



The Concept of Nudging: How Power Impacts One's Susceptibility to Nudges and the Intention to Influence Others Through Nudges

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Abstract

English

Title: The Concept of Nudging - How Power Models Intend to Influence Others Through Nudges

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Nudges are behavioural interventions that guide people's decisions toward more desirable options. Nudging as a tool to influence people's decision-making is a matter of great debate, with particular emphasis on issues such as power distribution, pre-existing preferences and information that may result in biases, as well as the premise that nudges primarily affect people when they are in irrational modes of thinking.

Within this discussion, I advance empirical insights into how power affects people's sensitivity to nudges as well as their behaviour towards using nudges on others. The current study examines therefore two parts, the impact of perceived power on people's nudging behaviour and the behaviour towards nudging mechanisms of the targeted individual. I hypothesized that power has a great influence in the nudged behaviour of individuals and their desire towards using it. I look at experimental data and evaluate if power impacts one's susceptibility to nudges and if the perceived power level might moderate effects such as comfortability, nudge acceptance or the likelihood to use nudges.

Keywords: Nudges, Powerful, Powerless, Influence, Decision-making process, Nudgeability

Portuguese

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Os empurrões são intervenções comportamentais que guiam as decisões das pessoas no sentido de opções mais desejáveis. O empurrão como instrumento para influenciar a tomada de decisões das pessoas é uma questão de grande debate, com particular ênfase em questões como a distribuição de poder, preferências pré-existentes e informação que podem resultar em enviesamentos, bem como a premissa de que o empurrão afecta principalmente as pessoas quando estas se encontram em modos de pensar irracionais.

No âmbito desta discussão, avanço os conhecimentos empíricos sobre como o poder afecta a sensibilidade das pessoas aos empurrões, bem como o seu comportamento em relação à utilização de empurrões nos outros. O estudo actual examina, portanto, duas partes, o impacto do poder percebido no comportamento de empurrar as pessoas e o comportamento em relação aos mecanismos de empurrar do indivíduo visado. Eu imaginei que o poder tem uma grande influência no comportamento de empurrar dos indivíduos e no seu desejo de o utilizar. Analiso os dados experimentais e avalio se o poder tem impacto sobre a susceptibilidade a um empurrão e se o nível de poder percebido pode moderar efeitos como o conforto, a aceitação de empurrão ou a probabilidade de usar empurrão.

Palavras-chave: “Nudges”, Poder, Falta de poder, Influência, Processo de tomada de decisão, “Nudgeability”

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List of Abbreviations

ELM	-	Elaboration Likelihood Model
AMT	-	Amazon Mechanical Turk
HIIT	-	Human Intelligence Task
SPSS	-	Statistical Package for the Social Sciences
PhD	-	Philosophiae Doctor
LLCI	-	Lower-Level Confidence Interval
ULCI	-	Upper-Level Confidence Interval
SD	-	Standard Deviation

1 Introduction

Human beings' function in a complex way. What makes them think and act the way they do? Why do people make the choices they do?

Research in behavioural economics and psychology have demonstrated how psychological factors interact with what should be irrelevant characteristics of the decision-making context from the standpoint of rationality, systematically biasing our decision-making and behaviour (Hansen & Jespersen, 2013).

Until recently, discussions over behaviorally informed techniques focused on nudges or interventions that guide people in a specific path while maintaining their freedom of choice (Thaler & Sunstein, 2008). Nudging is a powerful tool to make people's lives easier and help them make better decisions by overcoming cognitive burdens. Nudges can then influence people's decision-making process.

The concept of nudging relies on individuals' cognitive processes by helping their biased thinking when confronted with too complex or rare decisions. It therefore steers people in the desired direction to make them better off without limiting their choice set (Thaler & Sunstein, 2008).

Though there is still little empirical research for the successful implementation of nudging tools, especially concerning the different perceived power levels from individuals.

Moreover, in order to use nudges to alter behavior, one needs to wish to do so. Empirical research on how one's power position impacts such wish is scarce too.

Considering the underexplored research and the high potential of nudging changing people's behaviour, this study addresses this gap. It examines how nudging affects individuals in different power levels as well as their behavior towards the usage of nudges as behavior changing mechanisms.

Therefore, the following research questions are arising:

Research Question 1: To what extent can nudging influence people in different perceived power levels?

Research Question 2: How does one's perceived power level impact the willingness to use nudges on others?

The first section of the thesis is a literature review that covers the definition and purpose of nudging, as well as the nature of power. I will look deeper into the field of behaviour towards

nudging when the targeted person lies within different power levels and how people with different degrees of perceived power levels make decisions, and their expected usage of nudging tools on others. In the second part, I will describe the study I conducted to measure the effectiveness of the nudging methods on the self and others. Furthermore, I will introduce the overview of the study as well as the experimental design and analyze the results in greater detail. Finally, I'll present a broad discussion by determining whether nudging is a viable method for improving people's decision-making and whether power can assist people's decisions through nudging.

2 The Bases of Power

2.1 Power

Recently, power has been defined as the ability to influence and control others' feelings, behaviours, or thoughts effectively. According to a growing research corpus, power has profound consequences on individuals who wield it and as a result, it can be understood as more than a structural construct (Emerson, 1962) and as an individual psychological state or attitude (Keltner, Gruenfeld & Anderson, 2000). However, different definitions of power exist due to the complexity of the term power (French & Raven, 1959).

As a highly abstract symbol, the term 'power' has no real value other than its user chooses to ascribe to it (Hall, 1964). However, Weber (1922) describes power as "The probability that one actor within a social relationship will be in a position to carry out his own will despite resistance, regardless of the basis on which this probability rests" (p. 53).

Moreover, in social connections, asymmetrical control over vital resources and results is characterized as power (Russell & Fiske, 2010). The powerful's approach-related tendencies and goal-directed results are boosted by more access to valued resources and reduced dependency on others. However, in situations of power imbalances, the powerful may influence the success of others that are rather powerless by offering or withholding those resources (Hirsh, Galinsky, & Zhong, 2011; Keltner, Gruenfeld & Anderson, 2000). Hence, powerless individuals are more reliant on those holding the needed resources to achieve their goals. Meaning, those with less power feel more constricted and vigilant, which drains mental resources as well as impairs performance by compromising executive functions (Dépret & Fiske, 1993; Keltner, Gruenfeld & Anderson, 2000).

2.2 Types of Power

One of the most apparent truths of human life is that specific individuals have more influence than others, which emerges often under leadership roles (Northouse, 2013). Furthermore, as described above, powerful people often hold resources that are vital for the individuals with less power, meaning they are in a position to influence subordinates' emotions, feelings, and actions (Keltner, Gruenfeld & Anderson, 2000).

There are various ways that people in positions of power will influence people in positions of less power. Because of the variety of factors that affect power dynamics, French and

Raven (1959) proposed a broad classification of power strategies called power bases: coercive, reward, legitimate, expert, and referent power.

To start with coercive power, which is based on subordinates' assumption that a supervisor has the ability to punish them if they do not comply with their authority attempt (Sagi, 2015). Coercive power results typically in short-term enforcement, but it leads to harmful actions in the long run. In general, coercive power has been related to ineffective leadership (Aguinis, Ansari, Jayasingam & Aafaqi, 2008; Elangovan & Jia, 2000).

Second, reward power, is founded on believing that a superior should reward subordinates for desired behaviour (Sagi, 2015). These incentives may take the form of monetary compensation or better job schedules. Furthermore, receiving personal approval from someone the target likes, significantly increases reward power (Raven, 1992). Those can also be resources that are of importance of the powerless individual, and when taking those away, some individuals feel less valued. Moreover, due to rigorous incentive programs, employees can be tempted to fulfil quotas in an immoral or even illegal manner (Victor, 2021).

Third, expert power is based on the premise that, due to their organizational status, the manager has the ability to prescribe and regulate others (Raven, 1992). For example, employees in a corporate environment obey the orders of a boss who wields legitimate authority based on the manager's place in the organizational hierarchy (Sagi, 2015). This type of power is founded on subordinates' assumption that an individual within this organizational structure has job experience and unique knowledge or expertise in a particular field. However, the superior does not have a formal rank higher than the others (Sagi, 2015).

Finally, referent power is based on subordinates' interpersonal attraction and affiliation with a superior due to the superior's respect or personal liking (Sagi, 2015). Referent power has been linked to successful leadership because its association with subordinate satisfaction and efficiency is positively inclined (Hinkin & Schriesheim, 1989).

2.3 High Power People vs Low Power People

As seen above, the presence of power marks many social structures and frameworks and can be emitted very differently. In today's culture, those hierarchies serve to facilitate group decisions and also simplify tasks in their processes by giving some people and sometimes organisations authority and power over others (Pratto, Sidanius & Levin, 2006).

Nevertheless, powerful individuals are better equipped to meet their own desires and needs due to the fact that they are not reliant on the resources of (Galinsky, Gruenfeld & Magee, 2003).

People with low power are influenced mainly by their circumstances, but those with great power behave in accordance with their power motive. Concluding, different levels of power affect how people think, feel, and behave in various circumstances (Guinote, 2017). It is a relational phenomenon based on people's perceptions of their power with others and can significantly impact individuals' optimal decision-making (Guinote, 2017). People in a hierarchy characterised by power need to cooperate optimally in the pursuit of their goals in order to achieve common objectives (Albalooshi, Moeini-Jazani, Fennis & Warlop, 2020). However, considerable research reveals that power hierarchies have a varied impact on high-power and low-power peoples' performance and goal pursuit. To gain control over their outcomes, powerless people must pay attention to many sources of information in their environment. Consequently, they cannot dedicate as much time as they want to their demands (Guinote, 2007; Keltner, Gruenfeld & Anderson, 2000).

Crucially, research has shown that a lack of power reduces a number of basic cognitive control processes that guide the selection and monitoring of behaviours to support goal achievement, meaning that powerful individuals are more capable and willing compared to powerless individuals (Guinote, 2017; Smith, Jostmann, Galinsky, & van Dijk, 2008).

Moreover, various studies have suggested that power affects attention. It proposes that powerful people process knowledge that is applicable to open constructs more thoroughly (Higgins, 1996), as compared to data that does not apply to these constructs. As a result, these people can concentrate on central information while suppressing incidental, unrelated information (Guinote, 2007).

