The Role of Nudging Towards Sustainable Living

Exploring the role of nudging in changing human behavior towards sustainable living in residential architecture.

Abstract

The rapid change in climate change and negative impact on the natural environment is attributable to human behavior. Research has shown that the unsustainable way of living can be changed into a more desired, sustainable lifestyle by using the concept of nudging. Since current studies on nudging and its potential for sustainable behavior are mostly focusing on the policy-making process or small aspects in the built environment, this research aims to explore the role of nudging in changing behavior towards sustainable living in architecture, by answering the following question: What is the role of nudging in changing behavior towards sustainable living in architecture? The concept of nudging and choice architecture is explored as well as the notion of sustainability in architecture. This research describes an in-depth analysis of four case studies that are analyzed on the three pillars of sustainability and substantiated with the nudge theory. These case studies offer additional insights that try to close the gap between theory and practical interventions. The explored relationship between nudging and sustainability evaluates what role nudging plays in the architecture and the built environment towards sustainable living.

Keywords

Sustainable living, sustainability, human behavior, nudging, choice-architecture.

Problem Statement

Human behavior and the increase in population growth have become the main driver of environmental problems and pose a threat to the stability of the Earth system since the Industrial Revolution (Rockström et al., 2009). Continuing the use of natural resources, the current rate of greenhouse gas emissions and industrialized forms of agriculture will lead to undesirable consequences that will increase over time, such as global warming, urban air pollution, freshwater shortages, environmental noise, loss of biodiversity. These current demands on nature are compromising the well-being of humanity's future and putting the existence of mankind at risk (Rockström et al., 2009; Steg & Vlek, 2008; Gardner & Stern, 2002; Swim et al., 2011; Wackernagel & Rees, 1996).

More recently, a report of the Intergovernmental Panel on Climate Change (IPCC, 2013) has shown that a majority of 95% of the UN's climate researchers agreed that human activity is "the dominant cause of observed warming since the mid-20th century". This means that the environmental problems are attributable to human actions and are rooted in our behavior (Swim et al., 2011). To create more awareness about sustainability and the current negative impact of human behavior, policy tools are used such as the provision of information and value-based communication (Goepel, Rahme & Svanhall, 2015). Despite these tools, research shows that a majority of the people who understand the link between human behavior and climate change are unaware of their current behavior and significant negative impact on planet Earth. According to Page & Page (2014), this can be seen as the main reason why our daily behavior continues in an unsustainable way.

This undesired result can be explained by the complexity of human behavior. The way humans act and behave is influenced by a variety of different factors, such as social norms, habits and values, infrastructural and institutional context, and economic and

political debate (Mont & Power, 2013). Research over the past decades raised sincere questions about the rational behavior model these policy tools rely on. Counter to this rational decision-making process that is based on individuals seeking to maximize their utility and making choices that result in the optimal level of benefit, research in behavioral economics demonstrated that decisions are often based on heuristic processes, unconscious associations, automatic and learned responses (Marchiori et al., 2017). Human decisions are dependent on the context of the decision, often biased, flawed and have a strong tendency to follow the herds, and go along with the default option or status quo (Marchiori et al., 2017; Hofmann et al., 2009; Smith & DeCoster, 2000).

These theoretical and psychological insights of behavioral economists help to understand this complexity of human behavior. Behavioral economists Richard Thaler and Cass Sunstein understood this complexity of human behavior and shared their theoretical and psychological insights in the book *Nudge: Improving decisions about health, wealth, and happiness*. This book sparked the attention of governments interested in influencing the daily lifestyle of the population and helped policymakers in devising policies to enhance the decision-making process of people in favor of smarter, healthier, and more preferred, sustainable behavior (Hofmann et al., 2009; Smith & DeCoster, 2000). According to Thaler and Sunstein (2008), the Nudge theory is a gentle push towards the desired direction. "A nudge is a small aspect in the context of an individual that alters their behavior predictably without forbidding any options or significantly changing their economic incentives. To count as a mere nudge, an intervention must be easy and cheap to avoid". A nudge, when correctly applied into practice, can counteract the negative impact and reduce behavior that is seen as undesirable and can stimulate certain behavior that is seen as desirable (Mont et al., 2014).

