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CHOICE ARCHITECTURE, FRIEND, OR FOE? FUTURE DESIGNERS' PERSPECTIVE ON THE ETHICS OF DIGITAL NUDGES

Research paper

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Abstract

We make an abundance of choices daily and an increasing proportion of those choices are in an online context. Digital nudges refer to the use of design elements that guide the decision-making process towards a predefined goal. An important consideration when designing digital nudges is the ethical implications. In this study, we examine how future designers perceive ethics and the use of digital nudges as design elements in interaction design. We conducted a case study with 72 design students at two Nordic universities with a focus on the future designers' perception of ethics and the use of digital nudges as design elements. We show that ethics and reflection on responsibility are highly important aspects of choice architecture design and future designers understand ethics as crucial for design work, yet few reflect on whether a specific design or a nudge is ethical or not. Moreover, when it comes to nudging as a design element, both positive and ambivalent attitudes are common. Our main contribution consists of an in-depth understanding of future designers' perspectives on nudging, and we forward four fundamental questions which have implications for teaching the ethics of choice architecture to future designers.

Keywords: Digital Nudges, Choice Architecture, Nudging, Designers, Ethics, Ethical Design, Teaching.

1 Introduction

According to a common saying, we must only do two things: we must die, and we must make choices. Although this saying is not based on the scientific literature, we still know, through all of our interactions, that being human includes constantly making decisions about various aspects of our lives (Markus Weinmann, Schneider, & Vom Brocke, 2016; M Weinmann & Schnider, 2021). These decisions usually involve what appear to be minor or trivial choices, such as whether to take the right or left turn on the way home, if both are equally efficient, or choosing to drink still or sparkling water during lunch. Everyday decision-making can also involve significant decisions with long-term ramifications, such as choosing where to settle down, and whether to get married (and if so, to enter into a prenuptial agreement or not). As if deciding both on the small and the large was not enough, the number of choices that people face every day of both types has increased exponentially; there are choices to be made everywhere (Hagman, 2018; Sunstein, 2014). Thus, making informed decisions in every conceivable situation is not possible; it would result in cognitive overload (Rutkowski & Saunders, 2018). To cope with the number of decisions in everyday life, we make a variety of decisions based on routine and old habits. Drawing on routine and old habits we often face problems of self-control, or

result in postponing things due to cognitive overload from decision burden, or we even rationalize by simply deciding like ‘everyone else’ (Hagman, 2018).

Nudge theory originates from the field of behavioral economics and describes different ways of influencing individual choices through subtle changes in the local environment or in the context where decisions are made (Hagman, 2018). If people were flawless decision-makers with unlimited time, cognitive power, and resources then nudging would be useless (Sunstein, 2014). However, most of us are individuals that face time constraints, lack of resources, and limited cognitive capacity which often results in simplifications on which we base our decisions (Gigerenzer & Todd, 1999). Making decisions based on routine, or without truly reflecting on them is in the literature referred to as ‘cognitive bias’ (Schneider, Weinmann, & Vom Brocke, 2018; Markus Weinmann et al., 2016). Cognitive biases outline the opposite of clear judgment, which is enacted through a reflection process (Stryja & Satzger, 2019). Cognitive biases refer to automatic responses and actions, controlled by the automatic system, which is associated with the oldest part of the brain, the reptilian brain. To increase the complexity even further, our decisions today, are to a larger extent made in online contexts. It makes choice architecture i.e., the design of the environment in which choices are being presented to the decision-maker, a highly relevant topic both for designers and for users in online contexts. Due to that, in this paper, we explore choice architecture.