Low-power individuals are more concerned with the facts and information given right before the decision-making process instead of the "bigger picture" (Smith *et al.*, 2008). They lack the cognitive flexibility of the powerful (Guinote, 2007) and struggle to differentiate between goal-relevant and goal-irrelevant aspects of a signal by paying attention to both peripheral and central attributes of the environment (Overbeck & Park, 2001).

Moreover, advice taking is a crucial behaviour that can be influenced by power. Hence, people are less likely to listen to advice as power grows, even if it could help them perform better or make better judgments. As a result, while making judgements and decisions, authority may cause people to believe that they don't need others' input and place more weight on their first assessment (See, Morrison, Rothman & Soll, 2011).

Hence, this bias makes people susceptible to anchoring: a cognitive bias in which a single reference point or 'anchor' influences a person's decisions. Following the setting of the anchor value, an individual's future arguments, estimates, and so on may differ from what they would

have been without the anchor (Ni, Arnott & Gao, 2019). Those are flaws within the decision-making process of a human being which are only amplified by different power levels of individuals.

2.4 Power of Persuasion

Power does not only create flaws but is also a crucial aspect of social relationships. The gravity of power appears to have a wide range of effects on people's thoughts and behaviors. According to recent results, perceived power can increase or diminish persuasion depending on the circumstances, resulting in both short- and long-term behavioral effects. Within persuasion, power is most commonly transmitted through the source's or recipient's perceived power (Briñol, Petty, Durso & Rucker 2017). Furthermore, individuals may interpret a source depending on their message as powerful or powerless, which influences how they modify their attitudes (Kelman, 1958). Regarding the recipient, people can perceive themselves as powerful or powerless. However, a powerful source is often more compelling than a powerless source (Cialdini, 2001; Pfeffer, 1992; Yulk & Falbe, 1990).

In order to explore the fundamental processes through which perceived power might influence people's persuasion and evaluative judgements, I used the elaboration likelihood model, which is a general theory of attitude change created by Richard E. Petty and John T. Cacioppo in 1984. They aimed to develop a framework for organizing, evaluating, and understanding the efficacy of persuasive communication (Petty & Cacioppo, 1984). Furthermore, the ELM may be used to understand how power influences decision-making in general, even when no persuasive efforts are involved. According to this model, psychological processes can influence people's beliefs, views and actions through primary or secondary processes. The ELM distinguishes between two main persuasion paths: the central and the peripheral approach. The central route involves a high degree of elaboration on the message, where individuals generate a significant amount of knowledge about the arguments (Briñol *et al.*, 2017). According to the ELM, when the amount of thinking is high, people determine their evaluative judgments by assessing the relevance of all information within the persuasion context that comes to mind. Looking at the Figure below (Figure 1), persuasion will most likely emerge from a person's cautious and thoughtful examination of advantages regarding the facts offered when using the central route (Petty & Cacioppo, 1984). Furthermore, changes in attitude on the central route tend to last longer and are more predictive of behaviour than changes on the peripheral route (McNeill & Stoltenberg, 1989).

When the receiver of the message has little or no interest at all in the subject or information given, the peripheral route is utilized (Petty & Cacioppo, 1984). Individuals are more prone to focus on overall perceptions, early components of the message, their mood, positive and negative persuasion context signals, and other factors (Briñol & DeMarree, 2012). Individuals who want to save mental effort or are already convinced of their own thoughts and beliefs, frequently employ the peripheral route and depend more on heuristics when processing information.

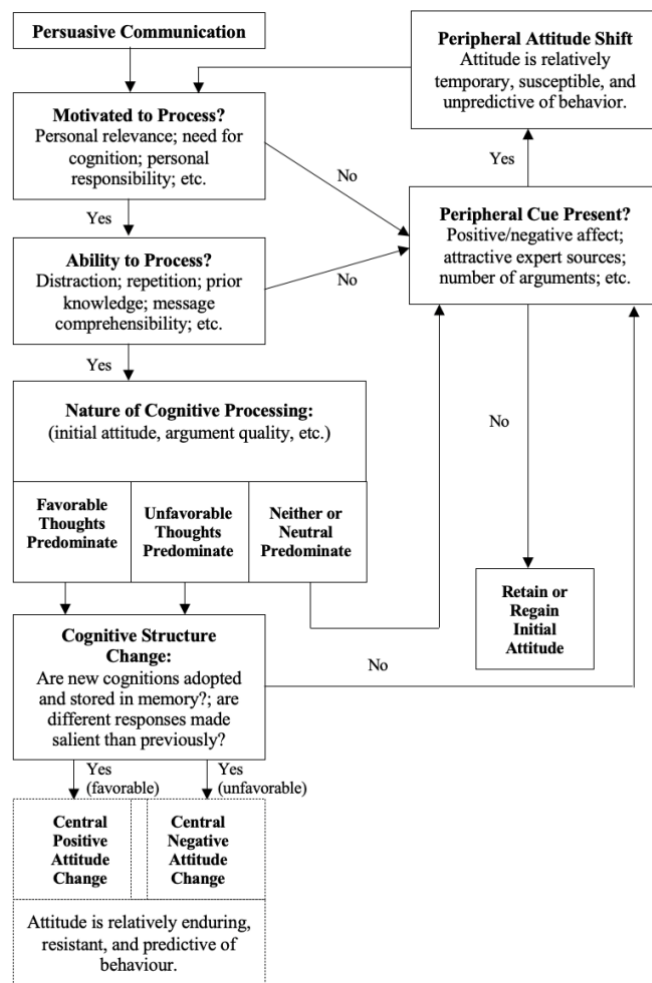


Figure 1: Central and peripheral routes to persuasion (Petty and Cacioppo, 1984)

People often believe that being powerful can communicate that one's opinions are right and reliable (Anderson & Galinsky, 2006; Briñol, Petty, Valle, Rucker & Bacerra, 2007), which reduces the need for additional information processing. Hence, those often act and think within the peripheral route.

2.5 The Influence of Power on Advice Taking

When we are unsure about something, we frequently seek advice from others to improve the quality of our decisions. Taking advice is seen as a crucial and adaptive part of human decision-making (Yaniv & Milyavsky, 2007). However, as seen above, with greater power comes less advice taking.

Diving deeper into the field of how an individual's perceived power level may influence the advice taking, research has found, that human decision-making is strongly biased by unconscious mental processes that sometimes produce good outcomes quickly, but sometimes cause irrational choices as well (Julmi, 2019).

Individuals are referred to as "taking advice" in literature when they adjust their initial assessment based on judgment from another source as well as recommendations offered (Hütter & Ache, 2016). Because power entails control over essential resources, rewards and penalties (Emerson, 1962; Keltner, Gruenfeld & Anderson, 2000), powerful people are by definition less reliant on others and more able to act on their own. As a result, while making judgements and decisions, power may cause people to believe that they do not need others' input and place more weight on their first assessment, which may be connected with the peripheral route of thinking. This point was already supported by Anderson & Galinsky (2006) above, since individuals with more power reported a higher overall level of confidence in themselves as well as greater confidence in the concepts that underpin their attitudes toward the intended outcomes (Briñol *et al.*, 2007). Also, it has been found that having greater power increases the use of stereotypes and reduces one's ability to assess other people's interests and attitudes and another individual does not get correctly assessed (Keltner & Robinson, 1997), which is an important fact about advice taking since Goethals and Nelson (1973) have shown, that people are more influenced by others who are similar to them and have comparable goals and objectives. This was also confirmed by Goodwin and colleagues (2000); whom discovered that individuals assigned to be powerful (operate as manager), as opposed to powerless (operate as assistants), were more inclined to stick to stereotype-consistent assessments after learning additional information regarding key evaluation targets.

Furthermore, those primed to have more power have a lower tendency to examine other people's perspectives. As a result, individuals are less inclined to embrace another person's point of view and more likely to believe that others would assess a statement from the same perspective as themselves (Galinsky, Magee, Inesi & Gruenfeld, 2006). Following, they would rather give advice than accepting it.

Hence, having more power has been found to lead to less advice taking (See, Morrison, Rothman & Soll, 2011). Importantly, studies have not focused on what happens when this “advice” lies outside of one’s consciousness.

2.6 Building the Bridge between Power and Nudging

It is described as the ability and opportunity for powerful people to influence the states and actions of others by providing or withholding resources. These can be material or social in nature, such as decision-making opportunities, support, or knowledge (Keltner, Gruenfeld & Anderson, 2000) (See section 2.2). Individuals can use their relationships with others to either provide resources, such as knowledge and recognition, or to impose punishments, such as ignoring the counterpart. Another type of resource that powerful people can provide is formal resources, such as recommendations or financial opportunities. This, however, is contingent on their status or role inside the framework wherein they operate. Furthermore, even if individuals control the resources, their power is reliant on whether or not the other person can obtain those resources through other means (Emerson, 1962).

Leading to the conclusion that people who have a higher perceived level of power are more confident in their intuition and use more automatic cognition, thus are more easily influenced by stimuli that are out of their own awareness (Guinote, 2017). Powerful people are significantly surer of themselves and their beliefs, and hence are more likely to react negatively to persuasive tactics used on them (Briñol *et al.*, 2017). However, when confronted with suggestions or options outside of their awareness, they tend to accept it more often.

Hence, a more subtle way of influencing them could be a beneficial method for changing someone's behavior without them knowing or believing they are being influenced.

3 The Concept of Nudging

3.1 Definition of Nudging

We all make many decisions every day. Some of them are important, while others are not. We gather a lot of information before making decisions, while we base others on gut feelings.

Individuals appear to be at least implicitly devoted to the concept of homo economicus, which is the belief that everyone of us chooses consistently well, and hence fits into economists' textbook description of human beings (Thaler & Sunstein, 2008).

However, research provided a picture of how human behavior is shaped by a variety of elements including desires and needs, values, social structure as well as political and economic climate (Mont & Power 2013). These behavioral insights tell us how decision-making settings might cause us to fail to accomplish our desired outcomes.

