated with CN (Barbaro and Pickett, 2005; Wolkso and Lindberg, 2013; Nisbet et al., 2019).

A recent meta analytic investigation conducted by Schutte and Malouf (2018) provides further evidence on the relationship between mindfulness and CN. Their study consolidated findings across 12 samples that included 2,435 individuals and demonstrated that the traits of mindfulness are consistently and significantly correlated with connectedness to nature. Two recent, preliminary studies have also attempted to investigate the nature of the relationship between CN and mindfulness. Aspy and Proeve's (2017) study found that people assigned to a mindfulness meditation intervention displayed greater connectedness to nature compared to people in the control

condition. Hamann and Ivtzan's (2016) study found that participants who were randomly assigned to what they called a 'nature intervention' group, which consisted of participants spending 30 minutes in nature for 30 days, were significantly more mindful compared to participants in a control condition. The findings from these two studies suggest that the relationship between mindfulness and connectedness to nature might be reciprocal rather than unidirectional.

1.11 Mindfulness Mechanisms and Environmental Behaviors

Given the nascent nature of research in the mindfulness-environment nexus, and the seeming lack of consensus about mechanisms in the broader literature, it isn't surprising that there are few studies that have tried to grapple with how mindfulness in fact affects environmental behaviors, intentions and attitudes. Most of the research investigating this relationship speculates on possible mechanisms based on existing knowledge present in the broader mindfulness literature, and there have been very few studies that have actually attempted to directly investigate the nature of that relationship.

A sizeable proportion of this sparsely studied subject area seems to point to the mediating effects of the aforementioned discussed construct of "Connectedness to nature". Studies have shown that mindfulness increases the levels of connectedness that practitioners feel towards nature, which then increases their concerns and attitudes towards the natural world, which consequently drives their action (Barbaro and Pickett, 2015; Dutcher et al., 2007; Schute and Malouf, 2018). While that relationship, especially the latter half of it (i.e., feeling of connectedness leading to intent and action), is fairly intuitive and backed

by empirical evidence, it doesn't quite explicate what mindfulness does, or what aspects of mindfulness practice impact the level of proximity people feel with nature. The question, 'why does mindfulness, in its various conceptualizations, have an impact on people's feelings about proximity to nature at all?' still begs clarification and answering.

Some nascent theoretical efforts have been made to answer this question. Wamsler (2018) proposes a few possibilities of how mindfulness may promote higher environmental concern and behavior. The author alludes to the aforementioned self-regulatory aspect of mindfulness and its potential role in bridging the intention-action gap, and speculates that mindfulness might be able to reduce automaticity and promote pro-environmental values, compassion, and increased self-control, and subsequently facilitate the translation of environmental intentions to actual behavior.

Amel and colleagues (2009) also suggest that the attentional aspects of mindfulness disrupt 'the automaticity of being' (Bargh and Chartrand, 1999) and create a greater self-world connection that eventually spurs people to take on pro-environmental behavior. Other studies make reference to that disruption as well, and claim that on top of inhibiting automatic behavioral inertia, mindful awareness makes alternative behavioral choices more salient (Dijksterhuis & van Knippenberg, 2000). Yet these findings raise the question, "is this enough to explain the mindfulness-connectedness-behavior link?" Is the act of paying close attention to daily behaviors and feelings and mental constructs in itself so pivotal and powerful such that people who pay close attention inevitably take up more environmental behaviors?

Some studies suggest that, beyond simply increasing people's attention , mindfulness increases people's subjective wellbeing by breaking or reducing the effects of the 'hedonic treadmill' (Seligman, 2002), through value-clarification (Carmody et al, 2009), and by fostering compassion and empathy (Lim et al. 2015). The engendered or amplified subjective well-being may encourage more prosocial and pro-environmental behavior. Some scholars argue that practices that cultivate mindfulness aid in creating a sense of identity that extends beyond the individual and extends to encompass wider forms of being (Shapiro et al, 2006). There have been studies that have shown how mindfulness increases people's empathy and compassion and increases 'felt connection' with other people and the world (Kemeny et al., 2012). Increased empathy and compassion have been shown to be effective in inducing pro-environmental attitudes and concerns (Berenguer, 2007; Schultz, 2000). While all of these suggestions seem correct, at least intuitively, they are still just suggestions. More rigorous studies that delve into this question and attempt to find evidence-based answers could increase our understanding of the relationship between mindfulness and environmental behavior.

1.12 Present research

The present project starts with an expansion of past work on the mindfulness-environmental behavior link by examining the relationship between mindfulness and household energy use behaviors-- a very specific and high-impact set of pro-environmental behaviors. Household energy consumption accounts for a significant proportion of the total global energy consumption. According to a 2016 study conducted

by the US Department of Energy (DOE, 2016), households accounted for 21.8% of total energy consumption in the US in 2014. Despite being a significant consumer, and consequently, a contributor to global GHG emissions, the issue of energy consumption at the household level seems to somehow evade the global energy conversation that mostly revolves around narratives about fossil fuels, systemic large-scale switches to renewables, novel carbon sequestration methods, and technological innovations.

Academic literature stemming from multiple specialized domains such as building construction and technology, resource economics, environmental engineering, and environmental psychology has, however, recognized the importance of reducing household energy consumption and unearthed a plethora of factors that influence household energy consumption. Some of those factors are obvious and intuitive, such as socio-demographic factors (e.g., household size, number of occupants, income levels, geographic settings). Structural elements of households are another obvious factor that affects energy consumption in households as well; bigger houses consume more energy and modern houses that are better insulated and use better building technology are more energy efficient.

Beyond those factors, one of the more traditionally overlooked determinants of household energy consumption is the behavior of the inhabitants of the households. Newer research studies have shown that household occupant behavior is a 'critical influence' on energy consumption patterns in that household and can maximize energy efficiency to the same extent that technological interventions can (Shweiker and Wagner, 2016; D'Oca et al.,

2018). Various studies within the domain have shown huge variability in the total amount of energy consumed in households that are nearly identical in terms of demographic and structural features (Branco et. al, 2004; Levermore,1985). Such is the significance of the behaviors of individuals in the households that Dietz and colleagues (2009) claimed that households can shave up to 20% of their energy consumption purely through behavioral adjustments without any structural changes that require financial considerations.

Given the urgency of stymying the effects of anthropogenic climate change, and in the face of projections that show skyrocketing energy demand in the world, individual and household level behavioral changes to curtail energy consumption merit urgent attention. Academic literature, in the course of the last few decades, has compiled a portfolio of behavioral interventions that can be used to reduce household energy consumption. This portfolio is primarily populated by interventions that are achieved through information loading through innovative educational outreach programs, personalized feedback through curated home energy reports (HERs) using various mediums (e.g., texts, emails, web based apps), financial incentives such as differential rates of pay, and uptake of efficiency based measures. While there is no denying that these interventions have been effective in some cases (e.g., Abrahamse et al.,2005; Allcott et al.,2014), their efficacy has been uneven based on a wide variety of moderating factors, including but not limited to socio-economic, structural and geographic variables. The exploration for novel, effective behavioral interventions to enhance this existing portfolio is well-warranted. As of today, there have been no studies that have specifically tried to understand the potential of mindfulness-based interventions to influence household energy behaviors.

Given this backdrop and the emerging empirical evidence showing the potential of

mindfulness based interventions on behavior regulation, combined with the sparse

knowledge about the relationship between mindfulness and energy behaviors, this project

provides initial evidence of the relationship between mindfulness related constructs and

household energy behaviors. Specifically, the project began by asking the following

research question (RQ1):

Is there a relationship between mindfulness, conceptualized as both a practice and as a

disposition, and household energy behavior/usage?

The results from two cross-sectional, correlational surveys that attempted to investigate

the relationship between household energy use behaviors and dispositional mindfulness

provide evidence that shows a significant, positive relationship between some facets of

mindfulness (Observe and Non-react) and household energy use, as well as between

mindfulness-related practices (e.g., meditation) and energy behaviors. I present the

findings of those studies in Chapter 2.

The observed relationship between mindfulness and positive self-reported energy use

behaviors, not previously demonstrated within the literature, opened up additional

questions. In the second part of this project, then, I asked the following research

questions (RQ2 and RQ3):

Do changes in mindfulness levels impact energy related decision making and other environmental behaviors?

Why is there a consistent and significant relationship between mindfulness levels and energy use behaviors?

I attempted to answer those questions via use of an 'inverted' exploratory sequential mixed-methods approach. I classify the method as an inverted one because a qualitative study was conducted based on the results of the quantitative study. A traditional mixed-methods sequential approach is often characterized by an initial qualitative phase of data collection and analysis, followed by a phase of quantitative data collection and analysis, with a final phase of integration or linking of data from the two separate strands of data (Berman, 2017). The details of my quantitative work and its results are presented in the second chapter. The third chapter presents qualitative work conducted for this project-- which involved in-depth interviews with 18 individuals who were committed both to mindfulness practices and environmental conservation. The final chapter discusses the results and implications of both parts of the project taken together.

CHAPTER 2

QUANTITATIVE METHODS AND RESULTS

2.1 Mindfulness and Household Energy Behaviors

The relationship between mindfulness and pro-environmental behaviors is still
understudied, and research around mindfulness and specifically household energy
behaviors is extremely sparse. The first phase of this project attempted to contribute to
that sparse knowledge. In this chapter, I present the results of the quantitative studies that
examined the relationship between mindfulness and household energy behaviors.
Primarily, the chapter outlines the methods and results for the investigation of the
following research questions:

RQ1: Is there a relationship between mindfulness, conceptualized as both a practice and
as a disposition, and household energy behavior/usage?

RQ2: Do changes in mindfulness levels impact energy related decision making and other
environmental behaviors?

2.2 Quantitative research methods

Quantitative research methods are widely understood as formal, objective, systematic
processes used to describe variables, test relationships between them, and examine cause
and effect associations between variables. The method generates numerical data and
seeks evidence either in support or not of a priori hypotheses using objective and
impartial scientific methods. The method is predominantly informed by positivist or post-
positivist paradigms (Davis and Fisher, 2018). Positivist paradigms historically emerged

as a movement to usurp the use of philosophy to make meaning of reality and the world, and are oriented by the idea that there exists "… an objective reality independent of any observations" (Rovai et al., 2014, p. 4) which can then be observed empirically and explained with logical analysis. Contentions around the overreliance of the sciences on positivistic methods exist, and researchers in the natural and social sciences are slowly evolving out of that overreliance by integrating qualitative methods or employing mixed methods approaches for their knowledge production. However, studies that employ quantitative methods still constitute the biggest bulk of the research conducted within the natural and social sciences.

Quantitative methods are extremely powerful and well-suited for finding general patterns or relationships between variables across samples of interest. While limited in their ability to capture nuances in phenomena under study, these methods use empirical data and produce unbiased results (Bloomfield and Fisher, 2019), which can consequently be tested for accuracy and replicability. As mentioned earlier, mindfulness within the environmental context is still understudied, and research around mindfulness and specifically household energy is extremely sparse. As such, there was value in employing a quantitative approach to identify patterns in the relationship between mindfulness related constructs and household energy behaviors.

There are different types of quantitative methods and a variety of research methods (refer to Bloomfield and Fischer, 2019). For this research, two web-based surveys were used to collect data between July and November, 2019 on Amazon's Prime Turk platform

(mturk.com). The platform is frequently used by researchers to conduct social science research (Smith et al., 2015) and collect affordable and high-quality data (Kennedy et al., 2018). There have also been studies that have reported data collected on Mturk to be better than data collected from subject pool participants (Hauser and Schwarz, 2016).The details of the two surveys and subsequent findings are reported in the sections below.

2.3 Mindfulness and Household Energy Behaviors (Study 1)

The purpose of my first study was to investigate RQ1, i.e., the relationship between household energy behavior and mindfulness related constructs. I used a web-based survey to assess people's engagement in mindfulness-based practices, their dispositional mindfulness levels and their self-reported household energy behaviors. I also assessed participants' general and financial stress levels to examine whether stress had any relationship with the two constructs of interest (energy use and mindfulness). I hypothesized that there is a positive relationship between people's engagement with mindfulness practices (and their mindfulness levels) and recurring household energy behaviors. I also hypothesized that participants who report higher stress levels will also report higher energy use in the household and are generally less mindful.

2.3.1 Participants

Participants for the survey were recruited on Amazon Mechanical Turk- a crowdsourcing web-based platform. All recruited participants were at least 18 years of age and resided in the United States and were remunerated USD 1.01 for their participation in the survey.

After discarding dubious data entries (incomplete entries, presumably 'bot' entries from the same IP addresses etc.), I had a working data set with 341 participants, out of which 194 were male and 147 were female. The mean age of the participants was 36.71 years.

2.3.2 Instruments and measures

The survey was prepared using Qualtrics- an online survey platform that allows researchers to create, collect and analyze data for various research purposes (www.qualtrics.com). The questionnaire included items that assessed participants' engagement with mindfulness as practice, their dispositional mindfulness levels, their self-reported one-time and recurring energy behaviors, their beliefs about climate change and energy use, perceived stress levels etc. To ensure good data quality, a 'catch' question that enabled me to identify answers provided by automated survey bots or by participants who did not follow directions well was included. The survey assessed the following constructs.

2.3.2.1 Mindfulness related measures

a) **Trait Mindfulness**: Trait mindfulness was measured using a shortened version of the Five Facet Mindfulness Questionnaire (FFMQ), the FFMQ-18. FFMQ-18, developed by Medvedev and colleagues (2018), contains 18 items that were derived from the original 39 item questionnaire. The original FFMQ is currently the most frequently studied and used measure of dispositional mindfulness. FFMQ is an instrument that was constructed after a factor analytic study of five independently developed mindfulness questionnaires:

the Freiburg Mindfulness Inventory (Buchheld, Grossman, & Walach, 2001), the Mindful

Attention Awareness Scale (MAAS) (Brown & Ryan, 2003), the Kentucky Inventory of

Mindfulness Skills (Baer et al., 2004), and the Cognitive and Affective Mindfulness

Scale (Feldman, Hayes, Kumar, & Greeson, 2004). The factor-analysis yielded five

facets: observing, describing, acting with awareness, non-judging of inner experience,

and non-reactivity to inner experience (Baer et al., 2006, 2008).

FFMQ defines mindfulness as a psychological construct that is composed of the five

discovered main facets. Facet "Observe" assesses practitioners' ability or tendency to

observe external and internal stimuli (e.g. sensations of the wind in the body); "Describe"

measures the ability or tendency to verbally describe those experiences, "Acting with

Awareness" (Act) measures the tendency to be presently aware of internal and external

stimuli; "Non-Judging of Inner Experience"(Non-judge) measures the tendency to not

judge a particular inner experience as good or bad; and, "Non-Reacting to Inner

Experience" (Non react) assesses the tendency to not immediately react to a particular

inner experience and "take a step back" to gain perspective.