Thaler and Sunstein (2008) follows by explaining that the Nudge theory is applied by the so-called choice architect who is responsible for organizing the environment in which people make decisions. Since the decision-making process of people is mostly influenced by their direct environment, choice architects play a serious role in changing behavior at the individual as well as the population level. Every choice the architect makes in the design process will influence or change the way people experience the environment. Therefore, according to Thaler and Sunstein (2008), there is no such thing as "neutral design". While designing environments, architects should understand how their choices will affect the daily life of the user and architects should therefore have a moral responsibility for how they stir people (Brabers, 2016). Once nudges are correctly implemented, architects can improve people's lives and help solve many of the current societal challenges (Neutel, 2017). Therefore, the concept of nudging has the potential to become a tool for promoting sustainable behavior that mitigates the current societal and environmental challenges humanity is facing today.

Nonetheless, current studies on nudging and its potential for sustainable behavior are mostly focusing on either the policy-making process or small aspects in the field of architecture. Therefore, the purpose of this research is to explore the role of nudging in changing behavior towards sustainable living in architecture in a residential setting. The aim is to take a closer look at the relationship between nudging and sustainability to evaluate if nudging plays an important role in architecture and the built environment that fosters sustainable living. This results in the following research question:

What is the role of nudging in changing behavior towards sustainable living in architecture?

To answer the main question, the following supportive research questions are made:

- *What principles of the nudge theory can be applied in architecture?*
- *How can sustainability be integrated into architecture?*
- *How can the nudge theory be integrated into sustainable architecture?*
- *What is the relationship between nudging and sustainability in architecture?*

Methodology

To answer the main research question, the research is divided into four sections. Each of these sections is answering one of the four supportive research questions and is built on each other. In this paragraph, the different methodologies for each of the supportive questions are outlined.

Chapter 1 begins with an outline of the theoretical understanding of the concept of nudging, determined through literature review. The purpose of this methodology is to examine several theories about the nudge theory, such as 1) *Nudge, Improving Decisions about Health, Wealth, and Happiness* from the behavioral economists Richard Thaler and Cass Sunstein, 2) *The Ecological Approach to Visual Perception* by psychological ecologist James Gibson in 1979, 3) *Nudging A tool for sustainable behavior* by Oksana Mont, Matthias Lehner, and Eva Heiskanen, 4) *Nudging to move* by Forberger, Reisch, Kampfmann and Zeeb, 5) *Nudging: A Way to Encourage Public Tenants to More Sustainable Behaviour?* by Albin Haglund, 6) A*ltering micro-environments to change population health behavior towards an evidence base for choice architecture interventions* by Hollands et al., and a few more studies looking into the theory of nudging and its implementation. The literature review will help establish an overview of these theories that exist, the relationship between them and the field of architecture, and to understand the behavioral psychology behind the theory. This chapter will result in an overview of principles that can be applied in architecture.

Chapter 2 deals with the notion of sustainable development. Since the notion of sustainability and sustainable development is a ubiquitous development paradigm (Mensah, 2019), the meaning and goals of sustainable development are examined through a literature review. This chapter aims to look into the three interconnected pillars of sustainable development, namely the environmental, social, and economic pillars. Next to this, the 2030 Agenda for Sustainable Development which includes 17 Sustainable Development Goals is explored and a relation will be made between the goals and the three sustainability pillars. This chapter aims to have a clear definition of sustainability in the field of architecture and to have an overview of what goals of sustainable development can be integrated into the architecture.