Nudging which has been specifically researched as a part of digital settings is outlined as digital nudging in the literature. Digital nudging and digital nudges have gained ground in interaction design as a means to use interface design elements to push users into certain directions and towards certain favorable behaviors (M Weinmann & Schnider, 2021). Digital nudges refer to the use of interface elements that guide the decision-making process towards a predefined goal within the digital artifact (Markus Weinmann et al., 2016). Since digital nudges aim at and have proven effective in, influencing people’s choices (Johnson & Goldstein, 2003), it raises fundamental questions about the ethics in design and how key issues like ethical design can be addressed in an educational context. Ethical design constitutes an emerging area of interest (Isind & Willermark, 2022a; Mingers & Walsham, 2010a; Mulvenna, Boger, & Bond, 2017; Mulvenna, Hutton, et al., 2017). Still, as pointed out by Hess and Fore (2018), although there is a consensus regarding the importance of teaching ethics as an integrated part of STEM programs (science, technology, engineering, and mathematics), few papers contribute with documented cases in this area. Since a large portion of designers, study STEM programs, the focus therein is of high relevance. Related to that, recent research has called for tangible examples where ethical design becomes an integrated part of higher education in general, and STEM in particular, to help students, become responsible designers (Isind & Willermark 2022). Against this background we ask the following research questions: i) *How do future designers perceive ethics and the use of digital nudges as design elements?* ii) *How can issues of choice architecture be addressed within education to raise central questions about responsibility in design?*

2 Related work

In this section, we both focus on the related work and the theoretical perspectives on digital nudging as well as on ethics in design and teaching.

2.1 Understanding nudges

When nudges were first introduced by Thaler and Sunstein in 2008, a nudge was defined as:

[...] any aspect of the choice architecture that alters people's behavior predictably without forbidding any options or significantly changing their economic incentives. To count as a mere nudge, the intervention must be easy and cheap to avoid. Nudges are not mandatory. Putting fruit at eye level counts as a nudge. Banning junk food does not. (Thaler & Sunstein, 2008) (p.6).

Since 2008, when Richard Thaler in collaboration with Cass Sunstein introduced nudges based on the definition above and won the Nobel Prize for the contribution, there has been a surge in the increased interest in choice architecture in general (Thaler & Sunstein, 2009). Decisions are highly context-dependent, which refers to the fact that the choice architecture, is highly influenced by the environment surrounding the choice (Bergram, Bezençon, Maingot, Gjerlufsen, & Holzer, 2020; Mirsch, Lehrer, & Jung, 2017; Thaler & Sunstein, 2009; Zimmermann & Sobolev, 2020). Nudging affects our cognitive system 1, which refers to a quick, intuitive, and automatic response system, as opposed to cognitive system 2, which refers to slower and more thought through and planned type of behavior (Kahneman, Lovallo, & Sibony, 2011). Nudges encourage prosocial behavior while leaving individuals unbound in their freedom of choice as the aim is not to remove any choices, nor is the purpose to introduce economic incentives that can extrinsically change behavior (Brown, 2021; Thaler & Sunstein, 2009). Thereby, nudges are seen as an efficient way of tuning the choice architecture, towards better choices (Blom, Gillebaart, De Boer, van der Laan, & De Ridder, 2021; Blumenthal-Barby & Burroughs, 2012; Engelen & Nys, 2020; Schmidt & Engelen, 2020). One significant change in choice architecture, that has become an important example to illustrate the functions and influence of nudges, is the shift between opt-in to opt-out, for organ donation; a change that nearly doubled the participation in organ donations (Johnson & Goldstein, 2003). Several nudge principles have been stressed including i) incentives; making incentives increasingly salient, to increase their effects, such as showing the cost instantly, ii) mapping; mapping information with the evaluation scheme, such as mapping megapixels to the size of the photo is printed, instead of only stating the megapixels, iii) defaults; setting the better option as default, i.e., changing from opt-out to opt-in (as described above), iv) feedback; providing users with feedback of what is good and what is bad, for instance through red sad smiley in traffic when driving too fast, v) anticipating errors; helping the users cope better, for instance by first returning the card to the user, before the money when withdrawing money in an ATM since more people forget their cards compared to people that forget their money, vi) structure complexity; structure complex trade-offs for the user, for instance through a guided process with several steps when purchasing products online (Thaler & Sunstein, 2009; Markus Weinmann et al., 2016).