All items use a 5-point Likert Scale (1- Almost never true, 5- Almost always true) to

measure the aforementioned facets. The FFMQ has been considered to be valid and

reliable across a variety of samples across various domains and there has been consistent

evidence that has supported its construct validity (Isenberg, 2009; Choi, 2015). Scores on

the measure have also been found to be highly correlated with other related constructs

such as openness to experience, emotional intelligence, and self-compassion (Baer et al.,

2006). The measure while widely used, is not flawless. There have been recent studies that have expressed and upheld concerns over its psychometric quality and reliability (Lecuona et al., 2019). Despite its flaws and apparent lack of consistency, I chose to use the modified version of the instrument because it does appear to be the best extant measure of dispositional mindfulness.

I used the FFMQ-18, the shortened version of the instrument for the survey. The FFMQ-18 was derived through the application of the Partial Credit Rasch Model and has been psychometrically validated to be used as a global short measure of mindfulness and its facets (Medvedev et al., 2018). As suggested by Baer and colleagues (2006), the total mindfulness composite score was calculated by summing participant responses on all the items.

b) **Mindfulness Identity:** Participants were asked if they considered mindfulness to be an integral part of their life and if they identified themselves as 'mindful' individuals. The responses were measured using a 5-point Likert Scale where 5:Definitely yes, and 1: Definitely not.

c) **Engagement in Mindfulness practices:** Participants' engagement in mindfulness as practice was assessed through questions that measured their frequency of engagement with mindfulness cultivating activities like Yoga, Breathing Exercises, Meditation and Physical Exercise. The responses were recorded using a 5-point Likert Scale, where 5: Always and 1: Never. I created a composite score called "Mindfulness Engagement" by summing the scores obtained in activities that have explicit ties to traditional mindfulness

practices (yoga, meditation and breathing exercises). I intentionally left out self-reported

physical exercise while calculating a composite score because physical exercises, unlike

mediation, yoga and breathing exercises, are not traditionally thought to be activities that

foster and cultivate mindfulness.

2.3.2.2 Energy related Measures

a) Self-reported recurring energy behaviors: Self-reported recurring energy behaviors

were measured using measures developed in a report prepared by Southern California

Edison and funded by California utility customers under the auspices of the California

Public Utilities Commission (Southern California Edison, 2016). The report contains

various scales that can be used to record self-reported data for norms, practices, material

culture, context and user experience related to energy behavior. All measures have been

empirically validated by the authors and are presented in the report.

Recurring energy behaviors are behaviors that individuals in households engage in

frequently, usually on a daily basis. Participants' engagement in these kinds of behaviors

was assessed through their responses to items that asked how often they engaged in

behaviors such as 'reducing heating in unoccupied rooms' or 'limiting their shower

times'. The responses available to participants were: 'Almost never', 'Rarely',

'Sometimes', 'Often', 'Always' and 'Not Applicable'.

Average scores for each participant was calculated by summing the scores of responses

and dividing it by the total number of available behaviors. The total number of available

behaviors differed in participants according to the number of behaviors that were "non applicable" in their specific cases.

2.3.2.3 Stress related measures: The survey also assessed participants' general stress, perceived general stress and financial stress levels.

a) Perceived Stress: Participants perceived stress levels were measured using the shortened version of Perceived Stress Scale (PSS), the PSS-4. This particular shortened version of the PSS is a widely used instrument for measuring the perception of stress. The instrument assesses participants' stress levels by using items like, "In the last month, have you felt that you were unable to control the important things in life?" The responses are measured using a 5-point Likert Scale where 5- Very Often and 1- Always. Composite scores are calculated after reverse coding a couple of items and adding the scores that the participants use.

b) General stress: Participants' general stress levels were measured using a straightforward question: "How stressed are you in general these days?" Responses were recorded on a 5-point Likert Scale, where 5- Very Stressed, and 1- Not stressed at all.

c) Financial stress: Financial Stress was measured using another straightforward question: "How stressed are you about money and finances?" Responses were recorded along a 5-point Likert Scale as well, where 5- Very Stressed and 1- Not Stressed at all.

2.3.3 Results

All statistical analyses were conducted using R studio, a free and open source integrated development environment, designed for R, a programming language for statistical computing and graphics (http://rstudio.com).

2.3.3.1 Zero Order Correlations

a) Mindfulness levels and Recurring Energy Behaviors

Mindfulness facets Observe (r= 0.38), Non-react (r= 0.24) and Describe (r=0.16) were significantly correlated with recurring energy behaviors. Facets Act (r= -0.04) and Non judge (r= -0.07) were not significantly correlated with recurring energy. Total Mindfulness Composite score was positively correlated with recurring energy behavior and was significant (r= 0.20). Refer to Table 1 for zero order correlations.

Table 1:Zero order correlations between various constructs. (Table continues onto next page)

	1	2	3	4	5	6	7	8	
1.Observe	1								
2.Acting with Awareness	0.10	1							
3.Non judge	-0.08	**0.51**	1						
4.Describe	**0.24**	**0.48**	0.40	1					

5.Non React	**0.16**	**0.22**	**0.32**	**0.39**	1				
6.Total Mindfulness	**0.39**	**0.70**	**0.65**	**0.82**	**0.67**	1			
7.Recurring Energy Behavior	**0.38**	-0.04	-0.07	**0.16**	**0.24**	**0.20**	1		
8. PSS Composite	0.7	**0.50**	**0.45**	**0.50**	**0.44**	**0.62**	0.07	1	
9. Mindfulness Practice	**0.25**	**-0.20**	**-0.29**	-0.03	**0.11**	-0.05	**0.45**	-0.05	1.00
Note: R values in bold are statistically significant.									

b) Stress, Dispositional mindfulness levels and Energy Use

Perceived Stress, General Stress and Financial Stress were strongly correlated with each other. They were all, however, insignificantly correlated with recurring energy behavior. On the other hand, stress levels, as expected, were negatively and strongly correlated with mindfulness facets.

Perceived stress, the composite of items derived from the PSS-4, was significantly correlated with Describe(r= -0.50), Non React (r=-0.44), Non judge (r=- 0.45), and Acting with Awareness(r=-0.50). However, the variable wasn't significantly correlated with the Observe facet. General stress and Financial stress, both highly correlated with Perceived Stress, followed the same trend and were significantly correlated with all

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mindfulness facets except 'Observe' as well. People's self reported engagement with

mindfulness related practices was also negatively, but non-significantly correlated with

their perceived stress levels.

c) Engagement in mindfulness practices and Recurring Energy behaviors

Recurring household energy behaviors were strongly and positively correlated (r=0.45)

with frequency of engagement in mindfulness practices (composite of scores obtained on

frequency of engagement in yoga, meditation and breathing exercises). This construct

was also positively and significantly correlated with facets Observe (0.25) and Non-react

(0.11). Interestingly, this construct was negatively correlated with all the remaining

facets; it was significantly correlated with facets Act (r=-0.20) and Non-judge (r=-0.29),

and was not significantly correlated with facet Describe (r=-0.03).

d) Mindfulness Identity and Energy behaviors

Respondents' self-ascription to the 'mindfulness' identity was also significantly and

positively correlated with their self-reported energy use (r=0.302).

2.3.3.2 Multiple Regression

Given that recurring household energy behaviors were correlated with some mindfulness

facets (Observe and Non-react), the engagement in mindfulness construct and the self-

ascription to mindfulness identity, I wanted to model a relationship that could try to

explain the relationship between recurring household energy and all the constructs related

to mindfulness that were significant during the correlation analysis. Table 2 lists results

of the regression model tested, using household energy behaviors as outcome variable and education levels, age, mindfulness facets Observe and Non react, engagement in mindfulness practice and ascription to mindfulness identity as primary predictors.

Table 2: Regression analyses for Mindfulness constructs as predictors of self-reported household energy behaviors.

Predictor Variable	Beta Value (B)	T value (t)	P value
Mindfulness Engagement	0.071	6.639	**1.25e-10 *****
Observe	0.057	4.800	**2.38e-06 *****
Non react	0.024	2.994	0.002951 **
Mindfulness Identity	0.027	0.951	0.342
Age	0.009	3.561	**0.000422 *****
Education	0.043	1.996	0.046757 *.
Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1 Residual standard error: 0.5204 on 340 degrees of freedom Multiple R-squared: 0.3316, Adjusted R-squared: **0.3198** **F-statistic: 28.12 on 6 and 340 DF, p-value: < 2.2e-16**			

The model was significant overall, with a $p < 0.05$ and explained 32% of the variability in the data. Results show that among variables related to mindfulness that might affect household energy use, people's frequency of engagement in yoga, meditation and breathing exercises and their dispositional capacities to Observe and Not react to inner stimuli are significant predictors of household energy use. People's age and education levels were both significant predictors of household energy use, while self-ascription to mindfulness identity appears to lose its predictive ability when controlling for people's engagement with mindfulness as a practice and their observing and non-reacting dispositions.

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Variance Inflation factor (VIF) is used to calculate the extent of correlation or collinearity/multicollinearity between predictors in a model. Higher values signify issues with the contribution to predictors in the model. A value higher than 5 is usually considered to be not ideal for predictive capacities of variables. A VIF analysis for the model above yielded the following results:

Table 3: VIF analysis of predictors in regression model.

Mindfulness Engagement	Observe	Non react	Mindfulness Identity	Age	Education
1.396	1.139	1.067	1.363	1.048	1.047

The plots below demonstrate that the data also met the assumptions of homogeneity of variance and linearity and the residuals were approximately normally distributed.

Figure 1: Plots showing data met assumptions of homogeneity of variance and linearity and residual normality for Study 1.
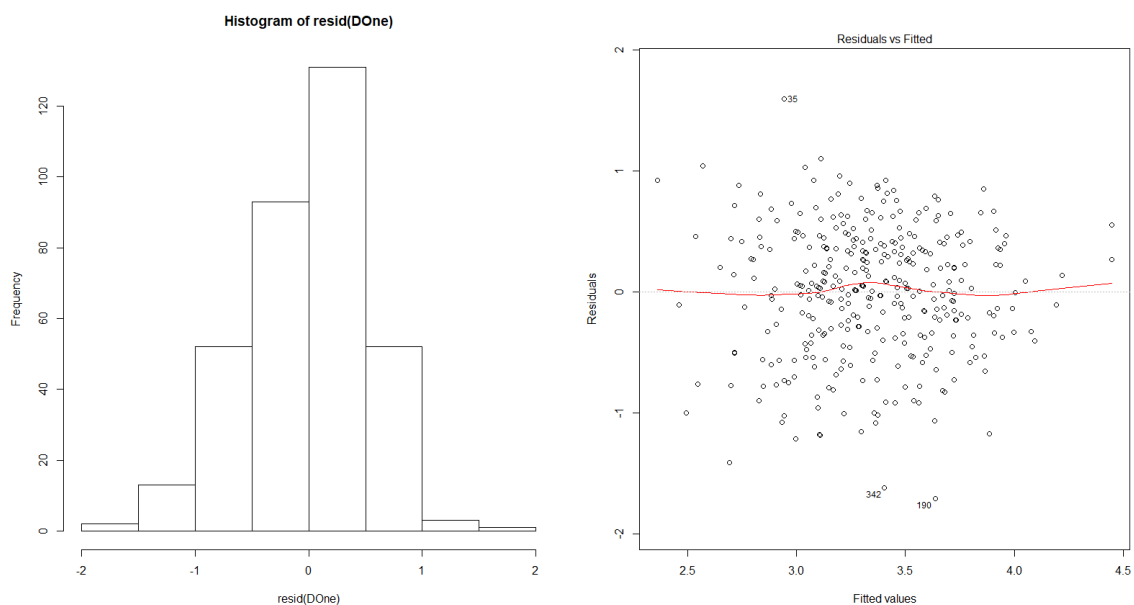
2.3.4 Discussion (Study 1)

The results of the first study provide evidence that a positive, significant relationship between certain facets of dispositional mindfulness (Observe and Non react) and recurring household energy behaviors exists. Similarly, results revealed novel and encouraging evidence of a moderate-to-strong positive relationship between engaging in mindfulness practices (e.g., yoga, meditation) and pro-environmental energy behaviors.

These results are encouraging because they bolster existing evidence about the relationship between dispositional mindfulness levels and environmental behaviors, writ large. More importantly, the study adds novel knowledge to existing literature by reporting evidence about the relationship between dispositional mindfulness facets and specifically household energy behaviors. It also presents evidence of the positive, and understudied relationship between engaging with mindfulness as a practice and household energy behaviors.

2.4 Effect of mindfulness on energy related decision making

The purpose of the second study was to investigate RQ2: Do changes in mindfulness levels impact energy related decision making and other environmental behaviors? I hypothesized that participants subjected to a mindfulness-based intervention would report higher state mindfulness (SM) levels post intervention which would then positively impact their energy related decision making (outcome variable). People's decision-making behavior was assessed by measuring the amount of money they chose to donate

from their potential earnings to ACEEE, a nonprofit organization in DC that lobbies for sustainable energy related issues in Washington DC. Beyond that, the study also aimed to replicate results that were obtained in Study 1.

2.4.1 Participants

Participants for this study were recruited via Amazon's Mechanical Turk as well. Again, we stipulated that participants were American and 18+ years of age. A total of 400 participants were recruited through the platform and were paid 0.51 USD for their participation. After discarding dubious and clearly bad quality responses, we had data from 327 participants. 171 of our participants were male, 154 were female, one person chose the 'other' option and one of them didn't want to disclose their gender. The mean age of the participants was 39.09 years.

2.4.2. Study design

The study was a web based randomized control trial (RCT) experiment in which we assigned 100 participants into each of three unique treatment conditions or a control condition: Mindfulness Based Intervention (MBI), Information-based intervention(IBI), 'Awe-inspiring' intervention(AI) , and a control writing condition. All the treatment conditions required participants to watch and follow directions provided through 2-minute long videos sourced from youtube. Participants in the control condition were asked to write about their day.

The treatment videos were embedded in a survey designed on Qualtrics. Participants in the MBI condition were asked to meditate with the help of a 2 minute long guided meditation video (https://www.youtube.com/watch?v=vLhOGEnEedk&t=70s). Participants in the information-based intervention watched a 2 minute long video that promoted energy efficiency (https://www.youtube.com/watch?v=ziYcze4Pv_o) while participants in the 'awe inspiring' category watched another 2 minute long video titled "The Pale Blue Dot" narrated by Carl Sagan (https://www.youtube.com/watch?v=HOEnEsb-Bz0&t=63s). Participants in the control group were asked to write a short paragraph about their day.

