Mindful Design and its Role in Sustainable Rituals

By

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A THESIS ESSAY SUBMITTED IN PARTIAL FULFILLMENT OF THE
REQUIREMENTS FOR THE DEGREE OF
MASTER OF APPLIED ARTS
in
Design

EMILY CARR UNIVERSITY OF ART + DESIGN

2012

Abstract

This paper explores whether designed objects can influence conscious, mindful behaviors and lead to the reduction of wasteful habits surrounding water use in the kitchen. The aim is to find answers to the following questions: can a designed object make people live more consciously, and can this consciousness reduce the amount of water wasted or overused in North American kitchens? A series of experience prototypes explore how to bring awareness to the task at hand, minimize the type of multitasking that engenders waste, and transform behavior around water usage. The prototypes provide insights into the successes and failures of each experience and indicate a future direction for opportunities. It is an investigation of how good design can change mundane tasks into meaningful, conscious experiences that have sustainable outcomes. This paper addresses B.J. Fogg's behavior change model and the Decomposed Theory of Planned Behavior. These behavior theories are joined with ideas about sustainable initiatives and mindful thinking to develop design criteria. Mindful thinking is deeply rooted in Buddhist philosophy; as such, this thesis investigates Zen Buddhist philosophies as a background for context, scenario development and support towards sustainable, mindful living. This thesis concludes with a prototype that evokes a meditative pleasure as part of the mealtime clean-up ritual, ultimately proposing that quality of experience can be more desirable than saving time.

Keywords: Buddhism, water conservation, timesaving rebound effect, mindfulness, simplicity, sustainable design, behavior change, ritual, multitasking, context quality, experience prototyping

List of Terms

The following definitions are excerpted from *The Oxford Online Dictionary*, unless otherwise noted (2012).

Attention: notice taken of someone or something.

Attitude: a settled way of thinking or feeling about someone or something, typically one that is reflected in a person's behavior.

Automatic: done or occurring spontaneously, without conscious thought or intention.

Awareness: knowledge or perception of a situation or fact.

Behavior: commonly defined as "the way in which one acts or conducts oneself, especially toward others." For the purposes of this thesis, this term is understood in reference to J.D. Rook's (1985) description of behavior as "a single action."

Choice: an act of selecting or making a decision when faced with two or more possibilities.

Conscious: aware of and responding to one's surroundings; awake.

Consumption: the using up of a resource.

Context: the circumstances that form the setting for an event, statement, or idea, and in terms of which it can be fully understood and assessed.

Experience: encounter or undergo (an event or occurrence).

Habit: commonly defined as "an automatic reaction to a specific situation." For the purposes of this thesis, this term is understood in reference to J.D. Rook's (1985) description of habit as "a series of automatic, single behaviors."

Intention: the action or fact of intending an aim or plan

Mindful: conscious or aware of something; the state of being attentive to and aware of what is taking place in the present moment.

Multitasking: the handling of more than one task at the same time by a single person.

Prototype: a first, typical or preliminary model of something.

Ritual: commonly defined as "a series of actions or type of behavior regularly and invariably followed by someone." For the purposes of this thesis, this term references J.D. Rook's (1985) understanding of ritual as "a series of intentional behaviors, that are meaningful."

Simple: easily understood or done; presenting no difficulty.

Sustainable: commonly defined as "able to be maintained at a certain rate or level." For the purposes of this thesis, this term is used as defined by The Brundtland Report, "Our Common Future," as meaning "meeting the needs of the present without compromising the ability of future generations to meet their own needs" ("Our common future," 1987).

Well-being: the state of being comfortable, healthy, or happy.

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Acknowledgements

It is a pleasure to thank those who made this thesis possible:

First and foremost, I offer my sincerest appreciation to my supervisor, Louise St. Pierre, who offered endless patience, support and guidance on this project. I attribute the level of my Masters degree to her encouragement and effort. One simply could not wish for a better or more supportive supervisor.

To my instructors, Deborah Shackleton, Jim O'Grady and Marc Baumgartner: the instruction, guidance and discussion you provided in class have been invaluable in regard to both this thesis and my professional development.

To my fellow design colleagues: Ana Luz Mejía Guerra, Karen Whistler, Marten Sims and Sogol Assadbeigi, your companionship and humor throughout this entire process have made this degree possible.

Tara Westover and Karolle Wall: the grammatical revisions and advice on writing structure were of utmost help.

My dog Charlie, who left his spot under a lilac bush to offer me never-ending, stress absorbing cuddles.

Lastly, I would like to thank my husband, Kurt. Your endless encouragement and commitment to live simply and sustainably is truly an inspiration.

Preface 1

Excerpt from *The Way of Oryoki* by Tesshin Paul Lehmberg

In the monastery, monks in training essentially live at their assigned seats in the meditation hall. They sit in cross-legged meditation at their seats, and they sleep and eat there too. At meals, the monks first unwrap their Oryoki bowls, always in a prescribed order, and lay them out on the place mat, always in the prescribed pattern. Servers, their fellow monks, then come around and serve the monks, two by two. The first bowl is for grains, the second for protein, the third for vegetables.

The food is eaten with dispatch—again, that efficiency—and seconds are offered. The monks eat all they ask for, down to the last grain of rice, the last sesame seed. At meal's end, the servers bring water for the monks to wash their bowls and utensils, and then the waste water is collected and the bowls and utensils repacked and re-tied, the last knot tied just so. The whole kit is then hung from its hook at each monk's seat.

Oryoki, though, is not merely an efficient meal; it is also—more importantly, now—a mindful meal. (Lehmberg, 2010, p. 5)

Tesshin Paul Lehmberg, an ordained Zen Buddhist priest, is the founding teacher at Lake Superior Zendo/ Aurora Dharma Temple in Marquette.

Preface 2

Turning off multitasking, turning on mindfulness

You are a busy working mother. A typical mealtime in your home is rushed, with family members flowing in the front door at various times. The table is being set, while the boiling water foams over the edges of the pot and sizzles into vapor as it hits the burner. Your son is asking questions about the dog, which is lying in the middle of the kitchen floor and hoping for food scraps, just waiting for you to trip over him. Your mind is racing from task to task, as you try to prevent dinner from burning, not to trip or break dishes, and to answer the never-ending questions. You spoon off portions to each member as they walk by the stove with their plate out like a cafeteria tray. Once everyone has sat down, you portion off the last bit food for yourself in a bowl. As you head toward the table to sit, each member of your family, having finished their meal, is venturing on to their next task, either at the table or in another room. You set your bowl of food aside and place each dirty plate into the dishwasher. You finally sit down at the table and eat your first bite of the meal. As you near the end of the meal, you use your fork to gather every last bit of food, leaving your bowl clean with only a small trace of the red sauce. You stand up, walking slowly over to the kitchen sink. Turning on the hot water, you slowly fill your bowl half way. Using a small rag, you neatly wipe off the smudges of red sauce using the warm water. It warms your fingertips as you gently stroke the smooth ceramic in slow semi-cyclical wiping motions. Taking the half-filled bowl, you mosey over to the window where your ferns are growing. Carefully, you offer the bowl of water to the plants by pouring it onto the soil. You make sure to evenly distribute the water among the six different pots, giving a sip of nourishment to each plant. After this, you use a cloth dangling from the cupboard to pat your bowl dry and replace it in the back of the cupboard where it will sit ready for your next meal.

CHAPTER 1: The Problem

Receiving this offering, we should consider
Whether our virtue and practice deserve it.

(Lehmberg, personal communication, February 3, 2012)

1.1 Introduction

I spent my youth surrounded by plentiful sources of fresh water, which fed and connected the Great Lakes. These bodies of water are captured in my memories, my maturing and my later awareness of the choices our society has made about the stewardship of our most precious resource. This thesis proposes that designers can help individuals adopt mindful behaviors and rituals in their daily lives that encourage conscious awareness of daily actions. In turn, this level of awareness can lower the incidence of thoughtless resource consumption.

Many individuals are transitioning their awareness and actions to emphasize ecological wellness through lifestyle choices (Elgin, 1993). In the voluntary simplicity movement, making adjustments in day-to-day living reflects active, responsible reactions to our current, complex ecological dilemmas. Duane Elgin asserts that "there is no dogmatic formula for simpler living, there is a general pattern of behaviors and attitudes that [are] often associated with this approach to living" (p.32). While Elgin lists many examples of how individuals live ecologically, three common expressions of living in this manner are:

1. Buying less. To reduce our consumption, individuals are paying less attention to passing trends and more attention to durability, aesthetic and function.
2. Shifting diets away from highly processed foods and meat toward local and organic produce.

3. Changing transportation modes in favor of more fuel-efficient methods, such as public transit, bike riding and walking.