2.2 Designing for Digital Nudges

Nudging, and examples of nudging as a design strategy can both relate to the physical sphere and the digital sphere. In regards to the physical sphere, changing a menu to highlight a healthier diet, without eliminating other choices, is an example of nudging implemented through physical design objects (Mirsch et al., 2017). Regarding the digital sphere, re-designing a website, to present the more sustainable path, without eliminating the less sustainable path, is an example of nudging implemented through digital design elements, and an example of digital nudging as a design strategy. While numerous researchers have suggested guidelines for designing nudges in offline contexts, the digital environments constitute unique opportunities for exploiting and exploring the power of nudging (Schneider et al., 2018). According to Schneider et al. (2018), digital nudging should make it easier for consumers to choose within a digital artifact and that decision should be a beneficial decision from the perspective of the individual, society, or even the climate. However, digital nudges are still under-researched and for instance, nudging through wearable devices, such as wrist-warn smartwatches, has not yet been understood fully and the same applies to digital nudges as design elements in digital artifacts. For instance, those wearing smartwatches get reminders, get feedback on their activity, and are presented with a comparison with friends (in some cases), elements which are used to nudge the person wearing the smartwatch, towards increased physical activity (Markus Weinmann et al., 2016). Increased physical activity is in general good but there are numerous questions to be asked about the process of implementation. Similarly, digital nudges that are a part of a digital artifact, such as an app, with embedded choice architecture designed into the app from the very beginning, are less explored in the literature. When designing digital artifacts, the underpinning design philosophy is a truly important pillar for the way that the digital elements within the digital artifact turn out to be (Islind, 2018; Islind & Willermark, 2022b; Willermark, Islind, Appelgren, & Taavo, 2020). Because the aim of nudges, is to impair the autonomy of the user to some extent and to present the user with a better choice, the eth-

ics behind nudges as well as behind digital nudges is widely debated (Bovens, 2009; Lembcke, Engelbrecht, Brendel, & Kolbe, 2019; White, 2013). It has raised several ethical concerns including whether nudges are paternalistic and if so, what are the boundaries for using digital nudges (e.g. Hagman, 2018; Hausman & Welch, 2010; Schubert, 2017). Moreover, on the topic of ethics, each designer needs an ethical compass and for that ethical compass to flourish, the designers need to reflect on their role. Isind and Willermark (2022a) illustrate the importance of cultivating ethical design, for designers that are ‘becoming designers’ and show that such an approach will help the designers make informed decisions, which will ultimately influence the decisions architecture of the users of the future digital artifacts that they are designing. This type of view is based on the notion that designers design the choice environments while designing the digital artifacts at hand. Through that type of rationalization, designers that apply a focused use of nudges, as a part of their design strategy, can be seen as designers that engage with designing digital nudging (Mirsch et al., 2017). According to Hagman (2018) several questions become important when designing for an acceptable nudge including; what is the goal with the nudge; how is it achieved i.e., the nudging technique, and; who benefits from it i.e. individuals, society, or both? For a designer, digital nudges raise the question of responsibility, awareness, and ethics. These questions are pivotal for the future of digital nudges and these types of questions are also at the heart of the interest within the Scandinavian school of design, a tradition that is rooted in the true interest in understanding the impact of design (Ågerfalk & Wiberg, 2018; Bjørn-Andersen & Clemmensen, 2017; Bødker, Ehn, Sjögren, & Sundblad, 2000; Ehn, 1988; Iivari & Lyytinen, 1999).

2.3 Ethics in Design and Teaching

Ethical design constitutes an emerging area of research interest. However, there is no consensus in the discussion of exactly what ethics entails, especially when it comes to the relation between ethics and nudges (Mingers & Walsham, 2010b). In addition to that, teaching ethics for those enrolled in a natural science program, such as STEM (science, technology, engineering, and mathematics) in general, and students in informatics, in particular, is an issue with even less convergence (Hess & Fore, 2018). The lack of agreement can be attributed to the fact that there is in general less focus on social science issues related to philosophy and ethics covered within STEM. However, many researchers agree that ethics: i) entail morality, goodness, care, and virtue, ii) can be understood as a field of philosophy, iii) hold discipline-specific standards in particular that are an addition to morality and ethical compass (Fore & Hess, 2020). It is important to cultivate those aspects for future designers, and considering that, it is interesting to investigate the way future designers perceive ethics concerning digital nudges. In regards to teaching ethics to the aforementioned informatics students, there are four main instructional strategies outlined by Hess and Fore (2018) including; i) there is a gap between the learning goals outlined, and the space for learning ethical disposition; ii) there is a gap between the philosophical discussion about ethics and learning skills such as morality, goodness, virtue, and care; iii) there is a gap between classroom interactions and lecture strategies, and in-depth understandings through experiential learning; iv) there is a gap between theory and practice, meaning that there is a consensus concerning the importance of teaching ethics, but few papers explain documented cases. When embarking on the use of ethical digital nudges, there are specific heuristics to keep in mind. These heuristics are i) autonomy and freedom of choice, ii) transparency and iii) goal-oriented justification (Lembcke et al., 2019). Based on these aspects, it becomes interesting to examine the intersection between ethics and the use of digital nudges as design elements, from design students’ point of view.