According to Thaler & Sunstein (2008, p.6): "A nudge [...] is any aspect of the choice architecture that predictably alters people's behaviour without forbidding any options or significantly changing their economic incentives". Nudging, according to this definition, is comprised of two fundamental principles: Choice architecture in combination with libertarian paternalism. First, choice architecture, which means that our decisions are influenced by the way that choices are presented. It denotes the informational or environmental framework that influences decision-making (Mont, Lehner & Heiskanen, 2015). As a result, a choice architect can help organize the decision-making context by changing the order in which options are presented, choosing default options, or framing information (Thaler & Sunstein, 2008). This will guide people in the direction that will make their lives as simple as possible.

The second principle is libertarian paternalism, which holds that people should be free to do whatever they want while being influenced to act in a certain way (Thaler & Sunstein, 2008).

As a result, libertarian paternalists guide people's decisions in ways that will improve their lives. It's meaningless to object to choice architecture or nudging in general since choice architecture is inevitable. Nature nudges, as does the weather, or even habits and traditions. As a result, humans are unable to wish choice architecture away (Sunstein, 2015).

Concluding, nudging is a powerful tool to make people's lives easier and help them make better decisions by helping to overcome cognitive burdens. Because one's choices are always influenced by the context in which we make them, and because such context is frequently manipulated by far more intrusive or subtle measures, like taxation or regulations, Hansen and

Jespersen (2013) summarize the situation eloquently: nudging is an acceptable approach to behaviour change.

3.2 The Purpose of Nudging

Economic models traditionally relied on the assumption that individuals make rational choices to maximize their utility (Wilson & Dixon, 2012). However, psychologists soon recognized that individuals do not have explicit, stable, or well-ordered preferences, making sub-optimal decisions every day (Sunstein, 2006). They suffer from biases and accordingly make decisions with insufficient knowledge, limited rationality, and rules of thumb (Tversky & Kahnemann, 1974).

Nudges tend to operate in cases where decision-makers have short attention spans, such as when determining whether to visit the dentist (Altmann & Traxler, 2014), vote or pay back loans on time (Cadena & Schoar, 2011). This is referred to the peripheral route, which was described above, where people have limited ability to digest the information. Powerful individuals often operate within this framework since they are rather deciding out of their gut because they believe the decisions they are making are correctly.

Optimization is cognitively demanding, and the result of a decision is often subject to certain doubt, which is one of the key reasons most people have little attention and are not entirely logical. Individuals may use heuristics to minimize or remove this effort, such as making decisions based on intuition or habit (Löfgren & Nordblom, 2020).

Social science has shown that humans often act in ways against their values. For instance, individuals value their health and yet behave in unhealthy ways, including drinking alcohol or smoking cigarettes. This discrepancy arises because two systems shape human behaviour: Automatic and Reflective (Kahneman, 2011).

The automatic system, also called system 1, refers to people's gut reactions, mostly like the peripheral route. It is intuitive, unconscious and fast. Individuals rely on the automatic system in large parts of their daily lives, for example, when speaking a native language or riding a bike (Thaler & Sunstein, 2008). On the other hand, the reflective system, called system 2, refers to people's conscious thoughts to make rational decisions. It is more deliberate, controlled and slow. Individuals use the reflective system mostly when making important decisions, e.g. which university to go to or planning a vacation (Thaler & Sunstein, 2008). If one wanted to compare this dichotomization with the one by the ELM exposed above, system 1, one could argue, would

be the equivalent of the peripheral route, whereas system 2 would be the equivalent of the central route.

Making an attentive decision takes some mental effort, but it will almost always result in the desired outcome. Unfortunately, most people lack the time, energy, or tools necessary to think consciously, rationally, and logically. Consequently, rather than logical and rational processes, most behaviours result from patterns, heuristic processes, implicit associations, or automatic and learned responses (Hofmann, Friese & Strack, 2009). The weaknesses that affect automated unconscious processes and passive decision-making are exploited by nudges, which take advantage of the unconscious connection between individuals and their environment (Thaler & Sunstein, 2008). Therefore, according to Thaler and Sunstein (2008), nudges effectively reduce the negative consequences of automatic thinking since it is not what we often connect with the term "thinking". Indeed, it has been argued that these cognitive flaws shape behaviour in suboptimal ways (Evans & Stanovich, 2013). The idea behind nudging techniques is to embrace these heuristics and biases by structuring the environment to stimulate desirable outcomes.

Consequently, it is often suggested that people should be more susceptible to nudges when they are in a system 1 mindset, especially powerful people since this influence is out of their awareness and bypass the behaviour of rejection of advice (de Ridder, Kroese, & van Gestel, 2021).

3.3 People's Nugeability

It is commonly said that nudges only work "in the dark", hence, as mentioned in the previous section, only when it lays outside of the awareness of the recipient (Hansen & Jespersen, 2013; Steffel, Williams & Pogacar, 2016).

It has been discovered that many individuals who are nudged do not recognize the presence of a nudge on their own (Kroese, Marchiori & De Ridder, 2016; de Ridder, Kroese & van Gestel, 2021). Following, that informing people about the presence of a nudge will make them feel pushed toward a specific option, causing reactance which will lessen or remove the nudge's influence.

Critics fear that nudge interventions may manipulate people into making decisions they would never make otherwise, which is related to worries about nudges "working in the dark" (de Ridder, Kroese & van Gestel, 2021).

When people cannot make deliberate decisions, nudge interventions can help them make decisions in their best interests while causing no harm to rational decision-makers.

3.4 Individuals Acceptability and Usage of Nudging Methods

As stated above (see section 3.2), individuals do not have explicit and well-ordered preferences and sometimes suffer from biases (Tversky & Kahnemann, 1974). Individuals with high power, in particular, are more prone to biased thinking. Furthermore, powerful individuals rely on automated information processing and, as a result, make quick decisions. They rely significantly on themselves and act in accordance with their objectives (Thaler & Sunstein, 2008). I expect that when power increases, people's willingness to accept advice declines, especially when they know about the influence taking place even when it could lead to a better outcome. Hence, even though power individuals are rather making decisions within the automatic system 1, and thus need more help in debiasing, they are less likely to not accept the advice or look for a change in behaviour. However, as they may be impacted and biased by stimuli out of their awareness, a nudge could be particularly good for influencing high-power people's decision-making without them realizing it. As a result, nudges, effectively lessen the harmful effects of automatic thinking, correcting biases and errors in human behaviour, and helping people make better judgments (Mont, Lehner & Heiskanen, 2015), might be particularly well suited to influence high power individuals.

Hypothesis 1a: Nudging methods alter peoples' decision-making process.

Hypothesis 1b: The higher one's power, the more likely they are to be influenced by nudges.

In line with the reviewed literature, people who feel powerful have approach-related feelings and emotions, and they pay greater attention to social incentives and other people's characteristics that meet their own goals and desires. Meaning, they are more likely to use others to exploit their desired goals. Hence, they employ nudges to guide others in the wanted direction and furthermore, guide the ones who are not acting in accordance with their goals. Furthermore, they have less of a problem giving advice to others due to the fact, that they are sure about their actions and decisions. People who are powerless, on the other hand, make more careful, controlled judgements about the intentions, attitudes, and actions of others, as well as inhibiting their own behaviors and acting in a way that is dependent on others.

Hypothesis 2: Higher power is associated with a higher willingness of using nudges for others.

Concluding, this study aims to find out two Parts. Part I deals with one's own susceptibility to nudges when finding oneself in different levels of power. Whereas part II deals with the nudging behaviors when the perceived power level of oneself is either high or low towards other individuals.

4 Methodology

4.1 Methods and Materials

As previously stated, past research has revealed that nudging treatments effectively change people's behaviour. I will test my hypotheses, firstly the ones on the effects of nudging on oneself when the perceived power level is high and low and secondly the effect of nudging behaviours of individuals with different perceived power levels towards others.

More specifically, the goal of this study is to evaluate if individuals with distinct power levels are to be influenced in their decision-making process and to identify the behavior of individuals within different power groups in regard to the usage of nudges as well as the acceptance, comfortability and likelihood of using those methods. I created an experimental study as it is the most common approach of proving causality (Malhotra, Nunan & Birks, 2017).

4.1.1 Overview of the Experiment and Procedure

The study consisted of an online questionnaire in English designed in Qualtrics and took about five minutes (Appendix 1). A between-subjects design of the study was used in order to be able to compare participants within different scenarios and conditions. It consisted of four scenarios (Nudge vs No Nudge) x (high power situation (manager) vs low power situation (employee)) to which participants were randomly assigned to in order to increase validity of this study (Malhotra, Nunan & Birks, 2017).

A five-point Likert scale was mainly utilized for all study measures, with higher numbers indicating more agreement with the statements.

The participants were directed to an opening text that included the informed consent form. Moving on to the first part of my questionnaire, participants were asked about their perceived power level without any interference. The Questions used for this part was used in experiments before and created by Anderson, John and Kaltner in 2012. This scale is named “The Total Sense of Power Scale”. I particularly used this for my first part of my study, for later reference I will call it part I, in order to find out if the perceived level of power, has influence of the nudging behaviour on oneself.

Participants had to answer questions out of their gut, to describe their perceived power level in regards to other people. This situation and the given answers are later one described as the “*Total Sense of Power*”.

Following this part, participants were grouped into two categories. Half of the individuals in my survey had to decide between two optional answers without being nudged. The other half of the participant group had to decide between three options and were nudged in a specific direction without knowing. Whether the participants were grouped within the Nudge Condition or not was later on described by the variable “*Nudge Condition*”.

Part I of my study is followed by the explanation of nudges as well as examples, for participants do better understand what nudges are. The subsequent randomization for the second part of my experiment (Part II), the well-known "manager-subordinate" role-playing approach was used to alter power, producing sensations of having and lacking authority in participants through asymmetrical outcome reliance. It was aiming to find out if the nudging behavior of individuals in different power level toward others changes depending on their level of power.

Lastly, the demographics were collected, and participants were debriefed as to what the goal of the study was.

4.1.2 Participants

In order to assure a high-quality data set, with enough participants to have a significant analysis, this study was distributed through my University and via Amazon Mechanical Turk (MTurk). Processes and tasks can be virtually outsourced to workers who support individuals and facilitate processes (Buhrmester, Kwang & Gosling, 2011). From simple data validation and research to more subjective tasks such as survey participation, certain individuals can be compensated monetarily in this crowdsourcing marketplace. However, even though participants are paid to fulfil a specific task, Buhrmeister et al. (2011) states, that the quality of the data is supposed to be independent of the compensation rate.