Participants were unable to skip videos until a minute had elapsed, in an attempt to ensure that participants watched what was being displayed to them. The interventions were also followed by a simple question related to the video to assess if they had watched the video. Data obtained from participants who failed to answer this question correctly were omitted. Beyond watching the videos and following directions, all participants were asked to answer questions about their recurring household energy behaviors, their dispositional mindfulness levels, their engagement in mindfulness related practices (Mindfulness Engagement), and their self-ascribed identities.

Immediately after the interventions, participants' state mindfulness (SM) levels were measured using the truncated version of the 'State Mindfulness Scale'(SMS). Tanay and Bernstein (2013) developed the SMS by integrating the conceptual understanding of mindfulness that stems out of Buddhist scholarship with the Bishop and colleagues'

(2004) two-part conceptualization of mindfulness. The authors' two level model of SM measures mindfulness through measurement of awareness of the 'objects of mindfulness' or 'what experience a person attends to' such as physical or mental stimuli, and the measurement of the 'quality of mindful awareness' which is 'how a person attends to experience' when interacting with aforementioned stimuli. The validated SMS measures items such as "I noticed pleasant and unpleasant emotions" and "I felt aware of what was happening inside of me" on a 5 point Likert scale 'not at all' to 'a lot'.

After an assessment of SMS, participants were asked to make a household energy related decision, which was the outcome variable. Participants were notified that they would be automatically entered into a lottery for $10 as a gift for their help with the survey. They were also provided with an option to donate part of or all of $10 that they could potentially win through the lottery to an energy related non-profit ACEEE. I hypothesized that participants in the MBI condition would report higher state mindfulness levels and consequently choose to donate more money to ACEEE.

After omitting incomplete and dubious responses, and responses that clearly indicated participants didn't follow instructions, we had the following number of participants per treatment condition: MBI=74, IBI= 84, AI=71, WC=98. Other constructs such as trait mindfulness, engagement in mindfulness activities and recurring household energy behaviors were all measured using the instruments that were used during Study 1.

2.4.3 Results

As in study 1, all statistical analyses were conducted using Rstudio.

2.4.3.1 Effects of interventions on participants' state mindfulness levels and donation behaviors: A one-way between subjects ANOVA was conducted to compare the effect of the various interventions on state mindfulness scores across four treatment levels. There was no significant statistical difference in group means of state mindfulness levels across the four treatment conditions [$F_{(3, 323)} = 1.545$, p=.203]. As expected, and potentially as a consequence of no impact of interventions on state mindfulness levels, there was also no significant difference in donation behaviors across treatment conditions [$F_{(3, 323)} = 0.574$, p=0.63].

The lack of discernible impact in levels of state mindfulness after exposure to various interventions, especially our mindfulness-based intervention, is potentially an indication of the inefficacy of either the measure of state mindfulness or the interventions themselves. There are multiple reasons why the various video-based interventions might have been ineffective. Participants might have not followed directions and watched the videos closely; it is to a degree wishful to think that respondents on a web-based platform meditated as directed by a survey that paid them fifty cents for their effort. Even in the most ideal scenario where all participants followed directions and actually engaged in the intervention, the 2-minute mindfulness intervention might have been ineffective in raising mindfulness levels. Beyond that, the instrument that measured their mindfulness levels might not have been sensitive enough to capture alterations in state mindfulness levels. I concluded that I could not make any statements about the directional impact of mindfulness on energy related decision making based on the results of the study. The

whole survey wasn't a waste, however. Available data on other measures can still provide

valuable insight on the relationship between dispositional mindfulness levels, both state

and trait, and recurring household behaviors (as well as between mindfulness practices

and energy behavior).

I present my findings about the relationship between recurring household energy

behaviors and constructs related to mindfulness facets in the sections below. I assessed

dispositional mindfulness levels and engagement in mindfulness practice using the same

instruments I used in the first study. I also assessed the relationship between self-ascribed

activist, environmentalist and 'mindful' identities and household energy behaviors during

this phase of the study. The self-ascribed identities were measured through a matrix

question that asked them how strongly they identified as environmentalist and activist,

where 5: Strongly, 1: Not at all. To assess how strongly participants subscribed to the

'mindfulness' identity, they were asked if they considered mindfulness to be an integral

part of their life and if they identified themselves as 'mindful' individuals. The responses

were measured using a 5-point Likert Scale where 5: Definitely yes, and 1: Definitely

not.

2.4.3.2 Mindfulness facets and Recurring Energy Behaviors

The relationship between mindfulness facets and recurring energy behaviors followed

almost the exact patterns as study 1. Facets Observe (0.14) and Non-react (0.19) and

Describe (0.11) were again significantly and positively correlated to self-reported

household energy behaviors. Facets Act and Non-judge were both negatively correlated

to energy behaviors, albeit insignificantly, also following the trend in the first study. Total Mindfulness was positively and significantly correlated to recurring energy behaviors as well. The zero order correlations are listed on Table 4.

a) Engagement in mindfulness practices and Energy behaviors: Self-reported recurring household energy behaviors were strongly and positively correlated (r=0.32) with frequency of engagement in mindfulness practices (yoga, meditation and breathing exercises). This construct was also positively and significantly correlated with facets Observe (0.18) and Non-react (0.21). This construct was negatively correlated with all the remaining facets; it was significantly correlated with facets Act (r=-0.16) and Non-judge (r=-0.20) and was insignificantly correlated with facet Describe (r=-0.05). The results follow the same patterns as in study 1.

b) Various self-ascribed Identities: People's self-ascription to various identities were also significantly correlated to energy behaviors. Respondents who identified as environmentalists (r=0.39) and activists (r=0.34) reported better energy behaviors in their households. Respondents who considered themselves to be 'mindfulness people' also reported relatively more positive household energy use (r=0.22). Respondents who identified themselves as activists (r=0.46), environmentalists (0.37) and mindfulness people(0.60) , also reported to have engaged in mindfulness practices more frequently.

Table 4: Zero order correlations between various constructs. R values in bold were statistically significant. (Table continues onto the next page.)

	1	2	3	4	5	6	7	8	9	10	11

1. Recurring Energy behaviors	1									
2.Acting with Awareness	-0.01	1								
3.Observe	**0.14**	0.25	1							
4.Non-Judge	-0.10	0.43	0.00	1						
5.Non-React	**0.20**	0.23	0.31	0.22	1					
6 Describe	**0.11**	0.44	0.45	0.28	0.41	1				
7. Total Mind	**0.11**	0.68	0.56	0.57	0.67	0.81	1			
8. Practice Engagement	**0.32**	**-0.16**	**0.18**	**-0.20**	**0.21**	0.05	0.02	1		
9. Environmental Idenitity	**0.39**	0.00	**0.23**	-0.09	**0.11**	0.08	0.09	**0.37**	1	
10.Activist Identity	**0.34**	**-0.17**	**0.14**	**-0.21**	0.05	0.04	-0.04	**0.46**	**0.59**	1	
11. Mindfulness Identity	**0.22**	-0.02	**0.22**	**-0.15**	**0.20**	0.09	0.10	**0.60**	**0.32**	**0.34**	1

2.4.3.3 Multiple regression

As in study 1, given that recurring household energy behaviors were correlated with mindfulness facets (Observe and Non-react), the mindfulness practice engagement construct, and self-ascription to various identities, I wanted to model the relationship between recurring household energy and all the constructs related to mindfulness that were significantly correlated to self-reported household energy behaviors.

Table 5: Regression analysis for mindfulness constructs as predictors of self-reported household energy behaviors.

Predictor Variable	Beta Value (B)	T value (t)	P value
Mindfulness Engagement	0.0441446	2.465	**0.01422** *
Observe	-0.0002524	-0.013	0.98938
Non react	0.0333583	2.596	**0.00986** **
Mindfulness Identity	-0.0209376	-0.427	0.66964
Activist Identity	0.0787754	1.786	0.07499 .
Environmentalist Identity	0.1693087	4.054	**6.34e-05** ***
Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1 Residual standard error: 0.7214 on 320 degrees of freedom Multiple R-squared: 0.213, Adjusted R-squared: 0.1982 F-statistic: 14.43 on 6 and 320 DF, p-value: 1.415e-14			

A multiple regression analysis that modeled various mindfulness constructs and ascription to identities as predictors of household energy behaviors showed that engagement in mindfulness practices, along with the facet Non-React were significant in predicting household energy behaviors. Self-ascription to the environmentalist identity was significant in predicting household energy behaviors, and subscription to the

mindfulness and activist identity weren't significant predictors in the model. The results

of the analysis indicate that among variables related to mindfulness that might affect

household energy use, people's frequency of engagement in yoga, meditation and

breathing exercises and their capacities to not react to inner stimuli are significant

predictors of household energy use, along with their self-ascribed identity as

environmentalists.

A VIF analysis for the model above yielded the following results. The VIF values of all

the predictors are reported below:

Table 6: VIF analysis of predictors in regression model.

Observe	Non react	Activist ID	Environmenta list ID	Mindfulness Engagement	Mindful ID
1.173912	1.146998	1.714727	1.616339	1.783050	1.611340

The plots below demonstrate that the data also met the assumptions of homogeneity of

variance and linearity and that the residuals were approximately normally distributed.

Figure 2: Plots showing data met assumptions of homogeneity of variance and linearity and residual normality for Study 2.
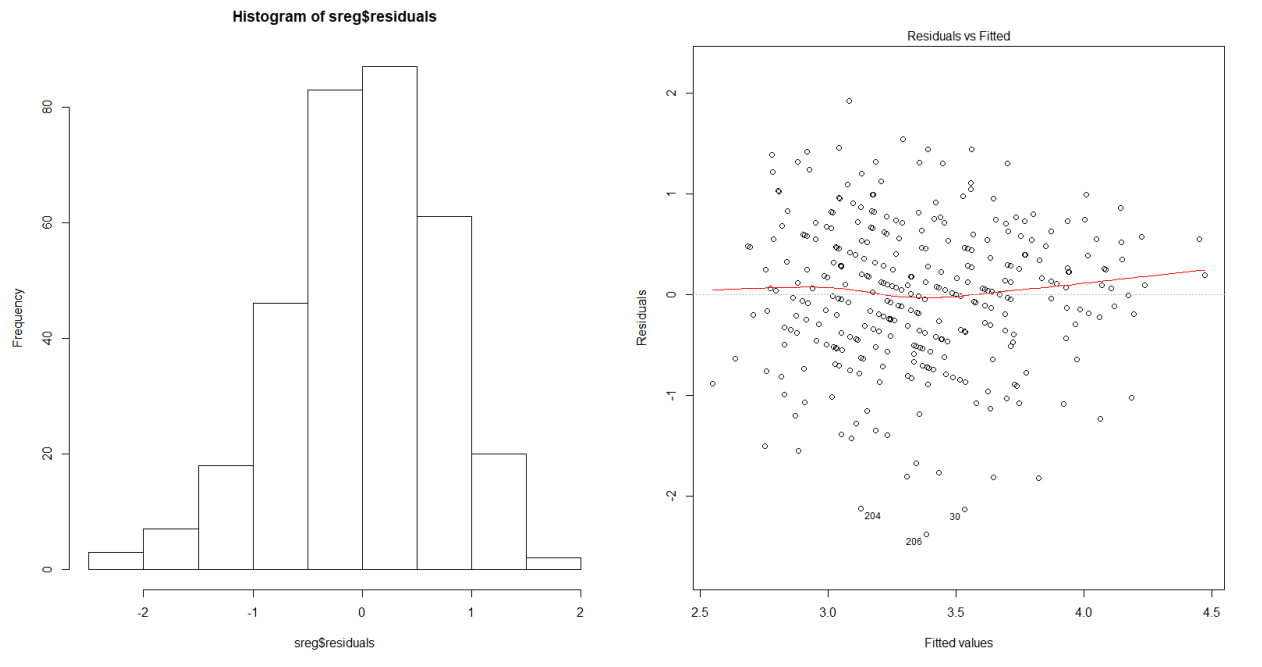
2.4.4 Discussion (Studies 1 and 2)

The results of our quantitative work across two independent samples provide us with evidence that a positive, significant relationship between certain facets of dispositional mindfulness (Observe and Non react) and recurring household energy behaviors exists; similarly, we find consistent evidence of a moderate-to-strong positive relationship between engaging in mindfulness practices (e.g., yoga, meditation) and pro-environmental energy behaviors. These results are encouraging because they add to and corroborate existing evidence regarding the relationship between mindfulness and various environmental constructs (Baer, 2006). In contrast, self-reported stress levels, while related to certain mindfulness facets, weren't predictors of household energy use.

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Correlational evidence of a relationship between mindfulness practice, specific facets of trait mindfulness (Observe and Non-react) and people's engagement with energy conserving behaviors invites perhaps more questions than it answers, specifically regarding the nature of the observed relationship. Is the relationship a causal one or is it the result of a third variable? Does change in mindfulness levels, potentially as a consequence of engagement in mindfulness related activities, actually affect the way people interact with their household energy architecture, or beyond that, other environmental behaviors?

An ideal research design to assess the aforementioned questions would involve a longitudinal experimental research design with a randomly selected sample, well designed interventions of various lengths, and tests of the efficacy of different mindfulness activities. The design would also allow researchers to track and measure potential changes in trait mindfulness levels and multiple quantifiable environmental behaviors (such as electricity usage, water consumption, etc). The design would be complete with a qualitative element that would help us understand how and why the interventions worked. A study as such would allow us to provide concrete evidence about the causal impact mindfulness has on environmental behaviors.

Given the logistics and time related constraints involved in such an undertaking, a study of that scale was not feasible for this project. However, there was still potential in being able to contribute to answering, or more so suggesting some answers to, the question of

why there is a significant, positive relationship between mindfulness related constructs and pro-energy, and more broadly pro-environmental concerns/behaviors. As mentioned in Chapter 1, the various mechanisms that have been presented to explain the mindfulness-environmental behavior relationship, while credible, are still suggestions. The need for more contextual, exploratory, in-depth research to understand mechanisms that facilitate the relationship between mindfulness and pro-energy and pro-environmental behaviors is still warranted.

After internalizing these logistical and methodological barriers, and a clear need for more exploratory studies, I decided to pursue my inquiry through a qualitative approach. I elaborate on my rationale to pursue a qualitative inquiry, the methods that I employed and my findings in the next chapter.

