USING BEHAVIORAL ECONOMICS TO INCREASE HEALTH SERVICE UTILIZATION WITH LOW-INCOME PATIENT IN A FREE CLINIC

by

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ABSTRACT

TRI B. TANG. Using behavioral economics to increase health service utilization with low-income patients in a free clinic. (Under the direction of DR. REGINALD SILVER)

Low-income individuals encounter significant personal, social, economic, and political obstacles to adequate health care. Transportation challenges, communication barriers, and a lack of trust in treatment, cooccurring with medical and financial illiteracy are all examples of these obstacles. Given these obstacles, there is a clear opportunity for behavioral economic interventions to encourage utilization of services at a free clinic. This includes interventions that uses default option, which is comprised of minor adjustments in the choice architecture that favor desirable selections while protecting individual autonomy. This research also evaluated the moderating effect that patient-provider concordance of language and gender as well as income have on the utilization of services. The research demonstrated that participants who were offered the default option showed greater utilization of the Food Pharmacy compared to participants in the free choice group. Patient-provider language and gender concordance moderates the main effect whereas income does not. The default effect is a well-established phenomenon in behavioral economics that has important implications for economic decision-making. By understanding the underlying mechanisms of the default effect and concordance policymakers and business leaders can design more effective interventions to influence consumer behavior.

Keywords: Behavioral Economics, Concordance, Default Effect, Free Clinic

DEDICATION

This dissertation is dedicated to my parents for always believing in me and pushing me to do remarkable things, to my three daughters for inspiring me to be the best person I can be, and to my brothers and sisters who have always encouraged me to reach for the stars.

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LIST OF ABBREVIATIONS

BE – Behavioral Economics

BIT – Behavioral Insight Team

CHIP - Children's Health Insurance Program

CMS – Center for Medicare & Medicaid

DE – Default Effect

DV – Dependent Variable

FDA – Food and Drug Administration

ID – Independent Variable

OECD - Organization for Economic Cooperation and Development

UK – United Kingdom

CHAPTER 1: INTRODUCTION

1.1 Summary

In 2020, 28.0 million people (8.6% of the population), did not have health insurance during the year (Keisler-Starkey & Bunch, 2021). Low-income families are more likely to lack health insurance, even with at least one working family member (Tolbert, Orgera, Singer, & Damico, 2020). Families and individual without health insurance often lack access to quality healthcare services (Keisler-Starkey & Bunch, 2021). Most uninsured individuals (84.6%) are working-age adults 19-64 years old (Keisler-Starkey & Bunch, 2021 (Keisler-Starkey & Bunch, 2021).

These statistics should be concerning for employers. Unfortunately, many companies are unaware of the connections between health and productivity. While companies recognize that investing in human capital benefits the bottom line, they are just now starting to appreciate the effect that health has on worker productivity ("Worker Productivity Measures," 2016). Indeed, the indirect costs of bad health, such as absenteeism, incapacity, or lower job performance, may be many times greater than direct medical expenses ("Partnership for Prevention. Leading by Example: CEOs on the business case for worksite health promotion," 2005). Productivity losses due to personal and family health issues cost US companies $1,685 per employee per year, or $225.8 billion each year (Stewart, Ricci, Chee, & Morganstein, 2003).

There are few primary care options for the uninsured and underinsured people with little income. Thankfully, to address this gap in the safety net, hundreds of free or volunteer-based clinics have been created around the nation (Geller, Taylor, & Scott, 2004). These clinics, which offer free or low-cost services to uninsured and underinsured patients, rely heavily on charitable funding, and rely heavily on the contributions of volunteer doctors and other health care workers.

Many volunteer-based clinics provide carefree of charge. Some free clinics are run by churches, health departments, or hospitals, while others are run by non-profit organizations on their own (Geller et al., 2004). Free clinics serve the uninsured, the working poor, and despite limited funding and understaffing many free clinics around the nation continue to operate (Kamimura, Christensen, Tabler, Ashby, & Olson, 2013). Often free clinics are the medical home for non-English speaking patients (Scheiber et al., 2023).

With limited funding and a high dependence on volunteers it is vital that these clinics provide services effectively. This study demonstrates the use of behavioral economics to increase the utilization of services that would benefit the health and well-being of patients who utilizes a free clinic. Behavioral Economics is the study of cognitive, social, and emotional influences on people's observable choice behavior. Behavioral economics uses low costs, simple behavioral interventions such as nudges intended to influence individual's behavior in a predictable manner, without prohibiting any alternatives (Janice & Barbara, 2016; Matjasko, Cawley, Baker-Goering, & Yokum, 2016). Behavioral economic research is different from traditional economics in that it assumes that people are not always rational, cost-benefit-calculating individuals who always carefully deliberate their choices. People are humans who sometimes take the path of least resistance and go with the easy and simple choice (Pelle Guldborg & Andreas Maaløe, 2013). In addition to measuring the effectiveness of Behavioral Economics on patient choice, this study also evaluates how patient-provider concordance, such as similarity in language or gender, can influence patient decision making (Street, O'Malley, Cooper, & Haidet, 2008). Prior research has suggested that racial and ethnic disparities may be mitigated if the patient and provider share the same race due to improved communication and increased trust(Salimah H Meghani et al., 2009). This shared identity between patient and provider is known as patient–provider concordance

(Cooper & Powe, 2004). In addition to race, many factors can contribute to patient–provider concordance, including language, age, gender, values, and socioeconomic status (A. Ma, A. Sanchez, & M. Ma, 2019; Otte, 2022; Street et al., 2008). Thus, later research has evaluated how a broader range of patient–provider concordance can affect the patient experience and overall care of the patient (Salimah H. Meghani et al., 2009; Otte, 2022). Most of these studies continue to focus on individual forms of concordance and do not consider the impact of Behavioral Economics such as Default Choice influence on patient decision making and healthcare utilization. Therefore, additional research may be beneficial to assess if language or gender concordance of the patient and provider moderates Default Choice's influence on utilization of healthcare services (Cooper & Powe, 2004; Salimah H Meghani et al., 2009; Otte, 2022)

1.2 Overview of Behavioral Economics and Default Effect

Behavioral economics is an interdisciplinary field that combines insights and methods from economics, psychology, and neuroscience to better understand human decision-making (Richard H Thaler, 2016). This field seeks to explain why people often make decisions that deviate from the predictions of traditional economic theory, and to develop more accurate models of decision-making that can account for these deviations (Kahneman & Tversky, 1979).

At its core, behavioral economics seeks to understand the cognitive and emotional factors that influence decision-making. For example, people may use heuristics, or mental shortcuts, to simplify complex decisions, which can lead to biases and errors (Tversky & Kahneman, 1974). Social norms can also play a powerful role in shaping behavior, as people often look to others for cues on how to act (Cialdini, 2003). Additionally, emotions can strongly influence decision-making, as people may be motivated to avoid negative feelings such as regret or fear (Loewenstein, 1996).

Behavioral economics has important implications for a wide range of policy areas. For example, by understanding the factors that influence food choices, policymakers can design interventions to promote healthier eating habits (Richard H. Thaler, 2008). In finance, insights from behavioral economics have led to the development of new financial products and services that better align with consumers' needs and preferences (R. Thaler & Sunstein, 2008). Similarly, in environmental regulation, behavioral economics can inform the design of policies that encourage pro-environmental behavior (Allcott & Rogers, 2014).

In this research, I will provide a comprehensive overview of the key concepts and theories in behavioral economics, including its historical development, key empirical findings, and ongoing debates and controversies within the field. I will draw on a range of primary sources, including seminal papers by Kahneman and Tversky (1979), Thaler (2016), and other leading behavioral economists. I will also explore the practical applications of behavioral economics in a variety of workplace and healthcare settings, highlighting the potential benefits and challenges of using behavioral insights to inform the design of choice architecture. Finally, I will discuss the future directions of behavioral economics research, including emerging areas of inquiry and the challenges facing the field as it continues to grow and evolve.

The introduction of a behavioral economic principle, known as a "nudge theory", has been a promising strategy to help individuals make beneficial choices for themselves and others. The term nudge theory can sometimes be interchangeably used with other terms such as nudge, nudging, choice architecture, or behavioral economics. The design of a nudge applies to strategic environmental changes intended to change individuals' behavior in a predictable manner, without prohibiting any alternatives or dramatically altering their economic incentives (Janice & Barbara, 2016). Nudge theory, a Nobel economics prize-winning concept, was made popular through the

book *Nudge* and empirical research of Behavioral Economist Richard Thaler and Cass Sunstein (Eric J. Johnson et al., 2012; Richard H. Thaler, 2008). Behavioral economics differs from conventional economics in that it considers that people are not necessarily rational, cost-benefit-calculating individuals who carefully consider their options (Pelle Guldborg & Andreas Maaløe, 2013). Even though Behavioral Economics uses psychology to study economic problems, the approach is usually rooted in traditional economic principles. It is a discipline that intersects psychology and economics. Behavioral Economics research has been applied to many domains, including health, finance, work performance, public policy, consumer marketing, and many others.

The use of behavioral economics principles such as “nudges” uses techniques that are typically affordable and less intrusive relative to conventional, direct approaches, which rely on human behaviors and cognitive boundaries (Bucher et al., 2016). The success of the method has culminated in a rise of research devoted to investigating the possible advantages of nudge strategies, such as in the workplace (Viktorija & Ljubomir, 2018), school cafeterias (Mazza, Dynan, Siegel, & Tucker, 2018), public policy (Eric J. Johnson et al., 2012), and even in the area of personal finance (Eric J. Johnson et al., 2012). Nudge is different from manipulation or deception. Manipulation is secretive and limits choice, whereas nudges influence choices without making alternative options appreciably more difficult, more costly, or requiring more effort or time (Eric J. Johnson et al., 2012; Pelle Guldborg & Andreas Maaløe, 2013). Unlike deception, which misleads or hides the truth, nudge offers transparency and freedom of choice (Pelle Guldborg & Andreas Maaløe, 2013).

An example of a nudge that demonstrates its effectiveness without manipulation or deception is research on retirement savings; using pre-commitment to encourage employees to

save for retirement. Retirement saving terms and conditions are explained to participants, and those who agree, set aside money the following year once he or she receives an annual increase. Through pre-commitment, participants in the Save More Tomorrow program, after the first year, improved from 4.4 to 9.1 percent in retirement savings. By the second year, the participants boosted their savings from 3.3 to 6.5 percent. Also, participants in the pre-commitment program boost their savings rate to an average of 13.6 percent by the fourth annual raise, while those who did not participate had cut their savings rate to 8.8 percent (Richard H. Thaler & Benartzi, 2004).

Another example of a nudge using default options is in sustainable energy use. The economist Sebastian Lotz studied 42,000 German households to see if they would be inclined to buy renewable energy depending on how the service was proposed to them. The study randomly selected consumers and placed them into two groups. One group of consumers were offered the option to opt-in to a plan that supplied their energy from renewable sources, at a slight increase of just $0.03 per kilowatt-hour, or about $15 a year. The second group had the renewable energy alternative preselected within a price structure but was offered a refusal option.

The effectiveness of default (opt-out) customers into a decision was unexpectedly high. About 7% of the opt-in group ultimately bought renewable energy plans, but 70% of the opt-out group opted to remain with their renewable energy plan. Although the researchers predicted that the opt-out "nudging" would maybe double green-energy contracts, this contributed to something closer to a tenfold rise (Ebeling & Lotz, 2015; Szaszi, Palinkas, Palfi, Szollosi, & Aczel, 2018).

1.3 Default Effect in Decision Making

One of the most effective and “sticky” nudge ideas is default effect (Kahneman, Knetsch, & Thaler, 1991). People have a tendency to stick with the present or default option when presented with a choice, even if other options may be more advantageous or desirable (van

Kleef, Seijdell, Vingerhoeds, de Wijk, & van Trijp, 2018). The default effect, also known as the status quo bias, is a well-documented phenomenon in behavioral economics that has received significant attention in recent years (Eric J Johnson & Goldstein, 2003; Samuelson & Zeckhauser, 1988; Richard H. Thaler, 2008). Research has shown that the default effect can have significant implications for a wide range of economic decisions, from healthcare choices (Eric J Johnson & Goldstein, 2003) to retirement savings (Choi, Laibson, Madrian, & Metrick, 2002) to organ donation (Eric J Johnson & Goldstein, 2004). For example, in the context of organ donation, countries with opt-in systems, where individuals must actively choose to donate their organs, have significantly lower rates of organ donation than countries with opt-out systems, where individuals are presumed to be donors unless they actively choose not to be (Eric J Johnson & Goldstein, 2003).

One possible explanation for the default effect is that it reduces cognitive effort and simplifies decision-making (Richard H. Thaler, 2008). When individuals are presented with a default option, they may perceive it as the "safe" or "recommended" choice, and thus be less likely to deviate from it. Additionally, individuals may have a preference for maintaining the status quo or avoiding change (Samuelson & Zeckhauser, 1988). Understanding the default effect is important for policymakers and business leaders who are interested in influencing consumer and workforce behavior. By manipulating default options, policymakers can nudge individuals towards more desirable behaviors, such as increasing savings rates or promoting healthy choices (Richard H. Thaler, 2008). Business leaders can also use defaults to their advantage, for example in many workplaces, employees use software applications for various tasks. Setting default options for these applications can increase efficiency and reduce errors. For example, setting the default font, margins, and spacing in a word processing program can save

time and ensure consistency in documents (Goldstein, Johnson, Herrmann, & Heitmann, 2008). Business leaders can gain efficiency by making certain options more salient or prominent in choice architecture (Eric J Johnson & Goldstein, 2003). The default effect is a well-established phenomenon in behavioral economics that has important implications for economic decision-making (Richard H Thaler & Ganser, 2015). By understanding the underlying mechanisms of the default effect, policymakers and business leaders can design more effective interventions to influence consumer behavior.