3 Methodology

The overall research approach for this paper is based on a case study. A case study aims to create practical knowledge such as lessons learned, design principles, or implications, to bring together action and reflection through illustrations from the case (Yin, 2009). The approach in this particular case study is interpretive (Walsham & Han, 1993) primarily grounded in the data derived from the engagement with the students, which were novice designers, where we looked for contextual details of the case (Miles & Huberman, 1994) and study the students understanding of ethics and their under-

standing of digital nudges, which outlines the unit of analysis in our research. The data collected for our case study was both qualitative and quantitative data which was used to explore future designers' perception of the use of nudging as a design element in interaction design. We collected the data in two steps, *firstly* by collecting data through a questionnaire (conducted in 2020, further elaborated on in 3.1) and *secondly* by designing an intervention with which future designers could engage (conducted in 2021). The empirical setting consists of design students (leading to a bachelor's degree in informatics) at two Nordic universities.

3.1 Empirical Data

For this paper, we conducted a two-step empirical data collection. In total, our paper included 72 design students. The first step, called *exploration*, included a questionnaire containing both fixed questions which could be answered on a Likert scale and a large set of open-ended questions was distributed to two student groups at two separate Nordic universities in 2020. The open-ended questionnaire was distributed to a total of 39 respondents, and we received 39 responses. In the questionnaire, the respondents were asked to rate statements on a five-point Likert scale ranging from "Strongly Agree" to "Strongly Disagree". In addition, the respondents were asked to describe their attitude to nudging as design elements in their own words to not steer the answers in any direction. We analyzed the findings from the 39 respondents. Based on those findings, we defined the second step of the empirical data collection called the *intervention*; our intervention was implemented in 2021. The intervention was conducted with a qualitative approach, which aims to deepen future designers' knowledge of choice architecture and enable deeper reflections and discussions on ethical considerations. The intervention included 33 individuals (23 male, 10 female). We divided the intervention into three significant parts, a) the whole student group was introduced to nudges, as well as dark patterns, and b) all students were given the task to reflect on, and find examples of, digital nudges and dark patterns on their own and hand in those examples individually, c) the students were divided into seven focus groups, where each got to tackle the same topic, in groups of what nudging is, how it can be perceived and how digital nudges can be used, and not used, as design elements.

3.2 Data Analysis

First, descriptive statistics were used to analyze the fixed response types. Second, the open-ended free-text answers were analyzed through an abductive open coding process (Bryman, 2015). The data was analyzed by a spiral procedure focusing on the meanings of the parts and then linking them with the whole in an integrative manner (Bryman, 2015). Initially, the answers for each question were read in their entirety and given one or more labels reflecting the respective answers, including "positive", "negative", "neutral" or "ambivalent" attitudes towards nudging. Thereafter, the labels were clustered according to emerging categories, to provide an opportunity to discover patterns in the data. The analysis was characterized by an iterative abductive approach, with adjustments of categories and mergers of labels and categories being refined.

The specific aim of the abductive process was to look for and distinguish ethical concerns to digital nudging and alternate between the empirical material, and the literature. Here, the abductive nature refers to the interplay between the empirical data, realized through real-world problems (inductively obtained) in combination with influences from theory (deductively inferred) (Gregory & Muntermann, 2011) by viewing "reality from the theoretical viewpoint or perspective" (Van de Ven, 2007, p. 104). The abductive nature has thereby involved shifting between inductive and deductive reasoning as a way to continuously revise, sharpen and re-formulate the research design (Gregory & Muntermann, 2011; Vallo Hult, Islind, Norström, & Willermark, 2021; Van de Ven, 2007) through engagement with the coding of the empirical data. Through our analysis, we focused on identifying ethical concerns to digital nudging and on deriving knowledge from that process (see Figure 1 for clarification).