CHAPTER 3

QUALITATIVE RESEARCH: MINDFULNESS AS AN EXPERIENCE

There is a significant body of knowledge, almost exclusively derived from quantitative studies (primarily correlational), that now substantiates the relationship between mindfulness and environmental constructs. The results from my quantitative studies, as presented in Chapter 2, add to that growing knowledge as well, both by extending past work to the domain of household energy use as well as by further establishing a connection between concrete mindfulness practices and environmental engagement. There is, however, a paucity of studies that delve deeper beyond establishing relationships between mindfulness and environmental attitudes, beliefs or behaviors. This lack of research and understanding of the relationship between mindfulness and pro-environmental constructs isn't unexpected, such is the newness of work at the intersection of mindfulness and environment. Although there is a clear need for longitudinal, experimental, quantitative work that assesses whether mindfulness (in all its conceptualizations) has causal impacts on environmental behaviors, there is also a palpable need for studies that can delve deeper into the mechanics of the existing, empirically identified relationship between mindfulness and pro-environmental constructs. Qualitative methods are well-suited for that process, as they allow researchers to explore known yet understudied relationships and processes and potentially formulate new theories (Leedy and Ormrod, 2001).

This chapter attempts to contribute to ameliorating that lack of knowledge by using a qualitative approach to answer the following specific question:

RQ3: Why is there a consistent and significant relationship between mindfulness levels (and practice) and pro-environmental behaviors?

This study started out as an attempt to understand the relationship between household energy behaviors and mindfulness. Results presented in Chapter 2 provide evidence of a relationship between mindfulness related constructs and household energy behaviors and add to, and corroborate, existing knowledge about the relationship between mindfulness and pro-environmental behaviors (discussed in Chapter 1). Given the purpose of this phase of the study was to dig deeper into the nuances of this consistently recurring relationship between mindfulness and pro-environmental behaviors and attitudes, it was necessary to expand our focus from household energy behaviors to broader pro-environmental behaviors.

3.1 A qualitative approach

The lack of consensus and the amount of contention in extant literature around all things mindfulness -- its conceptualizations, the processes that it operates through, and its impacts on individual practitioners -- seems to stem from inherent heterogeneity in the understanding and definition of "mindfulness". Practitioners' conceptualizations of mindfulness, their intents to pursue and sustain their practice, the kinds of tools that they use for practice and their subsequent experiences during their practice are all subject to individual choices and meaning making, and hence are all (potentially) multiform and diverse and subjective. Engagement with mindfulness is, at the end of the day, an

experience, and a very personal one. An investigation of people's individual experiences with mindfulness--as a psychological phenomenon and as a practice-- cannot be undertaken through quantitative work alone, particularly when examining a previously unexplored domain of behavior; the concept is simply too complex and idiosyncratic across individuals and contexts to be fully open to quantitative methods that inherently must rely on over-simplifications and short-hand operationalizations. Qualitative approaches to understand mindfulness have the potential to bridge the very palpable gap that exists within the literature regarding how mindfulness impacts different people and how it manifests in their individual environmental behavior; qualitative approaches are, after all, ideal for pursuing answers to questions that are related to individual experiences, meanings and perspectives (Hammarburg et al., 2016).

In addition to capturing people's individual, subjective meaning making processes, and potentially unearthing new models, a qualitative approach was suitable for this research because it would provide the study a semblance of a longitudinal study as well. One of the prominent critiques or shortcomings of extant mindfulness related research has been the snap-shot, cross sectional nature of data. Mindfulness, however, is both an experience and a process, and its examination needs a *longue durée* approach in order to capture the nature of changes that comes with the process. This study thus contributes to our understanding of how mindfulness impacts practitioners' environmental intentions and behaviors over a period of time by treating it as a process that can be explored retrospectively rather than treated as a phenomenon that exists at a particular point in time, divorced of intertemporal context and experience. Beyond that, increasingly more

researchers that engage in mindfulness work have called for more qualitative work to understand how mindfulness might affect behaviors in general (Van Dam et al., 2017) and specifically environment related constructs (Ericson et al., 2014).

3.2 Methods

3.2.1 Sample

In the vein of qualitative research methods' purposive sampling, semi-structured interviews were conducted with 18 individuals, all environmental professionals who identified themselves as mindfulness practitioners. These specific individuals were chosen for the study under the assumption that they would be able to discern if their mindfulness practice had an impact on their environmental behaviors, thus allowing me to pursue one of the key research questions in this subdomain of scholarship. Changes in environmental behaviors can be a consequence of multiple factors and influences (Morren and Greenstein, 2016) and people who both engage in mindfulness practice and are also dedicated environmental practitioners and advocates have the awareness to attribute (or not) their changes in behaviors to their mindfulness practice. Participants were identified through personal networks and were contacted through email to find suitable times for interviews.

The semi-structured interviews were 14-45 minutes long. Semi structured interviewing is a frequently used form of data collection in the social sciences (Horton et al., 2004; Mohajan, 2018). The semi-structured interviewing method, as its name implies, finds a happy balance by locating itself between the rigidity of 'structured interviewing method' (in which the interviewer enters the interaction with the participant with a rigid set of

questions, which are not to be deviated from) and the complete spontaneity of the amorphous 'unstructured interviewing method'. Semi-structured interviews have a structure and initial set of interview questions/prompts, but are also designed to allow researchers to be fluid and flexible in their conversations during the interview (e.g., by asking follow-up questions or moving towards unanticipated lines of questioning as a function of a participant's initial responses). This interview technique is well suited for seeking answers to 'why' questions, rather than questions pertaining to 'how many or how much' and can be used to 'explore more complicated questions' (Fylan, 2005), and hence is an appropriate fit for the present project, which is both exploratory and focused on a complex, not easily distilled set of concepts.

All in-person or phone interviews were conducted during the months of June and August, 2019. Interviews were conducted with energy entrepreneurs, environmental lawyers, land trust board members, environmental researchers, wilderness rangers, wilderness/nature guides, land stewards, environmental educators and others who work within the environmental sector. Most of the participants reported having a mindfulness practice and engaged in traditional mindfulness-inducing practices, such as meditation and yoga. Some practitioners mentioned their engagement with qi hong as a mindfulness practice as well. A few participants made direct statements about nature when talking about mindfulness practices and mentioned how their mindfulness is directly associated with them being or spending time in nature.

Participants were provided with written and verbal information about the study. Consent, both written and verbal was obtained for interviews. Interviews were recorded using a handheld recorder and were transcribed via the use of an online transcription service (rev.com). Data was analyzed using NVivo, a qualitative data analysis (QDA) software package.

Mindfulness, for the purpose of this phase of the research, is conceptualized as a phenomenon, as opposed to a disposition, which is conceptualized and experienced differently by different individuals with diverse personal histories and life-trajectories. Hence, data was analyzed using the methods prescribed by the transcendental and hermeneutic phenomenological schools of thought. There are multiple approaches to conducting qualitative research and data analysis (e.g., Quantitative Content Analysis, Grounded theory, etc.) and various approaches cater to the variety of ways questions are asked and can be asked. The phenomenological research approach was suitable for the study because it helps us understand and study lived human experiences around the nature and meanings of phenomena (Finlay, 2009). My analysis of experiences around mindfulness include both descriptive analyses, as recommended by the transcendental phenomenological analysis, and interpretive analysis, as recommended by the hermeneutic phenomenology (Mohamed, 2017). Analysis of data consisted of open, axial and selective coding, selection of categories and sense making of the essential themes that emerged during the coding process.

3.2.3 Results:

While the primary focus of the study was understanding the nature of the relationship

between mindfulness and pro-environmental behaviors and the mechanisms that

underline that relationship, I also asked questions about individual conceptualizations of

mindfulness, the general impact it had on practitioners' lives, and the way it impacted the

way they perceived nature. I present my findings for specific themes in the sections

below.

3.2.3.1 Conceptualizations:

While multiple conceptualizations of mindfulness populate the academic mindfulness

literature, Job Kabat Zinn's conceptualization of mindfulness, with all the contentions

that come with it, is without doubt held as the "gold standard" articulation of the concept.

This was not the case with our participants. While participants' conceptualization of

mindfulness did share a lot of fundamental constitutive elements with Kabat Zinn's

articulation, very few participants mentioned him, or his definition (verbatim) when

asked about their conceptualization of mindfulness. A few practitioners who did mention

his name identified it as a 'secular rendition' of mindfulness, and implied that there was

more than Kabat Zinn's definition to mindfulness. One of the participants commented:

"'*I use secular definitions of mindfulness when I am teaching, but for me without the*

notion of self-compassion and other compassion, it is harder for me to see the point of

it."

While participants' conceptualizations shared similar elements with extant scholarly

conceptualizations of mindfulness, they differed from them with respect to an explicit

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association of mindfulness with specific values such as kindness and compassion. As one participant stated:

"I think, paying attention, errm, and being open to whatever phenomenon is coming to me, and seeing the you know, seeing the projection of my own mind, on that phenomena, and being willing to you know to, catch myself without judgement hopefully, or at least seeing the judgement of myself and of others, and trying to be kinder, errm, I think a part of that also is, to myself and others."

Similar sentiments emerged in another interview:

".. mindfulness is the... As you said, be quiet. So, trying to say, just imagine being in your most comfortable chair on a rainy night, and just listening to the rain. Right there, so you don't have to strive for anything else. Learning with compassion, kindness, to allow our feelings to be, to find them in our body. Where are they located? And let them to be, and not becoming involved with them. Not trying to change that. And just having that spaciousness…"

Various participants considered mindfulness practice to be a 'skill' or a 'tool' acquired through 'hard work', and generally constitutive of processes and components listed below. It needs to be pointed out that while most human beings engage in the processes or with the components listed below without necessarily subscribing to the mindfulness paradigm or 'practicing mindfulness', participants in this study, as long term

practitioners, seemed to intentionally and consistently engage in or with the processes and elements below:

1) **Pausing, quieting down, slowing down**- Most participants indicated an intentional veering off from whatever is going on, 'slowing down' or 'being quiet' as a foundational element of mindfulness. This is an implication that most practitioners consider 'normal life' or 'the non-mindful life' to be too fast-paced and non-conducive for the practice element of mindfulness.

2) **Awareness**: Most of the participants also indicated that 'awareness' or 'attentiveness' was an important aspect of mindfulness. There was an implication that as human beings, we tend to be not as aware during our daily lives, and 'cultivation of awareness' by seemingly practicing to be aware (of experiences in the present) during mindfulness practice is one of the central components of mindfulness. This awareness seems to differ from our general understanding of awareness primarily because of its intentionality and its broadened loci of awareness, which during mindfulness practice includes various bodily sensations and mental objects (thoughts, emotions) in addition to the phenomena that are happening in the world outside their respective bodies.

Quite a few participants alluded to mindfulness providing them or being a process which enables them to be aware of awareness itself, or meta-awareness. One of the participants said mindfulness allowed them "*to see the projection of their own mind on phenomena*". Another participant put it poignantly as they described this meta-awareness when they

said mindfulness , " *..creates a capacity to move... a metaphor I like is, to move from the dance floor to the balcony.*" There have been multiple studies, primarily within the cognitive psychology domain, that have established and explicated about the important relationship between mindfulness and meta awareness (see Hargus et al., 2010; Holas and Jankowski, 2013; Dunne et al., 2019).

3) **Present/presence**: The notion of 'being present of/in the present' was an important theme that emerged from the conversations with the participants. The act of being "*fully present with whatever is happening*'' or being "*open to as much as possible to now*" was an important component of mindfulness. One of the participants interpreted this notion of being present as an antidote to *"missing life"* or living a choiceless life and that being mindful meant "*being present in a particular way, in this way that's actually allowing us to have choice.*" This concept of living an intentional life resonates with the conceptualization presented by the Langerian mindfulness model that explains mindfulness as a state of non-habitual, intentional, present-focused living.

4) **Observation**: Participants expressed that mindfulness practice required them to observe external or internal stimuli and phenomena in the present moment. The objects of observation ranged from physiological stimuli such as the breath or bodily sensations, mental stimuli such as thoughts to external, natural stimuli, as one participant articulated, "*hearing the sounds, maybe the swallows are passing through and I'm hearing the croaking of the frogs that stops for awhile and then it picks up again and a frog on the other side of the pond will say something.*"

The spaces of observation varied as well, as some participants identified the mental space

as their focus, "*realize what's going on in that crazy mind*", while some chose to focus on

"*the body*". Other participants talked about trying to take stock of everything in and

around them, as one of them reported asking,"*What can we listen to here? What do we*

hear around us? What do we smell around us?" during their mindfulness practice.

5) **Attitudes and values:** Most participants talked about observing various stimuli and

phenomena with certain attitudes, primarily non-reactivity- breaking the pattern of

habitually responding or 'reacting', and non-judgementality (as opposed to being

judgmental, or self-critical) along with openness, patience, acceptance and curiosity

being central to mindfulness practice.

Participants also repeatedly privileged the role of values such as kindness, compassion,

humility and gratitude to be important elements to their mindfulness practice. One of our

participants articulated their process as they said, "*Learning with compassion, kindness,*

to allow our feelings to be, to find them in our body."

6) **Investigation and Evaluation:** According to the participants**,** investigation and

evaluation of, as opposed to reaction to, the responses to non-judgmentally observed

present moment stimuli was an important element of mindfulness. This process is guided

by the aforementioned attitudes and values that participants embrace during mindfulness

and is usually self-examinatory, or 'self-critical'. One of the participants said, "*I feel as*

though I am practicing mindfulness when I am feeling reactivity within myself and before espousing that reactivity, I consider. That I consider, what is that arising out of? Why am I feeling this way?"

3.2.3.2 General Impact

All participants reported positive impacts of their mindfulness practice on their lives. This was almost expected because participants in the study were all long-term practitioners who had volitionally stuck with the practice and had reaped benefits from their engagement with the practice. It was nevertheless interesting to see how their engagement with the concept had manifested in their lives. As one participant put it:

"It's allowed me to be slower with my kids, more patient with them, with my wife. Much gentler on myself. But it's also, I think, it's given me... let's just say for now the mindfulness practice gave me a much greater clarity in my life's pursuit going forward."

3.2.3.3 Extent and Quality

Most participants used descriptors such as 'profound' and 'life-saving' to describe their experience with mindfulness. One of the participants expressed that mindfulness "*pervaded their everyday*" and that there was "*very little in their lives that isn't affected*". One participant expressed the deep impact engagement had in their life as they said, "*it's the thing that clicked for me and saved my life, in a lot of ways. I think it really does come down to that. Meditation and mindfulness has caught me in the moment of mental break, and then has carried me through to whatever degree in the midst of other really challenging circumstances.*"

While almost every single participant claimed that engagement with mindfulness had a very positive impact on their lives, some participants also shared their concerns about it being 'not for everyone'. A participant claimed that mindfulness wasn't good for people who had trauma in their personal histories. The question of suitability of mindfulness for everyone has also arisen within the literature and there have been various studies that have suggested that mindfulness does indeed generate negative impacts for people with difficult histories (Turner et al., 2011).

3.2.3.3 Locus of Impact:

The locus of impact of their practice, at least initially, is the practitioners' own selves. Practitioners talked about how their practice had helped them manage their stress and anxiety levels and cope with loneliness. It had also been of help for them during their recovery from serious illnesses and kept them away from unhealthy substances such as alcohol and other drugs. One of the participants reported that mindfulness had helped them discover their non-existent spirituality and helped to make them more patient.