1.4 Research Gap

The majority of behavioral economics research in the healthcare industry is associated with clinical decisions making, lifestyle changes, or health policies (Allan & Powell, 2020; Last, Buttenheim, Timon, Mitra, & Beidas, 2021; Matjasko et al., 2016; Mitesh S. Patel & Volpp, 2012; Yoong et al., 2020). There are not a lot of studies influencing utilization of services, especially with the low-income population (Ruggeri et al., 2020). Low-income people encounter significant personal, social, economic, and political obstacles to primary care (Kamimura et al., 2013; Starbird, DiMaina, Sun, & Han, 2019). Lack of transportation, communication barriers, schedule demands, a perceived lack of respect in treatment, cooccurring with medical and financial illiteracy are all examples of these obstacles (Kamimura et al., 2013; Kaplan-Lewis & Percac-Lima, 2013). In additional to these challenges, language barriers often make it difficult to achieve effective communication among provider and patients, provide high-quality treatment, and ensure patient safety (Al Shamsi, Almutairi, Al Mashrafi, & Al Kalbani, 2020).

Given these obstacles, there is a clear opportunity for behavioral economic interventions to encourage utilization of services at a free clinic. This will include interventions that uses default option, which is comprised of minor adjustments in the choice architecture that favor

desirable selections while protecting individual autonomy (Kamimura et al., 2013; Ruggeri et al., 2020). This research will also evaluate the moderating effect that patient-provider concordance of language and gender as well as income have on the utilization of services.

Concept Design

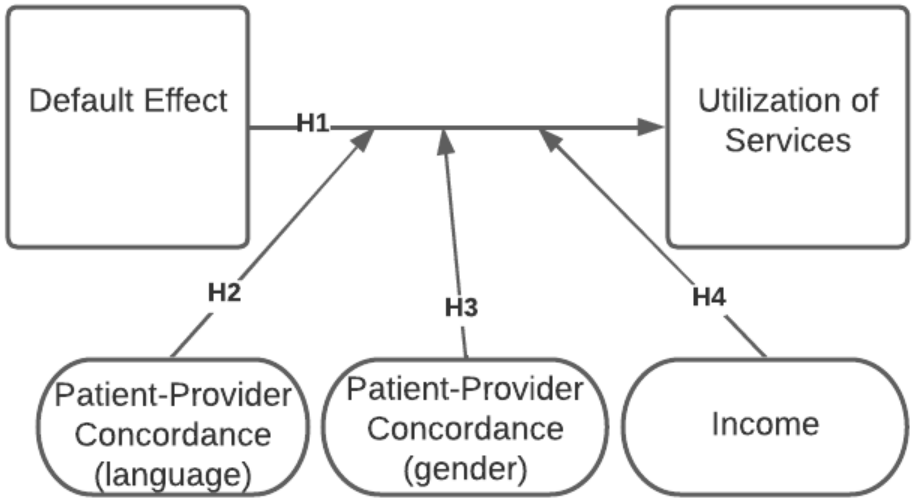


Figure 1: Research Concept

I intend to fulfill this research gap in the following four chapters. Chapter two will review the literature on behavioral economics research conducted in the healthcare industry. It will provide evidence that the influence of default option on health services utilization by low-income people is a significant gap in the behavioral economics literature. Chapter three describes the theoretical model and offers hypotheses. Chapter four provides an overview of the methods used to test the hypotheses. Chapter five presents the results of the hypothesis testing, and discusses the significance of the findings, real-world application, and limitations of the dissertation.

1.5 Research Questions

These are some of the research questions I will answer through this study.

Does default choice influence utilization of services? What impact does patient-provider concordance of language have on default choice and utilization? What impact does patient-provider concordance of gender have on default choice and utilization? What influence does income have on default choice and utilization? I believe that answering these questions will offer greater insight into the effectiveness of behavioral economic as well as its application in healthcare and other businesses.

CHAPTER 2: LITERATURE REVIEW & HYPOTHESES DEVELOPMENT

2.1 Status Quo Bias – Grounding Theory

One of the most pervasive and intriguing phenomena in human decision-making is the status quo bias. The status quo bias refers to the tendency of individuals to prefer the current state of affairs over any possible alternative, even if the alternative is objectively superior (Samuelson & Zeckhauser, 1988). This bias has been observed in a wide range of domains, including consumer behavior, financial decision-making, and public policy (Kahneman et al., 1991; Tversky & Kahneman, 1973, 1991). The idea behind default options is not entirely new. These concepts can be found in Samuelson and Zeckhauser's (1988) seminal study on the status-quo bias in public policy, it has been shown that policies that establish defaults have a significant influence on a broad variety of important decisions (Samuelson & Zeckhauser, 1988). Status quo bias is an emotional bias characterized by a desire for the preservation of one's present or previous condition of things, or a preference for not acting to change this current or previous situation (Masatlioglu & Ok, 2005; Samuelson & Zeckhauser, 1988). The existing baseline (or status quo) is used as a reference point, and any deviation from it is seen as a loss or gain. Individuals perceive and evaluate the present baseline or default choice as good in relation to diverse alternatives (Masatlioglu & Ok, 2005). Change inherently encourages risk, and individuals may be hesitant to place themselves in circumstances with unclear outcomes. The desire to retain things as they may have a significant impact on how individuals behave (Karl, Holle, Schwettmann, Peters, & Laxy, 2019).

When presented with a difficult choice, individuals prefer to accept the status quo, as the old saying goes, "When in doubt, do nothing." The complexity of the decision-making process is but one influencing factor on this status quo bias (I. Cho & D. W. Bates, 2018). While status quo

bias is generally seen as illogical, clinging to prior decisions is sometimes a safe and less challenging option owing to informational and cognitive constraints (Samuelson & Zeckhauser, 1988).

Early Research

In the early study by Samuelson and Zeckhauser (1988), participants were given a fictitious situation in which they inherited a substantial quantity of money. They were then told to choose how to invest the money by selecting from a set of predefined possibilities. However, some participants were shown a neutral version of the situation, while others were shown a version with a status quo bias. The participants in the neutral version were just informed that they had inherited money and had to pick from several investment possibilities. In this version, all options were equally acceptable; the desire to keep things as they were was not a consideration since there was no past experience to rely on. In the status quo version, participants were informed they had inherited money that had previously been invested in a certain manner. They were then given a variety of investing possibilities. One of the alternatives kept the portfolio's present investing strategy (and thus occupied the status quo position). The remaining items on the list were all alternatives to the status quo. Samuelson and Zeckhauser (1988) discovered that when participants were provided with the status quo version of the situation, they preferred it above the other possibilities. This high preference persisted throughout a variety of hypothetical circumstances. Furthermore, the more options participants are given, the more they like the status quo is maintained (Kahneman et al., 1991; Samuelson & Zeckhauser, 1988).

In situations that require individuals to select between the status quo (default) or alternative there is a tendency to stay with the default choice because of multiple reasons. One reason is loss aversion motivates individuals to continue with the default choice since changing

from the norm usually entails both losses and benefits, with losses receiving greater weight (Eric J Johnson & Goldstein, 2003; Kahneman et al., 1991; Keller, Harlam, Loewenstein, & Volpp, 2011). The impact of loss aversion is compounded further by present-bias, which is the excessive weight individuals put on current costs and rewards (Kahneman & Tversky, 1982; Keller et al., 2011; O'Donoghue & Rabin, 1999; Samuelson & Zeckhauser, 1988). Deviating from the norm often includes immediate, if minor, costs that are only offset by long-term rewards that, according to existing bias, are excessively discounted. (Keller et al., 2011; O'Donoghue & Rabin, 1999). Procrastination also works in favor of status quo bias, since departing from the default generally requires positive action, which people put off. Procrastination happens for a number of reasons, including current bias as a stress and anxiety coping technique, and in part because they are too optimistic that they will have more time in the future to make a better informed decision (Akerlof, 1982; Ariely & Wertenbroch, 2002; Keller et al., 2011; Luce, 1998).

Loss Aversion

One of the most influential explanations for the status quo bias is the concept of loss aversion. Loss aversion refers to the idea that people are more sensitive to losses than to gains (Kahneman & Tversky, 1979). According to this view, people's reluctance to change the status quo is rooted in their fear of potential losses. The fear of losing something they already have outweighs the potential benefits of a new option (Kahneman, 2011). Numerous studies have provided empirical evidence for the existence of loss aversion and status quo bias. For example, in a study by Samuelson and Zeckhauser (1988), participants were asked to evaluate the fairness of a hypothetical tax reform proposal. The proposal involved both a tax cut and an increase in government spending. Participants were presented with two versions of the proposal: one that maintained the status quo, and one that deviated from it. The results showed that participants

were more likely to endorse the status quo version of the proposal, even when it was objectively less fair than the alternative (Samuelson & Zeckhauser, 1988).

Other studies have examined the role of loss aversion in consumer behavior. For example, in a study by Johnson and Goldstein (2003), participants were asked to choose between two options for a mobile phone service plan. One option involved a monthly fee and a low per-minute charge, while the other involved a higher monthly fee and a lower per-minute charge. The results showed that participants were more likely to choose the option with the higher monthly fee, even though it was more expensive overall. The authors attributed this preference to loss aversion, as the higher monthly fee represented a loss that participants wanted to avoid (Eric J Johnson & Goldstein, 2003).

There are several theoretical explanations for the role of loss aversion in status quo bias. One explanation is that the status quo represents a reference point that people use to evaluate potential gains and losses (Kahneman & Tversky, 1979). According to this view, the status quo serves as a baseline against which all other options are evaluated. Any potential gain is evaluated relative to the status quo, while any potential loss is evaluated relative to the gain. Another explanation is that the status quo represents a default option that people feel obligated to follow (Eric J Johnson & Goldstein, 2003). According to this view, people view the status quo as the default option, and any deviation from it requires justification. This default option bias can lead people to stick with the status quo even when it is not in their best interest (Chavez, 2020).

The role of loss aversion in status quo bias has several important implications for decision-making. For example, it suggests that people may be more willing to accept small losses to avoid larger losses (Kahneman, 2011). It also suggests that people may be more resistant to change than previously thought, as the fear of potential losses can outweigh the potential benefits

of a new option. This has implications for public policy, as policymakers may need to consider the status quo bias and loss aversion when proposing changes or reforms (Bent, 2014).

Furthermore, the concept of loss aversion in status quo bias has implications for marketing and consumer behavior. Marketers may need to take into account consumers' attachment to the status quo and their aversion to potential losses when promoting new products or services. For example, emphasizing the potential gains of a new option and minimizing the potential losses may be an effective marketing strategy.

Overly Discounted Future and Cognitive Dissonance

A similar topic is how decisions between the present and the future are made. Although it is natural to prefer the present over the future, a phenomenon known as time discounting, taking this propensity to extremes is clearly not in one's best interests (Akerlof, 1982). The concept of overly discounted future is based on the idea that people tend to value immediate rewards more than future ones. This bias is often observed in situations where individuals are required to make a choice between an immediate reward and a larger, delayed reward (Akerlof, 1982). One possible explanation for status quo bias is the overly discounted future effect. For example, choosing between receiving $10 now or $15 in a month. Studies have shown that people generally prefer the immediate reward, even when it is smaller than the delayed reward (Ainslie, 1975; Loewenstein, 1987). This preference for immediate gratification may explain why individuals are resistant to change and prefer to maintain the status quo, even when it may not be optimal in the long term. This bias can have negative consequences for long-term decision-making, such as failing to save for retirement or neglecting preventative healthcare measures. The impact of overly discounted future can be significant, as small daily choices can accumulate over time and result in serious long-term health and financial consequences.

Another possible explanation for status quo bias is cognitive dissonance. When faced with information that contradicts their beliefs or behaviors, individuals may experience cognitive dissonance, which can result in feelings of discomfort and anxiety. To reduce this discomfort, individuals may be motivated to maintain their current beliefs and behaviors, leading to a preference for the status quo. For example, a person who values health and wellness but also enjoys smoking cigarettes may experience cognitive dissonance.

A study conducted by Ditto and Lopez (1992) found that individuals who were presented with information that contradicted their beliefs on controversial topics were more likely to maintain their original beliefs, even when presented with evidence to the contrary (Ditto & Lopez, 1992). To reduce the discomfort of cognitive dissonance, individuals may engage in various behaviors, such as ignoring or dismissing conflicting information, rationalizing their behavior, or changing their beliefs or behaviors to reduce the inconsistency (Festinger, 1957). These concepts have important implications for decision-making in a wide range of domains. In public policy, policymakers may need to consider these biases when proposing changes or reforms. In healthcare, clinicians may need to be aware of these biases when encouraging patients to adopt healthy behaviors or adhere to treatment plans. In marketing, companies may need to consider these biases when promoting new products or services.