Chapter 3 focuses on the relationship between the nudge theory and sustainable development, which is also determined through literature review. The goal of this chapter is to investigate how the nudge theory can be applied to sustainable architecture. For this, several studies will be examined, such as 1) *A practitioner's guide to nudging* by Kim Ly, Nina Mažar, Min Zhao and Dilip Soman, 2) *Strategic Recommendations for the Design of Nudges towards a Sustainable Society* by Nell Goepel, Maíra Rossini Rahme, and Frida Svanhall, and 3) *Nudging: A tool for sustainable behavior* by Oksana Mont, Matthias Lehner, and Eva Heiskanen. The aim is to understand the architectural design process of sustainable nudge design, thus the theoretical relationship of both concepts is analyzed.

Chapter 4 covers the case studies, which are used to explain, describe and explore the concept of nudging and sustainability in the everyday context. These case studies will answer the questions 'how', 'what', and 'why', such as 'how is the nudge theory implemented

that fosters sustainable living?', or 'what principles of the nudge theory are applied into architecture and why?', or 'how are the goals of sustainable development translated into the architecture of each case study?'. This method offers additional insights and tries to connect theory with the practical implementation of both concepts. Four different case studies have been chosen, because of their vision towards sustainable living: 1) *Urban Village Project* by Effekt Architects and SPACE10, 2) *Recipe for FutureLiving* by MAD Arkitekter, 3) *Sundsholmerne* by architect C.F. Møller, and 4) *Solaris* developed by Huggenbergerfries Architekten AG. These residential projects are analyzed based on the three pillars of sustainable development. Following, these architectural sustainable goals and interventions are substantiated based on the nudge theory. This will result in a better understanding of the relationship between the nudge theory and sustainable living in architecture and will define the role of nudge theory in changing behavior towards sustainable living in architecture.

Significance and Relevance of this study

Although many studies have been done on the concept of nudging, not much research appears to have been done on nudging towards sustainable living in architecture. Most of these studies are focusing on either the policy-making process or small aspects in the field of architecture. Hansen and Jespersen (2013), for example, focused on the policy-making process by describing the character of different nudge types to create a framework for the responsible use of the nudge theory in public policy. Furthermore, a study by Mont, Lehner and Heiskanen (2014) analyzed the existing evidence of nudging in fiscal and social policy, as well as environmental and consumer policy. Although the research offers valuable insights into the way nudging contributes to devising more successful policies for sustainable consumption, none of it is focusing on the relation with sustainable living in the built environment.

While several studies are focusing on the concept of nudging concerning the built environment, very little has been done on the relationship between sustainability and the implementation of architectural interventions. Forberger, Reisch, and Kampfmann (2019), for example, focused on the promotion of physical activity in the built environment by reviewing the use of choice architecture interventions. Besides, a study by Klege, Visser, Datta, and Darling (2018) is focusing on a non-residential building in which they focus on a small aspect of sustainability, namely the use of behavioral insights to design nudges aimed at reducing electricity consumption.

To summarize, not much research has been done on the role of nudging in changing behavior towards sustainable living in residential architecture, and the relationship between the nudge theory and choice architecture interventions that stimulate sustainable behavior.

The objective of this research is to explore the role of nudging in this field. The aim is to take a closer look at the relationship between nudging and sustainability to evaluate what role nudging plays in the architecture and the built environment.

One of the practical contributions of this study is an in-depth analysis of four case studies that are analyzed on the three pillars of sustainability and substantiated with the nudge theory. These case studies offer additional insights that try to close the gap between theory and practical interventions. Therefore, this research will be beneficial for architects and students who are interested in learning more about the psychology of human behavior, their impact in the daily life of the users they are designing for, and the different sustainable nudge interventions they can implement.

Ethical considerations

Given the concept of the nudge theory, there are several ethical considerations the reader needs to take into consideration. Literature and several practitioners raise their concern about the transparency of nudges because it nudges people in a direction they might not be aware of. The concept of nudging can be intrusive, lack transparency, be manipulative, and research shows that nudging can clash with moral values, such as liberty, autonomy, respect, and dignity (Goepel, Rahme & Svanhall, 2015; Engelen & Schmidt, 2020). To explain, nudging influences the context of the decision-making process, rather than the decision being made by the people themselves. The choice architect pulls the strings and uses psychological strategies to get people to do what the choice architect desires. Therefore, nudging makes people not personally responsible anymore for their actions. To make a nudge ethically acceptable, The House of Lords believes that choice architects should inform people about the intervention or make them aware of the implementation (Marchiori, Adriaanse & De Ridder, 2017). Besides, it should also be the moral responsibility of an architect to preserve important values, such as liberty, autonomy, respect, and dignity, and to be aware of the influence they have on shaping the context of the user (Brabers, 2016).