These examples show how a "deeper connection to people and place" (Thackara p.123) supports sustainable choices and behaviors.

This thesis proposes that in addition to these pragmatic choices, a deeper connection to objects and a more moment-by-moment awareness of daily activity have an important part to play in creating a sustainable future. As Duane Elgin (1993) asserts, "we cannot be deliberate when we are distracted from life. We cannot be intentional when we are not paying attention" (p. 24). If our objective is to aid a transition to a sustainable future, then people need to live and act within this purpose (Elgin). With each individual effort, people can begin to renovate their habits. These behaviors can become mindful rituals in people's lives; the objects they use can trigger these conscious actions. Instilling mindfulness in daily acts will be important in shifting collective action towards a sustainable future for all beings.

Using design, psychological and Buddhist literature as a background to develop project criteria, this thesis proposes that design has the potential to create objects that invite mindful rituals. A series of prototypes were developed to test an objects' ability to slow down tasks, encourage mindfulness, and reduce water use. Buddhist philosophies and rituals inspired this approach to water conservation, as well as the enhancement of personal and ecological well-being. The successes and failures of Phase 1: prototypes led to the development of design criteria, which is used to guide Phase 2: prototype exploration, within the context of slowing down as a method to conserving resources.

This thesis is structured into six chapters. Each contributing to the understanding of how a mindful, human-object relationship could form new behaviors and mediate sustainable water use in the home.

Chapter 1: "The Problem" introduces the current ecological issues society is facing as a consequence of established habits. This chapter examines water consumption and uses water as a context for testing the design criteria developed in this thesis. Multitasking

is described as a key contributor to automatic and distracted, and therefore wasteful behavior; while mindfulness in our daily actions is suggested as an approach to encourage lower water consumption.

Chapter 2: "Mindfulness" explains what it means to be mindful within our daily activities and gives examples of how Buddhist philosophies support sustainable behavior. This chapter defines mindfulness in terms of Buddhism and describes the relationship between Buddhist practices and the use of natural resources. This viewpoint offers unique insight into the adoption of sustainable behaviors through the use of rituals. The philosophies found in this chapter have influenced and guided the creation of the design criteria. Mindfulness, as defined in this chapter, is a goal of the design.

Chapter 3: "Quality of Experience," introduces methods to increase the quality of experiences through objects and contexts. This chapter discusses object attachment, persuasiveness, ritual versus habit, slowness, and context quality as lenses for viewing the human-object relationship. Next, the chapter describes the Fogg Behavior Model and the Decomposed Theory of Planned Behavior. These concepts are combined with an understanding of Buddhist mindfulness to form object/behavior experience prototypes that specifically encourage mindfulness and well-being, over time efficiency. Combining multiple concepts from the behavior theory, this project offers a unique perspective and approach to understanding objects and the roll they play within our experiences.

Chapter 4: "Objects and Relationships," gives several examples of how designers influence behavior through the use of simple, emotionally engaging objects. Contemporary design examples are discussed in terms of the emotional relationships they can encourage between the users and the objects. These precedents add to the discussion of how objects can be designed to be emotionally engaging and influence behavior.

Chapter 5: "Synthesizing Theories through Experience" describes six prototypes (Phase 1) in detail. Each prototype explored the potential of material, aesthetics and

experience to slow behavior. Theory is used to investigate the insights offered by each prototype. The successes and failures of these experiences provide further understanding into the human-object relationship, the ability designers have to influence behaviors and to establish rituals. This chapter concludes with design criteria gathered from the successes of the six (Phase 1) experience prototypes and leads into Phase 2: prototyping. Phase 2 suggests additional opportunities for slowing actions, conserving water and generating an entry into mindfulness in daily activities.

This combination of theory, physical making, and experience prototypes introduces a method that could be used as precedent by those who wish to instill sustainable, mindful actions in daily life. This project supports a slow design approach to sustainable living.

1.2 Limitations and Scope

This thesis specifically addresses product design. The experience prototypes described are preliminary measures to establish criteria and were completed by myself, "the designer," and a family member. This limitation is accepted as first-phase testing and recognizes the need for additional assessment. This thesis acknowledges that there are other methods of water conservation and does not claim that this method reduces a specific or significant amount of water. Rather, the conclusions of this thesis suggest that when mindfulness is incorporated into daily life, intentionality makes us more aware of our physical actions and could result in the consumption of less water.

I would also like to acknowledge my experience as a co-op researcher for Powertech Research Labs in Surrey, British Columbia as an influence on this project. For four months, I developed and conducted qualitative research with participants on energy use and the integration of clean energy solutions in daily life. This experience offered understanding into daily habits and rituals. It demonstrated to me that there are opportunities for design to mediate the unconscious, wasteful actions we all perform daily and that individuals want to consciously make sustainable choices. The knowledge acquired during this experience has guided my choice in literature, decision-making and my viewpoint when observing and assessing this thesis' prototypes.

1.3 Water consumption at the consumer level

Water is essential for all living things and human activity (Black & King, 2009). Water resources are under pressure because North American lifestyles demand significantly more (127%) water than they did in 1950 (Clift & Cuthbert, 2006). The future availability of this resource is dependant upon our current water practices. Simply put, we consume too much water. Current issues that are affecting water supplies are not the result of one behavior alone, but are the outcome of collective actions done on a global scale, such as urbanization, altered flows of rivers, climate change, pollution, competition and conflict (Black & King, 2009). Maggie Black and Janet King (2009) explain that, "new ways of managing water will have to be found in order to maintain quantity and quality and to achieve a fair distribution of this essential resource" (p. 19). Climate change and increasing population will continue to put additional strains on our water supplies, but individual measures in the home can collectively make a difference (Clift & Cuthbert, 2006). A shift in behaviors, attitudes and habits is a fundamental step in addressing the issue and learning how to consume less of this vulnerable resource.

North Americans consume the largest quantities of fresh water daily, compared to any other region (Black & King, 2009). Robert Glennon (2009) asserts that, "when it comes to water, more than any other commodity, we throw common sense out the window. We consume water as if it had no value and we consume it in the most ridiculous ways imaginable" (p. 38). Much water is wasted as a result of established habits within society. Significant amounts of clean water go down the drain (Clift & Cuthbert, 2006). Water waste in the kitchen, in particular, can be traced to behaviors and habits we perform on a daily basis. Jon Clift and Amanda Cuthbert (2006) report nearly 95% of the water that is delivered to our homes goes down the drain and "overall, only 3% of the water entering the average home is actually used as 'drinking' water" (p. 19). They continue by offering a few suggestions for saving water in the kitchen, such as fixing a leaky tap or by storing drinking water in the refrigerator. This leads to the questions: how can design help to shift wasteful habits to meaningful, water-saving rituals? Is the modern act of multitasking one of the factors contributing to the over-consumption of water in the kitchen? Do people just need to slow down?

1.4 Multitasking, lack of attention and well-being

For many people in contemporary North American culture, a fast pace has become usual (Rosen, 2008). Christine Rosen notes that this manner of living has become so common that we have adapted a word to describe it: multitasking. Originally used to "describe the parallel processing abilities of computers, multitasking is now shorthand for the human attempt to do simultaneously as many things as possible, as quickly as possible, preferably marshaling the power of as many technologies as possible" (Rosen, 2008, p. 105). This pace of human performance, however, is often unproductive and detrimental to the well-being of the individual (Brown & Ryan, 2003).

Dividing awareness and attention between multiple tasks detracts from the engagement with and experience of present reality. A lack of engagement results in individuals behaving automatically, with little awareness of the tasks and actions that they are performing (Brown & Ryan, 2003). With automatic responses to mundane activities, such as kitchen clean up, people can be distracted, lost in thought and unaware of their actions. Although some views suggest that "automaticity saves time and frees the mind for more important tasks, others argue that such automatic thought and behavior patterns may have problematic consequences" (Brown & Ryan, 2003, p. 824). At the University of Michigan, psychologist David Meyer "found that multitasking contributes to the release of stress hormones and adrenaline, which can cause long-term health problems if not controlled, and contributes to the loss of short term memory" (Rosen, 2008, p. 107). Another study by psychology professor Russell Poldrack, at the University of California, found that

> Multitasking changes the way people learn... We have to be aware that there is a cost to the way that our society is changing, that humans are not built to work this way. We're really built to focus. And when we force ourselves to multitask, we're driving ourselves to perhaps be less efficient in the long run even though it sometimes feels like we're being more efficient. (Rosen, 2008, p. 108)

When we discuss multitasking, we refer to the ability to shift our attention between tasks, as well as "to exercise judgment about what objects are worthy of our attention"

(Rosen, p. 109). Given what this evidence has shown, the constant state of shifting attention and intentionally distracting oneself can lead to the deterioration of individual and cultural well-being (Rosen).