One of the recurrent themes that emerged during analysis was how participants perceived that the practice had increased awareness of and improved their relationship to their own selves, what one participant described as the process of "*a deepening of their well of self-compassion*".

 "*It has affected my sense of what it is to be a self, what it is to be a human being. And then I don't want to say automatically but then, then, uhh, changes the way how I relate*

to others, how I relate to my own psycho emotional states, how I relate to fear, how I

relate to time, how I relate to the world, how I relate to the students. Basically, the main

shift is, it is a relational rotation."

This 'relational rotation'-- an altered relationship with one's own self--appeared to be a

direct effect of interviewees' mindfulness practices and seemed to spill beyond their

individual selves and manifest in their relationships in their worlds. One of the

participants put it succinctly when they said, "*I practice to be less of an asshole.*" Other

participants expressed that it had helped them "*connect more with other people*" and "*feel*

way more interested in other people and being of service". This 'spillover' effect of

mindfulness complements with Maslow's hierarchy of needs motivational theory;

mindfulness seems to help with people's sense of self-security, which then translates into

better relationships with other people around them (see Maslow, 1943, for a more

detailed insight into Maslow's theory).

3.2.3.4 Perception of Nature:

"I am more deeply equaled to see the connections between the living... I mean just the

world and its inhabitants, which I didn't necessarily think about as much when I was

younger before I did (meditate)... I guess I was thinking about it more in a scientific way

because that's what I was taught how to think scientifically but not necessarily

understanding the actual connectiveness between all the things on the planet and actually

in the universe... multiverse.

And if you look at nature... a passing ground, highlight of... well there's that thing and

that's this thing, that organism, and this ecosystem there. We still have to reduce it to

different parts. But for me it is while I'm cultivating mindful awareness in nature, all the boundaries that I would normally construct and my observation seem to become gray. Sort of can't tell where one thing starts and one thing begins."

Participants in the study expressed that mindfulness did change the way they perceived nature. Generally, they expressed that their practice helped them "enhance their appreciation" of nature and feel more connected to it. Some used words like 'amplified' or 'deepened' to explain the change in their relationship to nature, while some claimed that it provided them with a different 'tool' or 'language' to experience and interact with nature. When asked if mindfulness had impacted their perception of nature, one of the participants responded:

"Definitely. The natural world feels much more alive to me now. What I sense is really energies, which I never sensed before I started these practices. I feel energetic connections, not only with people but with other beings as well. In that way, nature comes along for me in a way that it didn't before."

Their response is typical of the responses that I gathered to the question about the impact of mindfulness on participants' perception of nature. I present the themes that emerged during analysis of participants' response to changes in their perception of nature as a result of their practice:

1) **Increase in perceived connectedness to nature**: Most participants believed that mindfulness increased their connectedness to nature. Participants outlined the processes/mechanisms that facilitated this relationship for them, which are outlined below. These processes are deeply entangled with each other and possibly mutually create and co-create each other and are not to be understood as linear or hierarchical processes or phenomena.

- **Facilitation of more intuitive, embodied, non-intellectual understanding, experience of connectedness in the natural world**: Participants expressed that mindfulness, especially the slowing down aspect of mindfulness, can "facilitate a more intuitive connection the world." This cultivation of nonintellectual connection to the world was echoed by many other participants who claimed that this embodied way of experiencing the world allowed them to experience existing relationships in the world much better and feel more connected to the world. One of our participants articulated it well when they said:

  As my awareness developed, my mindful awareness, my capacity for mindfulness developed, it became a lot easier or maybe more than normal to see how different things are connected.

- **Perceived dissolution of the nature-self/ nature-culture binary**: Beyond the perceived embodied understanding of the world that allows for practitioners to see the present interconnectedness in the world, participants also talked about how mindfulness had bridged or greyed their sense of separation from nature. One of

the participants said, "*What I've kind of come to is not distinguishing myself as not of the natural world.*" Another participant claimed that they used to conceptualize nature as something that was 'out there' and something they were separate from and said,

"I don't think that's true anymore. I think one of the things mindfulness has done for me is sort of blurring of the boundaries between who I am and what nature is and what our culture is and what nature is."

This dissolution of nature-culture boundary has resonances with feminist (Plumwood, 1993) and indigenous (Kimmerer, 2015) commentaries that critique western scientific paradigms that frame and pereptuate the division between people and nature, culture and nature,which in turn, these critiques claim have contributed to environmental degradation around the world.

- **Attribution of beingness to the non-human, more-than-human world:** One of the other consistent themes that emerged during analysis was how most participants expressed that mindfulness had helped them attribute 'beingness' to the natural elements of the world. A participant stated that they ask for "*permission from natural elements if it was OK to be in that place,*" while another talked about "*being held by trees while they are weeping because of distress*". One of the participants talked about how the locus of consciousness shifted between them and the trees during longer meditation retreats, while another participant framed it

as an extension of the notion of neighborhood to all beings, living and non-living

in the world. They quoted Aldo Leopold, possibly not verbatim, and said,

"*It's not about humans versus the earth or they're choosing one or the other that we*

can expand our sense of neighborhood to include not only the humans around us but

also the birds, the trees, animals, the rocks, the water."

2) **Increase in reverence towards and appreciation of nature:** Participants also expressed that

mindfulness had increased their reverence towards nature. One of the participants

expressed that they "*found nature more restorative*" and had more of a "*reverential*

attitude when they were out in nature" than they had before they meditated. Another

participant also mentioned that they appreciated nature more as a result of their practice,

" *.. the appreciation of it and the connection to it has changed as a result. It's all a gift*".

Another participant stated that mindfulness helped them recognize their appreciation of

nature when they said, "*by practicing mindfulness I recognize that nature makes me*

happy. Nature brings me joy and gratitude."

3.2.3.5 Impact on Environmental Behaviors:

Generally, mindfulness does appear to pervade practitioners' lives and manifest in their

environmental behaviors as well. Most participants believed that mindfulness had helped

them interact better with the environment beyond their dispositional affinity to the

environment. While most of them hesitated, and quite rightly so, to attribute all the

positive impact on just mindfulness, there seemed to be a general consensus among

participants that mindfulness had either 'strengthened' or 'added fuel to the fire' or in one of their words, 'oriented and supported' their existing ecological behaviors. When asked about if mindfulness had impacted how they engaged in environmental behaviors, one of the participants responded,

"I mean it's hard to like tease out any one thing in your life, right? But I feel mindfulness, which is a pretty overused term, but it's such an integrated thing that's it's so ... that I would have to say yes."

Participants also seemed to be deeply aware and hence careful about their impact on the environment and took actions and measures to lessen their impact. They stated that mindfulness had bolstered their intentions and actions to help reduce their consumption or their negative impact on the world.

"I want to be mindful; I want to consider. I don't want to take 20-minute showers like I did when I was 15. Now I take a shower once every other week, if that, and they might be on the longer side, but that's like 10 minutes now, comparatively."

"One of the things I'm really trying to cut down on is the use of plastics, so I'm real intentional about not accepting straws or not try to use the containers where I don't have to buy plastic or use plastic bags. And so, I just know the results of what happens in the ocean and it's not being recycled because of China right now and not taking our recycled materials. I'm getting ready to go do some shopping right now. So, I'm bringing my

canvas bags. I just went to a farmer's market this weekend and bought these mesh bags

that you can use to put fruit in, and again, you can get real... I want to be intentional. I

want it to be intentional of how products I use might affect the environment."

Participants highlighted the following specific behaviors and instances where they felt

mindfulness had helped them interact better with the natural world:

1) **Simplification and reduction of consumption**: Various participants expressed that

mindfulness had helped them rein in their unnecessary consumption habits, "*whittle the*

unnecessary stuff"and make them less materialistic and more conscientious about their

own consumption.

"I will say that my cravings for consumption have mostly disappeared through my

practice. So, I had a little bit of a ... what is that called when people go shopping because

they want to feel better?.Don't do that anymore. I think I've simplified a lot more. There's

things that I don't need any more that I did before."

A couple of participants didn't think that it had changed or impacted their environmental

behaviors as much, however, given that they had been careful of their consumption prior

to engaging with mindfulness and that while it has supported it, they didn't want to claim

that their practice had directly helped with their day-to-day practical environmental

behaviors. One of the participants said,

"It is interesting because I don't know if it (mindfulness) has changed my consumerist behavior all that much. The behavior it has changed more is that my like sort of personal spiritual engagement with the natural world."

2) **Communication around environmental issues**: Several participants pointed out mindfulness had impacted the way they communicated with people about environmental issues. Mindfulness helped participants be 'less judgmental and strident' and 'more patient' during their communication with people:

"I can first see them, then I might be able to get out of my way, then I might be able to gaze with them and I might be able to pay attention to them and provide some feedback to them in a way that connects to their values and might plant seeds to them to do something better in the future. And I think that comes from some level of mindfulness that doesn't come if I just walk up to them and judge them and accuse them and tell them that they are bad. You know, I think my practice has been really helpful in that way, as an educator."

A participant also expressed how mindfulness has helped them make their communication related to climate change and environmental issues more compelling, *".. it's allowed me to speak to people about conservation, climate change issues with a voice that's coming directly from my heart, which resonates... at least with the people that I've met with so far, which has been a good number of people in the past year, it really resonates."*

3) **Emotional resilience in the face of climate despair:**

"..as an organizer and an activist, (mindfulness) has been the tool that's really allowed me to stay present and real, and to begin to really feel fully engaged and alive. Activists who lead movements, need a tool to not fall down into despair and stay there. At the very least, to be able to inhabit those states of minds and look at things authentically and realistically, and be able to be with them…"

Participants were aware about suffering and hopelessness that arises out of the climate crisis and the plethora of environmental issues that populate the world. They claim that mindfulness allows them to sit with suffering and other difficult truths generated by the climate crisis and not run away from it. Another participant expressed that mindfulness teaches them to 'honor' their emotional capacities to deal with difficult emotions:

"We're living through a time that is filled with loss , and how do you respond to that, and there's a sense of, mindfulness also allows that sense of... It's one of the doorways of working with feelings. Now we can sit with all of our feelings. And we can really honor ourselves. We have kindness and compassion by giving ourselves space to have to understand the impact that we're having with our everyday lives."

This emotional resilience also seems to increase practitioners' capacities to see a fuller picture of the world, as in, beyond the awareness of suffering, practitioners expressed how mindfulness helped them see and be grateful for the beauty in the world as well. One of the practitioners talked about how mindfulness has allowed them to hold "*gratitude*

and beauty of the natural world". That capacity to be cognizant of the vast spectrum of emotions that they hold within themselves might help practitioners not just focus on their negative emotions and in turn, experience a less despondent world and be more resilient in the presence of climate grief or anxiety.

"I think that being able to focus on gratitude has been a large piece of the mindfulness work…..So there's an element of holding gratitude and what I see, and just in being able to hold beauty as well. That helps to ride the waves of life."

4) **Attending to the natural world and its elements:** Participants claimed that mindfulness helped them notice things in the natural world a little better and interact with the natural world with a deeper intensity. A participant told us how they "*found themselves pausing a lot more in the natural world*". Another participant said they were more present in the natural world:

"I am more perceptive in terms of the sounds in the forest, or the bird calls, or even the wind when it goes through the forest, or maybe just seeing...... Maybe I'm down the coast, I just feel like appreciating the sunsets or appreciating the clouds and how the interface of the oceans work together."

There have been various studies that have suggested increased attention, as a consequence of engagement with mindfulness, to be pivotal in affecting people's environmental behaviors. Scholars suggest that increased attention to the natural world

breaks increases the self-world connection (Amel et al., 2009) and makes alternative

sustainable choices more salient (Dijksterhuis & van Knippenberg, 2000).

3.2.3.6 Potential Mechanisms

This study primarily emerged from a desire to understand the various processes and

mechanisms that underlie the relationship between mindfulness and pro-environmental

behaviors. When presented with the question about how mindfulness impacts their

personal environmental behaviors, one participant said:

"I think that it's not really like you're turning the mindfulness switch on and off if it's

really become part of your orientation to the world. It's part of your orientation to the

world and so you are considering your choices."

Below are some of the themes that emerged when I analyzed the conversations around

mechanisms through which mindfulness appears to impact long term practitioners'

environmental behaviors:

a) Increased Attention: A few participants expressed that the attention component of

mindfulness 'automatically' pushes people to care more by allowing them to observe and

understand the world around them and their own actions a little better. As mentioned

before, this attentional aspect of mindfulness being a potential mediator for better

environmental behaviors has been highlighted by various other researchers as well (Amel et al.,2009; Bishop et al.,2004; Vago et al., 2014)

"..just paying attention, the natural outcome is we tend to do less harm when we see what we are doing. And I think most people are, either are not paying attention or don't want to pay attention because it is painful to do so.."

One participant expressed how this slowing down and paying attention aspect of mindfulness helps them *"facilitate a more intuitive connection to the natural world that is operating in a different scale than we (as human beings) are."*

b) Increased Awareness: Most participants expressed that mindfulness, through their intentional attention, had helped them increase awareness of their own selves, and a variety of other elements of their lives that have consequently helped them improve their environmental behaviors. I outline the various loci of awareness and how that translates to better environmental behaviors below:

Self: Multiple participants claimed that mindfulness had increased their understanding of their own selves better and expressed that it had helped with their "*inner sustainability landscape*". Another participant explained that the reframing of their relationship with their own self then reflected on how they interacted with the environment:

"Mindfulness is also about one's relationship to oneself, and my relationship to myself mirrors and reflects my relationship to nature. I've developed a better and fairer view of myself, and that's allowing me to be in the natural world more."

Relationships: Mindfulness seems to expose the interconnectedness of elements and make extant relationships in nature more accessible or palpable. It seems to do so in the following ways:

a) Mindfulness gives participants a 'non-intellectual, embodied understanding' of the world and helps them understand how everything that they do, however miniscule, has an impact. Participants claimed that this deeper understanding of connections and relationships in nature then logically pushes them to take actions that help rather than hurt nature:

"...and it could be different for different people, but for me, you know, I talked about how the practice has given me an embodied experience of the complexity of our interrelatedness with each other and. So, the logical conclusion, if that's your observation and we believe that's what's really happening, then a logical conclusion would be that every single thing that you do matters quite a bit."

b) Mindfulness seems to help people create relationships with the natural world differently. This reframing of the natural world from 'a place of resources cultivation' or

'scenery' to a 'companion' or space for relationship building, or their 'neighborhood' makes people more cautious about their behaviors.