A minimum sample size of thirty individuals per cell is recommended for an experimental study like the one I conducted (Wilson Van Voorhis & Morgan, 2007). As I wanted to increase my chances of not missing positive results, I increased the sample size by having overall 434 participants. However, excluding participants because of not completing the study or not answering the attention question correctly (Appendix 3), I was left with 291 valid answers (see Section 5.1). Following, the result was circa 72 participants per cell (nudge vs no nudge) x (high power individuals vs low power individuals).

Table 1 below depicts the participants' socio-demographic background, showing that most of them were between 21 and 30 years old (153 participants, 52,58%), and 43,64% were between 31 and 50 years old. In addition, most participants had a university degree or higher (88,66%), 6,87% had a

general qualification for university entrance, and the remaining part of the sample (4,5%) was on a lower educational level (the whole analysis can be found in Appendix 2).

<i>Gender</i>	<i>N</i>
<i>Male</i>	196
<i>Female</i>	93
<i>Age</i>	<i>N</i>
<i>0-20</i>	1
<i>21-30</i>	153
<i>31-50</i>	127
<i>50+</i>	10
<i>Level of Education</i>	<i>N</i>
<i>High School</i>	20
<i>Bachelor's Degree</i>	170
<i>Master's Degree</i>	78
<i>PhD or higher</i>	10
<i>Others</i>	13

Table 1: Sample of participants taking part in the experiment

4.2 Independent Variables

In my experimental study, I had two independent variables and a moderator variable. For the first part of the study, I used the nudge condition manipulation as the independent variable and the Sense of Power Scale as the moderator. For the second part, I used the power condition manipulation as the independent variable. I describe them below.

Nudge Condition: Within the first group, individuals taking part in my study were randomized to either a nudge condition or no nudge condition. This was important for the first part of my experiment (Part I) since I wanted to find out how susceptible individuals in high and low power positions are to nudges. Following, that both groups had to answer the same scenario, buying a newspaper in paper or rather having it as an ePaper, but only one group was nudged.

Moderator Variable: For the first part of my experiment, I was also using a moderator variable which was composed out of the “Total Sense of Power Scale” questions from by Anderson, John, and Keltner (2012). The set contained the following questions: “*In my relations with*

others I think I have a great deal of power”, “In my relations with others I can get others to listen to what I say”, “In my relations with others I can get others to do what I want”, “In my relations with others even if I voice my views, they have little sway”, “In my relations with others my ideas and opinions are often ignored”, “In my relations with others, even when I try, I am not able to get my way”, “In my relations with others if I want to, I get to make the decisions” Questions that were negatively framed, had to be reversed in the later part of the analysis. The answer to those questions, was then summed together and the median was calculated. For my analysis within the model 1 of PROCESS Macro of Hayes, this variable, called W, then served as the moderator variable.

High or Low Power Condition: Following the second grouping, it was independently randomized to the first one. Two exact same situations were given, were the participants had to answer questions regarding a work situation and how they would use nudges on the counterpart. The only difference was that one group was in a high-power position, meaning they had to imagine being a manager and how nudging would affect themselves as well as the usage on their employees, and the other group was put in a low power position, meaning, they were put into a role of an employee. This aimed towards the second part of my study. Hence finding out how individuals feeling powerful or powerless use nudges towards other individuals.

4.3 Measurement Variables

4.3.1 Dependent Variable Part I

The dependent variable for the first part of my study is the answers to the nudge question, which ended the following scenario: “Imagine you are a frequent reader of the New York Times newspaper for already some years now. Until today, you always purchased your newspaper at your local kiosk. However, you decide to take a look at the new offering they just proposed. You quickly realized you would save money and time when you decide for one of these options. Which would you select?”

I wanted to find out if individuals are to be nudged, even before getting confronted with the explanation of the term itself. Hence the Y variable for the PROCESS MACRO by Hayes is composed of those answers. Those answers were composed out of three different choices, “PAY 20€ monthly - GET New York Times ePaper every day for a year”, “PAY 30€ monthly - GET New York Times printed newspaper every day for a year” and “PAY 30€ monthly - GET New York Times ePaper and printed newspaper every day for a year”. Nevertheless, the second question was the Nudge, and when chosen, I had to eliminate the participants from my study.

4.3.2 Dependent Variable Part II

In order to find out if an individual that feels either powerful or powerless would mainly use nudging tools to influence others and secondary, how it would affect the self, a set of questions was used that included different behavioral trades. The answers to those questions were used as the dependent variable. The scale consisted of eight questions in total ranging from *"how acceptable would you think it is for you to use a nudge on them?"*, *"how comfortable would you be using a nudge on others"*, *"how likely would you be to use a nudge on them?"*, *"How comfortable would you be witnessing a nudge is being used on other managers?"*, *"How likely would you think it is that a nudge is used on yourself in the described consulting company?"*, *"How acceptable would you think it is for said company to use a nudge to influence you?"*, *"How comfortable would you feel thinking a nudge might be used on yourself?"*, *"Imagining a nudge is being used on yourself, how effective at changing your behavior do you think the nudge would be?"* and was presented in a five-point Likert scale, ranging from 1 - *"not at all"* to 5 - *"very much"*. For more detailed information, see Appendix 1.

4.4 Data Analysis

To evaluate the data, I used the programs IBM SPSS Statistics 24. As a result, the whole data set from the Qualtrics application was downloaded to conduct a statistical analysis. The responses were first grouped to generate descriptive statistics (means and standard deviations) for the participants' socio-demographic backgrounds.

5 Results

This section includes the analysis of the hypothesized effects. All the displayed variables and abbreviations used in this analysis are shown and described in the appendices (Appendix 4). Furthermore, variables that were negatively formed, were reversed scored and scales which included multiple items were summed in order to calculate their means.

5.1 Descriptive statistics

From a sample of 434 participants, a total of 291 participants successfully participated in the experiment. 143 participants failed to complete the study in the way I could use them for my study. 56 of them did not finish the study, 60 participants did not answer the attention question right as well as 27 participants that did not fully answer all of the given questions.

5.2 Reliability Analysis

All of the scales utilized in this study were evaluated and shown to be trustworthy in the literature. Nonetheless, I ran a reliability analysis to determine the Cronbach alpha.

Cronbach's alpha is the most widely used internal consistency reliability measure. It's most typically used when a survey contains several Likert questions that create a scale (Taber, 2018). I computed the Cronbach's Alpha for the questions used to summarize the variable of the total sense of power.

<i>Cronbach's Alpha</i>	<i>N of Items</i>
0,603	8

Table 2: Reliability Statistics Part I

Looking at the table 4, Cronbach Alpha is at 0.603, which is lower than ideal. However, I looked at my data to analyze which item could be deleted to increase the alpha.

	<i>Scale Mean if Item Deleted</i>	<i>Scale Variance if Item Deleted</i>	<i>Corrected Item- Total Correlations</i>	<i>Cronbach's Alpha if Item Deleted</i>
<i>In my relations with others, I think I have a great deal of power.</i>	23.0997	18.373	0.080	0.625
<i>In my relations with others, I can get others to listen to what I say.</i>	22.7835	17.818	0.193	0.597
<i>In my relations with others, my wishes do not carry much weight.</i>	23.7148	14.287	0.513	0.502
<i>In my relations with others, I can get others to do what I want.</i>	23.1031	18.541	0.045	0.636
<i>In my relations with others, even if I voice my views, they have little sway.</i>	23.6804	14.853	0.395	0.540
<i>In my relations with others, my ideas and</i>	23.4777	13.188	0.517	0.490

<i>opinions are often ignored.</i>				
<i>In my relations with others, even when I try, I am not able to get my way.</i>	23.4777	23.478	0.518	0.492
<i>In my relations with others, if I want to, I get to make the decision.</i>	22.8007	18.160	0.110	0.618

Table 3: Cronbach's Alpha test

The last column of my presented table above (Table 5) indicates what Cronbach's alpha would be if the question in concern were removed from the scale. When deleting most of the questions, it would result in lowering the Cronbach's alpha. However, when eliminating question 4, "*In my relations with others, I can get others to do what I want*", Cronbach's alpha would slightly increase. However, no item in particular seems worth removing and thus, I will use my set of questions as it is, knowing this is a limitation.

Following, for Part II of my analysis, however, I used different questions in order to find out the nudging behavior in regard to others and on oneself combining with different power situations.

5.3 Hypothesis Testing

5.3.1 Does Power Interact with Nudges to Predict their efficacy?

For the first part of my study, I have run a moderation analysis (Model 1) using Andrew Hayes' Process macro, a model that includes the independent variable as a predictor of the outcome Y (the decision-making process). The X variable will be used as the independent variable and displays the nudge condition, whereas the W (sense of power of an individual) variable will be the moderating factor. The moderating variable explains the direction of my conditional effect

of X as the independent variable on Y and also explains the strength of the effect of X on Y. Concluding, with this model I wanted to find out if the Nudge condition influences the decision-making process of individuals under the condition of differing levels of power. Hence, I wanted to find out if there is an effect of nudging in regard to the decision making of oneself and under what conditions (high or low power) the effect is significant.

The macro uses bootstrapping to verify whether this model proposed of X impacting Y moderated by W is accurate.

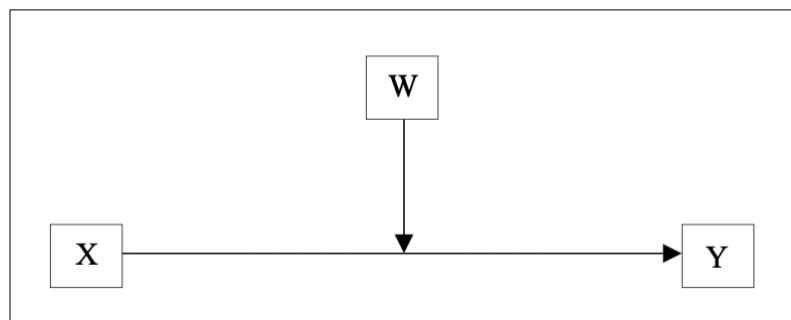


Figure 2: Conceptual Diagram for Model 1 (Hayes, 2013)

In order to increase the likelihood of having significant results in this study, I followed the advised sample size indicated by G Power (Appendix 6). The overall resulting sample-size of 291 was chosen, after conducting an F-Test which indicated that, for the result to be significant, the sample size needs to be above 266.