Increasing our speed and productivity, either through technical progress or our own daily behaviors such as multitasking, can lead to increased consumption. For example, if we are rushing through mundane tasks in the kitchen, the use of water can be overlooked. Between chopping vegetables, cooking on the stovetop and trying to wash the dirty dishes from the morning, our attention is quickly shifted when water boils over or smoke accumulates. We leave the sink, letting water run down the drain, until we have settled the disturbance. When we are not in present, conscious thought, we make wasteful mistakes due to our attention being split between tasks. In this case, water is overused and wasted. So how can design persuade, motivate and trigger us to slow down and decrease our consumption, while increasing our happiness and well-being?

The practice of conscious attention is an antidote to the distraction inherent in multitasking. Conscious attention and awareness have roots in contemplative traditions such as Buddhism. The Buddhist concept of mindfulness "is more commonly defined as the state of being attentive to and aware of what is taking place in the present" (Brown & Ryan, 2003, p. 822). This engagement in the present leads to pleasure and a holistic sense of vitality. Conscious attention has been scientifically linked to well-being in the cognitive, emotional and behavioral fields (Brown & Ryan). As such, it is not surprising that "many philosophical, spiritual, and psychological traditions emphasize the importance of quality of consciousness for the maintenance and enhancement of well-being" (Brown & Ryan, p. 822). Kirk Brown and Richard Ryan assert that performing conscious, mindful actions will lead to well-being and enjoyment of experience. This leads to the question: can a raised consciousness of our actions not only help us be happy, but also encourage us to pay attention to the task at hand, and support more thoughtful consideration of water consumption? These theorists suggest that we could actually learn more, and increase our well-being, by intentionally removing multitasking activities from our daily routines.

CHAPTER 2: Mindfulness

The mind can go in a thousand directions,
but on this beautiful path, I walk in peace.
With each step, a gentle wind blows.
With each step, a flower blooms.

(Hanh, 2006, p. 55)

2.1 Mindfulness in daily activity

Mindfulness in daily activity can be raised through small, conscious acts at the individual level. These, mindful actions have the potential to generate desirable living contexts for the future. Before discussing how to apply mindfulness to tasks in daily life, I will explain what it means to be mindful. Brown and Ryan (2003) describe the state of mindfulness as being:

> A quality of consciousness that is characterized by clarity and vividness of current experience and functioning and thus stands in contrast to the mindless, less 'awake' states of habitual or automatic functioning that may be chronic for many individuals. Mindfulness may be important in disengaging individuals from automatic thoughts, habits, and unhealthy behavior patterns and thus could play a key role in fostering informed and self-endorsed behavioral regulation, which has long been associated with well-being enhancement. (p. 823)

Brown and Ryan suggest that when meaning is inserted into daily activities, mindful habits develop. When these conscious actions become habit, individuals have the ability to adjust their attitudes and could transfer mindfulness to other aspects of their lives. These ideas are supported by Stuart Walker's (2011) statement that,

> Change towards more sustainable ways of living, if it is to be effective, has to occur at the level of our ordinary individual acts... Effecting meaningful and significant change at this everyday level requires a new sensitivity and the development of fresh perspectives... there is a need to reflect upon our activities and, where necessary, develop new practices. Such changes can yield many benefits for individual and communities, quite apart from any potential long-term contributions to the well-being of the natural environment. (p. 144)

Walker suggests that developing fresh perspectives is necessary in order for individuals to view their habits as unsustainable, and to make the conscious change to begin living ecologically. Walker continues by describing this conscious experience as "appreciating the nature of ordinary, mundane things... in which mundane and the spiritual are of equal importance – no distinction is made" (pp. 168-169). In this description he echoes the texts by Buddhist monk Thicht Naht Hanh that discuss the power of mindfulness (Hanh, 2006; Hanh, 2008). When we can appreciate and be mindful of the ordinary, we will understand what and how we choose to consume in our daily lives. These ideas inspire the following questions. Can the redesign of everyday objects help people view small daily tasks as meaningful? Can mindful acts reduce the amount of water wasted or overused in North American kitchens?

2.2 What is Mindfulness?

Mindful thinking is the combination of being present in one's actions and having a thorough understanding of each individual behavior performed. Buddhist monk and author Thich Nhat Hahn (2006) describes washing dishes as "being fully aware of the dish, the water, and each movement of my hands... not only do we do the dishes in order to have clean dishes, we also do the dishes to just do the dishes and live fully each moment while washing them" (p. 73). Hanh describes dishwashing as having equal importance to meditation. This state of mind is sought after in many meditative traditions: "the concept of mindfulness has roots in Buddhist and other contemplative traditions where conscious attention and awareness are actively cultivated. It is more commonly defined as the state of being attentive to and aware of what is taking place in the present" (Brown & Ryan, 2003, p. 822). In Buddhism, this acute focus on the present reality in every action is an important aspect of the path toward

enlightenment—the ultimate objective of the spiritual path (Chamberlain, 2008). Mindfulness is not only an ideal individual state, but also part of a social construct: incorporated into rituals, traditions and the disciplined Zen practice of being prudent with resources (Chamberlain, 2008). A series of rituals, such as reciting gathas or short verses, helps to trigger awareness in simple daily activities and reminds the practitioners of the resources the Earth provides. Breathing, deep relaxations and prayers, which focus on physically touching the earth, aid in the mindful appreciation of a deep interconnected relationship to the planet and all of its beings and resources (Hanh, 2008).

Traditionally focused around contemplative spiritual paths, mindfulness has been used both historically and in modern contexts to promote physical and psychological well-being. It "is an attribute of consciousness long believed to promote well-being;" (Brown & Ryan, 2003, p. 822). There are various ways by which individuals achieve mindfulness that "can vary considerably, from heightened states of clarity and sensitivity to low levels, as in habitual, automatic, mindless, or blunted thought or action" (p. 824). It is through this awareness, regardless of the clarity level, that actions can become meaningful, thereby increasing individual well-being.

Mindfulness has been more recently linked to physical and mental well-being in the field of psychology. Shauna L. Shapiro et al.'s (2006) developing theory on how mindfulness can affect positive change in well-being lists three major components as essential factors: intention, attention and attitude. As previously stated, this thesis defines these terms as follows:

Attention: notice take of someone or something.

Attitude: a settled way of thinking or feeling about someone or something, typically one that is reflected in a persons' behavior.

Intention: the action or fact of intending an aim or plan.

Shapiro et al's classification of the different aspects of mindfulness, contributed to the understanding and overall goal of attentiveness within this thesis project.
These are not separate stages to achieve mindfulness, but rather "are interwoven

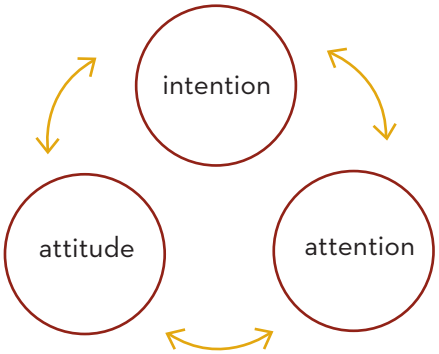


figure 1.1, Mechanisms of mindfulness

aspects of a single cyclic process and occur simultaneously" (p. 375). Through the combination of these acts, perception interrupts automatic habits and "helps us choose behaviors that are congruent with our needs, interests and values" (p. 380-381). The use of these three components (intention, attention and attitude) can be a leading force in changing current, wasteful behaviors regarding water use in the home.

2.3 Buddhist philosophy and natural resources

While Buddhism engages various forms of mediation and rituals, it also has "deep roots in the world of nature" (Chamberlain, 2008, p. 21). Buddhist philosophy covers not only the well-being of oneself but also the wellness of all beings. Buddhists believe that "all life is intricately joined" (p. 21). This philosophy signifies that humans and nonhumans are intimately connected. As Vietnamese Buddhist Hanh (2008) states, "we should deal with nature the way we should deal with ourselves! We should not harm ourselves; we should not harm nature" (p. 35). Congruently, while mindfulness brings well-being to individuals, it brings well-being to the larger environment. With an ecologically responsible intention toward the use of natural resources, the details of daily behaviors may transition along with attention and attitudes. In North America, natural resources such as water come into kitchens, providing nourishment and sanitation. If individuals gain a greater understanding, appreciation and connection to this life-dependent resource, it may trigger motivation toward mindful behavior. Examining how Buddhist culture is mindful of resources such as water provides valuable insights into methods of conservation.