The concepts of overly discounted future, cognitive dissonance, and status quo bias are interconnected and can have significant impact on decision-making. The tendency to discount future outcomes can lead to a bias towards maintaining the status quo, while cognitive dissonance can motivate individuals to maintain their current beliefs and behaviors. It is important to be aware of these biases and to develop strategies to overcome them, such as

providing immediate incentives for long-term benefits, addressing conflicting beliefs, and promoting the benefits of change.

Decision Fatigue and Cognitive Load

Decision fatigue is a psychological phenomenon where an individual's ability to make effective decisions is hindered due to fatigue resulting from the accumulation of numerous decisions made over a period of time. The idea of decision fatigue and its impact on the quality of decision-making has been studied in various fields of research. This section will discuss how decision fatigue or too many choices relate to status quo bias, and present supporting evidence from the relevant literature. The relationship between decision fatigue and status quo bias can be explained using the concept of cognitive load. Cognitive load refers to the amount of mental effort that is required to perform a task (Hirshleifer, Levi, Lourie, & Teoh, 2019). When an individual is subjected to decision fatigue, their cognitive load increases, which can make it harder for them to evaluate alternatives and decide. As a result, they may rely on heuristic shortcuts or default options, such as sticking with the status quo, to conserve cognitive resources (Shah & Oppenheimer, 2008). In a study conducted by Samuelson and Zeckhauser (1988), participants were asked to choose between two hypothetical medical treatments. The first group was presented with a simple choice between two treatments, while the second group was presented with a more complex choice between five treatments. The results showed that the second group was more likely to choose the default option, which was to stick with the current treatment, than the first group. The authors argued that this was because the second group experienced decision fatigue due to the cognitive load associated with evaluating five treatments, which made them more likely to stick with the status quo (Samuelson & Zeckhauser, 1988). Similarly, a study conducted by Hsee, and colleagues (1999) found that participants who had to

make a series of choices were more likely to choose the default option than those who had to make a single choice. The authors suggested that this was due to decision fatigue, which led participants to rely on the default option as a way of conserving cognitive resources (Hsee, 1996). Decision fatigue and status quo bias are related in that decision fatigue can lead individuals to rely on the default option or the status quo as a way of conserving cognitive resources. This can result in individuals exhibiting a strong preference for maintaining the existing situation, even when it may not be optimal. Understanding the relationship between decision fatigue and status quo bias can have practical implications for various fields, such as public policy and marketing, where decisions are made based on consumer preferences.

Previous research has shown that cognitive load can have a significant impact on performance, with higher cognitive load typically leading to decreased performance. A range of factors have been identified as influencing cognitive load, including task complexity, working memory capacity, and environmental factors such as noise and distraction (Evans & Schamberg, 2009). However, an emerging body of research suggests that income may also play a role in shaping cognitive load (Mani, Mullainathan, Shafir, & Zhao, 2013).

Several studies have investigated the relationship between income and cognitive load, with a particular focus on the impact of poverty on cognitive load. One such study, conducted by Mani et al. (2013), found that financial concerns can have a significant impact on cognitive load, reducing individuals' ability to concentrate and make decisions (Mani et al., 2013). Similarly, a study by Evans and Schamberg (2009) found that individuals living in poverty experienced higher levels of cognitive load compared to those with higher incomes (Evans & Schamberg, 2009). These findings suggest that financial stress may be a key mechanism through which income affects cognitive load. Other studies have explored the relationship between income and

cognitive load in more experimental settings. For example, a study by Piff et al. (2012) found that higher-income individuals were more likely to cheat in a game than lower-income individuals. The researchers suggest that this may be due to a sense of entitlement that is associated with higher income levels, which reduces cognitive load and makes cheating more appealing (Piff, Stancato, Côté, Mendoza-Denton, & Keltner, 2012). Furthermore, research has shown that income can affect cognitive load through its impact on working memory capacity. A study by Hackman and Farah (2009) found that individuals from low-income backgrounds performed worse on working memory tasks than those from higher-income backgrounds (Hackman & Farah, 2009). This suggests that income may have a direct impact on cognitive load by limiting an individual's capacity to process information efficiently.

Overall, the literature reviewed suggests that income can have a significant impact on cognitive load. Financial stress and limited working memory capacity appear to be key mechanisms through which income affects cognitive load, with individuals from low-income backgrounds experiencing higher levels of cognitive load than those from higher-income backgrounds (Piff et al., 2012). Since cognitive load can have a significant impact on decision fatigue and decision fatigue can lead individuals to rely on the default option or the status quo these findings have important implications for policymakers and practitioners, highlighting the need for interventions that address the financial stressors faced by low-income individuals and support the development of cognitive skills among disadvantaged groups.

2.2 The Evolution of Behavioral Economics – Default Effect

Behavioral economics is in a golden era, as shown by the awarding of the 2017 Economics Nobel Prize to behavioral economist Richard Thaler ("Richard H. Thaler – Prize Lecture," 2022). Behavioral economics has emerged as a subfield of economics, which

incorporates psychological insights into economic decision-making. The study of behavioral economics has been characterized by a growing interest in understanding how individual behavior deviates from rational expectations, and how this deviation leads to different economic outcomes (Heukelom, 2014). This section will discuss the evolution of behavioral economics, including the default effect and past research on behavioral economics.

Behavioral economics can be traced back to the work of Herbert Simon, who in the 1950s, argued that individuals have limited rationality and bounded rationality, leading them to make decisions that are not always consistent with traditional economic theory (Simon, 1955). However, it was not until the 1970s that behavioral economics began to gain widespread attention with the work of Kahneman and Tversky. Kahneman and Tversky (1979) proposed the prospect theory, which explains how individuals make decisions under conditions of risk and uncertainty. According to this theory, individuals make decisions based on potential gains and losses relative to a reference point, rather than absolute gains and losses (Kahneman & Tversky, 1979). This theory helped to explain why individuals tend to be risk-averse when it comes to gains but are willing to take risks when it comes to losses.

After Herbert Simon's work in the 1950s, behavioral economics continued to develop through the 1960s and 1970s. One notable early contribution was the work of Richard Thaler, who argued that people often behave irrationally when it comes to economic decision-making (Richard H Thaler, 1988). Thaler's work helped to lay the foundation for the field of behavioral economics, which became more prominent in the 1980s and 1990s. During this time, the field of behavioral economics began to gain widespread attention, thanks in part to the work of Kahneman and Tversky (Kahneman & Tversky, 1982; Tversky & Kahneman, 1991). In addition to the prospect theory, Kahneman and Tversky also introduced the concept of heuristics, which

are mental shortcuts that people use when making decisions (Kahneman & Tversky, 1982). Heuristics can be helpful in some situations, but they can also lead to biased or irrational decision-making. In recent years, the study of behavioral economics has expanded to include topics such as happiness, social preferences, and intertemporal choice. For example, research by Daniel Kahneman and Angus Deaton (2010) has explored the relationship between income and happiness, finding that beyond a certain point, higher income does not necessarily lead to greater happiness (Kahneman & Deaton, 2010).

One of the most notable contributions of behavioral economics to date is the identification of the default effect. The default effect refers to the phenomenon that people are more likely to choose the default option when deciding, even when the default is not in their best interest. The default effect has been observed in a wide range of settings, from organ donation to retirement savings (Eric J. Johnson et al., 2012). Research on the default effect has shown that it can be influenced by a variety of factors, such as the salience of the default option and the number of options available. For example, a study by Eric Johnson and colleagues (2003) found that people were more likely to choose a retirement savings plan when they were automatically enrolled in the plan, rather than having to actively opt-in (Eric J Johnson & Goldstein, 2003).

Past Research on Behavioral Economics:

Behavioral economics may appear to many observers to be a novel concept. A lot of the enthusiasm around behavioral economics has occurred in the last 10 years or so. The first turning point was the 2002 Nobel Prize in Economics being given to experimental economist Vernon L. Smith and economic psychologist Daniel Kahneman, whose innovations and methods encouraged behavioral economists even though experimental economics is not behavioral economics (Altman, 2004). The second was the 2017 Nobel Prize in Economics being awarded

to behavioral economist Richard Thaler, who has written colorfully about his contributions in his book Misbehaving (R. Thaler & Sunstein, 2008; Richard H Thaler & Ganser, 2015). As a result of his best-selling book with legal scholar Cass Sunstein, Thaler is well known for his work on behavioral public policy and behavioral finance, also referred to as "nudging" (Leonard, 2008; Richard H. Thaler, 2008). These philosophers have had a considerable influence on contemporary policy, not least because they worked with former US President Barack Obama and former UK Prime Minister David Cameron to develop their respective policy plans. The development of comparable units all over the world, including Australia, Lebanon, and Mexico, to mention a few, was prompted by the establishment of a "nudge" unit in Cameron's Cabinet Office (Halpern, 2015).

Between 2002 and 2017, behavioral economics won three Nobel Prizes, reflecting its transformation from a purely theoretical subject to one with significant real-world policy importance for both public and private policymakers. (Chavez, 2020; Halpern, 2015; Leonard, 2008). Additionally, it might aid common people in better understanding some of the choices they must make.

The past few decades have seen a surge of interest in behavioral economics, with numerous studies investigating various aspects of human decision-making. One of the most widely studied topics in behavioral economics is the role of social norms in decision-making. For example, Cialdini and Goldstein (2004) demonstrated that people are more likely to reuse towels in a hotel when they are given a message that emphasizes social norms (Cialdini & Goldstein, 2004). Behavioral economics has also explored the role of social preferences in decision-making, including the impact of fairness, reciprocity, and altruism (Fehr & Schmidt, 1999). This research has helped to explain why people sometimes behave in ways that are not strictly rational from an

economic standpoint. Another area of research in behavioral economics is the role of emotions in decision-making. Loewenstein et al. (2001) argued that emotions play a critical role in decision-making, with individuals often making decisions based on how they feel rather than a rational assessment of the options (Ariely, Loewenstein, & Prelec, 2003).

These discoveries would lead one to believe that behavioral economics is a far older subject (Heukelom, 2014; Richard H Thaler & Ganser, 2015). Some argue that all economics should be concerned with behavior since it effects decisions and decision-making. After all, economics is the study of alternatives. However, beginning in the 18th century, economics began to shift away from behavior as it could be completely explained in terms of decision psychology and toward observable choices as a measure of revealed preferences (Heukelom, 2014). Economists thought that economic decision-makers are restricted by rigid behavioral constraints in order to simplify these preferences surrounding choices—specifically, that consumers want to maximize their happiness and firms aim to maximize profits (O'Boyle, 2009; Urbina & Ruiz-Villaverde, 2019). Consumers and corporations are assumed to accomplish this as effectively as possible by applying mathematical tools to determine the optimal solutions in mainstream economics (O'Boyle, 2009). Modern economists removed all the socio-psychological aspects of real-world decision-making while building these pure mathematical models that captured these behavioral criteria (Urbina & Ruiz-Villaverde, 2019).

Prior to modern economics mathematizing choice analysis, economists spent a lot of time thinking about how psychological variables effect the incentives and motivations that form the core of economic analysis, stretching all the way back to Adam Smith (Ashraf, Camerer, & Loewenstein, 2005; Heukelom, 2014; Richard H Thaler, 2016). Adam Smith is most known for his 1776 masterpiece, in which he argues that the price mechanism's "invisible hand" should be

left to operate without government intervention (Ashraf et al., 2005; Smith, 1887). However, in his 1759 opus, he wrote extensively about compassion and other social emotions that influence people's relationships with others around them, which are key findings in modern behavioral economics study (Ashraf et al., 2005; Smith, 1822).

The establishment of behavioral economics began as a challenge to the conventional economic idea that humans are hyperrational, maximizing, self-benefiting, non-intrinsically driven individuals (Heukelom, 2014; Richard H Thaler, 2016). In the 1950s, Herbert Simon, a political scientist and human behavior student who went on to win the Nobel Prize in economics, established the concept of "bounded rationality" (Heukelom, 2014; Simon, 1955, 1956). In summary, he claimed that people had inflexible cognitive boundaries in terms of how much information they can absorb and remember when necessary. Furthermore, since one must make judgements about so many things, heuristics, rather than conventional utility-maximizing behavior, must be used. As a consequence, in order to cope with what would otherwise be an overwhelming amount of knowledge given their limited cognitive capacity and time to absorb it all, humans satisfice rather than maximize (H. Schwartz, 2002; Simon, 1955, 1956). Simon also argued that the decision process, which is at the heart of behavioral economics, should be given far more attention because it connects economics with other social sciences that seek to understand how people make decisions individually (psychology), in groups and communities (sociology), and as organized political units (politics) (Simon, 1956). Traditional economic theory disregards the decision-making process because it believes that customers would simply choose the best option available by matching their preferences with price and quality data. (Doucouliagos, 1994; O'Boyle, 2009). The decision-making process is less significant than the result. Simon critiques traditional theory in this area, claiming that a rationality theory that does

not account for problem resolution in the face of complexity is inadequate (Simon, 1955). It is worse than insufficient, according to Simon, since it may be profoundly misleading by providing 'solutions' to economic concerns that have no practical value" (Simon, 1978). He goes on to say that researchers must find effective search processes, which he refers to as "heuristic search": search that is concerned with devising or identifying search procedures that will allow systems with limited computational capacity to make complex decisions and solve difficult problems (Simon, 1978).