"build a relationship in new ways with the environment….Be able to stop, pause and be mindful of your awareness, new things come in that weren't there before. So mindfulness can make space and time to be able to engage, I think that once you're aware of something and you form a relationship with it, you're going to take better care of it."

One of the ways mindfulness helps people build new relationships with nature is through the dissolution or bridging of the nature-self binary.

"Emotionally, psychologically and spiritually, that is geared towards reducing the sense of separation. You know, nature is out there and I'm here, and I'm going into nature by going out there is much, much more primary and a sensing, no inside, no outside. The sense of separation is reduced over time when we practice mindfulness."

Suffering: Mindfulness also increases the awareness of suffering in the world for some participants. While this newfound awareness of the ubiquity of suffering, especially related to the climate crisis and environmental degradation, can elicit despair and inaction, practitioners talked about it being a potential catalyst for action as well:

"As long as you don't fall apart, you practice mindfulness, you could, I guess one could open themselves to suffering and then completely fall apart and then leave the

mindfulness practice. But if you stick with it, and you have that discipline, then you have to act. So, there is so much suffering and every little bit I can do to abate that I do."

Awareness: Some participants defined mindfulness as being an awareness of their own awareness or a 'meta-awareness'. This mechanism/experience has been described as 'decentering' in some conceptual models as well (Hayes-Skelton and Graham, 2013). This new-found awareness helps practitioners observe their own lives better and detangle and simplify their lives, eschew materialism and reduce their consumption:

"Rather than getting all caught up in all the stuff that happens, to be able to step back from that and just stay grounded."

c) Emotional Resilience: Mindfulness appears to also foster emotional resilience and increase people's capacity to engage with a variety of emotions that come up during life in the contemporary world. Participants talked about being able to stay with uncomfortable feelings and of being able to confront those feelings better, instead of "externalizing everything that is unpleasant" to them. One of the participants expressed:

"I mean we tend to externalize everything that is unpleasant. You know, I want my waste to go away so I don't have to look at it, and I don't have to be reminded of pain, what I consuming and throwing away. And, paying attention to that naturally makes you err, you know, naturally changes behavior."

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This kind of intentional engagement with difficult, uncomfortable situations, a derivative or consequence of the 'non-reactivity' or 'non- judgmental' observation aspects of awareness, seems to then spur practitioners to take action to ameliorate the suffering and discomfort. In the context of climate change, this process helps garner action despite the severity and seeming insurmountability of the issue:

"I think it helps provide solace too because it's very, very hard to be in a world right now. It's very, very painful. So I feel like, you know, so you could just like feel like I just, I can't deal with this and just shut it out, you know? I feel like mindfulness helps keep me engaged."

Another participant corroborated that process when they said:

"We are so trained and we are so habituated to escaping and avoiding every difficult feeling that comes up, that this really intentional practice of staying, like we are going to be exposed to some very big existential fears and also like unmanageable joys you know, that process of staying. I think that practice of routinely, errm, slowing down the reaction time and catching ourselves in our tendency to flee and gently staying develop that capacity, you know, it is like a muscle that has to be worked."

As the quote above points to, mindfulness also seems to increase people's ability to recognize and hold good, positive emotions or 'unmanageable joys' as well, which may be important for people to be able to take positive actions in the world (Davenport, 2017):

"So there's an element of holding gratitude and what I see, and just in being able to hold beauty as well. That helps to ride the waves of life."

d) Increased salience of positive values and actions and value- action alignment:
Participants stressed on their active and intentional engagement with values such as kindness, compassion, humility, and gratitude during their mindfulness practice. Persistent practice or engagement with mindfulness increases the salience of these values and attitudes for practitioners. These values then guide practitioners' general and environmental behaviors in the world. One participant put it poignantly when they said:

"...it does come down to our capacity to be present and to act wisely from a place of presence and to act with kindness and compassion and joy to the best of our ability. And those are all the fruits of mindfulness."

In addition, and perhaps more importantly, mindfulness can bolster existing value systems and help people align their values with their actions. This has vast implications for bridging the value-action and intention-action gaps prevalent in the context of environmental behavioral interventions (Barr, 2006; Kennedy et al., 2009):

"...it sort of helps you to sort of align everything cause it gives you this mechanism for aligning. cause you're aligning every of your values and then, but your actual, how you live in the world, they're all aligned.."

e) Loss of egocentrism and fostering of holistic view:

Mindfulness also encourages and fosters a more holistic view of the world by discouraging self-centred thinking. One of the primary tenets of traditional mindfulness practice is the recognition of and awareness of our tendencies of self-involvedness and remediation of that kind of thinking. Mindfulness allows practitioners to move beyond the "I" narrative as one of our participants explained,

"We are lost in our small self, we are lost in our ego, we're lost in the endless project of me. The project of self-improvement, and when we are our best selves, as a fruit of practice, we are not lost in that small me, small I. And we see more holistically, we just naturally can. And that tends to be a better, a less separate, and a wiser, kinder place from which to act and function."

That reduction of self-preoccupation, or 'the curtain-pulling' from the normative self-focused projection of life, seems to allow practitioners to see and experience a larger world beyond themselves, full of relationships and connections that are beyond their relatively insignificant selves, and act in accordance to their new found view of the world:

"I think moving beyond that paradigm of checking out or just pushing and pulling against all of our experience, and just resting back in it, all of a sudden the curtain pulls back a little bit and it's like, "Oh, this is actually what's going on. Actually, in this experience of right now, there isn't much of a place for a sense of me." So I think that, for me, has started to shift a lot of the narrative around other, connection to the natural

environment, and connection to who I might actually be versus this idea of who I got

pumped with to be."

f) Evaluation of self in relation to the world:

The self-evaluative aspect of mindfulness encourages people to examine and evaluate

their own behaviors and take actions, to be what one participant framed to be "self-aware

and self-critical, to strive to improve or course correct in how they live their lives." As

another participant put it:

"So just having time to think about what we're doing and why we're doing it could be

really useful, to take a step back and be like, are we in the right direction? Is our

approach right?"

This consistent, constant self-critique and evaluation of one's behaviors in combination

with the embracing of salient values and attitudes then encourages participants to

improve behaviors that pertain to their lives and the environment. The themes that have

emerged can be visualized as a tentative model that is presented in Chapter 4.

3.2.3.7 Discussion

Results of the in-depth interviews with individuals dually engaged in both mindfulness

and environmental practices suggest that long term mindfulness practitioners primarily

conceptualize mindfulness as a skill, or a tool, that is constitutive of the following

processes and elements: Slowing/quieting down, paying attention to the present,

observing stimuli and phenomena with certain attitudes such as non-judgmentality and non-reactivity, and, evaluation of responses to those phenomena with certain values such as compassion for self and others, kindness, and humility.

Across participants, mindfulness seems to have had a profound impact on practitioners' lives and actions. The primary locus of impact seems to be practitioners' selves and mental well-being, which then appears to spill over to others. Mindfulness also impacts people's perception of nature. Participants expressed that mindfulness 'amplified' or 'deepened' their connectedness to nature by providing them a different language or tool to experience it. Engagement with mindfulness allows people to see relationships in nature more readily in part because it fosters a non-intellectual and embodied understanding of the world and the relationships that exist here. This non-intellectual understanding of the world stems from the practitioners' perceived dissolution of the nature-culture binary, or the blurring of lines between the self and the world as it is.

Generally, participants agreed that mindfulness does impact their environmental behaviors, as we had anticipated based on the results of the quantitative research presented in Chapter 2 as well as the existing body of research in this domain. Participants' responses suggest that mindfulness primarily works to promote better communication about environmental issues with others, reduce unnecessary consumption, and better deal with climate related suffering and pain.

Moreover, the present research suggests that this causal relationship exists in part because the attentional aspect of mindfulness translates, "automatically" in the words of some participants, to care for the environment, which then consequently translates to behavior. Others believed that increased awareness of the nature of self and the world as it exists fosters practitioners' ability to sit and engage with difficult truths and emotions, which then helps them take action despite the despondency and anxiety generated by the climate and environmental crises they engage with regularly as environmental professionals. The mindfulness framework practitioners subscribe to also increases the salience of values such as compassion, kindness, humility, and gratitude known to promote pro-environmental action (e.g., Schneider et al., 2017), in part perhaps because they help reduce or inhibit egocentric thinking (Schultz, 1998). That diminishment of egocentric thinking fosters a holistic view of the natural world, which then translates into care and consequently pro-environmental action. Beyond that, the evaluative component of mindfulness encourages people to be self-critical and evaluate their own actions, which then allows them to engage in behaviors that are aligned to their values.

CHAPTER 4

DISCUSSION: FROM MOMENT TO MOMENT AWARENESS TO
ENVIRONMENTAL STEWARDSHIP

Across multiple studies and divergent methodologies (i.e., cross-sectional, large-scale

surveys and in-depth qualitative interviews), the results of the present project strongly

suggest that mindfulness, conceptualized either as a disposition or as a practice and

phenomenon that is experienced or engaged with, is uniquely and powerfully related to

individuals' environmental intentions, attitudes and behaviors. This is true both when

considering pro-environmental behavior writ large as well as in the specific context of

household energy conservation behaviors.

The results of the present work add novel and significant insights to the existing small but

rapidly growing body of research focused on the mindfulness-environmentalism

relationship. In addition to being one of the first studies that explores this relationship in

the context of a specific and highly important subset of pro-environmental behaviors (i.e.,

household energy conservation decisions), the present work also contributes to the

literature by examining, using novel methods for this domain, the nature of that

relationship. Specifically, the research works to address a fundamental question that

remains unanswered in the extant literature, namely, is the relationship between

mindfulness and environmental engagement merely a coincidence, or does mindfulness

have a direct, causal impact on how people interact with the environment? Beyond that,

the present study is also one of very few studies that conceptualizes mindfulness as a

practice and an experience, and adds new dimensions to the existing body of knowledge

that is replete with studies that investigate the relationship between pro-environmental constructs and mindfulness as a disposition.

4.1 Mindfulness facets and Household Energy Behaviors

In Chapter 2, I investigated the relationship between mindfulness--as a disposition and as a practice--and household energy behaviors. Dispositional mindfulness facets Observe, Non-react and Describe were consistently correlated with household energy behaviors across two distinct quantitative studies. Multiple regression analyses from the first study showed that facets Observe and Non-React were significant predictors of self-reported household energy behaviors, even when controlling for engagement with mindfulness as a practice. In study two, only facet Non-react was a significant predictor of household energy behavior after controlling for people's environmentalist identity and their engagement with mindfulness as a practice. Facets Non-Judge and Acting with Awareness, perhaps surprisingly, were both consistently negatively correlated with household energy behaviors. This result is consistent with findings from other studies as well; a 2015 study by Barbaro and Pickett found these two specific facets, Observe and Non-react, were significant in predicting pro-environmental behaviors while other facets weren't statistically significant.

Facet Observe measures respondents' ability to notice or attend to internal and external experiences, such as sensations, cognitions, emotions, sights, sounds, and smells. Nonreactivity to inner experience is the tendency to allow thoughts and feelings to come and go, without getting caught up in or carried away by them (Baer et al., 2006).The

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ability to observe stimuli, both internal and external, without self-criticism or judgement, potentially allows people to notice their own unconscientious habitual patterns in their daily interactions with their household energy architecture and correct them. Barbaro and Pickett (2015) suggest that the observing component of mindfulness, which is unique among all facets for its focus on external stimuli rather than just cognitions or emotions (Baer et al.,2006), may help in the intensification of experiences in nature through greater attention to environmental stimuli. This notion of deepened observation of environmental stimuli facilitating a deeper connectedness to nature has been corroborated by participants in the qualitative study presented in Chapter 3 as well. The facet Observe might serve similar purposes in the context of household energy behaviors: the ability to be more observant of the external world, might increase practitioners' awareness of their own habitual energy related behaviors, and help change them if they find them to be excessive or unnecessary.

Across both studies, facet Non-react appears to be especially salient in predicting household energy behaviors and broader environmental behaviors. Baer and colleagues' study (2006) showed that this facet was strongly related to constructs of less absent-mindedness and less dissociation. Lessened dissociation combined with less absent-mindedness might reduce people's tendencies to get caught up in their thoughts and feelings, and be more present and intentional in their lives, which eventually might manifest positively in their household energy behaviors.

Results from both studies show that facet Describe was also significantly correlated with recurring household energy behaviors. While it is hard to explain how the ability to describe internal feelings and label internal experiences (Baer et al., 2008) might serve to help with improvements in household energy behaviors, or other environmental behaviors, Barbaro and Pickett (2015) speculate that there might be indirect ways this facet might impact pro-environmental behaviors. They claim that the facet Describe might predict environmental behaviors, specifically, because this facet is strongly related to emotional intelligence and self-compassion (Baer et al.,2006). Recent studies have shown the roles that compassion (Pfattheicher et al., 2015) and emotional intelligence (Robinson et al., 2019) play in fostering pro-environmental tendencies and behaviors.

Facets Acting with awareness and Non-Judge were consistently non-significant predictors of participants' self-reported household energy behaviors. These findings are a bit non-intuitive given that acting with awareness and being non-judgmental or non-critical of oneself and others during mindfulness are central tenets and consequences of mindfulness practice. This trend, however, has also been replicated in other studies as well. As mentioned earlier, Barbaro and Pickett's (2015) study reported similar trends; Non-Judge and Acting with Awareness facets were not significantly correlated with pro-environmental behaviors. Of note is that these two facets were also not significantly correlated to engagement in mindfulness practice in both quantitative studies in the present study as well; people who reported frequent engagement in mindfulness related activities reported low Acting with Awareness and Non-judge scores.

People who engage in mindfulness practice and are consequently more aware might actually be more attentive of their inability to be less judgmental or less aware during their daily lives, and hence might report lower Acting with Awareness and Non-judge scores. Engagement with mindfulness as a practice does bring forth that paradoxical situation-- the more aware one becomes of one's awareness and one's behaviors, the more aware one becomes about their own deficiencies around being non-judgmental or living more intentionally. One of the key outcomes of a sustained mindfulness practice might be the awareness of how unmindful people are in their lives. The items in the FFMQ might not be sensitive enough to potentially capture that new-found awareness. A future study around this paradox might help with this issue.

4.2 Mindfulness practice and Household Energy behaviors

The relationship between some dispositional facets and self-reported household energy behaviors is quite novel and an encouraging addition to existing literature. However, results that validate frequent engagement with mindfulness cultivating practices (yoga, meditation and breathing exercises) as a significant predictor of household energy behaviors might in fact be a more unique and novel addition to existing literature. Frequent engagement with mindfulness related activities was a significant predictor of household energy behaviors in both studies; in fact, the mindfulness practice composite measure was the strongest predictor of pro-environmental energy behaviors across both studies (except for "environmentalist identity," as we would expect). This finding is important for multiple reasons. First, this is the only study that has established the relationship between people's engagement with mindfulness as a practice and their

household energy behaviors. Beyond that, it also provides mindfulness scholars an alternative testable measure during interventions and research. There haven't been many studies within the environmental domain that have linked and tested the relationship between people's engagement with mindfulness as a practice and environmental constructs. My literature search revealed only one correlational study by Jacob and colleagues (2008) that showed evidence that people who engaged with mindfulness meditation reported being more responsible when interacting with the environment. There were no other studies, at least within the environmental domain that went beyond conceptualizing mindfulness as a disposition.