"Water flows from high mountain sources.
Water runs deep in the Earth.
Miraculously, water comes to us,
And sustains all life." (Hahn, 2006, p.13)

The reciting of gathas, or short prayers, encourages followers of the practice to generate awareness and to acknowledge their thanks. Resources such as water have many different gathas, depending on the situation of use. The above gatha "enables us to see the stream of fresh water in our own hearts so that we feel completely refreshed. To celebrate the gift of water is to cultivate awareness and help sustain our life and the lives of others" (Hahn, 2006, p. 13). The poetic philosophies of gathas offer a delightful method for how we might generate mindfulness in our daily actions by taking a moment to recite, reflect and acknowledge our impact on the environment.

2.4 Buddhist ritual Oryoki, the 4 bowls

Buddhist philosophy and traditions provide insights regarding ecological issues currently facing North America. Additionally, the philosophies offer a clear understanding of where our consumptive behaviors could transition. The traditional, formal rituals also offer a tangible illustration of the sustainable management of natural resources.

Participating in a formal Zen ritual, Colin Beavan (2009) described his experience on his blog, which is paraphrased below:

> During formal Zen meals, waste is not permissible. There are four bowls placed grid-like, forming a square. The top right bowl is filled with water, and the others with food. All food is expected to be finished. Upon completion, tea is poured into the upper left bowl and the bottom two remain empty, containing only the bits and pieces of food particles that remain lining the sides of the bowls. The tea is then swirled briefly around the first bowl, gathering the food particles off the vessel walls. The hot liquid is then transferred to the other bowls, repeating the swirling action. Once the tea has reached the last bowl, the tea is drunk. The water in the

top right bowl is then poured, identically to the tea, sequentially through the bowls. Just like the tea, the water is drunk along with all remaining food particles in it. The bowls are then clean, and the meal concludes by briefly drying the vessels.

This ritual offers just one example of mindfulness via sequential behaviors. There is no waste; every element and action serves its purpose. The amount of one bowl of water is used to wash three more bowls. In comparison, the amount of water used for this task is much greater in modern North American kitchen contexts. Dishes are generally rinsed, soaked and then washed, either by hand or a dishwasher. If meal clean up simply and mindfully became part of the modern North American dinner ritual, this thesis argues that water, as a result, could be conserved in the kitchen.

Buddhist rituals illustrate the capacity for mindfulness to moderate consumption. Our attention, intention and attitude guide our actions and through an increased consciousness we could evolve our behaviors into sustainable rituals. As designers we can learn from these examples to set the conditions to guide mindful rituals in North American homes. The philosophies found throughout this chapter influence and contribute to the goals of the criteria. This next chapter explores the potential for objects to support and inspire awareness in simple, mundane household tasks, and discusses the potential for design to transform everyday objects and contexts to facilitate mindfulness.

CHAPTER 3: Strategies for Change

Water flows over these hands.
May I use them skillfully
To preserve our precious planet.

(Hanh, 2006, p. 20)

3.1 Discovering sustainable habits through observation and memory

In order to understand mealtime and cleanup activities further, I conducted general observations. I used video recording to observe my kitchen sink. Viewing the video, I saw a general rush of multitasking to get through the chores associated with preparation and cleanup. In order to get through the processes quickly, the tap was generally left running or, in some cases, dishes were left to soak until morning. Overall, I noted that numerous dishes were used unnecessarily. Habits that led to this overuse included getting a clean glass out of the cupboard for a drink of water, placing it in the sink to be washed, and repeating this sequence again later on in the day. This type of habit tends to go unnoticed until it is acknowledged and revealed by another person or, in this case, by a recording. The video footage led me to reflect on my childhood habits, many of which were intended to save my mother additional work. For example, our household had a one-cup rule for the day. We each chose our cup color in the morning and had to use this single cup for the rest of the day. Before long, each of us had established favorite cups. While the initial goal was to relieve my mother from the task of washing excessive cups, the amount of water used to wash only three cups versus fifteen also had a water-saving significance over the long term.

These personal realizations confirm that rushing and multitasking contribute to thoughtless use of water. In examining the rush to get work done in the kitchen, and considering the

insights on mindfulness discussed in the previous chapter, I realized that I had to first deal with the challenge inherent in asking people to slow down and take more time to accomplish their daily tasks.

3.2 Rebound effect and time-rebound effect

When discussing the eco-efficiency of products intended to promote sustainability, many researchers refer to what is called the rebound effect. Edgar Hertwich (2005) describes the rebound effect as "a behavioral or other systemic response to a measure taken to reduce environmental impacts that offsets the effect of the measure" (p. 86). An example of this effect could occur when many people switched to energy-efficient compact fluorescent light bulbs. While the bulbs consume less energy, many people, conscious of this, could start to leave their lights on for longer periods of time. In other words, how products are used can negatively offset the intended eco-effectiveness of the object. As such, sustainable design practice requires an understanding of how physical behavior and habits develop simultaneously with cognitive desires and motivations.

In addition, researchers suggest that there is a time-rebound effect, where timesaving innovations can lead to increased product and energy consumption (Hoffsetter, 2006; Hertwich, 2005; Young, 2010). Many individuals view sustainable and "environmentally friendly behaviors [as] time investments in the environment because many environmental friendly behaviors need more time (gardening, public transport)" (Hoffsetter, 2006, p. 110). The negative associations with participating in activities that take time, regardless of their positive social and ecological outcomes, leads Hertwich (2005) to question the organization of modern daily life and the current timesaving product solutions that increase consumers' environmental impact. An example of a timesaving but resource-consuming product is a clothes dryer. Instead using wind and a clothesline to dry, we are able to have clothes dried in a mere forty-five minutes with the use of electricity. Although this product saves time in the process of drying, we are no longer using free wind energy. Not only are we consuming and paying for electricity,

we are also increasing our ecological impact by requiring the production, maintenance, and disposal of this equipment. In the end, we are increasing our energy and material consumption to save time, thus causing a time-rebound effect.

In the context of this thesis, it must be acknowledged that there may be resistance to the proposal that individuals take more time to accomplish tasks. Many sustainable design theories, however, offer strategies for encouraging people to take more time and care in their activities. In addition, new theories around designing for behavior change offer additional strategies for encouraging the shifting of behavior. These strategies are detailed below.

3.3 Context quality

When we interact with an object, all of the qualities that surround that experience are part of the context of that interaction. This context includes the environment in which we interact and the pleasure we feel during the experience of that interaction. This section describes how an increase in the quality of an experience can offset the negative view that is associated with taking more time to accomplish tasks such as meal cleanup.

An increased quality of context can enrich the life of the user and positively influence their physical, psychological and ecological well-being. Manzini (2003) advises that "to combine living better with consuming less is necessary to improve or regenerate our contexts of life" (p. 2). In 2003, an exhibition titled Sustainable Everyday: Scenarios of Urban Living, proposed new strategies for living, which "result[ed] from social and system, rather than technological innovation" (Manzini, 2006, p. 2). Promoting environmental and social sustainability, the exhibit focused on a future, sustainable lifestyles and experiences, rather than a particular product. For example: slow experiences such as community gardens can lead to increased context quality because it brings pleasure to the community and contributes to an alternative lifestyle that is less resource consumptive. Manzini and John Cullars (1992) proposed that through context quality, pleasure can offer new valued experiences that are more auspicious to

the environment. Contributing to the ideas presented in this thesis; if basic needs are met and design can increase the context quality, mindful behaviors in the kitchen could become associated with well-being rather than additional time requirements.

3.4 Object quality

Objects themselves can also evoke thought and promote slowness. Kristina Niedderer (2006) suggests that "modification of function in the sense of a disruption-of-function can be used to break through patterns of perception and preconception and to cause mindfulness" (p.10). This statement supports the concept that function can change automatic behaviors, and lead to the development of sustainable, mindful rituals. The qualities of an object that might disrupt function range from malfunction to additional actions that cause attention to the object and reflection on the experience (Niedderer). An example of this can be found in the first experience prototype, found in chapter 5, where the object is too large and heavy to carry to the kitchen sink and therefore forces manual washing or wiping down at the table.

Many individuals, including Jonathan Chapman and Donald Norman, have written on how the physical qualities of an object can invite emotional connection and attachment to that object. Chapman (2005) asserts that "the more an individual consciously or unconsciously relates to the sensory/aesthetic, cognitive/behavioral, and personal/symbolic qualities of an object, the more profound will be the attachment" (p. 101). Chapman further suggests that there can be varying degrees of emotional connection to objects, depending on the qualities it offers to the user. Norman (2003) notes that emotions have the power to change behavior. Although emotions tend to happen over a fleeting period of time, they have the ability to influence our moods and even encourage or discourage traits that can promote the development of rituals we might continue to perform throughout our lifetime. Since the physical qualities of an object can evoke an emotional response, and that response can influence behavior, a thoughtful designer can design an object with the intention of eliciting a particular emotion and consequent behavior.