Looking at the Table below (the whole analysis found in Appendix 7), it can interpret the effects of whether nudging an individual in the process of decision-making is impacted by one's sense of power as follows (Part I of my experiment): (a) The effect of the nudge condition on the decision-making process can be analyzed as an significant predictor of the choice people are making ($b= -12.8885$, $t(287)= -7.5617$, $p= .0000$). (b) The effect of the perceived level of power individuals experience is a significant predictor of the choices people are making as well ($b= 11.2024$, $t(287) = 3.6555$, $p= .000$). The higher the perceived level of power of an individual, the less they alter their decision-making process. (c) Looking at the interaction of both these values, meaning how the power level has influenced the nudging behaviour on other individuals, the analyzed result is a significant predictor ($b= -13.6397$, $t(287)= -4.3816$, $p= .0000$).

	<i>coeff</i>	<i>se</i>	<i>t</i>	<i>p</i>	<i>LLCI</i>	<i>ULCI</i>
<i>constant</i>	13.4232	1.6956	7.9163	.0000	10.0857	16.7606
Nudge_C	-12.8885	1.7045	-7.5617	.0000	-16.2434	-9.5337
SoP_Ttl	11.2024	3.0645	3.6555	.0003	5.1706	17.2342
Int_1	-13.6397	3.1130	-4.3816	.0000	-19.7669	-7.5126

Table 4: Logistic regression analysis

However, to interpret the interaction itself is difficult, therefore, I take a look at the simple slope of the process to find out under what specific situations this result is significant (Appendix 7). The addition of the interaction was a significant change to the model, $F(1,287) = 19.1981$, $p = .0000$ (this p-value matches the p-value for the interaction above), R^2 change = .0506.

I looked in regard to the simple slope at ‘- 1SD’ (Standard Deviation) below the mean, the mean itself and ‘+1 SD’ above the mean in order to interpret the result in closer detail. The Mean for the total sense of power scale was 3.3239.

Following, with one SD below the mean, the result was a significant predictor of altering peoples decision making process with the influence of nudging as well as having a lower perceived level of power ($b = -5.2859$, $t(287) = -2.1467$, $p = .0327$). However, the higher the perceived level of power, the better is the chance of a nudge influencing the decision-making process in greater detail ($b = -20.4912$, $t(287) = -8.5315$, $p = .0000$). Looking at the effects of power and nudging on the decision-making process, concluding, the interaction of power and nudging has a great deal of influence in one’s decision-making process. Especially for individuals with a very low perceived level of power (-2.3239 to -1.9028 below the mean of the sense of power scale) since the p-values are significant (see Appendix 7, Part “Conditional effects of focal predictor at values of the moderator”). However, people with low to moderate feelings of power (-1.729 to -.6397 below the mean) are hardly influenceable (see section 3.3). Finally, looking at the significance level of high-power individuals (-5,817 below the mean and above) the hypothesis holds true, that their decision making is influenced by nudging, likely because this lies out of their own awareness.

Meaning, I can accept hypothesis 1a, since the analysis holds true for the condition of the nudge effectiveness. Moreover, I can accept hypothesis 1b as well, since the perceived power level of an individual has an influence on the decision-making process under nudging tools.

5.3.2 Does Power Impact Nudging Behaviour Towards Others?

To evaluate whether power impacts the way one uses nudges on others (Part II of my experiment) a multivariate ANOVA was conducted with various dependent variables related to the perceived acceptability of using nudges and with one fixed factor: the power position one was randomly allocated to. Those dependent variables were crossed with the low- or high-power condition. Following, this analysis serves as the anchoring point of evaluating if people in different power situations perceive nudge behaviours differently and according to that, if they alter their behaviour to nudges when feeling comfortable for example.

Table 7 shows that 149 participants were grouped in the low power condition, and 142 were grouped in the high-power condition. It might not be equally distributed since some people did not answer the attention question correctly.

		<i>Value Label</i>	<i>N</i>
<i>hp_lp</i>	-1.00	Low Power	149
	1.00	High Power	142

Table 5: Between Subject Factors

The descriptive table (Appendix 8) displays the mean and standard deviation for the two different dependent variables that the independent variable has split. The table also includes "total" rows (N), which allow for calculating averages and standard deviations for groups that are simply divided by the dependent variable for high and low power.

I am looking at a multivariate ANOVA, which extends the analysis capabilities of variance by assessing multiple dependent variables simultaneously. It statistically tests the differences between group means. In this analysis, the linear combinations of different dependent variables are considered to conclude the equality or inequality of the group means. Specifically, believing that high or low power influences the likelihood, acceptability, comfortability and effectiveness of using a nudge on either the self or others.

Looking at the outcome of the between-subject effect (Appendix 9), I interpret the corresponding p-values to find significance. It shows that only one variable seems significant when crossing with the high or low-power condition. The power condition only affects the comfortability of using a nudge on others (comf_a: $F= 4.218$, $p = 0.041$). The more power you

have, the more comfortable you are feeling using nudges on others. This could hold true, because of the fact described above (see section 3.5). High-power individuals are more likely to employ nudges to come closer to their intended goals and needs, according to researchers (Keltner *et al.*, 2001). People who feel powerful have approach-related feelings and emotions, and they pay greater attention to social incentives and other people's characteristics that meet their own goals and desires. Meaning, they are more likely to employ nudges to guide others who are not acting in accordance with their goals.

Since the p-value is significant with the variable of comfortability, I look at the estimated marginal means of this variable. Figure 6 below shows that high-power people are usually more comfortable than low-power people using a nudge on others.

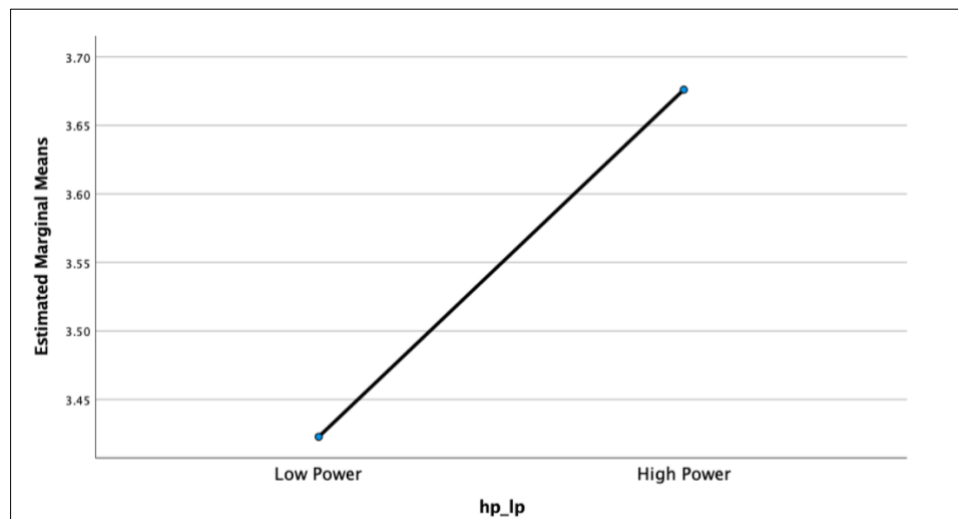


Figure 3: Estimated Marginal Means of comf_a

As a result, I can accept Hypothesis 2 in regard to the comfortability of high-power people using nudges on other.

6 General Discussion

The purpose of this study was twofold:

- a) to evaluate if nudging had a different impact on people's decision-making depending on their sense of power and if there are any limitations when nudges are used on oneself.
- b) to evaluate whether one's power impacts nudging behaviour towards others. It was investigated whether a higher or lower perceived power level motivated people to use nudges on others.

As a result, this section assesses the main findings and evidence provided. It also analyses the flaws in the current experiment and the findings relevance for future research.

6.1 Main Findings

The image that emerges is of busy individuals attempting to make sense of a complex environment in which they can't afford to think thoroughly about every decision they must make. People follow rules of thumb that occasionally lead them wrong.

Previous studies have shown the impact of situational and personal characteristics on individuals' nudging behaviours, but there was no evidence on the behaviour resulting from nudges of powerful and powerless people. Resulting, this experimental study was dedicated to find out about, firstly, to what extent nudging influence people in different perceived power level and secondly, how does one's power feelings impact the usage of nudging behaviours on others.

Even though taking advice can improve decision making in a lot of aspects of life, people are sometimes prone to behave as they do not need to listen to others. Powerful people are less reliant on the resources of others than powerless people, and as a result, the powerful are better equipped to meet their own desires and needs and believe their opinions and decisions are better than anyone else's. Further research suggested that the state of thinking has an impact on the decision-making process as well as. When the receiver of the message has little or no interest in the information given, the peripheral route is utilized. This route is used more from powerful people, since they already believe that their decisions and outcomes are right and do not need to put more effort into the decision. The central route is used, when individuals are more investigated in the decision-making process. Mostly powerless people are investigated within this route, since they are dependent on other people due to their resources and hence have to think more about their outcome and consequences.

Concluding, higher powered individuals are less inclined to embrace another people's point of view resulting in taking less advice when obvious and trying to use convincing behaviours on others in order to steer them in the desired directions. It follows, when one's perceived level of power is low, individuals are more likely to listen to others, consider their advice, and take into account other external influences when making decisions. Whereas high-power people are more likely to make decisions based on their gut instincts and rather quickly, because they are confident in themselves and rarely seek advice from others.

Following, the results of my study support the view that nudging does alter behavior (H1a), in line with previous research (Hansen & Jespersen, 2013) and that high-power individuals are particularly prone to such influence (H1b). Interestingly, this effect was found in comparison to a "middle power" group. When looking at low power individuals, we see that actually they are also more likely to be influenced by nudges. Hence, this could lead to the conclusion that especially high and low power people are susceptible to nudges. This might be, because with high power people, they operate in a system of thinking where they do not put much effort in the decision-making process and decide rather out of their gut. For low power people, they consider the bigger picture, think about the decision and evaluate the information given. However, for both it is also out of their awareness zone. Moreover, as said above low power people, are dependent on others' resources and therefore, rather take the information given into advice within the decision-making process. When a nudge is used on them, even without knowing it, those individuals rather react by following the guidelines and incentives given, because they feel, the consequences could be more severe.