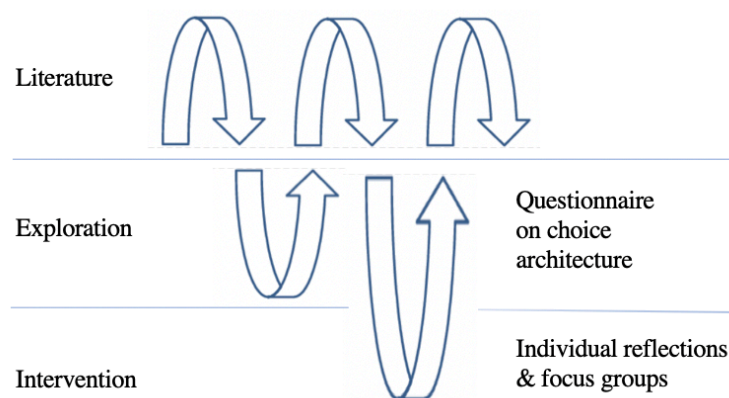


Figure 1. Data analysis

4 Results

First, we present designers' attitudes towards ethics in design in general followed by their attitude towards the use of digital nudging in particular.

4.1 Design and Ethics

When the design students rate their perceptions of the importance of ethics in design work, there is a clear majority on the higher degree of the scale (See Figure 2, from the exploration part of the study).

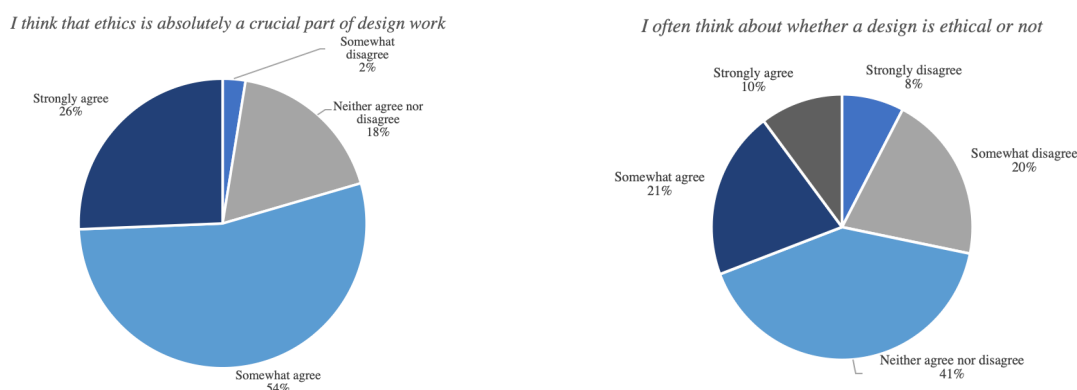


Figure 2. Distribution of responses to statements about ethics and design.

When the design students rated whether they think about if a design is ethical or not, the distribution is more even between the answers with a majority in the middle (see Figure 2, also from the exploration part of the study). Here next, we combine and present the free-text answers from the exploration phase, with the individual findings, and the focus group quotes from the intervention phase. The design students were asked to reflect on whether there were companies, organizations, or purposes for which they would not design, due to ethical considerations. A stream of answers indicates that ethics as a designer is a type of luxury that one can choose or opt out of depending on situations as illustrated by: *“It depends entirely on my personal situation. If I need money to survive and there is no other way out, I probably have a different ethic and morality than the one I have right now. I have some companies that I do not want anything to do with, but if I was in need, I doubt that I will refuse a job due to ethics.”* The excerpt comes from the intervention phase and illustrates how different types of values such as ethics are leveraged against pragmatism and employability. Similarly, employability and sala-

ry are emphasized by others: *“Apart from a criminal organization, I think I would not reflect too much on for whom I work.”* Similarly, from the focus group, discussion one participant pointed out that: *“everybody has their price”* and some of the others sitting in the same group nodded.