For example, the Orioki (the four-bowl meal ritual described in chapter 2) engages the user with ordinary objects, in this case bowls, in a meaningful and sustainable manner. The user is consciously aware of all that is being consumed and of the meaning behind each individual action. Niedderer (2006) discusses this dimension of function as being symbolic. The functional intent is not always visible in the object's form, but can be noted in the use of the object. The response the user has from this interaction with the object can provide a profound social dimension "which includes the existential being of the individual" (p.9). These examples show the human-objects' capability to facilitate meaning and mindfulness in small individual actions we perform daily. This information adds to the discussion for sustainable approaches on changing behavior.

Chapman (2005), Niedderer (2006) and Norman (2003) attest that the functional and formal qualities of an object can influence behavior, establish conditions for mindfulness, and create an emotional connection between the user and the object. The series of experience prototypes that are discussed in chapter 5 explore specific ways that the qualities of an object might establish new behaviors when doing clean-up chores in the kitchen.

Through the careful use of design, designers have the ability to create objects that are simple to use, motivating and which have the capability to prompt use. Niedderer (2006) argues that "a disruptive function can cause mindful awareness" but must compensate the disruptive action with additional desirable and thoughtful functions (p.10, 17). Deep emotional attachment between user and artifact (Chapman, 2003) may decrease wasteful, consumptive habits in the kitchen while simultaneously promoting holistic well-being. Design has the ability to stir emotion through form, function and experience with objects.

Some designers suggest that it is possible to create an emotional attachment to an object, experience or ritual (Chapman, 2005; Norman & Ortony, 2003). Jonathan Chapman (2005) describes this relationship as such:

> "The meaningful associations that users project upon objects capable of delivering such experiences posses a similar potency, and frequently catalyze robust emotional connections between subject and object. It

> therefore follows that immersive experiences play a role in forging strong attachments between subject and object, and that these experiences possess a far greater validity than simply to entertain, or sustain, attention span" (p. 103).

Designers can use the power of these emotional connections to persuade individuals to change unsustainable behaviors and to encourage sustainable habits (Faludi, 2009), which could then evolve into mindful, holistic rituals in daily routines.

3.5 Slow design

Slow design is described by Alastair Fuad-Luke (2002) as a "design paradigm where the role of design is to balance socio-cultural and individual needs with the well-being of the environment" (p. 4). This idea could lead designers in a direction that not only improves our daily life, but also our society by repairing the health of the environment (Fuad-Luke). Slow design looks at the actions individuals perform on a daily basis. As described in this thesis, the ability to focus and find meaning in these actions is commonly lost when multitasking, resulting in overconsumption and waste. While ordinary daily experiences have a tendency to lack a sense of spirituality, an increase in consciousness and awareness around a particular task can emerge when single-tasking (Hanh, 2006). Slow design and mindfulness theories are highly complementary.

Eli Blevis and Erik Stolterman (2007) discuss the concept of ensoulment as a direction for sustainable design, stating that "ensouled things imply well-cared for things, looked-after things, durable and enduring things. Such things lend themselves to sustainable behaviors more than things that are frequently disposed" (p. 4). Likewise, Ezio Manzini (2006) and Kristina Niedderer (2006) emphasize that design could be used to increase context and object quality to make living with fewer material objects more desirable. The authors indicate that design has the capacity to set the conditions for mindfulness. This acute awareness, when placed in the context of the kitchen, can lead to the careful use of water and reduce unnecessary waste.

3.6 Persuasiveness

In an era where "biases push our behavior toward overconsumption, irresponsibility and shortsightedness," (Faludi, 2009, p. 1) designers can use persuasive techniques to influence sustainable behavior. Persuasive design looks at the ability to change habits through interaction with objects. Jeremy Faludi (2009) suggests that persuasive design has the ability to "craft a product's user experience so that the user's actual interaction with the product changes their behavior." B.J. Fogg is a leading researcher in the area of persuasive design, however his work is primarily focused on persuasive technologies. Faludi (2009) discusses Fogg (2009) "elements of behavior," in more general terms and leads the discussion into three areas of persuasion: tools, media and social actors. This thesis references Faludi's interpretation and argues that objects can be persuasive due to tactile and functional cues. Object quality can offer satisfaction and emotional connection, thus reinforcing a pleasant experience of use, and contributing to positive feedback that is important in persuasive design. These strategies will be interesting when applied to an object whose purpose is to generate mindful actions.

3.7 Ritual vs. habit

Rituals are intertwined throughout daily activities, from highly structured religious rituals, to simple household activities. A series of repeated behaviors, such as the preparation of a single cup of coffee in the morning, can be a ritual. Many people wake up, pull out their coffee grinder, smelling and listening for the beans to be ground to the perfect coarseness. They consciously listen for the kettle to huff, so they can lift it off of the burner before it screams. Using a No.1 filter, they pour the boiling water over the coffee grounds, taking in the aromatic smells of the cup of coffee. In a few moments, they will be sipping the hot liquid in the chair by the window. These predictable and repeated sensations and actions work together to create a meaningful experience for people, who then anticipate and enjoy the process of making their daily morning coffee.

Rituals are developed to contribute structure and meaning to ordinary daily activities (Rook, 1985). Differentiating between habit and ritual is important when discussing

behavior change. Behavior can happen automatically, without consciousness. A habit tends to be something repeated, ranging from addictive and compulsive to automated behavior. A ritual is similar to a habit in the way that it can vary from a very spiritual and structured set of actions to a more loose ritual such as mealtime in the home (Rook). Dennis Rook differentiates between habit and ritual, however, by noting that a ritual is "a larger, plural experience, while habits tend to be singular behaviors... although some habits are complex and highly involving, they are often less personally meaningful than rituals" (p. 252). The difference between a habit and a ritual, therefore, lies in the emotions and importance that the person engaged in the behavior invests in that behavior.

Some rituals are very casual, such as family mealtime, and allow for spontaneous deviation (Rook). It is with these casual daily rituals where design can facilitate new, mindful behaviors to transition toward sustainable use of water in the kitchen.

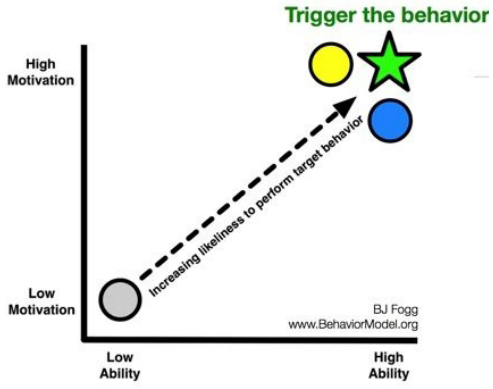
3.8 Behavior models

This paper addresses two models for designing to encourage behavior change: the Fogg Behavior Model (FBM) by B.J. Fogg and the Decomposed Theory of Planned Behavior (DTPB) by Moons et al. The FBM addresses behavior specifically, while the DTPB references a few additional factors, such as emotion and cultural acceptance. The following section briefly describes each theory, and elaborates on how this thesis integrates these ideas with the three stages of mindfulness (section 2.2) and theories of context quality (section 3.3).

3.8.1 The Fogg Behavior Model

The Fogg Behavior Model (figure 1.2) was developed by B.J. Fogg, a pioneer in persuasive technology and behavior models. His framework suggests that there are three prime factors for behavior change: motivation, ability and triggers. In order for a behavior to happen, all of these

figure 1.2, Fogg Behavior Model



factors must be present. Fogg, however, suggests that motivation and ability can "trade off" (2009, p. 3), with a desired behavior being achieved if motivation is high enough or the task is simple enough.

3.8.2 The Decomposed Theory of Planned Behavior

The Decomposed Theory of Planned Behavior suggests that in order to change behavior, three main factors must be accounted for: attitude, subjective norm and perceived behavior control (Moons et al., 2009). With each of these factors, however, there is an added complexity that is dependent on the user's personal history and cultural context. This theory suggests that the behavior needs to be perceived as important to the user. The differences between the FBM and the DTPB is that the latter suggests that there must be an emotional, cognitive response to the action in order to learn and accept a new behavior, while the former states that the user must be conscious of, and have an intention to perform the behavior.

3.8.3 Designing mindful rituals

Designing for mindful rituals must take into account multiple factors. Mindfulness is a quality of consciousness that disengages us from automatic thoughts, behaviors and habits. Everyone can practice mindfulness by finding meaning in the choices we make and the actions we perform. Over centuries, Buddhists have developed strategies that support mindful practice and behavior. For example, Thich Nhat Hanh (2006) describes the reciting of gathas or short poems as a method to achieve mindfulness in everyday life. Composing your own gatha is one way to practice mindfulness in a way that fits the specific circumstances of your life. The aim is to find ways to regularly bring attention back to the present moment. Mindful rituals, as described in Section 2.4, illustrate the capacity of mindfulness to moderate consumption. Our attention, intention and attitude guide our actions, and through an increased consciousness we could evolve our behaviors into sustainable rituals.