Despite the fact that few economists were aware of restricted rationality and its implications, the concept did not receive general recognition for many decades (Conlisk, 1996; Rabin, 1998). Many economists were attracted by results in the psychology literature that suggested conduct that violated the predictions of the conventional economic model by the 1980s (Heukelom, 2014; Simon, 1978). The work of psychologists Kahneman and Tversky was particularly important in this regard (Kahneman & Tversky, 1979, 1982). Kahneman eventually earned the Nobel Prize in economics; Tversky died before he could be honored (Shefrin & Statman, 2003). A study they wrote for the journal Econometrica on prospect theory, a concept they pioneered, provided an alternative explanation for individual economic risk-taking behavior. (Kahneman & Tversky, 1979).

According to prospect theory, people evaluate decisions based on the prospective benefits and costs associated with the outcomes rather than the utility of the results. (Kahneman & Tversky, 1979). Prospect theory has quite different implications than traditional consumer choice theory: When it comes to earnings, people are risk averse, but when it comes to substantial losses, particularly specific ones, they are risk avoiders. Most individuals, for example, would rather have the assurance of getting $500 than a 50-50 chance of earning $1,000 or nothing,

exhibiting risk aversion. Most individuals, however, prefer a 50-50 chance of losing $1,000 to the certainty of losing $500, indicating risk-taking behavior (Kahneman & Tversky, 1979).

Later, some psychologists, like Schwartz, suggested that consumers may have too much choice (B. Schwartz, 2004). More options are undoubtedly good in economics since they enable one to ignore the undesirable alternatives. Choice is often seen as motivating and invigorating by psychologists (B. Schwartz, 2004). According to Schwartz and colleagues, people who strive to maximize (rather than satisfice) in a choice-laden environment have lower levels of satisfaction, regret over the alternatives not taken, and, ultimately, less enjoyment and a greater predisposition toward despair (B. Schwartz et al., 2002).

Finally, Thaler, an economist, and Sunstein, a legal scholar, wrote Nudge in 2008, which helped to popularize the concept of behavioral economics (Richard H. Thaler, 2008). The book, and the idea on which it is founded, "libertarian paternalism," was essentially a manifesto for policymakers claiming that government and private groups may give significant assistance to consumers in making key decisions. The premise is that individuals frequently make judgments that are not in their best interests, and hence should be guided toward better decisions by others who are more educated. This viewpoint, of course, differs greatly from the standard economics paradigm, in which people are expected to make decisions in their best interests (Richard H. Thaler, 2008).

Behavioral economics has come a long way since its inception in the 1950s. The field has made significant contributions to our understanding of human decision-making and has highlighted the limitations of traditional economic theory. The default effect is one of the most notable contributions of behavioral economics, and research in this area continues to be active.

As we move forward, it is likely that behavioral economics will continue to be a fruitful area of research, shedding new light on the complexities of human decision-making.

Current Themes in Behavioral Economics

The previous part discussed the history of behavioral economics without going into detail on how behavioral economists may be used. This section will look at a number of contemporary challenges that behavioral economists explore in order to highlight the relevance of these ideas and the key themes present in the literature. Behavioral assessments of motivators and incentives; social factors; risk, heuristics, and biases; time and preparation; and the limitation of traditional economic theory to explain real-world decision-making are a few important themes and ideas from behavioral economics literature that are most relevant in revealing real-world decision-making challenges.

Motivators and Incentives:

As previously said, economics is largely concerned with incentives and motivations—money as an incentive, for example, in defining a decision to work as a balancing act in which earnings obtained motivate individuals to forsake leisure time (Richard H Thaler, 2016). Psychologists improve behavioral economics' understanding of motivation by differentiating between extrinsic and intrinsic impulses (Shefrin & Statman, 2003). Extrinsic reasons include all external rewards and punishments—money is the most obvious example, but physiological punishments, such as physical pain or discomfort caused by another or oneself, are another example (Rebitzer & Taylor, 2011). There are also internal reasons such as pride in a job well done, dutifulness, and intellectual engagement (Rebitzer & Taylor, 2011). Dan Ariely and his colleagues conducted some of the most well-known behavioral studies indicating that social characteristics impact experimental participants' willingness to donate to a charity or public

good: Individuals are more charitable when their contributions are made public than when their contributions are kept private (Ariely & Jones, 2008). Extrinsic monetary incentives may not always inspire work as much as intrinsic reasons. Students, for example, are often eager to labor for intellectual stimulation rather than monetary benefit. This illustrates that people are driven by more than only external incentives and disincentives like money, physical rewards/punishments, or social consequences (Ariely & Jones, 2008). Chess, computer games, and the physical challenges associated with sports all pique people's attention and enthusiasm even when no monetary rewards are provided.

It is, however, difficult to discern between internal and external motivations. There's also the problem of extrinsic motivation "crowding out" intrinsic motivation (Gneezy & Rustichini, 2000, 2004; Weibel, Wiemann, & Osterloh, 2014). Behavioral economists Uri Gneezy and Aldo Rustichini (2004) conducted study on this issue at an Israeli preschool. Due to the problem of parents being late to pick up their children, the preschool created a system of penalties for latecomers. However, the penalties had the unexpected effect of increasing rather than reducing the frequency of late pickups by parents (Gneezy & Rustichini, 2004). Gneezy and Rustichini (2004) related this to a crowding-out problem: offering incentives to fine crowded-out parents to come on time. Instead, parents regarded the penalty as a cost: they were paying for a service by paying a charge, thus it became an economic transaction in which timeliness became less essential. (Gneezy & Rustichini, 2000, 2004).

One set of motives that behavioral economists have spent a lot of time exploring is social incentives, which are best shown in what is possibly the most renowned behavioral experimental game: the Ultimatum Game, invented by Werner Güth (1982) and colleagues. (Güth, Schmittberger, & Schwarze, 1982). The investigator gives an experimental participant a sum of

money to distribute—say, $100—and asks her to propose that a portion of this money be donated to a second experimental participant, Mike. Tina's proposition is presented to Mike, who has the choice of accepting or rejecting it. If Mike rejects Tina's offer, none of them will get anything. Tina will be self-interested and make the lowest offer she feels she can get away with when she plays this game, according to traditional economics. In this case, she would give Mike $1, and if Mike is rational, he would accept $1 since $1 is better than $0. In reality, the proposers are quite generous, paying considerably more than the equivalent of $1 in a broad range of Ultimatum Game experiments, including research spanning cultures, socioeconomic factors, and even testing with monkeys playing the game for juice and fruit (Gale, Binmore, & Samuelson, 1995; Güth et al., 1982; Proctor, Williamson, de Waal, & Brosnan, 2013; Richard H Thaler, 1988). Respondents, on the other hand, often turn down even fairly big offers. What is the situation? Behavioral economists explain these and other results from analogous games in terms of people's social preferences (Gale et al., 1995; Richard H Thaler, 1988). People dislike observing unequal results; this is known as inequity aversion, which is divided into two types: unfavorable inequity aversion and helpful inequity aversion (Richard H Thaler, 1988). People have adverse inequity aversion when they do not want to suffer inequality (Gale et al., 1995; Sanfey, Rilling, Aronson, Nystrom, & Cohen, 2003; Richard H Thaler, 1988). Mike will exhibit unfavorable inequity aversion in the Ultimatum Game when Tina makes a low-ball offer, which may force him to reject quite large bids. Beneficial inequity aversion, on the other hand, is concerned with not wanting to see others treated unfairly, therefore Tina will not make the lowest viable offer to Mike because she considers it would be unfair. Unsurprisingly, individuals are significantly more concerned with unfavorable inequity aversion than advantageous inequity aversion, despite the fact that both have been proven in a large number of experimental tests to have a significant

influence on their attitudes toward generosity (Gale et al., 1995; Nowak, Page, & Sigmund, 2000; Sanfey et al., 2003; Richard H Thaler, 1988).

Social Factors:

In addition to these studies on social preferences, behavioral economists have looked at how social variables influence people's perceptions and decisions. These social elements may be divided into two categories: informational effects and normative influences (Baddeley, 2010; Deutsch & Gerard, 1955). The term "informational influences" relates to how individuals learn from other people. When individuals are unsure what to do or are confronted with a complex and unexpected series of potential outcomes, it makes sense to look at what others are doing, presuming that they may know more about the best course of action than they do (Banerjee, 1992; Deutsch & Gerard, 1955). Economists have examined this problem in terms of updating probabilistic estimates—in a seminal study, Banerjee (1992) offered a basic model of herd behavior in which sequential decision makers monitor preceding ones' actions and infer some information from them. He used this concept to explain why consumers pick restaurants based on popularity, even if they had secret indications about their quality. He demonstrated that, under some situations, rational people may disregard their own knowledge in favor of following the mob, resulting in wasteful consequences. He also explained ways to increase social learning by bringing some randomness or variety into the decision-making process (Banerjee, 1992). Banerjee's study on social learning, information cascades, and collective behavior has been highly quoted and significant in the field. People respond to informational signals in a reasonable way—perhaps not the extreme kind of rationality that underlies most of economics, but nevertheless reasonable—as a consequence of a logical thinking process (Baddeley, 2010; R. Thaler & Sunstein, 2008).

Normative social elements, which concern how individuals respond to requests from their social circles, are less obviously rational (Berg, 2003; Dold & Schubert, 2018). To comprehend these social factors, behavioral economics depends on key notions from social psychologists such as Stanley Milgram and Solomon Asch, as well as their colleagues. The electric shock experiments conducted by Stanley Milgram generated controversy (Burger, 2009; Milgram, 1974). An experimenter instructed participants to give what they thought were severe electric shocks to other people who were hidden from view. Milgram's volunteers were still able to hear the people who were purportedly receiving the shocks. These people were just actors, but the experimental participants had no idea, and a significant number of them (though not all) were willing to go through what they were told were life-threatening levels of shock: the actors allegedly experiencing severe pain, screaming, and, in some cases, going worryingly quiet after the shocks. Milgram said that his volunteers' willingness to participate in such heinous behavior demonstrated that individuals are sensitive to devotion to authority (Burger, 2009; Milgram, 1974). People prefer to do what they are taught, especially when faced with physically and intellectually challenging conditions (De Vos, 2009; Milgram, 1974).

Solomon Asch's research is another noteworthy set of social psychology experiments that affected behavioral economics (Asch, 1955). He devised a line experiment in which participants were directed to look at an image of a line and then match it with another line of the same length to assess conformity. This was a basic task, but Asch and his colleagues complicated it by exposing their participants to other people's guesses. Unbeknownst to its members, the groups voting online lengths included a sizable number of experimental confederates who had been instructed to lie about the length of the lines. Assume that twenty volunteers are gathered to execute the line job, but nineteen are conspiring with the researcher and just one is genuine.

What would the twentieth, real participant does if the others all provided stupid, inaccurate responses to this simple question about lines? When Asch and his colleagues saw others making inaccurate answers, some of the real participants (though not all) changed their minds and responded in a plainly incorrect manner. In other words, many people seemed to be inclined to ensuring that their replies resembled those of the other participants in their group, without taking into account the chance that these people were incorrect or lying (Asch, 1955; Larsen, 1974). The emotional emotions of the individuals were mixed. Those that stuck to their earlier comments did so with assurance. Conformists who altered their replies to fit in with the group had a variety of reactions, with some experiencing painful self-doubt and others blaming other participants for their mistakes (Asch, 1955; Baddeley, 2013; Larsen, 1974). Why would someone reconsider what seems to be an evident wrong answer? This experiment does not provide an answer to the question of logical versus illogical conduct. It may be illogical to respond incorrectly just because you witness others doing so. Another hypothesis, consistent with rational decision-making, was presented by Nobel Laureate economist Robert Shiller: maybe the real participants believed that it was considerably more likely that their single assessment was erroneous than that nineteen others were mistaken (Shiller, 1995, 2002) . They weighed the odds and determined that the chances of such a large number of other people being wrong were tiny, so it made sense to follow them (Shiller, 1995, 2002).

In general, as seen in the restaurant example above, many individuals use the choices and behaviors of others to guide their own decisions and actions. When individuals imitate others, they are using a rule of thumb—a fundamental decision-making method that helps us navigate challenging situations, especially ones marked by information and choice overload (Gilovich, Griffin, & Kahneman, 2002). The pervasiveness of online information and reviews is another

way individuals use knowledge about others' actions and behaviors as advice in today's society. People, for example, will examine what others have done and what others think before buying a new computer or booking a hotel room. When faced with a huge quantity of information and several alternatives, it makes sense to follow others and use what behavioral economists refer to as a herding "heuristic." Following the herd is a straightforward way to make a choice. This leads us to the vast and significant literature on heuristics and bias, which evolved because of Daniel Kahneman's and Amos Tversky's extensive experimental work on the subject.

Risk, Heuristics, and Bias:

Heuristics are cognitive methods or shortcuts that people utilize to make decisions easier (Gilovich et al., 2002). Individuals may use mental shortcuts to make rapid and efficient judgments based on limited information. Heuristics have been widely researched in psychology, economics, and computer science (Gilovich et al., 2002; Kahneman & Frederick, 2002). Heuristics have been studied in the area of psychology via numerous theoretical frameworks such as prospect theory, which examines how people make judgments under uncertainty (Kahneman & Tversky, 1979), as well as the recognition heuristic, which proposes that individuals utilize recognition as a signal to make decisions (Goldstein & Gigerenzer, 2002). Heuristics have also been used to explain cognitive biases such as the availability bias, which happens when individuals depend too much on easily accessible information (Tversky & Kahneman, 1973). Heuristics have been explored in economics in the context of decision-making under risk and uncertainty. Researchers have investigated the influence of heuristics on financial decisions such as investing behavior (Barber & Odean, 2001) and the use of credit cards (Soman, 2001).