In addition, and of critical importance, we found that mindfulness practice was a significant predictor of environmental behavior even after controlling for differences across participants with respect to environmental identity. This indicates that there is a unique effect of mindfulness practice (and mindfulness indicators more generally) on energy use behaviors above and beyond any connection between mindfulness and environmental attitudes and/or identity. In turn, this suggests that developing mindfulness practices may be beneficial in terms of promoting pro-environmental action even amongst people or groups that do not otherwise "care" very much about the environment, suggesting a novel area for future investigation.

Moreover, the empirical findings across both studies point us to the significance of frequent, or in other words, more consistent and intentional engagement in mindfulness practice, in the context of pro-energy and broadly pro-environmental behaviors. One

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wouldn't be too far from the mark to assume that anyone who frequently and consistently

engages with mindfulness cultivating practices, also subscribes to the mindfulness

paradigm in which the practices are embedded in, and embraces the value systems and

code of ethics that guide their practice. This framework that the practitioners' practice is

embedded in is paramount in affecting how one interacts with their household energy

architecture, and more broadly the natural world. This extrapolation is bolstered by the

results of the qualitative work as well: people who actively practice mindfulness for

longer periods consistently conceptualize mindfulness to have ethical dimensions, and

pin that subscription to an ethical framework to be the force that changes their behavior.

While dispositional mindfulness measures are valuable, and certain trait scores might be

bolstered (or in the case of Acting with Awareness and Non-judge, weakened) by these

practices, a measure of how often people practice, or if they subscribe to a mindfulness

paradigm, is a much more tangible and accessible measure to gauge the impact of

mindfulness.

The mindfulness practice-related findings, in both Chapters 2 and 3, are also important to

highlight because of the issues that I have identified previously (see Chapter 1) with

relying solely on existing instruments to measure mindfulness as a disposition. Simply

put, existing instruments might not be the best way to measure mindfulness, especially

out of context. While they are valuable instruments when used contextually, adjacent to

mindfulness-based activities or a long-term practice, they might not be the best way to

measure 'mindfulness' in isolation, without engagement with or knowledge of

mindfulness as practice. When measured out of context, these measures end up

measuring people's abilities or tendencies to observe, act with awareness, be nonjudgmental and non-reactive and be good at describing their internal events, but the ability to do all of those, or be those, doesn't necessarily qualify one as 'mindful'. Consistent, decontextualized use of these instruments to gauge mindfulness might set up a false narrative by which we come to think of mindfulness as a sum total of these five seemingly independent and value neutral facets, rather than the much more complex moral, experiential, embodied, context- and practice-dependent construct that it truly is.

Most mindfulness conceptualizations that populate and direct academic literature have contributed to the idea of mindfulness being a value-neutral concept. Usually, mindfulness within the psychological sciences is conceptualized as a state of non-judgmental and non-reactive awareness of the present moment. However, long-term mindfulness practitioners, even when engaging with mindfulness in its non-soteriological, secular rendition, stress the importance of ethics and value systems to their mindfulness practice. At this point, it is almost a given that academic and scientific conceptualizations have diluted and noticeably diverged from the traditional, usually Buddhist conceptualizations of mindfulness. There however seems to be a troubling trend within the sciences and the corporate world where a further degree of bastardization of the concept is occurring, where scholars and mindfulness entrepreneurs have managed to strip even the secular conceptualizations of mindfulness of their ethical and value based dimensions. These conceptualizations have rendered mindfulness to almost a pill or energy-drink like construct that is administered in various doses, at various times of the day, to increase productivity or to rid people of stress, anxiety and other psychological

issues. While there are still benefits of this doubly diluted version of mindfulness, conceptualizing mindfulness just as a therapeutic intervention, or even just as a disposition, adds to that trend of dilution; it trivializes the concept that has a long, rich sociocultural history. It also undermines the notion that staying mindful is much more than a dispositional trait (which is automatic) and more so a skill, learnt through diligent hard work. There are multiple scholars that have problematized this degree of popularization and dilution of mindfulness (Purser, 2019; Grossman, 2015).

Mindfulness, within the Buddhist framework started out, and still is, a soteriological tool that is learnt through regular practice that encourages practitioners to live their present lives guided by certain essential attitudes and values. It is much more than being aware of the present, it is also about how you stay in the present, and what kind of values and attitudes you take during that presence. While secular, and more specifically academic and corporate conceptualizations reduce those evaluative qualities or dimensions to constructs such as acceptance and non-judgmentality, mindfulness is conceptualized by long term practitioners as a much broader concept rooted in and accompanied by additional and very specific values such as kindness, compassion, empathy etc. My study contributes to the literature in that it provides more evidence to refute normative academic and corporate conceptualizations of mindfulness, and asserts that mindfulness, without conversations about value systems that uphold and guide it, probably shouldn't be talked about as 'mindfulness'. At this point, it is paramount that we start differentiating between the types of 'mindfulness' that we discuss and acknowledge that

Buddhist mindfulness is different from secular mindfulness, which also, is significantly different from academic mindfulness.

**4.3 Mindfulness, according to practitioners**

The results of my qualitative study show that none of the participants conceptualized mindfulness as a disposition or used the overly used Kabat Zinn conceptualization. While most participants acknowledged the Buddhist roots of mindfulness, none of them claimed to subscribe to their mindfulness practice to achieve *Nibbanic* freedom from suffering as well. There were foundational similarities, however, in the way they tended to conceptualize mindfulness as a practice. Participants practiced to cultivate a different kind of intentional awareness- during which participants also paid attention to internal stimuli (e.g., thoughts, emotions and feelings) and how they responded to those stimuli. However, mindfulness went beyond being just aware or being present; participants conceptualized it either as a skill, or a life-long practice, or in their words, "hard, lifelong work". Their conceptualization also put tremendous amounts of focus on the explicit values and attitudes that come entangled with the concept. This implies that there is a very palpable difference between how academics, usually mostly from within the positivistic psychological sciences, and the general public, non-psychologists, and long-term practitioners conceptualize the concept.

Based on the participants' responses about their individual conceptualizations of mindfulness one can piece together an alternate, secular conceptualization of mindfulness practice: Mindfulness practice is the act of intentionally taking the time to pause or quiet

down or veer away from normal life, to pay attention to or be aware of external or internal phenomena (e.g., sounds, sights, mental objects, emotions, etc.), of practitioners' choosing happening in the present moment, so that they can intentionally observe them with attitudes of non-reactivity, non-criticality, with acceptance, patience and curiosity. During practice, people learn to evaluate their responses to the stimuli while oriented by values such as kindness, compassion and empathy, so that they can choose to be non-reactive in their normal lives and live as kind, compassionate people. This practice is embedded in a proposed mindfulness framework, explained in the next section (refer to Figure 1 for a visual representation).

4.4 The Secular Mindfulness Framework

Figure 3: Proposed secular mindfulness framework.
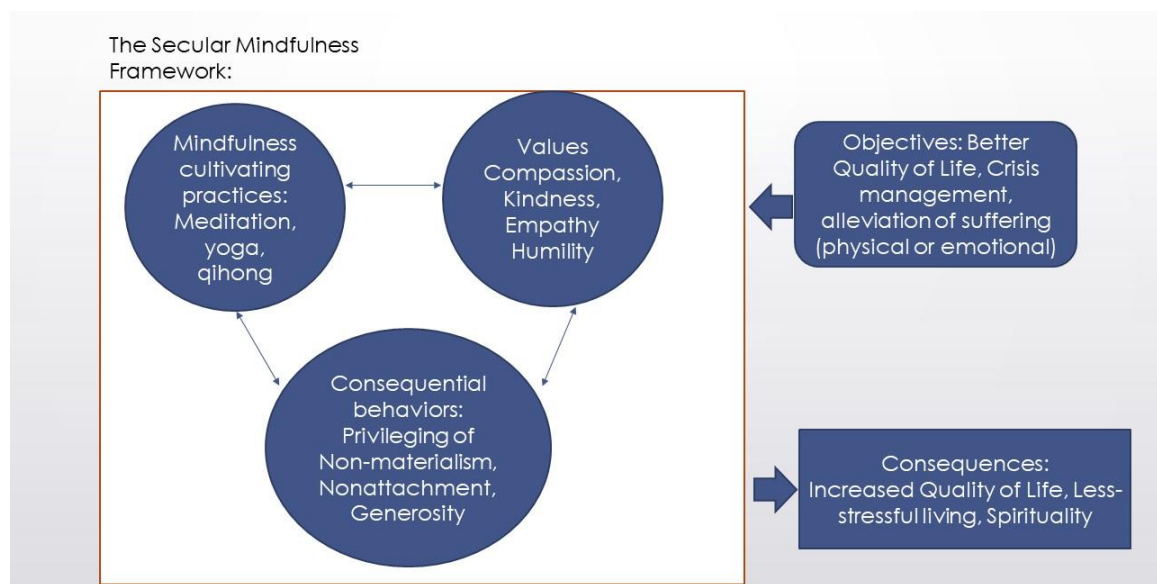
The proposed secular mindfulness framework can be conceptualized as an ideological system that consists of three interactive elements: mindfulness cultivating practices, the

values that guide the actions of practitioners, and consequent behaviors that perpetuate

and bolster the practice and value elements. The value systems that guide the network are

fundamental to the framework, and the skills and practices such as observing one's breath

or mental objects are very unique and specific to the framework as well. The framework

also champions certain behaviors, or ways of being (e.g., simplistic, not-materialistic,

generous, non-harming), which in turn bolsters the value systems and aids in sustaining

the practices as well.

Practitioners engage with and embrace the concept, and develop a practice, not

necessarily to seek salvation, but for a better quality of life, stress reduction, or for the

management of their emotional or physical suffering. As explained in Chapter 3,

practitioners who engage with the concept for a long duration and maintain a practice

report experiencing a better quality of life, with less stress and anxiety. The primary

components of the system complement and bolster each other. While these value systems

and practices exist by themselves outside the framework, their coming together, adjacent

and reciprocal to each other, is what makes secular mindfulness the concept it is. The

proposed secular mindfulness framework has similarities, but is also discernibly different

from the religious, soteriological Buddhist conceptualization of mindfulness as well as

the value-neutral, neuro-cognitive conceptualization that is mindfulness.

4.5 Mindfulness and Connectedness to Nature

The present study also provides novel insights into how mindfulness fosters

connectedness to nature. The qualitative approach taken in Chapter 3 facilitated a deeper

understanding of the various nuances and constructs that mediate that relationship. Most

participants claimed that their mindfulness practice had changed the way they perceived

the world, and that it had helped them feel more connected to nature. Mindfulness

Figure 4: Conceptual model of the relationship between mindfulness practice and Connectedness to Nature.
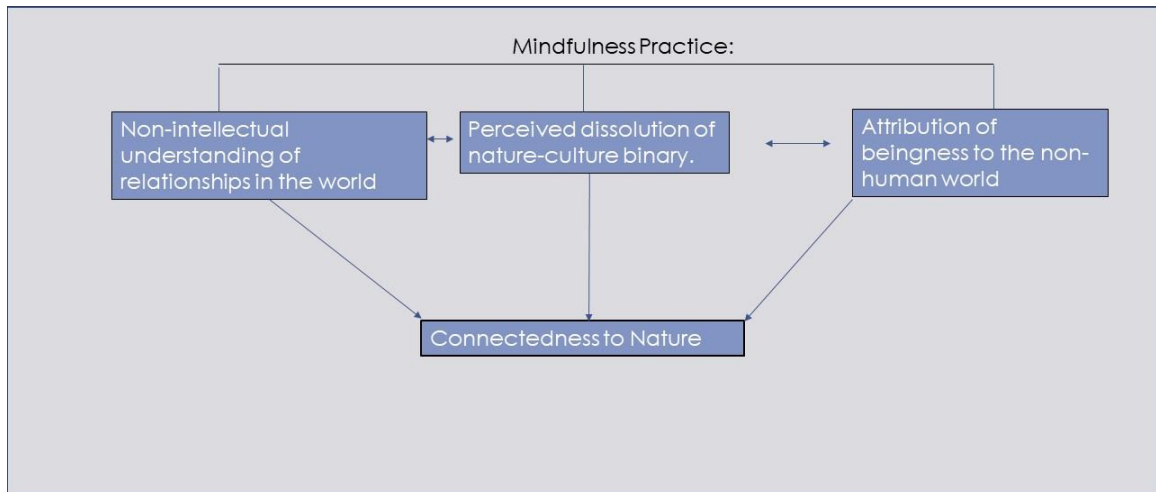
appears to increase that connectedness to nature by facilitating a more embodied, non-

intellectual understanding of the natural world through which participants 'really see' the

interconnectedness of the world. Mindfulness also appears to reduce or bridge the

socially constructed nature-culture binary or the nature-self binary and thus allows

practitioners to attribute beingness and intelligence to the non-human or more-than-

human world. That dissolution and attribution of beingness to the more-than-human

world then consequently increases their perceived connectedness to nature.

Based on the themes that emerged through the qualitative data analysis process, I propose

a tentative model that explains the process by which mindfulness promotes connection to

nature (see Figure 2). The elements in the model are co-created and reinforced by each

other and are potentially nonlinear in nature. The elements within the model have

resonances in knowledge produced in various humanities-based studies such as

indigenous studies, feminisms, etc. For example, the idea of non-intellectual, embodied understanding of the world has been explored and championed by feminists and indigenous scholars who critique the positivistic, western 'scientific' way of viewing nature (Plumwood, 1993). The notions of dissolution of the nature-culture binary and kinship to the more-than-human world have also been discussed in these fields that consistently critique the one dimensional way the scientific world approaches nature and its conservation (Haraway, 2015).

On top of that, the constructs in the proposed models also seem to be related to or resonate with the items that constitute the connectedness to nature scale (Mayer and Franz, 2004), a widely used instrument that measures people's felt connection to nature. Items in the instrument such as "I have a deep understanding of how my actions affect the world" and "I often feel like I am only a small part of the natural world around me, and that I am no more important than the grass on the ground or the birds in the trees" could be a consequence of a 'non-intellectual embodied understanding of the world'. Items " I often feel a sense of oneness with the natural world around me" and "Like a tree can be a part of a forest, I feel embedded within the broader natural world" harken to the 'perceived dissolution of the nature-culture and nature-self binary'. The 'attribution of beingness' construct might encourage mindfulness practitioners to score higher on items such as 'I often feel a kinship with animals and plants' and 'I recognize and appreciate the intelligence of other living organisms.' This potentially explains the existing reported relationship between mindfulness and Connectedness to Nature.