3.9 Summary and strategies

The theories below provided a lens for developing prototypes and further refining a list of criteria to help explore and encourage mindful rituals. Trigger, ability and motivation categories, drawn from the FBM, are useful when the designer's intention is to change an initial, non-repetitive behavior. The DTPB addresses emotion as a factor for behavior because it can create attachment between the user and the object. Both the FBM and the DTPB models are focused on single behaviors. By adding awareness of the three stages of mindfulness, this project now supports explorations of an object's ability to change more than one behavior into a meaningful ritual. The following theories are used in this thesis to support the goal of influencing sustainable behavior through mindful rituals:

1. The Mechanism of Mindfulness: The interwoven qualities of attention, intention and attitude.
2. Context Quality: The qualities surrounding the environment we interact in and the pleasure we feel during the experiences of that interaction.
3. Object Quality: Physical qualities that invite emotional connection and attachment to objects.
4. Slow Design: The balance of socio-cultural and individual needs with the well-being of the environment.
5. Persuasiveness: Tactile and functional cues can change habits through interaction with objects.
6. The Fogg Behavior Model: This model suggests three prime factors for behavior change: motivation, ability and a trigger.
7. The Decomposed Theory of Planned Behavior: There must be an emotional, cognitive response to the action in order to learn and accept new behaviors.

The combination of these lenses allows for a thorough review of an objects' potential to enable sustainable behaviors. Design has the potential to influence behavior through the interaction with emotionally engaging objects. The integration of Buddhist philosophies with design theory can offer vision and influence when developing objects for sustainable behavior change because "Buddhism provides unique insights and practices that integrate the human and the natural world" (Chamberlain, 2008, p. 25).

These theories informed the decisions and development of design criteria which expanded into phase 2: prototyping. The elaboration on behavior change models, such as Fogg's and Moons et al., through physical making, offers a way to understand and support conscious change around resource consumption.

CHAPTER 4: Objects and relationships

The water with which I wash these bowls
Tastes like ambrosia. I offer it to
The spirits to satisfy them.

(Lehmberg, personal communication, February 3, 2012)

The following projects by designers such as Emma Lacey, Jella Jongerius, Kenya Hara and Naoto Fukasawa offer precedent for designing human-object relationship, inviting mindfulness, and disruption as ways of provoking and supporting behavior change.

4.1 Evolving objects and relationships

Designer Emma Lacey (2009) conducted a case study and found that drinking vessels, such as mugs, are "highly ritualistic objects" and that "ceramic tableware [is] thought to offer layers of experience beyond simply eating and drinking" (p. 87). She found in her primary research that participants chose and defended their favorite mug—proving that empathy and emotional attachment had been formed around the vessel. Lacey concluded the study with three original designs, which have "features that are a subversion of form or function that encourages the user to interact with and experience the object on a conscious level" (p. 92). One of the designs, Slide, is a play on the traditional cup and saucer. The saucer is drastically curved upward to allow it to double as a bowl. The cup has a round bottom allowing effortless movement when nested in the saucer. The shape of these objects "provide a degree of autonomy, in that the form or function of the piece can be changed" (Lacey, p. 91). These unique characteristics create a bond between the user and the vessel, nurturing attachment to the human-object relationship and generating emotion. Reinforcing the bond by caring for the object develops behaviors that could turn into a meaningful ritual's between

the user and object. Lacey also suggests that objects which allow a certain level of experimentation and consumer interpretation, carry "individual, social, cultural and emotional value" (p 90). If the object creates a surprise, or has unique characteristics, the user often forms a bond with the object to showcase it to others.

figure 1.3, "Slide" by Emma Lacey (left)

figure 1.4, "Click" by Emma Lacey (right)

This is true of the author's Click cup, which changes position when it is filled. This work also explores how meaningful interactions and experiences with an object can expand its life and durability, which is acknowledged in the desire to use, care for and repair the object. This relationship then fulfills us, and we have less desire to obtain more objects.

4.2 Designating home and handcraft through material combination

Industrially produced objects can invoke meaningful experiences through subtle cues in the form and the tactile qualities of their material. Non-Temporary Ceramics for Tichelaar Makkum, designed by Hella Jongerius, demonstrates this by showing how hand-dipped glazes can make each individual piece unique. These inimitable attributes of objects develop meaning in the human-object relationship through personalization. Hella Jongerius offers unique insights into establishing designated spaces or "homes" to which her objects belong. She plays with pattern and texture to evoke tactile senses. In her 1999

figure 1.5, "Embroidered Tablecloth" plate detail, 1999, Hella Jongerius,

photo by Gerrit Schreurs

Embroidered Tablecloth series, Jongerius uses pattern to integrate a tablecloth with earthenware. The patterns flow from the fabric and across the tableware. At second glance, one will notice that pattern physically connects the two objects, implying a permanent relationship. This exemplifies how a mass-producible object can have handcrafted character, form attachment with users, and incite emotional responses.

4.3 Re-thinking the mundane

figure 1.6, Redesign of toliet paper, by Shigeru Ban,

REDESIGN exhibit, by Kenya Hara

Kenya Hara's 2007 exhibition, Re-Design, experiments with the redesign of mundane products. Hara recruited creative individuals to tackle the redesign of objects such as matches and toilet paper. When architect Shigeru Ban was paired with toilet paper, Ban created square tubes to form the center of the roll. The center form changes how the paper will wrap around it, creating a square with soft, filleted corners. When stored, this shape stacks more stably, and leaves smaller gaps between the rolls when stacked. An interesting observation for sustainability is the resistance the square roll provides when the paper is pulled from a dispenser. This roll not only generates a loud noise, but the movement requires more effort than a standard roll. This effort implies that less paper could be used, relative to the traditional smooth-rolling, circular toilet paper roll, which could increased consciousness during use. These simple changes start a new, aware relationship and offer new affordances to us.

4.4 Beauty in simplicity

figure 1.7, "Vertigo Trays" by Naoto Fukasawa

Naoto Fukasawa's Vertigo Trays show how simple organic forms can provide an array of function and beauty. The relationship that the vessels have with one another is ever-changing, depending on the user. The unique nesting of these objects within the tray, and within each other, show how negative space can be just as beautiful

as the object itself. This triggers and allows motivation, ability and emotion to emerge through interaction with the tray and the nesting vessels.

These four designers illustrate how objects can evoke emotion through form, material, pattern and curiosity. The human-object relationship is highlighted by how the design influences the way that people interact with the objects. Taking this further, we can understand that this relationship might develop over time. These precedents offer designers insights into ways of seeding mindful rituals in the home.

CHAPTER 5: Synthesizing theories through experience prototypes

> In this world of emptiness
> May we exist in muddy water with purity like a lotus
> Nothing surpasses the boundless mind
>
> (Lehmberg, personal communication, February 3, 2012)

A series of prototypes exploring mindful experiences between human and object are at the foundation of my inquiry. Marion Buchenau and Jane Fulton Suri (2000) term this type of exploration as "experience prototyping". This is defined as any sort of exemplification to understand, communicate and explore what it is like to engage with a product, system or space. They also advocate the importance for the designer to "'explore by doing' and actively experience the sometimes subtle differences between various design solutions"(425). This allows the designer to play and expose flaws and repercussions of each particular design direction.

This thesis uses these methods to conduct experience prototypes that explore ways to slow down our actions in the kitchen. They were tested by myself 'the designer' and a family member. This limitation is accepted as a first-phase testing process with motivated participants. It is anticipated that most early adopters of this type of object will come from a similarly motivated demographic, however further testing with less motivated participants should still be conducted.

The tactile and physical interaction with the objects, were of utmost importance during this process. The following sections describe the most influential experiences and central learning's.

5.1 Phase 1: Experience prototyping

5.1.1 Prototype 1: CNC Table Top-ware

Many cultures have formed habits to make cleaning dishes easier. Bread, tortilla and naan are common examples of food items used to wipe dishes clean of sauces and bits of food at the end of the meal, reducing the amount of water needed for soaking and washing (Q&a the Italy, 2012; Soto, 2006; "Indian survival guide," 2008). This understanding led to the investigation of objects that would force this behavior due to the size and weight of the object. I designed a heavy tabletop with recessed bowl shapes. The only way to clean this item was to wipe it down. It also must be wiped immediately to prevent food from hardening on the surface.

figure 1.8- 2.0, Prototype 1 process

During the prototype, there were many successes. Food transferred easily between recessed vessels, and offered a great interactive experience with food and with others. Clean up was very easy and required a minimal amount of water (1 liter). Just as Fogg suggests, there was a trigger (the object), but I speculate that motivation and ability would decrease over time because it lacks practicality. Once the novelty wears off, the motivation to use this object would decrease. This object, therefore, would not be ideal in establishing a new daily ritual in the kitchen to conserve water. This prototype, however, led me to develop further design criteria and other explorations.