The accessibility Heuristics are focused with using readily available information—either recent happenings, early moments, or emotionally intense or engaging experiences (Tversky & Kahneman, 1974). People's memories of such salient information influence their risk assessments. A common example is the impact that colorful and sensationalized news items have on people's judgments, which is connected to a kind of availability heuristic known as the affect heuristic (Dale, 2015; Tversky & Kahneman, 1974). For example, vivid reports of terrible airline and train disasters remain in people's minds, prompting them to avoid flights and trains, despite the fact that people are far more likely to be run over by a vehicle when crossing the street, which they do every day without thinking twice about (Kliger & Kudryavtsev, 2010; Tversky & Kahneman, 1974). People overestimate the risk, assuming that airplane and railway collisions are more likely than pedestrian accidents because information on aviation accidents is far more publicly disseminated, readily accessible, and memorable (Gilovich et al., 2002; Kliger & Kudryavtsev, 2010; Tversky & Kahneman, 1974).

The representation Heuristic judgements are about analogy assessments—people evaluate the likelihood of separate occurrences based on their similarity to things they already know about (Dale, 2015; Tversky & Kahneman, 1974). Kahneman and Tversky asked participants in many of their experiments to read a person's profile and evaluate whether it described a lawyer or an engineer. Many of their participants estimated the likelihood that a person described was a lawyer or an engineer based on how well the profile matched their preconceptions and assumptions about attorney versus engineer features (Tversky & Kahneman, 1974).

Anchoring and adjustment are concerned with the manner in which individuals make decisions in regard to a reference point (Dale, 2015; Tversky & Kahneman, 1974). In Kahneman and Tversky's tests, for example, when participants were asked to estimate the number of African

governments in the United Nations, their replies might be influenced by first having them spin a wheel to receive a number. Those who rolled a lower number predicted a lesser number of African states in the United states (Tversky & Kahneman, 1974).

Another important contribution made by Kahneman and Tversky stems from their research on heuristics and bias: their own independent behavioral theory of risk, called "prospect theory" (Kahneman & Tversky, 1979). Prospect theory arose as a result of a series of behavioral studies that exposed numerous fundamental flaws in expected utility theory—economists' traditional explanation of risk (Edwards, 1996). There are several differences between these two approaches to evaluating hazardous decision-making, but one of the fundamental assumptions of expected utility theory is that people's risk preferences are stable: if someone is a risk-taker, they are a risk-taker (Levy, 1992). They will not modify their thoughts even if the risky alternatives provided to them are phrased differently. This pertains to three key components of prospect theory: In prospect theory, risk preferences change (Levy, 1992). People's risk preferences fluctuate according to prospect theory. People, for example, are more willing to take risks in order to avoid losses, which ties to a key concept from prospect theory known as "loss aversion" (Edwards, 1996). People will make the same choice whether they are facing losses or gains, according to traditional economics, regardless of the absolute size of the influence on them (Edwards, 1996). Individuals, however, respond differently to losses and profits, according to prospect theory—people worry far more about losses than they do about wins, and one facet of this is that people would take bigger risks to prevent losses than they would to obtain advantages (Edwards, 1996). This also ties to a crucial part of prospect theory. People make decisions depending on their starting points, which are frequently the status quo or their starting positions

(Barberis, 2013; Kahneman & Tversky, 1979). This feature is closely related to the anchoring and adjustment heuristics discussed above.

Time and Preparation:

Another branch of research in behavioral economics is based on basic insights about people's ability to plan their choices and decisions across time. According to standard economic theory, people acquire persistent preferences for time, just as they do for risk (Barberis, 2013). This means that it doesn't matter whatever temporal horizon they look at. People that are impatient are impatient regardless of the situation. Behavioral economists question this view of how individuals plan and make decisions over time, citing significant evidence from psychological testing that people are too impatient in the short term—a condition known as present bias (Barberis, 2013; Edwards, 1996). People prefer benefits and expenditures that occur sooner than those that arrive later. When people compare spending on their credit card today versus spending on their credit card in a year or a year and a day, standard economics predicts that their decisions should be time consistent: if they choose to spend today, they should also prefer to spend in a year and a day; and if they prefer to spend in a year and a day, they should also prefer to spend tomorrow (Barberis, 2013; Levy, 1992). However, behavioral studies show that individuals are more impatient in the short term than in the long term: they prefer to spend today over tomorrow, but when planning for the future, they prefer to spend in a year and a day rather than a year (Barberis, 2013). People place a premium on instant pleasure. Behavioral economists like as David Laibson have incorporated this in models of discounting that differ from those used in orthodox economics, most notably hyperbolic discounting (Laibson, 1997). This is more than just an intellectual curiosity since it has practical implications, explaining anything from procrastination to addiction. People may postpone costly or unpleasant behaviors

due to present bias. It might also explain a wide range of negative behaviors as well as a lack of good ones. Stefano DellaVigna and Ulrike Malmendier, economists, conducted an eye-opening experiment in their study of gym-going habits. They noticed that some clients signed up for yearlong contracts and then only attended to the gym a few times, despite being offered pay-as-you-go membership as an alternative (DellaVigna & Malmendier, 2006). Over the course of a year, and sometimes longer, these seldom gym-goers were basically paying excessive costs for each visit that they would not have had to pay if they had more accurately predicted their future behavior when they signed up for the gym. Normal economic analysis makes this difficult to explain, but when behavioral economists account for present bias, this behavior becomes comprehensible. Gym-goers desire to go to the gym often, but when forced to choose between going to the gym and another (more) enjoyable activity, they change their plans (DellaVigna & Malmendier, 2006).

Present bias might also explain why individuals overeat and struggle to stop smoking, drinking, and using drugs (Eric J. Johnson et al., 2012; O'Donoghue & Rabin, 2015). There are other differences, such as how some individuals deal with their tendency for present bias. Because more intelligent decision-makers realize their present bias, they use commitment devices to bind their future selves. They may, for example, freeze their credit card in a block of ice to prevent their future self from participating in irresponsible purchasing sprees (O'Donoghue & Rabin, 2015; O Donoghue & Rabin, 2006). The fact that individuals are not all equally sensitive distinguishes present bias from other biases (O'Donoghue & Rabin, 2015). Some individuals have stronger self-control than others, and there is a growing corpus of study on individual differences, including personality variables, and the role they play in understanding their varying susceptibilities to behavioral bias (O Donoghue & Rabin, 2006).

Limitation of Traditional Economic Theory

The conventional or "neoclassical" economic model of consumer behavior contains critical assumptions about how individuals act. Traditional economic theory holds that people understand what would make them the best off, and that they achieve this state (given the resources and wealth at their disposal) by making rational choices among the options available (Urbina & Ruiz-Villaverde, 2019). Based on market information and their own experiences, they may deduce quality and cost. They are not fooled by false assurances or affected by advertisements. Individuals entered the market with predetermined preferences and likes merchants cannot convince them of what they want since they already know. In such a circumstance, and if markets are working well—for example, prices are not inflated by the behavior of dominant companies, and information about alternatives is readily available—then government participation in a well-functioning market can only do one thing: obstruct it (Hummel & Maedche, 2019; Szaszi et al., 2018).

In their book Nudge, Thaler and Sunstein vividly illustrate this theoretical discovery by differentiating between two categories of being: mythological Econs and genuine Humans (Richard H. Thaler, 2008). Humans act like...humans, whereas economists act hyperrational. Homo economicus, or rational economic man, is a word that dates back to the eighteenth century (O'Boyle, 2009; R. Thaler & Sunstein, 2008). Traditional economists are seen to make irrational decisions, always selecting the solutions that are most likely to benefit them (Doucouliagos, 1994; Urbina & Ruiz-Villaverde, 2019). They have already developed their preferences before entering the marketplace (Urbina & Ruiz-Villaverde, 2019). They maximize completely—that is, they do not settle for "just acceptable," which is referred to in the literature as "satisficing"(Mohamed, 2006; H. Schwartz, 2002). Finally, a classical economist would make

decisions only based on self-interest, not envy or benevolence (Doucouliagos, 1994). There is also no room for intrinsic motivation. It's tough to see why an Econ would donate to charity, recycle, or volunteer if there was no financial motivation (Frey, Savage, & Torgler, 2010; Richard H. Thaler, 2008).

2.3 Behavioral Economics in Clinical Decision Making

Over the last 2-3 years, one of the most significant advancements in clinical decision support has been the use of behavioral theories and methodologies from behavioral economics and other fields such as social psychology to improve the probability of success (I. Cho & D. Bates, 2018). The process of assessing and comparing the possibilities, risks, uncertainties, and alternatives for selecting a course of action is referred to as clinical decision-making (Croskerry, 2003; Elstein, 2002; Leonard, 2008). The use of clinical decision making has resulted in several advantages, including pharmaceutical safety, diagnostic test ordering, and cost-cutting measures. However, the implications on practice have often been minor, with any influence on clinical outcomes remaining unclear in the majority of cases (I. Cho & D. Bates, 2018; Greenes, 2011; Jaspers, Smeulers, Vermeulen, & Peute, 2011; Pearson et al., 2009). Clinical decision making will most certainly grow more sophisticated, particularly to the utilization of new methodologies such as big-data analytics and machine learning. However, if doctors opt to apply the proposed techniques will have a significant impact on any therapeutic effect. Historically, most clinical decision making methods assumed that clinicians are rational, thoughtful, and would react favorably to evidence-based recommendations (Elstein, 2002; Greenes, 2011). Behavioral theories, on the other hand, imply that clinicians make judgments quickly and often participate in instinctive behaviors, and so their decision-making may be best impacted by emotional and social aspects through strategies such as nudges and other types of social incentive

(J. S. Blumenthal-Barby & Heather Krieger, 2015; Gong, Hay, Meeker, & Doctor, 2016; Hallsworth et al., 2016; Ranji et al., 2006).

According to traditional economic theory, people operate as fully aware and rational agents. Behavioral economics, on the other hand, integrates essential features of economic theory with psychological insights into frequent biases that impact decision-making (Ariely & Jones, 2008; Kahneman, 2011). According to behavioral economics, decision-making contains predictable biases, which permits designed interventions to anticipate and counteract biases to achieve socially acceptable results, and even modest modifications may have a large impact on the decision-making environment (Richard H. Thaler, 2008). For example, using proper default settings may have a significant influence and nurture positive results (I. Cho & D. Bates, 2018; Gong et al., 2016; R. Thaler & Sunstein, 2008). Many studies have been conducted to improve financial habits, such as automatically enrolling workers in voluntary retirement savings plans while still giving them the option to opt out (Richard H. Thaler, 2008). The impact of behavioral economics on behavior in many fields has heightened interest in its use in health care (Hough, 2013; Lee, 2006; Platt & Huettel, 2008). Behavioral economics insights may be utilized to increase the chance of a successful clinical decision making.

Behavioral economics and psychology studies have recorded and analyzed many of the habits, biases, and tendencies that underpin decision-making, especially those that depart from what economic theory predicts. These variations are not random or insignificant; rather, they indicate regular patterns of cognitive biases with huge ramifications for health care (Rice, 2013).

In recent years, behavioral economics has been applied to health care. A thorough literature study of cognitive biases and heuristics in medical decision-making discovered categories, with loss/gain framing bias, relative-risk bias, availability bias, and omission bias

being the most studied (Jennifer S Blumenthal-Barby & Heather Krieger, 2015; Rao, Afshin, Singh, & Mozaffarian, 2013). 68% of the studies discovered a bias or heuristic, and 34% evaluated doctors (J. S. Blumenthal-Barby & Heather Krieger, 2015). Behavioral economics tools, such as clinical decision making, have lately been used to improve clinical care quality. For example, sending a letter to the top 20% of antibiotics prescribers in England saying that their practice was prescribing antibiotics at a greater rate than 80% of United Kingdom's National Health System (NHS) Local Area Team practices resulted in much less antibiotics being distributed (Hallsworth et al., 2016).

Behavioral economics is also strongly tied to strategies for improving clinical care quality, which usually depend on modifying physicians' behavior, such as minimizing unnecessary treatments or diagnostic tests. Several studies have looked at consensus-recommended best practices for planning and executing quality-improvement interventions such as provider education, audits and feedback, checklists, frontline personnel or target groups, or offering direct financial incentives (Ranji et al., 2006). However, it is unclear if these strategies impact clinician behavior. Another strategy is to use behavioral science principles to influence behavior, such as employing social signals and small adjustments in the therapeutic setting. Related research has used behavioral science models to uncover novel social and cognitive technologies for gently influencing physician decision-making while retaining their freedom of choice (Loewenstein, Brennan, & Volpp, 2007). With proper acceptance and reactions to clinical decision making, such techniques help to achieve the objective of effective, evidence-based therapy in health care. Default effect is a behavioral economics idea that have often been explored in clinical decision research. Below, are case examples relevant to this behavioral economics method.