Relation Research & Design

Figure 1-1 shows the relationship between research and design and how the findings of this research form the starting point of the design phase. The following question will be answered in the design phase: *How to design a dwelling complex in Merwehaven that nudges the modern households towards sustainable living?* Therefore, understanding the theory and implementation of architectural interventions towards sustainability are needed to guide and inform the designer in the second phase of the project, the design phase. Here, the context of the design plot and user group will also be investigated.

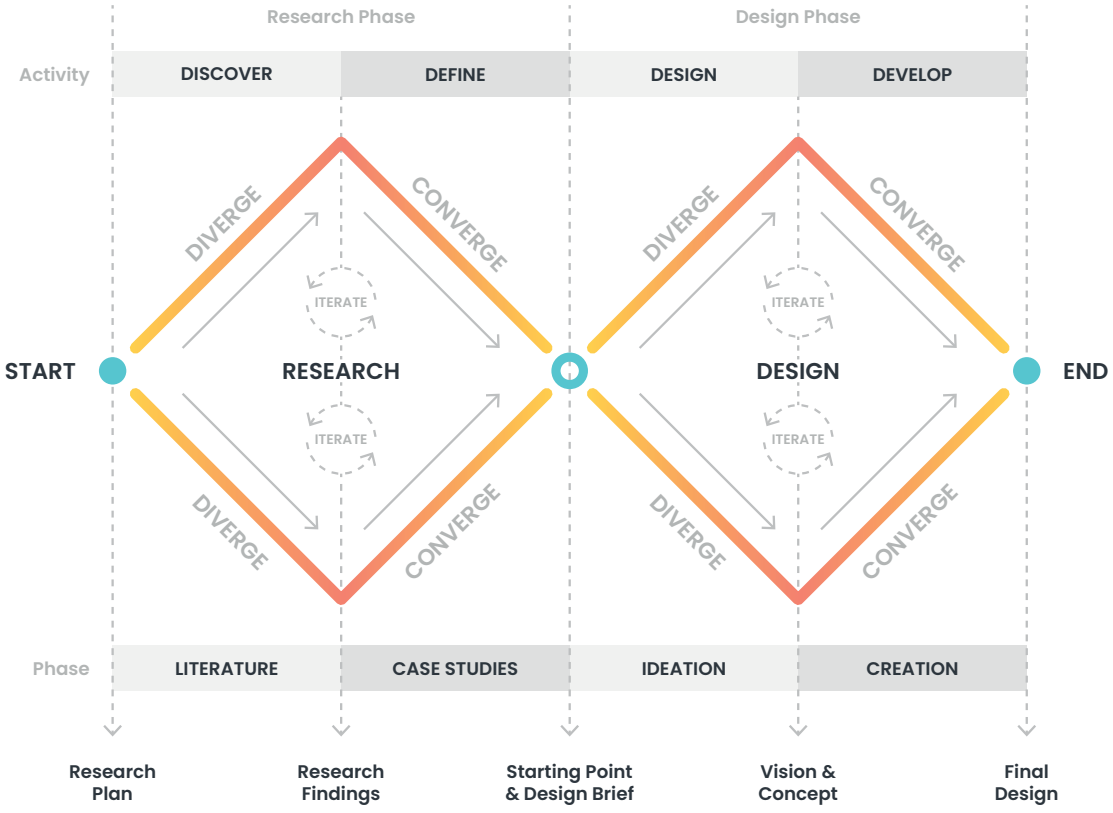

Figure 1-1: Research diagram that explains the relation between the findings in the research phase and its input for the design phase.

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