5.1.2 Prototype 2: Vacuum formed bowls, subtle surprise

As Chapman suggests, emotions can be established in the human-object relationship if there is an evolving dynamic between the two. Essentially, they grow, learn, care and evolve together over time. For this experience prototype, I decided to work visually with the element of surprise.

Typically the human-vessel object relationship is constant, as the form of the vessel is consistent. This prototype tested how this relationship could offer surprise by evolving the form of the vessel. The dented structure on the inside of the bowl created visual variety depending on the contents put inside.

figure 2.1- 2.3, Prototype 2 process

Although successful aesthetically, the functionality of these objects in terms of their ability to aid in the conservation of water or to change behavior failed. The changing crevices, although lovely, offered a difficult surface to wash, let alone wipe clean. Although these vessels may establish emotional attachment and motivate the user to use them, they did not meet the measures for wash-ability with minimal amounts of water.

5.1.3 Prototype 3: Pouring / designating a home

With this prototype, I designated a specific space in the home for the vessel. Theoretically, this could provide motivation to return it to its space when not in use. This repetition of behavior could develop habits, which in turn could become mindful rituals if more meaningful elements are added later.

In the Buddhist ritual Oryoki, a small amount of water is poured, gently swirled around a bowl, and then poured into the next bowl, with the process repeating. All focus is on the water gently moving around the bowl, removing the remaining bits of food.

figure 2.4- 2.6, Prototype 3 process

These two inspirations led to experimentation with how a designated home might lead to the reuse of water from one soaking bowl to the next. This incorporates the functional design of the vessels, as well as designated space where the pouring of water would take place.

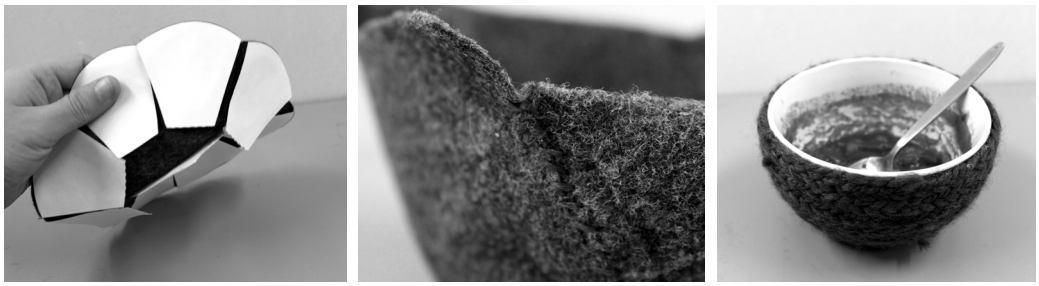
The vessel walls were shaped to imply a direction of pouring. The designated home provided a space and a device to place above the sink. Upon connecting the two, manual power was used to rotate the wheel and water was poured from one vessel to the next.

This prototype interpreted the Buddhist ritual literally as mere function. Although having a designated space could form a habit, the likelihood that this would become a ritual is low. Meaning and attention were missing from this experience, which would cause low motivation to actually perform the behavior repeatedly.

5.1.4 Prototype 4: Integrating materials: Ceramic and wool

The fourth experience prototype explored the merging of material and texture. Felted wool was attached to the outside of a ceramic bowl. People are naturally motivated to keep the material dry and clean, so this tended to slow down the process of both eating and washing.

figure 2.7- 2.9, Prototype 4 process



The fabric also inhibited immersion in water, something I attempted to do with size and weight in prototype #1.

Although this process may seem a bit tedious, this object offers many other affordances to make up for the hurdles. For example, the fabric layer could allow for easy personal customization. The thick wool material offered insulation from the heat of the ceramic, provided soften qualities when placing in the table, as well as being aesthetically beautiful. The tactile experience with this object evokes the senses to make the experience solely about the human-object relationship. This experience clarified that in order to slow down tasks that most individuals want to hurry through, design must offer other desirable affordances and tactile experiences that increase the context quality.

5.1.5 Prototype 5: Washing immediately at the table

This prototype tested the ability to trigger an action due to the unfamiliar presence of a large bowl of water located on the table for washing immediately following a meal.

figure 3.0- 3.2, Prototype 5 process

The intent was to form a new habit and mealtime ritual that involves washing up at the table, instead of placing the dishes near the sink. This prototype offered valuable insights into the process of wiping down dishes at the table with a set amount of water for the day.

Washing at the table rather than the kitchen sink instantly sparked awareness of the task at hand. The dishes were washed with extreme care, delicacy and consciousness. This is mindfulness. This spark of awareness led to specific choices about the dishes that were used during the day. For example, each of us became responsible for the

vessel we used and frequently used it multiple times before washing it. As a result, significantly fewer dishes were used during the day, and there was no large stack of dishes left to do at the end of the night or in the morning. This was a meaningful experience for my household, as it offered more time for relaxation with each other and a sense of comfort for having the task of washing up already completed.

5.1.6 Prototype 6: Two vessels, Three days

Is it really necessary to wash each dish immediately after use? Following prototype 5, this investigation tested the length of time you use a dish before feeling the need to wash it. The two members of the household used the visual cues of food residue to indicate when an appropriate time was to wash a dish. Two dishes were used. One cup and one bowl, and both remained fairly clean until day three.

figure 3.3- 3.5, Prototype 6 process

The bowl was also used to test the formation of a new habit. Once the bowl was used, water was taken from the tap to fill the bowl for soaking purposes. This water was then transferred to other family members' dirty bowls. This process allowed the same water to be used for soaking and rinsing the vessels. The bowls were then dried prior to use with a cloth.

This prototype provided a significantly lessened amount of chore work for our household and resulted in unexpected attention to what we chose to eat and how we chose to prepare food. It was noted that the dishes remained clean generally until dinner time. We noticed that we began to intentionally choose food that would reduce the need for washing, such as raw vegetables. This experience prototype demonstrated that when mindfulness is applied in one area of activity, it can flow over into the choices you make in other areas—in this case, the food we chose to consume during this time.

5.2 Learning from the experience prototypes

Designing these experience prototypes led to some new insights about how to design for a water-saving ritual. Observations include that a disruptive element, such as a washing station at the table can support the development of a new ritual. However, it must be designed well to inspire motivation. Barriers can force change, so long as the barrier is not too unwieldy, as in prototype #1. Prototype #3 shows that barriers can be offset by an increase in context quality (the fabric). Prototype #6 illustrates how a motivated user can become engaged in a new ritual and start to make supporting changes in other habits, such menus that facilitate easy cleanup. This prototype does not yet address how to inspire motivation. Prototype #4 offers tactile and aesthetic affordances to make up for the extra time it takes to wash. The ability to wash may become a barrier that results in inactive use of the object.

Taken all together, these experience prototypes offer insights for new ways of designing. They also lead to a set of criteria for Phase 2: prototyping that would specifically change washing up rituals to slow down the user and use less water. The design criteria determined for Phase 2 are:

- Combination of material to evoke tactile senses and slow tasks down
- Ability to be customized, instill ownership
- Designated home for the object when not in use
- Interactive experience that evolves or is transformable
- Offer aesthetic and experience affordances to balance the time spent caring for the object
- Does not inherently make the user perform a certain way, but simply reminds the user to act mindfully
- Easy to wash
- Increased context quality