In behavioral economics, the idea of opting out is known as default effect. Opt-out indicates that a preferred behavior occurs automatically but may be ignored, whereas opt-in indicates that deliberate steps are required to conduct a chosen behavior. Opting out simplifies the target behavior and firmly conveys the recommended course of action. The tendency of favoring the existing condition of events is known as status-quo bias. Such conduct is plainly dangerous, and well-known examples of government initiatives that maintain the status quo include a government plan in the United States for opting out of retirement savings (Leonard, 2008), the Save More Tomorrow program (Richard H. Thaler & Benartzi, 2004), and an organ donation program (Eric J Johnson & Goldstein, 2003).

Bourdeaux et al. (2016) investigated the impact of employing default ventilator settings commensurate with modest tidal-volume objectives and a big dashboard with alarms for high tidal volumes in a tertiary hospital's surgical intensive-care unit (Bourdeaux et al., 2016). They looked at 2,144 consecutive patients who received regulated mechanical breathing for more than an hour and discovered that changing the default ventilator settings and utilizing a dashboard can have a significant impact on clinical decision-making. Schuler et al. used the same technique to modify the antibiotics order set for discharge prescriptions, with the goal of reducing the length of antibiotics prescribed for uncomplicated epidermis and soft-tissue infections in a children's hospital, and discovered a sustained improvement in prescribing practices over a six-month period (Schuler et al., 2016). Default bias may be helpful since it provides providers with a default choice that optimizes benefits while minimizing risks.

2.4 Behavioral Economics in Healthy Lifestyle Choices

As a technique to promote healthier behavior, nudging may be used as a theoretically grounded and potentially effective way to help individuals make healthier lifestyle choices.

People have multiple opportunities throughout a day to make lifestyle choices, whether its deciding what to eat, what to do or how active someone is. The opportunity to make a healthy food choice can occur in many settings, whether at the coffee shop, fast food restaurants, or in the home kitchen. Many researchers have examined and conducted field experiments and the implementation of nudges in the real-world environment demonstrate that these behavioral economic theories are viable solution to improving one's healthy behaviors. These can be categorized in three primary nudge orientation: behavioral nudges, cognitive nudges, and emotional nudges. Each category can have several nudge techniques (Cadario & Chandon, 2019).

Behavioral Nudges

Behaviorally oriented nudges aim to affect individuals' actions without them having to be aware or knowledgeable of what is happening. They have access to select from a variety of options, including options that are healthier. Nonetheless, the desired behavior is the easiest in decision-making such as when the item is more conveniently placed by the cash register or the default options already selected (Hansen, Schilling, & Malthesen, 2019; Kroese, Marchiori, & de Ridder, 2016). In the study by Hansen *et al.*, they increased the number of vegetarian lunches chosen by attendees of a conference from 2% to 87%, merely making the vegetarian meal a default choice when they were registering for the conference. The participants still had the opportunity to change to other meal options, but 287 out of 333 participants stuck with the vegetarian default option.

Convenience: Across all settings such as retail stores, fast food restaurants, hospital cafeterias, elementary schools, or universities, when the researcher made the food choice more effortless and more convenient, they realized a positive increase in the desired behavior. In

additional to the example above other convenience nudges are placing desired items at the checkout counter, placing vegetables first in the cafeteria line, or prepackaging products as ways to make the healthy selection the easy one.

In studies where researcher surveyed participants after the behaviorally oriented nudge choice occurred, most participants did not notice a difference. Even though they were not aware, as high as 76% of customers in one study were positive about being helped to make healthier choices (Kroese et al., 2016). Furthermore, many of the participants surveyed did not think that the behavioral nudge made a difference in their selection, while the results were clear that indeed it did. One can say that these techniques are effective without much personal effort.

Container Size: A second behaviorally oriented nudge is by changing the size of the food container, such as a plate, a bowl, a cup, or anything that food is contained in. Reducing the plate size correlates to the reduced amount of food someone serves for themselves, consumes, and even waste. The opposite is true with larger containers. This effect is even more remarkable when people are not aware that the plate is larger or smaller. According to this study, "Chinese buffet diners with large plates served 52% more, ate 45% more, and wasted 135% more food than those with smaller plates" (Wansink & van Ittersum, 2013).

Of the three studies that evaluated the impact of food container size, both field studies and laboratory studies concluded that the container's size directly correlates to food amount. Two studies showed that if the patrons had an example of a target amount of food, the participants could meet the target even with different size containers (Van Ittersum & Wansink, 2012; Wansink & van Ittersum, 2013).

Cognitive Nudges

Cognitive nudges appeal to a person's rational and intellectual reasoning. This type of nudge seeks to influence what people know. The two types of cognitive nudges described in this review use labeling and visual enhancements.

Labeling: The label styles described in the review consist of nutritional labeling with information such as calories, fat contents, or sugar. It also consists of health labels such as the recommendation of daily calorie intake or daily fat/sugar intake recommendations. Nutrition labels describe the nutrition of a food item. This detail involves the meal's size, the number of portions in the container, the calories per serving, and the sum of different nutrients in the food. With the understanding of nutrition labels, a person should adopt a balanced lifestyle and make it easy to select the most nutritious food.

Health labels go beyond nutrition content but offer a recommendation for what to eat and how much of it. The US Food and Drug Administration provided Daily Value and % of Daily Value recommended amounts of nutrients to consume or not to exceed each day such as Calories, Sugar, Fat, Cholesterol (Variyam, 2008). The studies with only labeling interventions alone, whether with nutritional labeling or health labeling, had small or no effect on food selection and calories consumed (Bollinger, Leslie, & Sorensen, 2011; Downs, Wisdom, Wansink, & Loewenstein, 2013). Nutrition labeling had a role in the sustainability of a future selection when combined with another nudge, but alone had negligible effect. There was a lot of interest on the effectiveness of health labels when New York City required restaurants to post caloric content next to its price on the menu boards in 2008 (Julie S. Downs, George Loewenstein, & Jessica Wisdom, 2009; Severson, 2008).

Visual Enhancement: The second type of cognitive nudge uses visual enhancements. Visual enhancement does not explicitly include wellness or nutrition information; it is cognitively focused since it advises customers of health choices by making the item more visible to the consumer, therefore increasing the chances of it being selected. An example of this type of nudge is water bottles' placement at eye level in a cooler while sodas are at the lower level, further away from eye level (Van Gestel, Kroese, & De Ridder, 2017). Another example is through color-coding (green is healthy, red is unhealthy, and yellow is moderately healthy), or through unique icons such as smiley face for healthy and frown face for unhealthy.

Both Labeling & Visual Enhancement: The studies that used nutritional labeling intervention alone, such as posting calorie value for each menu item or providing the recommended calorie per meal and per day, without any other nudge, had small or no effect on food calories purchased. (Bollinger et al., 2011; Downs et al., 2013). When combined with visual enhancements, the results improved. These studies started with nutritional information only; then, they added a visual cue such as an emoticon, stoplight color, or graphic warning label. When the visual enhancement was added, one study decreased sugary drink purchase from 21.4% to 18.2%, while another study increased the healthy chips sale by 5.4% over the less healthy option (Donnelly, Zatz, Svirsky, & John, 2018; Mazza et al., 2018).

Furthermore, when a cognitive nudge is combined with the behavioral nudge, the results showed more desirable results than compared to a cognitive nutritional labeling nudge alone(Julie S Downs, George Loewenstein, & Jessica Wisdom, 2009; Kroese et al., 2016; Thorndike, Sonnenberg, Riis, Barraclough, & Levy, 2012). At a fast-food restaurant study, the researchers provided the participants with a menu with each food item's calories and recommended calorie intake according to health experts (Elbel, Kersh, Brescoll, & Dixon, 2009).

The researchers did not see any effect when providing just calorie information or recommendations (p =0.18 and p=0.92), respectively. When the researcher changed the position of the food items so that the lower-calorie items were in the front of the menu and the higher-calorie items were in the back of the menu, in addition to the nutrition labeling, participants were 48% more likely to choose a low-calorie sandwich. Inversely, the opposite also occurred, when the participants were presented with a menu with higher-calorie sandwiches in the front, they were 47% less likely to choose the healthier sandwich option (Julie S. Downs et al., 2009).

Some people may wonder what the role of nutritional labeling is if it has so negligible effect on participants' food selection. When combined with other nudge techniques, education, and understanding of the nutritional value and benefits have shown to be the reason why healthy choices continue after the nudge intervention stops (List & Samek, 2015). Without the nutritional label and understanding of what they mean, the desired behavior quickly ends when intervention stops. This finding is important since this can have real life applications.

Emotional Nudge

Emotional nudges aim to affect how someone makes a selection by provoking how they feel about their choice. You might have heard the phrase, "don't go to the grocery store hungry." Studies have shown that how people chose is heavily tied to internal sensory cues, ambient sensory cues, and other emotional cues such as the feeling of hunger (Koch, 2013; Wansink & Chandon, 2014). Studies have identified two emotional nudge techniques that aim to provide a positive feeling or offers a visual or verbal reminder.

Positive feeling: One kind of emotional nudge technique provokes a positive feeling, such as a compliment or a reward for making the desired choice. Unlike a behavioral or cognitive nudge, which influences what they do or what they know, an emotional nudge triggers

a feeling response. An evolving neuropsychology trend believes that emotions interact with and affect other dimensions of cognition, such as attention, memory, and reasoning (Dolan, 2002). A positive message or gift either before or after the desired behavior showed a positive predictor for the desired behavior. One study of elementary students showed a more substantial number of students choosing white milk's desired behavior over chocolate milk when given a gift before the selection was made. The desired behavior was also great than the students who made a commitment to choosing the healthier option (Samek, 2019). For sustained behavior, the combination of a positive feeling act (emotional nudge) with an educational message (cognitive nudge) showed as an effective combination (Janet et al., 2014; Samek, 2019).

Visual or Verbal Reminder: Another type of emotional nudge technique uses verbal or visual reminder such as asking, "Would you like fruit with that?". Studies with emotional nudges have strong positive correlation between the intervention and desired behavior (Allan & Powell, 2020; Chernev, 2011; Donnelly et al., 2018; Mazza et al., 2018; Shrestha, Pedisic, Neil-Sztramko, Kukkonen-Harjula, & Hermans, 2016). This is true across various research settings such as elementary school, grocery store, cafeteria-like restaurant, and various subjects such as children and adults. An everyday visual and audio reminder that most people have experienced is the seatbelt warning in a car (Kleef, Broek, & Trijp, 2015). Using a reminder prompt to select a vegetable, buy fruit, or drink more water has also shown to be effective (Kleef et al., 2015; Lai, List, & Samek, 2020; List & Samek, 2015; Miller, Gupta, Kropp, Grogan, & Mathews, 2016).

Both Positive Feeling and Reminder: Studies also showed that combining emotional nudges with other nudges, such as behavioral or cognitive nudges, can increase the desired effects of healthy food selection further (Lai et al., 2020; Miller et al., 2016). When a group of students was given the option to pre-order their meal, a behavioral nudge, they increased fruit

selection by 27% and vegetable selection by 15%. Also, when there was the reminder message that, "Your order does not look like a balanced meal," this increased the fruits and vegetable selection to 51% and 30%, respectively (Miller et al., 2016).

2.5 Behavioral Economics in Policy Development

A compelling case can be made that behavioral economics give itself well to the economics of health care, a domain in which consumers frequently lack or have difficulty comprehending information in the face of a multitude of critical choices, where a wrong choice can have tremendous negative consequences, and where people's decisions do not always appear to be in their long-run best interests (K. J. Arrow, 1978; Janice & Barbara, 2016; Rice, 2013). In this regard, Richard Frank proposes that if one considers the salient economic institutions of the health sector, one may anticipate that sector to be a fertile ground for applying behavioral economics (Frank, 2007).

This section examines some recent research that demonstrates the importance of behavioral economics to understanding health and health care decisions. It is separated into numerous parts that target specific policy concerns such as organ donation, health insurance enrollment, option simplicity, cigarette use reduction, and obesity. This research concentrates on applications related to consumer choice making, which is the subject of this research analysis, rather than provider or institutional decision making.

Organ Donation:

Organ donation is an excellent candidate for an evident success in the use of behavioral economics to health-related decisions. Most nations have a chronic shortage of organs for transplant, and casualties of traffic accidents are a major source. When applying for or renewing a driver's license in most US states, people specify whether they want to be an organ donor, and

as of 2009, 43% of US drivers were enrolled in state donor registries (America, 2011). In a society dominated by conventional economic thought, the sole factor determining whether a person decided to be a donor would be if the mental advantages he or she gained (say, by aiding a stranger in the most significant way) outweighed the emotional costs (e.g., the wishes of their family, religious, social pressure, or other personal convictions).

However, the truth is completely different. Desire to donate organs differs widely by country and state within the United States. According to Johnson and Goldstein, a 2003 survey found that willingness rates were nearly 100% in Austria but just 12% in neighboring Germany, and 86% in Sweden against 4% in Denmark. Rates range from 79% in Alaska and Montana to 1% in Vermont and 12% in Texas (Eric J Johnson & Goldstein, 2004; Rice, 2013). These distinctions are crucial. The Department of Health and Human Services estimates that 18 individuals die each day in the United States while waiting for a transplant (Services, 2021).