However, most of the design students did lean towards ethical considerations being an important factor in their choice, as illustrated by: *“If you work for a company that, for example, does not support basic human rights of minorities, then you are also supporting it. Of course, not everyone can refuse a job, but if you are not in a lot of financial trouble then I think you should avoid companies that violate people's rights.”* Some gave specific examples, and weighed them against their overall wellbeing, as illustrated by another student: *“I would not want to work for, say, a company that makes warplanes. I would have a hard time falling asleep at night, and it would not be a comfortable thought to know that I was spending my life pushing for war.”* This quote was derived from the focus groups, to which the peers agreed. On a similar note, another future designer reflected in an individual reflection: *“I usually put my morals and happiness above money. I find good morals and happiness very closely related and if I feel like a company is forcing me to make bad moral decisions it will affect me negatively.”*

Furthermore, some reflected on their role in society at large and the ethical compass of the companies they choose to work for as illustrated by: *“I want to do projects that have a positive effect on society. If I know that a certain company does not have healthy operations and does not return a positive to the community, then I would not take on projects with them.”* Additionally, some named specific branches that they would not want to work for as illustrated by a future designer in an individual reflection: *“Oil companies, and companies that do not use green energy, companies that do not help anyone but instead only make money at the expense of people, animals or the planet as a whole, I would never work for them”* and similarly another future designer uttered: *“Some companies do not operate on the basis I want to support. Blind profit no matter what the cost to the environment, sweatshops, etc.”* Yet others named specific companies that had been in the news spotlight, for unethical conduct as places they would not choose to work for or political parties that they do not sympathize with and these were both visible in the focus group discussions, as well as in the individual reflections. A student from the focus group round explained that he now understood the importance of carefully thinking about the influence that designers have: *“What I have now understood, both from reflecting alone and reflecting in this focus group is that nudging is so incredibly common. Digital nudges are literally everywhere in the software that we use every day. These are things that you may not always think twice about, but they clearly have a big impact on the choices that our users make when using a particular software or website. Now I understand how important it is that I think about this when I am designing. It's easy to influence people too much, and maybe it is easier than I first thought, to actually just design in dark patterns.”* Similarly, another participant said: *“As a designer, it is important to design the software so that it does not include any type of dark patterns. We can definitely use nudges, but we cannot make them go too far. If we just implement nudges, then we are thinking about the users, and just helping them make better choices. Nudging can be good for the users but within reason. It does not matter if the goal of the software is to make money, there are better ways to make money off people than to trick them, helping them make choices that are better for them, is a wonderful feeling though. I really want to design software with a good choice structure for users. I do not want to use sales tricks and really will avoid dark patterns just to help make the users feel comfortable using the software. In my opinion, the reputation of the software and the wellbeing of the designer and the users is the most important thing, everything else, like the profit, comes after that.”* In another focus group, another participant uttered: *“My role is to think about the user and think about making the world a better place. If I can help people make better decisions for themselves, I will always choose to do that.”*

4.2 Attitudes Towards Nudging

Based on the free-text answers from the exploration phase, combined with the views analyzed in the intervention phase, most excerpts were classified as positive towards nudging as design elements (41), followed by ambivalent attitudes (24). Furthermore, three excerpts show a neutral approach and only

four are directly negative towards nudging as a design element (See Table 1). However, some participants were more nuanced in their way of reflecting, especially in the focus groups, and on those occasions, we classified the majority of their views into one of the following categories.

Category	Number of excerpts
Positive	41
Negative	4
Ambivalent	24
Neutral	3
Total	72

Table 1. Categorization and number of excerpts.