5.3 Phase 2: Prototyping: Response to criteria

5.3.1 Prototype 7: Mindful washing at the table

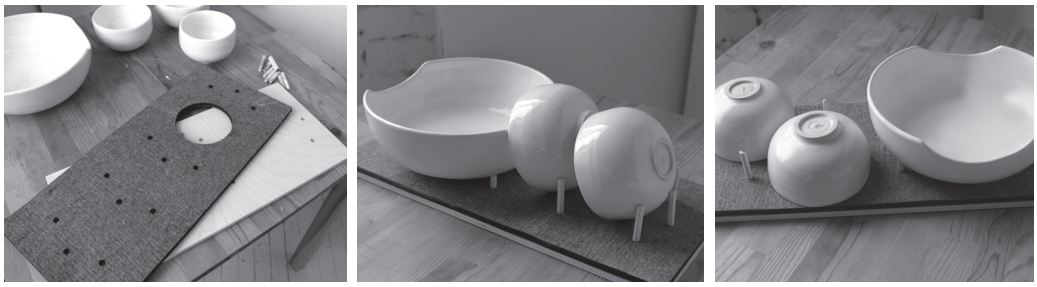
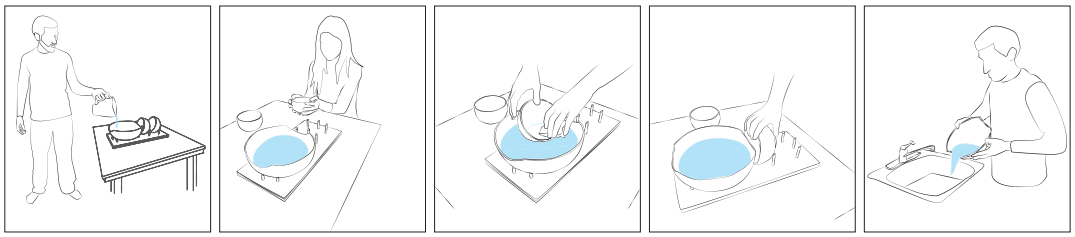


figure 3.6-3.8, Prototype 7 process

Two different size ceramic bowls with a birch and felt base, tested the facilitation of washing at the dining table. These objects create a new ritual at the table that could trigger the user to rinse immediately after use, while allowing the user to determine how frequently they change the rinse water. Requiring the user to replace the water repeatedly could develop mindfulness surrounding daily water use in the kitchen. The wood base and supports allow for the entire piece to be mobile for cleaning and for use in other areas of the home. The wool felt offers a soft padding like quality to rest the bowls, but is also removable to allow for cleaning or replacement. The circular cut in the felt and the wooden pegs provide a designated place for the two different sized bowls. The recessed cuts along the rim of the larger bowl provide a comfortable nesting area for the user's wrists while they are washing.

figure 3.9, Prototype 7 ritual



Step 1:
In the morning, fill the large bowl with the set amount of water you plan to use for the day.

Step 2:
Use the smaller bowls for snacks and small meals throughout the day.

Step 3:
After the finishing a meal, wash out the small bowls in the larger bowl filled with water.

Step 4:
Set small bowls to dry by placing it between the larger bowl and the wooden pegs.

**Reuse and repeat throughout the day.*

Step 5:
After your last meal of the day or when the water in the large bowl visibly becomes soiled, discard or reuse as greywater in other areas of the home.

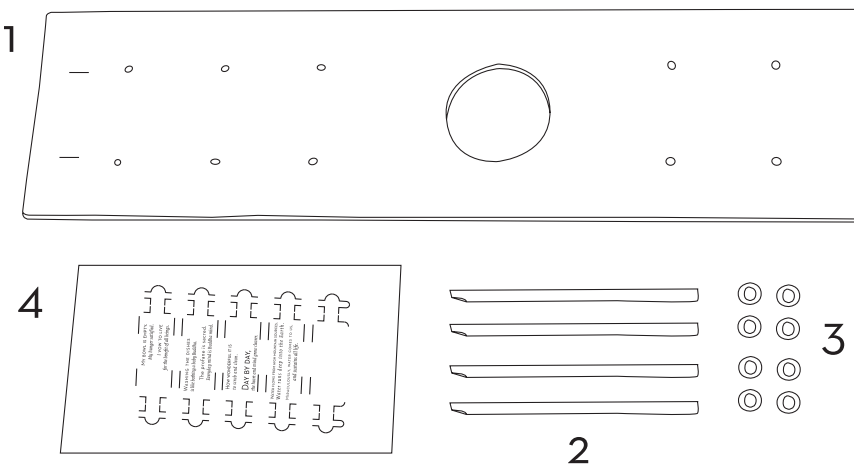
5.3.2 Prototype 8:Entry to mindfulness

This prototype focuses on table space usage and interactive experiences, while providing guidance to learn mindful rituals. Dominating the center of the table, the felt and dowels create an alluring landscape for washing and drying dishes. This prototype focuses on adapting to the users' existing dishes by providing a space for a large rinsing bowl and adjustable felt mounds to rest smaller dishes. The new integration of a personalized gatha provides a conscious entry into a mindful ritual.

figure 4.0-4.2, Prototype 8 process

The design consisted of four components. Each item is essential, achieving functional and aesthetic minimalism.

figure 4.3, Prototype 8 list of parts

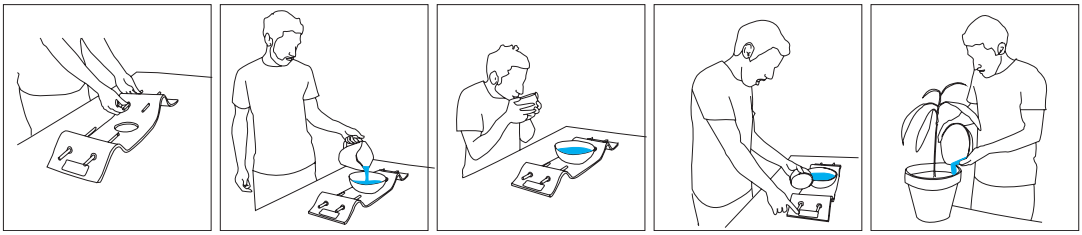


1. The felt padding: A natural material that can retain structure and offer a gentle resting area for fragile ceramic dishes. The fabric is transformable with the use of the other components, offering a changing landscape that nests dishes while they are not in use.

2. Wood dowels: The beveled form of the wood dowel references a needle, inferring a physical weaving action through the holes on the felt. The flattened end indicates the area where the users' fingers grasp the object. When woven, the dowel provides a space for silverware to rest.
3. Rubber washers: Offer grip and support to the tension points between the felt and the dowel.
4. Gathas: Gathas are short verses that can be used to call attention to the moment by reciting the verse. Several gathas are offered as part of the product. Each gatha is laser-etched onto canvas. The canvas taps fit into designated slots nears the resting place for the bowl, so that the user can select the gatha of their choice, or write their own verse on to the blank spaces that are also provided.

These components offer an entry level experience to mindful thought and ritual. By providing a space at the table to mindfully wash dishes following a meal, the interactive qualities of the felt and wooden dowels allow the user to form an attachment with the object. The adjustable felt landscape and multiple choice of gathas create a dynamic and evolving human-object experience. The holes, washers and dowels provide a method to vary forms with the felt. These objects can be used by one or many individuals, evoking play and discussion at the table while actively allowing the users to participate and acknowledge their water use.

figure 4.4, Prototype 8 ritual



Step 1:
Choose your gatha and arrange the dowels to create a landscape to rest your dishes.

Step 2:
In the morning, fill the large bowl with the set amount of water you plan to use for the day.

Step 3:
Use your dishes throughout the day.

Step 4:
Mindfully wash your dishes in the larger rinsing bowl while reciting your chosen gatha.

Step 5:
At the end of the day, discard the soiled water by using the grey water to nuture a plant.

5.4 Future directions

This thesis considers how mindful interactions with objects can increase our consciousness, which could in turn, make us more aware of the resources we consume. It also explores how designs could help a target audience establish new mindful rituals.

Designers who wish to focus on the human-object relationship with an emphasis on emotional, cognitive responses in behavior change scenarios may find useful examples in some of this work. In particular, it is hoped that this thesis helps to fill a knowledge gap in the field of persuasive design, where there is limited available information on non-digital objects for behavior change. This project also begins an exploration into mindful design as an approach for sustainable social change.

There are several challenges to be addressed in future work. In order to form new rituals, designs must be customized to the users lifestyle. Therefore, designing a ritual for a family of eight would differ from a household with dual income, no children. However, this focus on a specific audience could lead to acceptance and influence on secondary and tertiary audiences.

5.5 Summary

Many designers are seeking ways to address the pressing ecological issues that society is facing. This thesis suggests that by carefully planning the impact that objects and experiences have on individuals, new daily rituals can be created. It argues that by designing to evoke conscious experiences, designers can motivate more sustainable behaviors.

Throughout the span of this investigation, a series of experience prototypes in the kitchen were used to explore different approaches to the chore of washing up. The prototypes focused on the human-object experience and the formation of new daily rituals to transform behavior around water. Divided into two phases, the first prototypes tested different avenues of experience. Successful approaches to minimizing waste and generating awareness were then funneled into a list of design criteria. Prototypes developed in phase 2 attempted to meet all criteria, while actively

encouraging a new water conscious, clean-up ritual at the kitchen table following each meal. Both prototype phases took into account many different behavioral, philosophical and design theories, all of which guided the refinement.

Particular insight was drawn from mindful rituals in Buddhism, which can provide rich inspiration for designers. Mindful behavior is practiced in Buddhism and among groups who follow a voluntarily simple lifestyle. The objectives of this project are to encourage mindful, conscious behavior in daily action, while reducing water consumption and waste.

Buddhist literature also clearly describes how important individual behaviors are to conservation efforts. The conscious effort of individuals could reduce our impact, moderating our demand on the environment and the resources that we depend upon. Active, conscious experiences help people to begin to identify and care for our natural resources.

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