All of this leads to the second part of my study, where I wanted to find out if the level of perceived power influences the nudging behaviour of individuals on others. Research found that, individuals suffer from biases and accordingly make decisions with insufficient knowledge and rules of thumb. Although it has been stressed that nudges are gentle suggestions to encourage people to make decisions in their own best interests, it has been observed that people in various power situations perceive and use nudges differently. Especially powerful individuals use their resources to influence the success of others that are rather powerless by offering or withholding those resources. This makes them more dependent on the powerful and they believe they need to follow those that have more power. Several studies supported this statement, that a powerful source is often more compelling than a powerless source, since, as already described, individuals with more power reported a higher overall level of confidence in themselves as well as greater confidence in the concepts that underpin their attitudes toward the intended outcomes. Since this holds true, and the general confidence level is high within

powerful people, they are also more confident and comfortable using nudging behaviours on others. High-power individuals are more likely to employ nudges to come closer to their intended goals and needs, according to researchers. People who feel empowered and dominant have approach-related thoughts and emotions, and they pay more attention to social incentives and other people's qualities that align with their objectives and aspirations. They are more prone to use nudges to guide people who are not operating in line with their objectives. My data partly supports my H2 as I found a significant effect in the predicted direction for one of my dependent measures: comfortability. Contrarily to what was expected, other measures (acceptability and likelihood of using those methods) were not affected by nudges. This result may arise because people with higher power feel more self-reliant and comfortable with themselves from the beginning, hence they also feel comfortable using nudging methods because they believe their decisions and methods used are right and good for others. Comparing to the other two factors of acceptability and likelihood of those nudging methods, one could say, that a nudge is still something which alters an individual decision-making process. Hence, high and low power people may know, that when using those methods, they would indirectly change the outcome of the other individual and interfere with their point of view even though it could be for the better. Meaning, they may partly be occupied using it in the first place because of this thought and hence, the results were not significant in my experiment since they are indifferent when it comes to acceptability and likelihood of using nudges.

6.2 Limitations of this Study

Any experiment has limitations that must be taken into account. Individuals are exceptionally responsive to the expression of text messages, as evidenced by a previous study (Kareklas, Carlson & Muehling, 2014). As a result, it's vital to keep in mind that alternate wordings could have had different outcomes. Although the nudge treatments used in this study were trustworthy, they may have had some validity issues depending on the participants. Furthermore, participants were expected to read the information thoroughly to apply nudging correctly, and their responses were required to reflect this. As a result, if participants did not recall the message or read the material well enough, they were more likely to guess, resulting in a skewed outcome. Despite the fact that the sample size of 291 people is substantial, it cannot be considered typical of any community.

As previously stated, (see section 5.2), the Cronbach's Alpha was relatively low, leading to one limitation of this study, since two important factors to consider when evaluating a measurement tool are validity and reliability (Tavakol & Dennick, 2011).

Finally, there may have been faults in people's responses as with any online self-report. This could have happened due to people providing intentionally erroneous or memory-based responses. The online study guaranteed complete privacy at the start of the study to diminish the self-presentation concerns that could result in biased responses.

6.3 Future Research

The current findings pointed out that nudging is a potential tool to motivate individuals in different power levels to actively support their own goals and desires by using nudges to guide other people into their preferred directions. However, to claim full effectiveness of nudging methods regarding people's actual behaviour in regard to different power levels, future research is needed to replicate the results by conducting more experiments with a wider spread of participants. In addition, further research could examine whether this finding holds true for other real-world domains or concerning different social contexts, where a closer reality on a general work environment is given.

Furthermore, more research could further examine whether different nudging mechanisms according to Sunstein are more effective in other contexts. It should be investigated if the current findings are generalizable to other tasks, as well as to other power manipulations and to real world settings. Therefore, further investigation could be conducted to analyse how nudging treatments interfere with different personal backgrounds, goals and personal desires as well as behaviour patterns. Besides, future research could also measure how cultural differences relate to the effectiveness of nudging interventions and how race and sex has an influence on the sense of power state people are perceived to be in.

7 Conclusion

Most actions in modern society occur within the framework known as organization. Interaction between two or more individuals who believe that their desires can best be realized through the combination of personally possessed qualities or resources is an essential condition for an organization (Hall, 1964). Adopting a nudge theory approach requires making efforts to modify the workplace environment so that employees are being increasingly able to make decisions that benefit them, their job happiness, and professional advancement, as well as have a beneficial impact on the organization (Hall-Ellis, 2015).

Nudging may be used by experienced managers or individuals in high power positions to influence subordinate decisions and maintain the practice across the institution as a learning organization (Hall-Ellis, 2015).

However, not only within the organizational framework does the use of nudges improve people's behaviour and is becoming more prevalent all over the world (Whitehead, Jones, Howell, Lilley & Pykett, 2014). Nudging techniques are easy to implement, effective, and nearly free. Although exploratory research has generated promising findings, there are still many unanswered questions. The answers to these issues, which are concerned with the relationship between power and nudging interventions, may contribute to the creation of nudging theory and practice. However, it's also unclear how much information about nudging strategies can be shared without jeopardizing their effectiveness and whether people's expectations of being influenced can help to limit this effect.

Previous studies have demonstrated that nudging can be a useful and effective approach in a variety of situations. This work was created to build on previous research regarding people's decision-making at various levels of power. In other words, the current study looked into the use of nudging mechanisms in various settings involving people with high and low power. The findings show that nudging has the ability to improve decision-making patterns significantly. Furthermore, findings show that the interaction between power and nudging tools has a significant impact on the decision-making process, reflecting that people in a really low state of power and individuals in high power positions are impacted by those factors.

Moreover, the key findings reveal that one important result of the different power levels is that individuals in higher power settings are more comfortable applying nudges however, the remaining aspects comprising this hypothesis like acceptability and likelihood of using those methods did not yield significant results. This experiment serves as a foundation for future

research aimed at distinguishing between people with high and low power in what concerns changing their behaviour through nudges.

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Appendices

Appendix 1 Overview Study

1. Default Question Block

Welcome and thank you for participating in this experiment. I am conducting this survey as part of my master Thesis at Católica Lisbon.

The study consists of answering multiple questions.

The purpose is to gain insight into how individuals perceive their power level towards other individuals and what follows with this. It will only take about 5 minutes to complete.

Please answer as honestly as possible. All answers will be kept strictly confidentially and are anonymous. This means that there will be no way to link your responses to your identity. The data collected will be used for research purposes only.

If you have any questions about this study, please email Jessica Kaiser (152119274@alunos.lisboa.ucp.pt).

By continuing you agree to participate.

Thank you!

2. Sense of Power Scale

Please answer the following questions as truthfully as possible.

Indicate the extent to which you agree with the following statements (*Answer possibilities ranged from 1-5 with 1 “Strongly disagree”, 2 “Somewhat disagree”, 3 “Neither agree nor disagree”, 4 “Somewhat agree”, 5 “Strongly agree”*):

In my relations with others I think I have a great deal of power.

In my relations with others I can get others to listen to what I say.

In my relations with others I can get others to do what I want.

In my relations with others even if I voice my views, they have little sway.

In my relations with others my ideas and opinions are often ignored.

In my relations with others, even when I try, I am not able to get my way.

In my relations with others if I want to, I get to make the decisions.

3. Randomization One

3.1 Choice Condition

Please read the following scenario and indicate how you would decide in case of a real-life problem. Please try to consider only the described scenario:

Imagine you are a frequent reader of the New York Times newspaper for already some years now. Until today, you always purchased your newspaper at your local kiosk. However, you decide to take a look at the new offering they just proposed. You quickly realized you would save money and time when you decide for one of these options. Which would you select?

- PAY 20€ monthly - GET New York Times ePaper every day for a year
- PAY 30€ monthly - GET New York Times ePaper and printed newspaper every day for a year

3.2 Choice Nudge Condition

Please read the following scenario and indicate how you would decide in case of a real-life problem. Please try to consider only the described scenario:

Imagine you are a frequent reader of the New York Times newspaper for already some years now. Until today, you always purchased your newspaper at your local kiosk. However, you decide to take a look at the new offering they just proposed. You quickly realized you would save money and time when you decide for one of these options. Which would you select?

- PAY 20€ monthly - GET New York Times ePaper every day for a year
- PAY 30€ monthly - GET New York Times printed newspaper every day for a year
- PAY 30€ monthly - GET New York Times ePaper and printed newspaper every day for a year

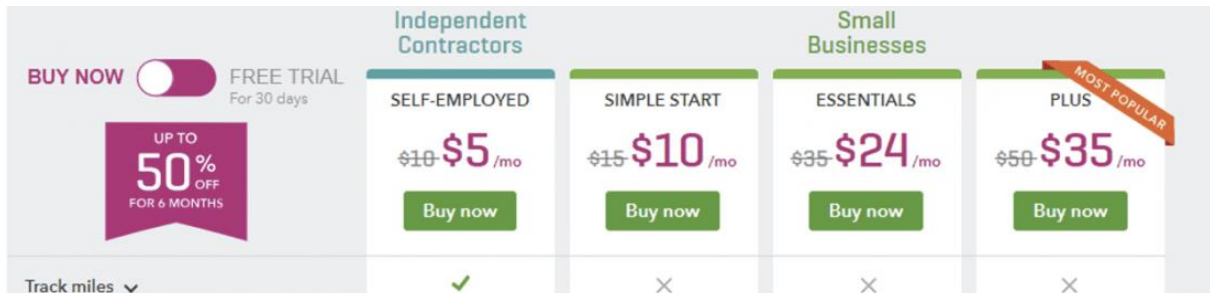
4. Nudge Information

A Nudge is derived from Richard Thaler and Case Sunstein, which they describe as: “A nudge, as we will use the term, is any aspect of the choice architecture that alters people’s behavior in a predictable way 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.”