The variances in the data for the nations mentioned above are attributable to the way the contribution option is presented. In nations with extremely high rates, one is assumed to be willing to be a donor until one expressly opts out, indicating an unwillingness to participate. Only by expressly providing permission is one believed to be willing to give in the countries with the lowest rates. One possible compromise would be to mandate that, while renewing a driver's license, a person expressly state (by ticking one of two boxes) whether he or she is willing or unwilling to be an organ donor (Janice & Barbara, 2016). Because there would be written proof of the decedent's choices, this strategy would also make it simpler for family members to support the decision. The United Kingdom recently implemented such a policy, in accordance with the suggestions of its "Nudge Unit," as mentioned below (Pelle Guldborg & Andreas Maaløe, 2013; Richard H. Thaler, 2008).

Not surprisingly, in such a very personal issue as organ donation, the ethical concerns are nuanced. One may argue, as Thaler and Sunstein do, that mandating an opt-out mechanism is a government overreach since it suggests that individuals who do not go to the bother of expressly opting out want to be contributors (Leonard, 2008; Richard H. Thaler, 2008). However, one can make the opposite argument: if a person does not explicitly choose to be a donor, he or she may still want to be after a fatal accident, but either (a) did not understand their options while alive or (b) did not want to consider the organ-donation decision because it was too painful to consider.

Enrollment in Government-Sponsored Health Insurance Program

Traditionally, enrolling eligible people and families in health insurance programs to which they are entitled has appeared to be an insurmountable task. According to Kenney et al., five million children might be insured under the Children's Health Insurance Program (CHIP), but their parents have not joined up (Kenney, Cook, & Dubay, 2009). Traditional economics struggles to explain this, but behavioral economics provides insights into how to enhance enrolment (Blumenthal-Barby & Burroughs, 2012).

In the case of CHIP, the reframed problem is not an absence of a parent's interest. Rather, it is a lack of awareness of qualification and registration procedures, as well as administrative hurdles erected by state agencies, which are frequently unintended. To improve the number of children receiving these benefits, the US Department of Health and Human Services established a $200 million bonus pool in 2010, which was made available to specific states who were successful in redesigning their registration processes (Cassidy, Guyer, & Kenney, 2011). States might get incentives if they completed at least five of the eight simplification processes and demonstrated that enrollment increased more than it would have without. These practices included determining CHIP eligibility using information from other state programs, completing

forms for applicants using data already accessible to the state, removing in-person interviews, and not requiring enrollment renewal for a full year (Cassidy et al., 2011).

Baicker and colleagues recently addressed the broader subject of how behavioral economics might help improve enrollment rates in public health insurance plans (Baicker, Congdon, & Mullainathan, 2012). The authors investigate why take-up rates among people who are already qualified for coverage are so low, concluding that several factors are likely contributors: problems understanding the costs and benefits of alternatives, the sheer amount of choice, a bias toward the present over the future, a misunderstanding of the degree of risk faced, and issues associated with how individuals frame the problems in their own minds (e.g., being turned off by the certainty of paying a small premium in comparison to the lack of certainty that they will use program benefits). Sommers and colleagues concluded in a similar study that suggested that states will need to offer comprehensive insurance of needed benefits; offer community-based outreach; and consider more significant changes to their enrollment procedures, such as automatically enrolling people in Medicaid based on their participation in other programs (Sommers, Tomasi, Swartz, & Epstein, 2012). Indeed, the exact causes for low take-up, which differ in every insurance program, are critical in selecting the most successful policy measures. If social stigma is a concern, automatic enrolment or, at the very least, not needing in-person interviews could be a beneficial approach (Bansak & Raphael, 2007; Blumenthal-Barby & Burroughs, 2012).

Prescription Drug Insurance Plan Selection Simplified

In 2006, the Medicare program added a new prescription medication benefit. Enrolling in private healthcare insurance programs provides access to these benefits. Because the federal government covers 75% of premium expenses, it is often in the best interests of Medicare

beneficiaries to join if they do not have a suitable retiree Medicare-supplemental insurance policy that provides coverage for prescription drugs or if they are not eligible for Medicaid (Hanoch, Rice, Cummings, & Wood, 2009).

In many aspects, the program has been a success: enrollment and satisfaction are high, and typical premiums have been at or below initial predictions. However, there have been issues, which derive in part from the vast number of plan options offered. For the first several years of the program, the average Medicare recipient had 45 different prescription plan options. Medicare has sought to eliminate some of the unpopular alternatives during the last two years, but most states still have 30 different plans to select from (Gruber, 2009; Heiss, Leive, McFadden, & Winter, 2013).

This broad selection has created what some see as a dilemma. Few consumers choose the most cost-effective plans, which are those that reduce the amount of premium payments and out-of-pocket copayments (Hanoch et al., 2009). According to Gruber , fewer than 10% of registrants choose the lowest plan; comparable findings were achieved in a different research by Heiss and colleagues (Gruber, 2009; Heiss et al., 2013). According to Abaluck and Gruber, if just three options were available, societal welfare would be maximized (Abaluck & Gruber, 2011). Although there are open enrollment periods each year during which customers can switch plans, nearly no one does, which is consistent with the status quo bias reported in behavioral economic research. However, subscribing to a less expensive plan may save you $300-500 each year on average (Abaluck & Gruber, 2011; Domino, Stearns, Norton, & Yeh, 2008; Heiss et al., 2013). Similarly, Heiss and colleagues found that it may save Medicare billions of dollars every year because the program covers 75% of premium expenses (Heiss et al., 2013).

The traditional economic approach would be to educate them with knowledge to help them make better decisions, but Medicare has already done that. To locate the lowest cost plan, contact a toll-free number or visit a website; in either case, supply information on each medication you are taking. The book Nudge offers an entertaining anecdote of how Thaler and various members on his team all tried entering the identical prescription information; each came up with a different cheapest strategy (Richard H. Thaler, 2008).

Various behavioral interventions have been proposed to address the issue that, despite having access to knowledge, people do not appear to be making appropriate decisions. One strategy is to give less information about each treatment plan so that consumers may focus on the most crucial details. Barnes et al. discovered that employing symbols such as stars rather than numbers made it easier for most people to understand (Barnes, Hanoch, Wood, Liu, & Rice, 2012). Another approach is to limit the number of options. Rice and Cummings offered a system in which the Medicare program would make the first cut, reducing the number of application plans to a dozen or so by selective contracting based on benefits and rates, and only those would be available to customers (Rice & Cummings, 2010). An even more successful strategy would be for the Medicare program to determine how much each plan would cost a beneficiary based on the specific prescriptions they used the previous year, and then notify each individual of the lowest plan. One might even go so far as to enroll them on the lowest plan automatically. This technique, however, would almost certainly meet political opposition because most insurers would lose subscribers consequently.

Tobacco Use policies

Traditional economic techniques, such as boosting tobacco pricing through taxes and giving information about the dangers of smoking, have proven fairly effective in lowering

tobacco usage (Frazer et al., 2016; Saffer & Chaloupka, 2000). Furthermore, several rules aiming at secondhand smoke have made smoking more uncomfortable for people (for example, restricting smoking in office buildings forces people outside in all types of weather). Nonetheless, smoking rates are far higher than public health experts would want (Callinan, Clarke, Doherty, & Kelleher, 2010). Men's smoking rates plummeted from 46% to 27% in 16 Organization for Economic Cooperation and Development (OECD) nations between 1980 and 2004, whereas women's rates fell significantly less, from 28% to 20% (Blades, 2007).

The smoking rate in the United Kingdom is close to the OECD (Off, 2012). The Cameron government established the Behavioral Insights Team (BIT) in 2010, which the press branded the "Nudge Unit" (Team, 2011). One set of demonstration projects is typical of behavioral economic interventions: encouraging individuals to sign stop smoking contracts and rewarding those who do (Off, 2012; Team, 2011). Another approach, possibly even more inventive since it encourages narcotic addiction, is pushing the use of electronic cigarettes (Team, 2011).

In its most recent annual report, BIT urged policymakers to explore regulating e-cigarettes, which provide nicotine vapor while one "smokes" an artificial cigarette but do not appear to have the same negative health consequences as traditional smoking (Team, 2011). The behavioral assumption is that it is simpler to induce individuals to engage in a related activity than it is to totally erase the habit. BIT claims that it has the potential to save tens of thousands of lives in the United Kingdom (Off, 2012). It is critical to emphasize that the advice is for more regulatory effort to create and approve safe products, not for the development of a broad program encouraging the use of e-cigarettes (Off, 2012; Team, 2011). Indeed, these devices are still fraught with controversy: most anti-smoking organizations in the United States oppose their

usage until they are authorized by the Food and Drug Administration (Cahn & Siegel, 2011; Schraufnagel et al., 2014).

2.6 Patient-Provider Concordance – inequitable utilization of healthcare services

Race and racial differences in health care have been widely established (Chen, Vargas-Bustamante, Mortensen, & Ortega, 2016; Alyson Ma, Alison Sanchez, & Mindy Ma, 2019). Despite advancements in medical technology, medication and general health in the United States, ethnic and racial minorities remain to have lower rates of healthcare utilization, lower rates of medication adherence (Traylor, Schmittdiel, Uratsu, Mangione, & Subramanian, 2010), fewer medical interventions, shorter life expectancy (Chen et al., 2016), worse clinical outcomes, and receive unequal treatment and/or advice from their provider (Bleich, Simon, & Cooper, 2012; Chen et al., 2016). In 2015, the economic consequences of racial health inequalities were projected to reach $35 billion in excess health-care spending, $10 billion in illness-related productivity losses, and over $200 billion in premature mortality (Jerant, Bertakis, Fenton, Tancredi, & Franks, 2011; Alyson Ma et al., 2019). As a result, decreasing these disparities may decrease both direct and indirect spending (Ford, Konrad, Godette, & Corbie-Smith, 2008). Patient-provider race concordance is one aspect that has been thoroughly established as having a major influence on use and health outcomes across a wide range of medical disciplines (Chen et al., 2016; Ford et al., 2008; Jerant et al., 2011; LaVeist & Nuru-Jeter, 2002).

"Race concordance" happens when a patient's race matches that of the individual's provider, but "race discordance" occurs when their respective races do not match (Alyson Ma et al., 2019). Past research has shown that when given the option, patients often pick providers of their own race (Cooper-Patrick et al., 1999; Gray & Stoddard, 1997). Patients who have racial concordant relationships with their doctors often report better levels of satisfaction with their

treatment, greater levels of confidence in their medical provider, and perceives higher quality of care (Saha, Taggart, Komaromy, & Bindman, 2000; Schoenthaler et al., 2014). Spanish-speaking patients who have language concordant with their provider had greater satisfaction and better medication adherence than when the patient and provider did not speak the same language (Traylor et al., 2010). It has also been demonstrated that language concordance influences the perceived quality of patient-provider communication during medical appointments (Saha et al., 2000; Schoenthaler et al., 2014). In a study, Shen et al. (2018) discovered that race concordance influences patients' clinical encounter experiences in a meta-analysis of the effects of race on communication. While there was some variation in the communication domains and measures across studies, 11 of the 12 studies on race concordance in the review discovered that racial discordance consistently predicts poorer perceived patient-physician communication (Shen et al., 2018). There is substantial evidence to support the concept that variations in provider care and language or cultural barriers may have a detrimental impact on minority patients' health outcomes (Cooper & Powe, 2004; Alyson Ma et al., 2019; Van Ryn, 2002). It has been shown that provider opinions about minority patients impact both the degree of care offered to minority patients and the inequitable utilization of appropriate healthcare services by minority patients (Salimah H Meghani et al., 2009; Shen et al., 2018). It has also been shown that the patient-provider connection has an impact on informed consent, social history-taking, and adherence to postoperative care recommendations (Haider et al., 2015). Research has shown that gender and language concordance can improve patient satisfaction, trust in the provider, and adherence to treatment recommendations. A study published in the Journal of General Internal Medicine found that female patients who saw female physicians were more likely to receive recommended preventive services, such as mammograms and Pap tests, than those who saw male physicians

(Jackson et al., 2022). The issue thus becomes whether patient-provider racial discordance relates to worse patient-provider communication and outcomes, as has been often suggested. Whilst race and ethnicity concordance get greater attention, gender and language concordance may be addressed in a comparable way.

On the negative side, gender concordance may also reinforce stereotypes and biases about gender roles and medical expertise. Patients may assume that providers of the opposite gender are less knowledgeable or skilled in certain areas, leading to lower confidence in their care. Additionally, patients may feel uncomfortable discussing certain health concerns with a provider of the same gender due to cultural or personal reasons (Jackson, Kay, Scholcoff, Becher, & O'Malley, 2021; Jackson et al., 2022).

Overall, the impact of patient-provider gender concordance on health services can depend on various factors, such as the patient's personal preferences and the provider's level of cultural competence (Street et al., 2008). It is important for providers to be aware of the potential effects of gender concordance and strive to provide patient-centered care that meets each patient's unique needs and preference.

2.7 Gap in the Literature – Utilization of Healthcare Services by the Underserved

Behavioral Economics have been utilized in many sectors such as business (Platt & Huettel, 2008), finance (Sulka, 2019), energy (Ebeling & Lotz, 2015) and marketing (Chandon, Hutchinson, Bradlow, & Young, 2009). More recently healthcare leaders have applied these principles in various healthcare sectors to assist with clinical decision making (Cox, Sadiraj, Schnier, & Sweeney, 2016), lifestyle changes (Thorgeirsson & Kawachi, 2013), and healthcare policies (Liu, Wisdom, Roberto, Liu, & Ubel, 2014). There have been some behavioral economics research on healthcare utilization (Atella et al., 2019; Last et al., 2021), but not a lot

of research on the default effect on utilization. Little research has evaluated behavioral economics effects with an economically disadvantage population such as clients who quality for care at a free clinic. Furthermore, no research has looked at the relationship of patient-provider concordance and income on default effect for this population.