Regarding positive attitudes, a recurring statement is that nudges constitute a “smart” and “friendly” design element. This is seen as an effective strategy that leads to kindly pushing in the desired direction for the individual or society, as illustrated by: *“If I can make the world a better place, I’m happy”* or: *“It’s remarkable how little it takes to achieve a change, like setting the better option as the default option”* or: *“I think it is interesting first and foremost. I think many people benefit from getting a little nudge”*. This quote was derived from individual reflections. The future designers also emphasize that there are no neutral design situations and that nudging as such, does not eliminate the user's choices as illustrated through a future designer’s individual reflection: *“From my logical point of view, I agree with the statement that there are no neutral choices. Everything we do is a choice, even automatic and instinctive choices (I breathe automatically but I can choose to hold my breath when needed and I can lower or increase my heart rate). Not making a choice is also a choice, but it is still my own choice. Nudging presents you with the choice by highlighting it in a certain way; it is simply a nicely staged choice.”* Others reasoned in similar ways in the focus group: *“I am pretty much in favor of it, it is not taking anything away from a person, just making the best or healthiest option by default instead of something random or in alphabetical order or just something. Some option must be the default, why not the one that is nationally or healthily best for us”* and yet another future designer stated in an individual reflection: *“I think it is good that we as future designers can point the consumer/user in the ‘right’ or a more sustainable direction, but at the same time does not deprive the consumer of their own will.”* Another participant, from the focus group round, uttered: *“When you go into [an online grocery shop], the first thing you see is health products. I really love this. I did not realize this before, but now I am truly amazed. You must scroll way down to find pastries, sweets and chips, and things like that to buy. This is very, very good.”*

Only four participants were seen as unilaterally negative towards nudging as design elements in our analysis. In those cases, the answers were brief but describe nudging as manipulations that can be equated with “dark patterns” as illustrated by: *“It is simply a light version of dark pattern.”* Similarly, another participant said: *“Dark Patterns can, in my opinion, be just horrible and annoying, when I notice them, then sometimes I just want to stop using the [website / digital artifact]. I sometimes don’t see the difference in dark patterns and nudges though, sometimes it seems that dark patterns are just nudges that have gone too far”* yet another said: *“We simply should not change the path of people’s choices.”*

In total, 24 participants out of 72 uttered ambivalent views when we combine our findings from both the exploration step and the intervention step of our study. Those that expressed an ambivalent view of nudging as a part of design practice reasoned in terms of: *“on the one hand this, yet on the other hand that.”* The ambivalent approach both stems from an uncertainty about setting boundaries, i.e., deciding when the implementation of nudging goes too far as well as questions about who has the right to decide what constitutes the desirable choice, as illustrated by a future designer in an individual reflection

in the intervention phase: “Nudges are good until they have become a dark pattern. Then they have stopped helping the user and only benefit the company” and: “Sometimes it is okay, but it is very easy to go too far.” Difficulty evaluating desirable directions was also stressed in both phases and is here illustrated through the views of a future designer in the exploration phase: “As long as it is genuine for the good of humanity, it is positive, which is difficult for any organization to determine” or: “I’m divided on the issue. Depending on the situation and ethical issues, they can have pros and cons.” A quote derived from a student in a focus group in the intervention phase. Furthermore, three future designers express a neutral posture towards nudging and simply describe it as a “classification of concept” or that they “have no opinion” or “In the future, I guess I will do what my boss tells me to do.”

5 Discussion

Digital nudging will have a major impact on future information systems research and practice (Markus Weinmann et al., 2016). Since user interfaces will always influence the user, future information systems designers need to understand the behavioral effects of interface design elements so that digital nudging does not occur accidentally causing unintended effects. As pointed out in previous research, designers must understand how their designs affect users’ choice architecture so that the designers can decide whether to apply a design that nudges users deliberately or a design approach that reduces the effects of the design on users’ choices to increase and embrace they’re free will (Gigerenzer & Todd, 1999). Such understanding calls for an informed and reflective design.

In this study, we analyze the perception of ethics and digital nudges as a design element, seen from the viewpoint of future designers. Digital nudging, as a design strategy, should make it easier for consumers to make choices that are in the best interest of the individual, or society at large (Schneider et al., 2018), but to do so, the designers of the future need to reflect upon the ethics of choosing design element that promotes digital nudging. However, it does not only requires a solid knowledge base of design and human cognition (Mirsch et al., 2017) but also calls for domain-specific knowledge regarding the unique design situation. The unique design situation, and the ethics of the choices of designers of choice architecture, are at the very core of this paper. Designers will most likely face complex phenomena with difficult-to-predict consequences both in the short and the long term and to prepare the designers of the future, they do have to make informed decisions, about the way they influence the choice architecture of their users. Thus, a design situation is typically unique, intricate, and ill-structured (Nelson & Stolterman, 2012) which adds additional dimensions of complexity to the use of digital nudging.