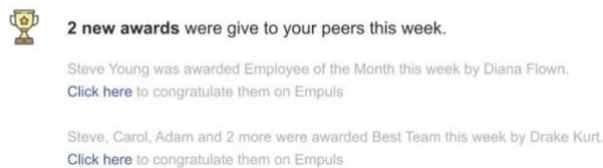
Most of the time, nudging is out of most people’s awareness and accordingly many do not realize that they are being subconsciously steered in a different direction of decision making.

To get a broader Idea of a nudge, four examples are presented:



Example 1 (see above): This can be used to push the sales of a specific product or service by highlighting a distinct option. It is displayed next to similar products. However, the customer feels that when it is the "most popular" option, it must be the best deal.

See what you are missing out on



Example 2 (see above): A manager nudges its employee in a specific direction by awarding weekly prizes for the worker of the week. By distributing these awards, employees are more willing and motivated and are thus indirectly encouraged to work more and achieve better performance.



Example 3 (see above): Placing a pair of eyes in meeting areas to make people feel observed and anticipate employees to behave better and in a more ethical way.

5. Randomization Two

5.1 High Power Condition

Please read carefully through the following scenario:

Imagine you are a managing director in a consulting firm, and you are responsible for 30 employees. The organization sets various meetings with their clients, and as the managing director, you have to distribute the work that subordinates must complete, set goals for the team and approve projects. You know your work well and hence, make all the decisions within the company.

Please answer the following questions regarding the displayed scenario (*Answer possibilities ranged from 1-5 with 1 "Not at all", 2 "Not really", 3 "Undecided", 4 "Somewhat", 5 "Very much"*):

- In terms of changing your employees behaviour, how likely would you be to use a nudge on them?
- In terms of changing your employees behaviour, how acceptable would you think it is for you to use a nudge on them?
- In terms of changing your employees behaviour, how comfortable would you be using a nudge on them?
- How comfortable would you be witnessing a nudge is being used on other managers?
- How likely would you think it is that a nudge is used on yourself in the described consulting company?
- How acceptable would you think it is for said company to use a nudge to influence you?
- If you are attentive, answer this question with "not really".
- How comfortable would you feel thinking a nudge might be used on yourself?
- Imagining a nudge is being used on yourself, how effective at changing your behavior do you think the nudge would be?

How powerful do you feel?

- Not at all
- Not much
- Neither a little nor a lot
- A little
- A lot

5.2 Low Power Condition

Please read carefully through the following scenario:

Imagine you are an employee in a consulting firm and consist of a team of 30 individuals. The organization sets various meetings with their clients, and as an employee, you have to complete any task that the managing director assigns to you and follow instructions regarding goals in this consulting firm. As an employee, you know the work well and strictly follow the procedures set by the director.

Please answer the following questions regarding the displayed scenario (*Answer possibilities ranged from 1-5 with 1 "Not at all", 2 "Not really", 3 "Undecided", 4 "Somewhat", 5 "Very much"*):

- In terms of changing your colleagues behaviour, how likely would you be to you use a Nudge on them?
- In terms of changing your colleagues behaviour, how acceptable would you think it is for you to use a nudge on them?
- In terms of changing your colleagues behaviour, how comfortable would you be using a nudge on them?
- How comfortable would you be witnessing a Nudge is being used on your colleagues?
- How likely would you think is it that a nudge is used on yourself in the described consulting company?
- How acceptable would you think is would be for said company to use a nudge to influence you?
- If you are attentive, answer this question with "not really".
- How comfortable would you feel thinking a nudge might be used on yourself?
- Imagining a nudge is being used on yourself, how effective at changing your behavior do you think the nudge would be?

How powerful do you feel?

- Not at all
- Not much
- Neither a little nor a lot
- A little
- A lot

6. Demographics

Please indicate your age:

Please indicate your gender:

- Male
- Female
- Non-binary / third gender
- Prefer not to say

What is your highest educational level?

- High School
- Bachelor's Degree
- Master's Degree
- PHD or higher
- Others

What is your nationality?

Appendix 2 Demographics

	<i>Frequency</i>	<i>Percent</i>	<i>Valid Percent</i>	<i>Cumulative Perc.</i>
<i>Male</i>	196	67.4	67.4	67.4
<i>Female</i>	93	32.0	32.0	99.3
<i>Non-binary / third gender</i>	1	0.3	0.3	99.7
<i>Prefer not to say</i>	1	0.3	0.3	100.0
<i>Total</i>	291	100.0	100.0	

Table 6: Gender Distribution

	<i>Frequency</i>	<i>Percent</i>	<i>Valid Percent</i>	<i>Cumulative Perc.</i>
<i>High School</i>	20	6.9	6.9	6.9
<i>Bachelor's Degree</i>	170	58.4	58.4	65.3

<i>Master's Degree</i>	78	26.8	26.8	92.1
<i>PHD or higher</i>	10	3.4	3.4	95.5
<i>Others</i>	13	4.5	4.5	100.0
<i>Total</i>	291	100.0	100.0	

Table 6: Educational Level

Appendix 3 Attention Question Cleaning

	<i>N</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Mean</i>	<i>St. Deviation</i>
<i>Please answer the following questions regarding the displayed scenario: - If you are attentive, answer this question with "not really".</i>	149	2	2	2.00	0.000
<i>Please answer the following questions regarding the displayed scenario: - If you are attentive, answer this question with "not really".</i>	142	2	2	2.00	0.000
<i>Valid N (listwise)</i>	0				

Table 7: Attention Question

Appendix 4 Variable Description

Describing the different variables with the respective questions in the low and high-power condition:

	<i>High Power Condition</i>	<i>Low Power Condition</i>
<i>likely</i>	In terms of changing your employees behaviour, how likely would you be to use a nudge on them?	In terms of changing your colleagues behaviour, how likely would you be to you use a Nudge on them?
<i>accept</i>	In terms of changing your employees behaviour, how acceptable would you think it is for you to use a nudge on them?	In terms of changing your colleagues behaviour, how acceptable would you think it is for you to use a nudge on them?

<i>comf_a</i>	In terms of changing your employees behaviour, how comfortable would you be using a nudge on them?	In terms of changing your colleagues behaviour, how comfortable would you be using a nudge on them?
<i>comf_p</i>	How comfortable would you be witnessing a nudge is being used on other managers?	How comfortable would you be witnessing a Nudge is being used on your colleagues?
<i>likely_used_s</i>	How likely would you think it is that a nudge is used on yourself in the described consulting company?	How likely would you think is it that a nudge is used on yourself in the described consulting company?
<i>accept_s</i>	How acceptable would you think it is for said company to use a nudge to influence you?	How acceptable would you think is would be for said company to use a nudge to influence you?
<i>comf_s</i>	How comfortable would you feel thinking a nudge might be used on yourself?	How comfortable would you feel thinking a nudge might be used on yourself?
<i>effect_s</i>	Imagining a nudge is being used on yourself, how effective at changing your behavior do you think the nudge would be?	Imagining a nudge is being used on yourself, how effective at changing your behavior do you think the nudge would be?

Table 8: Question differentiation between the high and low-power condition

Furthermore, to deeper understand the meaning of the different analysis and the variables used, I further describe the various parameters:

<i>Variable</i>	<i>Description</i>
<i>hp_lp</i>	-1.00 = Low Power 1.00 = High Power This variable describes the grouping of people in either the high-power situation as being a manager or the low power situation with being an employee.
<i>Sum_choice</i>	This variable was designed to filter out the participants who were randomized into the nudge condition as well as answered the question with the nudge itself. To work better with the variable, I had to group it for my SPSS analysis.

<i>Nudge_C</i>	Nudge Condition can be either the participants being randomized in the group where they were influenced by a nudge when answering the given questions.
<i>SoP_Ttl</i>	In order to find out whether individuals taking part in this study are feeling rather powerful than powerless, we had to sum all of the sense of power questions and form the mean.
<i>Feel_of_power</i>	This variable was composed of the power questions. Each participant was randomized in either a high power or low power condition and had to answer the question "How powerful do you feel?" at the end. The variable summed up both participant groups in order to uses it for the SPSS analysis.
<i>LP_HP</i>	-1.00 = Low Power 1.00 = High Power This variable was composed based on the <i>Feel_of_power</i> variable. Weather the participants answered the Power question from 1 to 3 or 4 and 5. Participants answering either 1,2 or 3 where grouped into the low power condition and people answering with 4 or above were grouped within the high-power condition.

Table 9: Variable explanation

Appendix 5 Reliability Analysis Distribution Part I

	<i>N</i>	<i>%</i>
<i>Valid</i>	291	100,0
<i>Excluded</i>	0	0,0
<i>Total</i>	291	100,0

a. Listwise deletion based on all variables in the procedure

Table 10: Reliability analysis distribution

Appendix 6 G Power Test

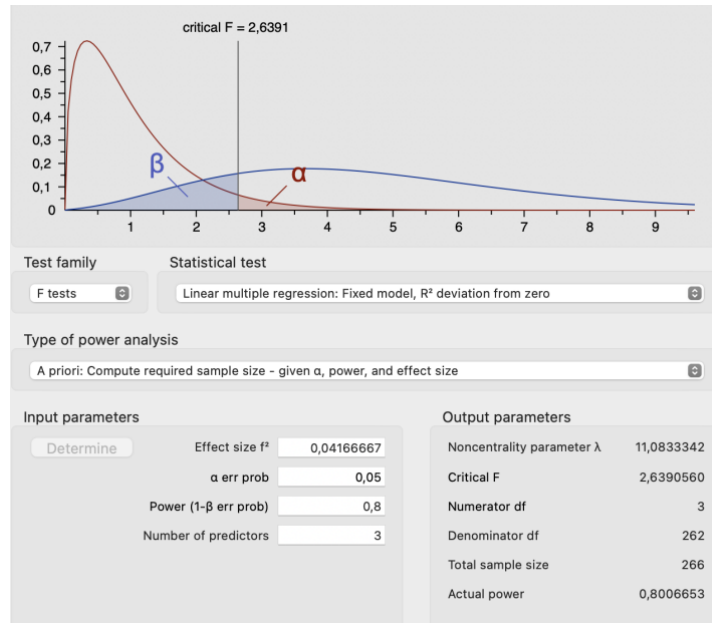


Figure 4: Reliability analysis distribution

Appendix 7 Moderate Multiple Regression Matrix

Run MATRIX procedure:

***** PROCESS Procedure for SPSS Version 4.0 *****

Written by Andrew F. Hayes, Ph.D. www.afhayes.com
 Documentation available in Hayes (2022). www.guilford.com/p/hayes3

Model : 1
 Y : sum_choi
 X : Nudge_C
 W : SoP_Ttl

Sample
 Size: 291

OUTCOME VARIABLE:
 sum_choi

Model Summary							
	R	R-sq	MSE	F	df1	df2	p
	.4942	.2443	831.1365	30.9197	3.0000	287.0000	.0000

Model						
	coeff	se	t	p	LLCI	ULCI
constant	13.4232	1.6956	7.9163	.0000	10.0857	16.7606
Nudge_C	-12.8885	1.7045	-7.5617	.0000	-16.2434	-9.5337
SoP_Ttl	11.2024	3.0645	3.6555	.0003	5.1706	17.2342
Int_1	-13.6397	3.1130	-4.3816	.0000	-19.7669	-7.5126


```

Product terms key:
Int_1      :      Nudge_C x      SoP_Ttl

Test(s) of highest order unconditional interaction(s):
R2-chng    F      df1      df2      p
X*W        .0506   19.1981   1.0000   287.0000   .0000
-----
Focal predict: Nudge_C (X)
Mod var: SoP_Ttl (W)

Conditional effects of the focal predictor at values of the moderator(s):

SoP_Ttl    Effect      se      t      p      LLCI      ULCI
-.5574     -5.2859   2.4623   -2.1467   .0327   -10.1324   -.4393
.0000     -12.8885   1.7045   -7.5617   .0000   -16.2434   -9.5337
.5574     -20.4912   2.4018   -8.5315   .0000   -25.2187   -15.7638

Moderator value(s) defining Johnson-Neyman significance region(s):
Value      % below    % above
-1.7929    .6873      99.3127
-.5817     7.5601     92.4399

Conditional effect of focal predictor at values of the moderator:
SoP_Ttl    Effect      se      t      p      LLCI      ULCI
-2.3239    18.8086   7.4735   2.5167   .0124   4.0989     33.5184
-2.1134    15.9371   6.8370   2.3310   .0204   2.4801     29.3941
-1.9028    13.0656   6.2045   2.1058   .0361   .8536      25.2776
-1.7929    11.5656   5.8760   1.9683   .0500   .0000      23.1312
-1.6923    10.1941   5.5772   1.8278   .0686   -.7833     21.1714
-1.4818    7.3225    4.9572   1.4771   .1407   -2.4346    17.0796
-1.2713    4.4510    4.3476   1.0238   .3068   -4.1063    13.0083
-1.0607    1.5795    3.7535   .4208    .6742   -5.8084     8.9673
-.8502     -1.2921   3.1835   -.4059   .6851   -7.5580     4.9739
-.6397     -4.1636   2.6532   -1.5693   .1177   -9.3857     1.0586
-.5817     -4.9549   2.5174   -1.9683   .0500   -9.9099     .0000
-.4291     -7.0351   2.1916   -3.2100   .0015   -11.3488    -2.7214
-.2186     -9.9066   1.8510   -5.3521   .0000   -13.5498    -6.2634
-.0081     -12.7782   1.7053   -7.4933   .0000   -16.1346    -9.4217
.2024     -15.6497   1.8025   -8.6824   .0000   -19.1974   -12.1020
.4130     -18.5212   2.1092   -8.7811   .0000   -22.6727   -14.3697
.6235     -21.3927   2.5510   -8.3860   .0000   -26.4138   -16.3717
.8340     -24.2643   3.0701   -7.9034   .0000   -30.3070   -18.2215
1.0445     -27.1358   3.6335   -7.4682   .0000   -34.2875   -19.9841
1.2551     -30.0073   4.2235   -7.1048   .0000   -38.3204   -21.6942
1.4656     -32.8788   4.8305   -6.8066   .0000   -42.3864   -23.3712
1.6761     -35.7504   5.4486   -6.5614   .0000   -46.4746   -25.0261

Data for visualizing the conditional effect of the focal predictor:
Paste text below into a SPSS syntax window and execute to produce plot.

DATA LIST FREE/
Nudge_C    SoP_Ttl    sum_choi .
BEGIN DATA.
-1.0997    -.5574    12.9917
.9003     -.5574    2.4199
-1.0997    .0000    27.5962
.9003     .0000    1.8191
-1.0997    .5574    42.2007
.9003     .5574    1.2182
END DATA.
GRAPH/SCATTERPLOT=
SoP_Ttl WITH    sum_choi BY    Nudge_C .

***** ANALYSIS NOTES AND ERRORS *****

Level of confidence for all confidence intervals in output:
95.0000

W values in conditional tables are the mean and +/- SD from the mean.

NOTE: The following variables were mean centered prior to analysis:
SoP_Ttl Nudge_C

----- END MATRIX -----

```

Table 11: Moderate Multiple Regression Model by Andrew Hayes

Appendix 8 Descriptive Statistics

	<i>hp_lp</i>	<i>Mean</i>	<i>Std. Deviation</i>	<i>N</i>
<i>likely</i>	Low Power	3.6510	0.96511	149
	High Power	3.7676	0.81359	142
	Total	3.7079	0.89476	291
<i>accept</i>	Low Power	3.6711	1.02300	149
	High Power	3.8521	1.01721	142
	Total	3.7595	1.02244	291
<i>comf_a</i>	Low Power	3.4228	1.10393	149
	High Power	3.6761	0.99323	142
	Total	3.5464	1.05720	291
<i>comf_p</i>	Low Power	3.4832	1.03717	149
	High Power	3.5704	1.08109	142
	Total	3.5258	1.05790	291
<i>likely_used_s</i>	Low Power	3.6644	1.04371	149
	High Power	3.7817	0.93866	142
	Total	3.7216	0.99387	291
<i>accept_s</i>	Low Power	3.6242	1.08725	149
	High Power	3.5000	1.07684	142
	Total	3.5636	1.08210	291
<i>comf_s</i>	Low Power	3.3356	1.14851	149
	High Power	3.3239	1.00741	142
	Total	3.3299	1.08012	291
<i>effect_s</i>	Low Power	3.6577	0.96403	149
	High Power	3.6338	0.97106	142
	Total	3.6460	0.96587	291

Table 12: Descriptive Statistics

Appendix 9 Hypothesis Testing

<i>Source</i>	<i>Dependent Variable</i>	<i>Type III Sum of Square</i>	<i>df</i>	<i>Mean Square</i>	<i>F</i>	<i>Sig.</i>	<i>Partial Eta Squared</i>
<i>Corrected Model</i>	likely	0.988 ^a	1	0.988	1.236	0.267	0.004
	accept	2.381 ^b	1	2.381	2.288	0.131	0.008
	comf_a	4.663 ^c	1	4.663	4.218	0.041	0.014
	comf_p	0.553 ^d	1	0.553	0.493	0.483	0.002
	likely_used_s	1.000 ^e	1	1.000	1.0112	0.315	0.003
	accept_s	1.121 ^f	1	1.121	0.957	0.329	0.003
	comf_s	0.010 ^g	1	0.010	0.008	0.927	0.000
	effect_s	0.042 ^h	1	0.042	0.044	0.833	0.000
<i>Intercept</i>	likely	4001.538	1	4001.538	5002.283	< 0.001	0.945
	accept	4115.220	1	4115.220	3954.044	< 0.001	0.932
	comf_a	3664.044	1	3664.044	3314.673	< 0.001	0.920
	comf_p	3617.501	1	3617.501	3226.684	< 0.001	0.918
	likely_used_s	4031.268	1	4031.268	4081.347	< 0.001	0.934
	accept_s	3690.193	1	3690.193	3151.001	< 0.001	0.916
	comf_s	3224.532	1	3224.532	2754.462	< 0.001	0.905
	effect_s	3865.609	1	3865.609	4129.964	< 0.001	0.935
<i>hp_lp</i>	likely	0.988	1	0.988	1.236	0.267	0.004
	accept	2.381	1	2.381	2.288	0.131	0.008
	comf_a	4.663	1	4.663	4.218	0.041	0.014
	comf_p	0.553	1	0.553	0.493	0.482	0.002
	likely_used_s	1.000	1	1.000	1.1012	0.315	0.003
	accept_s	1.121	1	1.121	0.957	0.329	0.003
	comf_s	0.10	1	0.010	0.008	0.927	0.000
	effect_s	0.042	1	0.042	0.044	0.833	0.000
<i>Error</i>	likely	231.183	289	0.800			

	accept	300.780	289	1.041
	comf_a	319.461	289	1.105
	comf_p	324.004	289	1.121
	likely_used_s	285.454	289	0.988
	accept_s	338.453	289	1.171
	comf_s	338.320	289	1.171
	effect_s	270.501	289	0.936
<i>Total</i>	likely	4233.000	291	
	accept	4416.000	291	
	comf_a	3984.000	291	
	comf_p	3942.000	291	
	likely_used_s	4317.000	291	
	accept_s	4035.000	291	
	comf_s	3565.000	291	
	effect_s	4139.000	291	
<i>Corrected Total</i>	likely	232.172	290	
	accept	303.162	290	
	comf_a	324.124	290	
	comf_p	324.557	290	
	likely_used_s	286.454	290	
	accept_s	339.574	290	
	comf_s	338.330	290	
	effect_s	270.543	290	

- a. R Squared = 0.004 (Adjusted R Squared = 0.001)
- b. R Squared = 0.008 (Adjusted R Squared = 0.004)
- c. R Squared = 0.014 (Adjusted R Squared = 0.011)
- d. R Squared = 0.002 (Adjusted R Squared = -0.002)
- e. R Squared = 0.003 (Adjusted R Squared = 0.000)
- f. R Squared = 0.003 (Adjusted R Squared = 0.000)
- g. R Squared = 0.000 (Adjusted R Squared = -0.003)

h. R Squared = 0.000 (Adjusted R Squared = -0.003)

Table 13: Test of Between-Subject Effects