I present the model as a directional one despite my intuitive understanding that the relationship between mindfulness and connectedness to nature is in fact reciprocal and reinforcing. This assumption is backed by recent work in the field, which similarly shows that the relationship might be reciprocal (Aspy and Proeve, 2017; Haman and Ivtzan, 2016). Some participants in the qualitative study also helped with that understanding; a couple of participants elaborated on how their connectedness to nature actually directed them to their mindfulness practice and informed their present mindfulness practice. Still, I present the model as a directional one because the mediating constructs and the pathways that might describe the relationship in the other direction, might be different. In other words, people who are more connected to nature might get to mindfulness or engage with it through completely different pathways. Further investigation and testing of the proposed model is reserved for future efforts.

4.6 Mindfulness and Pro-Environmental Behaviors

The qualitative study also corroborates the quantitative evidence that mindfulness, both as a disposition and a practice, does appear to have a causal impact on environmental behaviors. It would be too early to declare that engagement with the concept can single-handedly change people's environmental behaviors. However, it does not appear to be too far off the mark to claim that it bolsters or supports people's intentions and pro-environmental dispositions, which eventually manifests in their environmental behaviors. Among people who identify themselves as environmental professionals, or people who care about the environment, mindfulness seems to help with better interactions with the environment, reduction of excessive material consumption, better communication with

people about environmental issues and development of emotional resilience in the face of climate anxiety or despair. I present these results with caution, however, because these conclusions are based on conversations with people who already hold environmental issues and conservation at the center of their lives. The way mindfulness impacts people who aren't environmental professionals and don't quite hold issues about the environment close to their hearts might be entirely different to the way it impacts people in our sample, although the unique effects of mindfulness practice on energy behavior (discussed above) do suggest that the potential benefits may accrue beyond the core of committed environmentalists.

Based on the conversations with the participants in my qualitative work, mindfulness doesn't seem to impact practitioners' environmental behaviors directly, however. Instead, any kind of impact on environmental intentions, perceptions or behavior may be a byproduct of the direct benefits engagement in mindfulness confers on practitioners. Mindfulness has never been touted as a panacea for environmental issues, at least not for a significant chunk of its 2500 years long existence. That is not to say that it hasn't been touted to be a pathway to other incredible things, of course; Buddhism touts it to be one of the tools for achieving spiritual liberation from universal suffering, secular mindfulness touts it to be a tool to improve one's quality of life, the clinical world presents it to be a tool to improve mental health and reduce stress, etc. But it has, at least until very recently, never been presented as a solution to the environmental crises we face. Most who encounter and embrace mindfulness practice don't take on the practice for the sake of improving their environmental behaviors. They do so for all the other

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reasons mentioned earlier, elaborated in detail in Chapter 3. Most of the participants in

my study started meditating as a response to (personal) crises, existential or health-

related, or to make meaning of the world. Not a single participant that I spoke to reported

to have a mindfulness practice to become a better environmentalist.

As such, it may be somewhat wishful thinking to expect mindfulness to be particularly

effective in helping promote more positive environmental decision-making, especially

while it is couched in narratives and frameworks that aren't directly related with

environmental narratives (or even overtly moral ones). The efficacy of mindfulness

practices is closely tied to the values and frameworks and the objectives of the practice it

is couched in. There have been a couple of studies that have been conscientious to make

that connection and study the effect of mindfulness based interventions when they are

supplemented or complemented by other environmental behavior related interventions

(Barett et al., 2016; Tang et al., 2017). The results of my qualitative work, however,

allow me to claim, though cautiously, that engagement with mindfulness does help in

regulating environmental behaviors, at least in case of mindfulness practitioners who also

engage with environmental work, even when they didn't enter and sustain a practice to

specifically better their environmental behaviors through the mechanisms that I

highlighted in Chapter 3. Again, the mechanisms that come into play might be different

for people who don't subscribe to the mindfulness framework, or don't care as much

about the environment. That warrants more investigation and could be a future extension

for additional research in this domain. I present a visual schematic of potential

mechanisms that facilitate the relationship between mindfulness practice and environmental behavior in Figure 3.

Figure 5:: Conceptual framework for mechanisms that mediate the relationship between mindfulness and environmental behaviors.
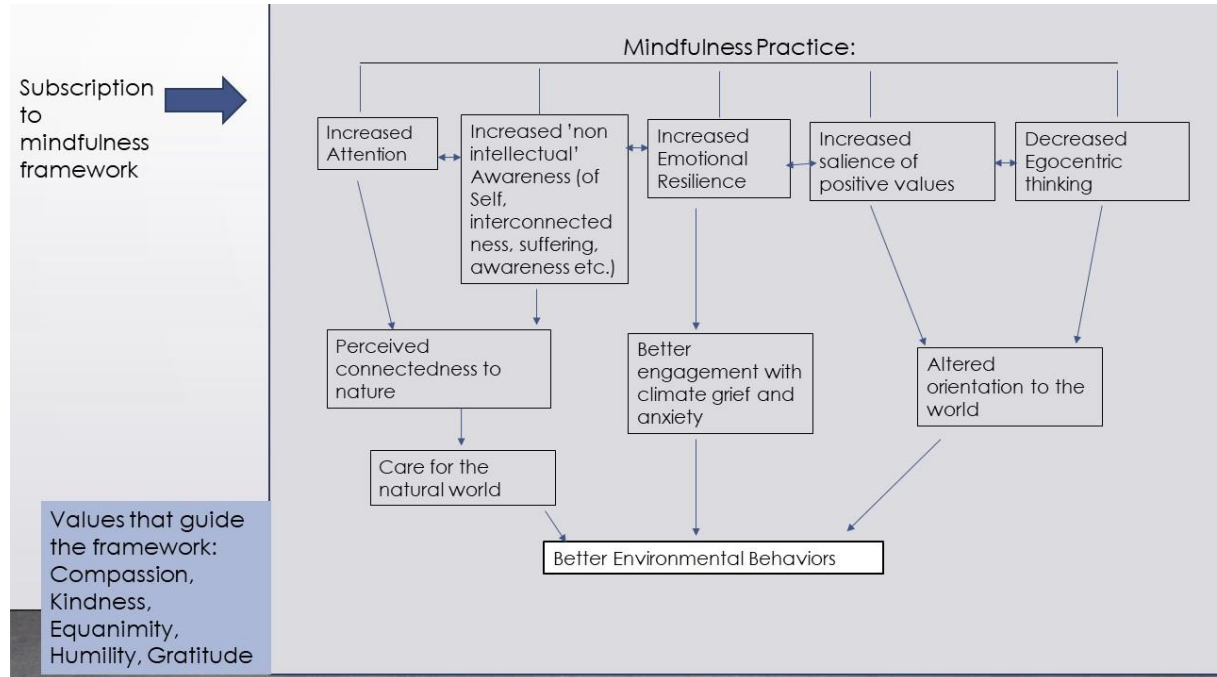
Potentially, the most important step process that facilitates the causal relationship between mindfulness and pro-environmental behaviors is the subscription to the mindfulness framework discussed earlier (also visualized in figure 1). Once a person subscribes to the framework, they perceive increased connectedness to the world via increased attention to and reverence for the natural world and increased embodied awareness of various objects and constructs. That increased perceived connectedness might increase their care for the natural world. That increased care for the natural world consequently, as suggested by a number of studies, might manifest in their environmental behaviors (Barbaro and Pickett, 2016; Rosa et al., 2018).

Mindfulness, through its fostering of embodied awareness of the nature of the world and privileging of non-reactionary attitudes, appears to also foster increased emotional resilience against the backdrop of climate change- and environmental degradation-related despair and anxiety as well. That emotional resilience in turn encourages people to take action (including interpersonal communication with others around them) rather than ruminate on despair, which can be engendered by the enormity of climate change and lead to inaction (Doherty and Clayton, 2011).

Mindfulness also deters practitioners from taking an egocentric approach and fosters a more holistic thinking about the world. That holistic approach to life, along with increased salience of values such as compassion and kindness, alters people's orientation to the world. This notion of altered orientation to the world resonates with other similar mindfulness related proposed constructs such as decentering (Hayes-Skelton and Graham, 2013) or reperceiving (Shapiro et al.,2006). Engagement with mindfulness as a practice changes the way people interact with their worlds, during which most practitioners attribute beingness and intelligence to all natural elements as well. That altered orientation to the world, when guided by values such as compassion, kindness and equanimity, then may manifest in their interactions with the environment.

4.7 Implications

Looking across both the quantitative and qualitative research conducted as part of this project, a number of implications emerge. First, the research provides further evidence of a link between engagement in mindfulness practices and pro-environmental engagement,

including but not limited to household energy use behaviors. This finding holds

implications for research and application at the mindfulness-environment nexus because

the frequency of engagement with mindfulness practices is a more objectively

observable, tangible metric than the self-reported measures of dispositional mindfulness

that dominate the extant literature. In addition, measuring mindfulness practices rather

than dispositions likely faces a lower probability of inconsistency across instruments as

well as lower self-reporting desirability biases. Still, further studies are needed to

standardize the various dimensions of an effective mindfulness-based intervention (e.g.,

time duration, frequency, intensity) and to create consistent definitions about key factors

(e.g., when mindfulness becomes a "practice").

Second, the models and conceptualizations that are proposed in this study, while not

comprehensive, add to existing knowledge and theorizing regarding the mindfulness-

environment nexus. The varying conceptualizations and mechanisms that facilitate the

relationship between mindfulness and connectedness to nature, and mindfulness to

environmental behaviors, might serve to support further investigation into the potential of

mindfulness based interventions within the environmental domain to make changes

related to environmental intentions and behaviors. Beyond that, as one of the first studies

that has taken a qualitative approach to understand mindfulness as a nuanced,

individualized experience in the context of environmental behaviors, we hope the present

work encourages future research to also pay attention to people's experiences and

narratives, rather than aggregate numbers to understand the multifarious relationship that

mindfulness establishes with various environment-related constructs.

Third, this study also aligns itself with a plethora of other studies that point to the troubling issues that surround the study and operationalization of mindfulness as a concept within the western corporate and scientific worlds. The bid to operationalize and popularize mindfulness has allowed for the dismissal of the concept's socio-historical roots and its code of ethics and morality that came with it. That decontextualizing and commodification of mindfulness can be framed as an issue of cooptation and cultural appropriation. Academic scholars and clinicians who work with the concept need to be wary of the way they discuss and research mindfulness and be introspective about whether they are contributing to the bastardization of the concept. One way to do so would be to recognize the specific conceptualizations of mindfulness under study and use specific descriptives such as 'secular mindfulness' or 'scientific mindfulness' rather than just the umbrella term 'mindfulness' during discussions around the concept. The recognition that there are discernible differences in how mindfulness is conceptualized in different settings and by different groups of people might help streamline the study of the concept.

Finally, given the way mindfulness is conceptualized and used in various domains, it would be wishful to hope that mindfulness on its own can have a major impact on environmental behaviors. Although a growing body of evidence shows that it bolsters people's relationship with nature, helps with their consumption and aids them in their activism work by building emotional resilience, substantially more work is needed to confirm that it is in fact a reliable tool to impact environmental behaviors. This study

adds to the encouraging initial findings, at least for individuals within the environmental

domain to bring mindfulness into their work and into their lives.

4.8 Limitations of the study

The present study (including both the quantitative and qualitative empirical research) has

several important limitations that must be kept in mind. First, participants self-reported

all measures, including household energy behaviors. Self-reported measures can be

compromised by various biases and reporting and recall errors. Future research should

focus on special behavioral measures of pro-environmental and pro-energy behaviors in

controlled settings (e.g., use objective measures of household energy or resource

consumption), or at least use a diary method to record engagement in mindfulness related

behaviors and pro-environmental behaviors, to provide a more reliable assessment of

participants' mindfulness and environment related behaviors. The research presented in

Chapter 2 relied on data from participants that are sampled from web-based platforms

and data collected from such sources suffer from issues of data reliability and data

quality. Participants in Chapter 3 were mostly relatively older and white, and hence not

diverse. Although that potentially is a reflection and function of the demographics of

those who tend to engage in mindfulness in the United States, it would have been

beneficial to interview practitioners from racially and ethnically diverse backgrounds as

to bring forth their voice about this rapidly popularizing and polarizing concept. In

addition, all data were collected at a single point in time; this is particularly limiting for

the quantitative data, which prohibits drawing any strong conclusions or making strong

claims about causal effects.

4.9 Conclusion

Results from both quantitative and qualitative research conducted as part of this project add to existing evidence of a link between engagement in mindfulness practices and pro-environmental engagement, including but not limited to household energy use behaviors. Dispositional facets Observe and Non-react were significant predictors of self-reported household energy behaviors, along with frequent engagement with mindfulness practices such as meditation, yoga and breathing exercises. Measuring people's engagement with mindfulness as a practice through mindfulness fostering activities (meditation, yoga, qi-hong etc) is a much more tangible and, hence, more reliable metric than measuring people's dispositions. Future studies would benefit from integrating it alongside the more popular dispositional measures of mindfulness during research. More research is necessary to standardize the construct to ensure reliability.

The results from the qualitative study reveal mindfulness to be a complex, multidimensional concept that is understood and experienced differently by different people. Unlike usually value-neutral academic and corporate conceptualizations, long term practitioners who engage with the concept report their practice to have strong ethical dimensions. Engagement with mindfulness as a practice impacts practitioners' perceived connectedness to nature and supports their environmental behaviors. The study provides conceptual models that attempt to explain the relationship between mindfulness practice, connectedness to nature and pro-environmental behaviors. The models are not

comprehensive, but are contextual and empirically backed, and are an important contribution to the sparse mindfulness-environment literature.

There is without doubt much more work needed to identify whether or not mindfulness is in fact a reliable tool to help improve people's environmental behaviors. Future research would benefit from moving beyond conceptualizing mindfulness as a disposition and studying it as a practice or an experience as well. Researchers need to be specific in differentiating Buddhist, traditional mindfulness from secular and academic mindfulness to avoid contributing to the commodification and cooptation of traditional mindfulness. More mixed methods longitudinal work is necessary to uncover more mechanisms that facilitate the relationship between mindfulness practice and pro-environmental constructs. Engagement with mindfulness has potential in positively affecting people's environmental behaviors, but there is much that needs to be known before it can be presented as a solution for environmental issues. For the time being, mindfulness-based interventions might be best seen as complementary to other direct interventions, such as policy changes, or targeted educational campaigns.

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