As we have illustrated in this paper, the digital nudging cannot be separated from the broader perspective of ethics. We cannot ignore the power of designers as important players in the future of information systems, and we need to take the role of leading them into an understanding of their role of becoming conscious and responsible designers, seriously. The recent debate surrounding the exploitation and data mining of users’ experiences for finical gain through surveillance capitalism as one driver in information systems design, the nurture of addiction through social media, the design and use of information systems to systematically polarize views concerning elections (Zuboff, 2019), all outline further reasons for why ethics and digital nudges need to be tightly coupled and are needed now more than ever. From this point of view, design ethics need to be approached in several ways. It includes several fundamental questions. The fundamental questions are: i) *what does it mean to do good, for whom are we operating, and in what context?* ii) *which interest do you as a designer, represent in your design role?* iii) *What values are attributed to user autonomy?* And, iv) *Is something automatically ethical simply because it is potentially useful to the user?*

As information systems become an increasingly powerful part of our being, and as we streamline educational programs, we must shed light on the importance of teaching and learning ethics, so that future designers make informed decisions when altering the choice architecture of the users within the digital artifacts that they are designing. Digital nudges and digital nudging need to be seen in a larger context of design theory concerning “underdetermined problems” (Stolterman, 2008) “messy” situations

(Schön, 1983), or “wicked problems” (Nelson & Stolterman, 2012; Rittel & Webber, 1973) that it does neither allow for a simple procedure nor an easy characterization. Engaging in design is thus a complex and multi-layered task. Being a designer entails leveraging different perspectives and interests and engaging with wicked problems which also touch upon issues of responsibility and ethics. Based on this study, we stress the importance of addressing choice architecture within education. Furthermore, we demonstrate how choice architecture can be used as a pedagogical strategy to discuss and portray the responsibilities and influences that design and designers have. The vast majority of the future designers in this study fully grasp the importance of ethics in design. The future designers show maturity, and respect for their future role as designers, and understand the importance of applying ethical digital nudges. However, the designers herein are still students, and could thereby be seen as novice designers and thus lack solid experience as expert professional designers. That also means that they do not have to weigh ethics against other aspects such as employability, utility, aesthetics, and functionality in practice. Still, their views are valid, and it is important to cultivate ethical design systematically in information systems practice and education. It is furthermore important that we, as information systems researchers and educators see to it that the designers of the future become reflective through a continued voyage towards educating the future generation of designers in making informed decisions while designing.

This paper has limitations that should be noted, and that also can serve as areas for future research. *First*, the data is bound to the context of Nordic universities. *Second*, the empirical data with 72 design students is a limited sample. *Third*, perspectives on nudging have been explored through self-reporting, an approach which includes a risk of socially desirable responses’ which has been described as the tendency of people to answer in a way that might be seen as more socially acceptable. Thus, the ecological validity of the self-reports can be questioned. A future area of research could be to explore design students’ experiences in other contexts including different countries and design domains. Future work could also include in-depth research on design ethics and responsibility of novice designers.

6 Conclusions

This study illustrates future designers’ perspectives on applying ethical design to digital nudges. We discuss the complex role of nudges as design elements, which need to be addressed both in research and in design theory as well as in design practice. Furthermore, we illustrate the importance of applying ethical design to digital nudges already in the educational environment that has the task of educating future generations of designers. The implications are directed to those who are engaged in, and occupied with, educating future designers in the ethical design of digital nudges. We argue for the importance of linking concrete design elements to the grand questions about design theory and ethics in design when educating future designers. In this specific case, it involves creating and cultivating awareness of choice architecture as a phenomenon and fostering both reflections around and discussions on the complexity and ambiguity of choice architecture and its link to design theory and ethics. To do so, we forward several fundamental questions that can be used to guide such a process: i) *what does it mean to do good, for whom are we operating, and in what context?* ii) *which interest do you as a designer, represent in your design role?* iii) *What values are attributed to user autonomy?* And, iv) *Is something automatically ethical simply because it is potentially useful to the user?* Our findings show that awareness of choice architecture and agency can serve as a powerful tool that leads to fruitful discussions of basic questions concerning both design as a phenomenon and design as a profession and last but not least, on the ethical considerations around design in general.

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