At the heart of behavioral economics is the notion that strengthening the realism of economic analyses' psychological roots will enhance the discipline (Loewenstein et al., 2007). On its own terms, economics generates theoretical discoveries, improves predictions of field phenomena, and suggests better policy. This view does not mean a complete rejection of the neoclassical economic approach based on utility function, equilibrium, and performance (Julie S Downs et al., 2009). The neoclassical method is advantageous because it equips economists with a conceptual framework that can be applied to nearly any type of economic (or even noneconomic) behavior and offers testable prediction (Camerer, Loewenstein, & Rabin, 2004). The majority of the works alter one or two assumptions in mainstream theory in order to achieve better psychological realism (Loewenstein et al., 2007). These deviations are frequently not significant since they loosen simple assumptions that are not crucial to the economic approach. For example, nothing in basic neoclassical theory states that individuals should not worry about justice, that dangerous outcomes should be weighted linearly, or that the future must be discounted exponentially at a constant rate.' Other assumptions simply admit the limitations of human computational capability, motivation, and self-interest (Camerer et al., 2004). These assumptions are procedurally reasonable because they propose functional strategies for addressing issues that are frequently so complicated that even contemporary computer algorithms cannot solve them correctly (Richard H Thaler & Ganser, 2015). In an ideal world, individuals would always make optimum decisions that benefit and satisfy them the most. In

economics, rational choice theory asserts that when given with several alternatives in a scarcity situation, individuals would select the option that maximizes their own satisfaction (Richard H Thaler & Ganser, 2015). This theory holds that, given their desires and limits, humans are capable of making rational decisions by effectively assessing the costs and advantages of each accessible alternative (Gneezy & List, 2006). The ultimate pick will be the best option for the person (Matjasko et al., 2016). The logical individual possesses self-control, is unaffected by emotions or other forces, and so understands what is best for himself (List & Samek, 2015). Unfortunately, behavioral economics demonstrates that people are not rational and cannot always make wise judgments but are influenced by nudges (Richard H. Thaler & Benartzi, 2004). Due to this irrationality, people's decision can and are often influenced by unconscious bias and stress (Haider et al., 2015).

2.8 Hypothesis Development

Across various settings whether increasing utilization of flu vaccines administration (G. B. Chapman, Li, Colby, & Yoon, 2010), increasing healthy eating (Hanks, Just, Smith, & Wansink, 2012), or increasing organ donation (Pelle Guldborg & Andreas Maaløe, 2013), whenever a default option is intentionally introduced, the intended behavior increases. Many examples of this have been described in this chapter related to clinical decision making, lifestyle choices, or policy development (I. Cho & D. Bates, 2018; Eric J Johnson & Goldstein, 2004; T. Rice, 2013). Default choice consistently increases the intended behavior, especially when that behavior is the utilization of a service (Goswami & Urminsky, 2016; Halpern, 2015; Viktorija & Ljubomir, 2018). Applying default choice in other settings have demonstrated an increase in utilization of service and intended behaviors such as health food selection (Ackerman, 2014; Julie S. Downs et al., 2009; Kroese et

al., 2016; Martinez, Rodriguez, Mercurio, Bragg, & Elbel, 2018; Rohde & Verbeke, 2017; Ronald, 1974).

It is already established by behavioral economics research that default options tend to increases utilization. Therefore it is hypothesized that intentionally applying a default option as the independent variable would have a positive association to utilization.

H1: Default option shows greater utilization of services compared to free-choice option..

Patients report fewer language and cultural obstacles when they get language-concordant treatment that is consistent with their culture and traditions (Cooper & Powe, 2004; Pérez-Stable, Nápoles-Springer, & Miramontes, 1997; Rayan, Admi, & Shadmi, 2014). Language concordance between physicians and their patients has been shown to be a major contributor to better treatment quality and better health outcomes among minorities (Manson, 1988; Salimah H Meghani et al., 2009; Rayan et al., 2014). A large body of research indicates that language gaps between patients and physicians put patients at risk for a number of negative outcomes, such as diabetes management, medication adherence, and unhappiness with emergency department visits (Carrasquillo, Orav, Brennan, & Burstin, 1999; Fernandez et al., 2011; Traylor et al., 2010).

The unique contribution of this study is applying the context of default choice in a healthcare setting as well as evaluate the moderating relationship of patient-provider concordance with language (patient language match with provider language) on utilization of services. It is hypothesized that in the presence of patient-provider language concordance there will be a significant effect on the relationship between default effect and utilization of services.

H2: Patient-Provider language concordance moderates the relationship between default effect and utilization of services, such that presence of language concordance reduces the gap between default option and free-choice option compared to absence of language concordance.

Men and women doctors may have different practice and communication styles, according to research. According to one extensive meta-analysis, women doctors interact with patients differently than their men counterpart and are more inclined to engage in active collaboration and emotionally oriented talks (Bonds, Foley, Dugan, Hall, & Extrom, 2004; Schmittdiel et al., 2009). Numerous studies also indicate that women doctors lay a greater focus on preventative treatments and counseling than men physicians (Franks & Bertakis, 2003; Roter, Hall, & Aoki, 2002; Schmittdiel et al., 2009). The impact of patient-provider gender concordance (described as the patient and healthcare provider identify as the same gender) on enhanced patient confidence in physician, provision of preventative treatments, and visit length has also been studied (Bonds et al., 2004). These effects may result in better results for patients identifying as a woman from doctors who identify as woman (and maybe patients who identify as a man from physicians who identify as a man) than for patients in gender-discordant relationships (Bonds et al., 2004). Yet, evidence showing gender concordance is a significant component in healthcare quality is inconsistent. There has been no research that look at the relationship between gender concordance and the default impact on service utilization.

The goal of this research is to look at how gender concordance (patient's identified gender matches the physician's identified gender) influences the relationship between default effect and service utilization. The unique contribution of this study is applying the context of default choice in a healthcare setting as well as evaluate the moderating relationship of patient-provider gender concordance on utilization of services.

H3: Patient-Provider gender concordance moderates the relationship between default effect and utilization of services, such that presence of gender concordance reduces the gap between default option and free-choice option compared to absence of gender concordance.

Researchers in many countries have discovered a positive relationship between income and a person's health status (Coburn, 2004; Feinstein, 1993; Kennedy, Kawachi, Glass, & Prothrow-Stith, 1998; J. Lynch et al., 2004), which exists for both psychological and physical health (Ettner, 1996; Stronks, van de Mheen, & Mackenbach, 1998), in males and females of all ages, and for the majority of causes of death (Mackenbach & Howden-Chapman, 2003; Najman et al., 2004; Pappas, Queen, Hadden, & Fisher, 1993). Even though, the evidence is divided on whether income causes health or is just correlated with it. The evidence is clear that people with higher incomes tend to have higher utilization of healthcare (Andersen, Kravitz, & Anderson, 1975; Mangalore, 2006; Navarro, 2004; Power & Matthews, 1997).

While economists believe that individuals are responsible for their own health care decision because they make personal decisions to invest in education and health options (Grossman, 2017; Mangalore, 2006), sociological literature suggests that individual decisions to use health care must be considered in a social context and that the strong relational influences between health care usage, health status, and income are primarily a social phenomenon (Navarro, 2004; Power & Matthews, 1997). As one of the variables promoting good health and strongly connected to health and income, a clear knowledge of how individuals make this decision is equally essential. While several studies have identified substantial impacts of financial and socioeconomic characteristics on utilization of medical care facilities, research also contains evidence of health care system inequities (Doorslaer, Wagstaff, & Rutten, 1992; Gerdtham, 1997). More affluent individuals tend to receive more primary care and hospital care (Blaxter, 1997); physicians generally spend more consultation time with, and are inclined to explore more thoroughly, patients who seem to have more means (Blaxter, 1987; Cartwright, O'Brien, & Stacey, 1976). It has also been stated that differences in physician contact cannot be

attributed solely to differences in levels of illness or family income (J. Lynch et al., 2004), and that individual utilization decisions are the result of a complicated process of weighing the costs and benefits of treatment and are not guided solely by health status or other enabling factors (Coburn, 2004; Mangalore, 2006). Access to healthcare services is a basic human need, yet low-income patients often face a range of challenges when it comes to accessing healthcare (J. Lynch et al., 2004). Low-income patients face several challenges when accessing healthcare services such as a lack of Health Insurance (K. J. Arrow, 1978). A significant proportion of low-income individuals lack health insurance coverage, making it difficult for them to access affordable healthcare services (Blumenthal-Barby & Burroughs, 2012). Without health insurance, the cost of medical services can be prohibitively expensive, leading to financial strain. Low-income patients often live in areas with limited access to healthcare providers, including physicians, specialists, and clinics (K. J. Arrow, 1978). This can result in long wait times for appointments and limited access to preventative care. If they have access to provider getting there could be challenge(Feinstein, 1993). Many low-income patients do not have reliable transportation to get to medical appointments, making it difficult for them to attend scheduled appointments or access emergency medical care (J. W. Lynch, Kaplan, & Shema, 1997). Often times low-income patients who are non-native speakers of the dominant language in their region may face language barriers when accessing healthcare services (Cooper & Powe, 2004). This can lead to miscommunication between patients and healthcare providers, which can impact the quality of care received.

H4: Income moderates the relationship between default effect and utilization of services, with higher income associated with a stronger relationship between default effect and utilization of services.

Direct Effect of Default Effect	
H1	*Default option shows greater utilization of services compared to free-choice option.*
Moderating effect on the relationship between Default Effect and Utilization	
H2	*Patient-Provider language concordance moderates the relationship between default effect and utilization of services, such that presence of language concordance reduces the gap in service utilization between default option and free-choice option compared to absence of language concordance.*
H3	*Patient-Provider gender concordance moderates the relationship between default effect and utilization of services, such that presence of gender concordance reduces the gap in service utilization between default option and free-choice option compared to absence of gender concordance.*
H4	*Income moderates the relationship between default effect and utilization of services, with higher income associated with a stronger relationship between default effect and utilization of services.*

Table 1: Research Hypothesis Summary

CHAPTER 3: METHODS

This research was a proactive study that utilizes original data collected from the Community Free Clinic from January 2023 – March 2023. This study received IRB approval for research use. IRB-23-0378.

This study took place at The Community Free Clinic in Concord, NC, which is a standalone free clinic with an in-house pharmacy located in Cabarrus County, USA. The clinic provides healthcare and pharmacy services to low-income, uninsured, working-age adults with chronic health conditions and other primary medical care needs. Clinical and pharmacy services are provided four days (Monday – Thursday). In 2019 the clinic served 429 patients with 3,698 clinic appointments and 22,334 prescriptions filled for uninsured adults with a $5,234,240 average whole pricing value of prescriptions. This free clinic does not receive any government subside (Medicare/Medicaid) or any insurance reimbursements. Patients received free care through the contribution of donors and grants (Free Clinic).

This study was to explore the use of Behavioral Economics in a healthcare setting to see how this impacts the use of services such as the Food Pharmacy. The Food Pharmacy aims to increase access to healthy food and promote nutrition for families. This service is free to any Community Free Clinic patient who choose to utilize it. The Food Pharmacy was open available two weeks out of the month alternating weeks (calendar attached). Patients of the Community Free Clinic, who are age 18 and older are eligible to participate in this study. All participants were given the opportunity to use the Food Pharmacy. They were randomly assigned to a Free Choice or Default Choice group. Each group has the same access to the Food Pharmacy. Regardless of participation, patient's clinical visit was not affected, and they had full access to the Food Pharmacy.

Patients who participate in the research agreed to share demographic information about themselves to the researcher such as age, race, gender, primary language, employment status, and household income. All participants signed a consent form and HIPAA release form.

3.1 Measures

This section identifies and discuss the dependent, independent, and moderating variables illustrated in the conceptual mode of the research. In examining the association between default effect and utilization of services, and the moderation of patient-provider language and gender concordance and income. Additionally, how the variables will be measured to complete the study is described here.

Dependent Variable:

The dependent variable (DV) will be the *Utilization of Healthcare* Services measured as percentage of participants who utilized the Food Pharmacy service. The dependent variable Utilization of Healthcare Services was calculated as a dichotomous variable by evaluating whether the patient showed up (value of 1) to the Food Pharmacy or they did not show up to utilize the service (value of 0). Our research goal is to understand factors that influence a patient's decision to utilize the Food Pharmacy including the relationship between gender and language concordance and income into their decision-making process.

Independent Variables:

The primary independent variables for this research will be *Default Effect* measured as participants grouped in the "Default" group (value of 1). This group received the nudge intervention to make a Food Pharmacy appointment before they left with the prompt, "The Food Pharmacy aims to increase access to healthy food and promote nutrition for families. The Food Pharmacy is open every other week, Monday through Thursday from 9am to 4pm. Please stop at

the front desk to make an appointment to pick up your free meals." Whereas the non-intervention group without the nudge, "Free Choice" group (value of 0) was asked to call to schedule for a Food Pharmacy appointment with the prompt, "The Food Pharmacy aims to increase access to healthy food and promote nutrition for families. The Food Pharmacy is open every other week, Monday through Thursday from 9am to 4pm. Feel free to call to schedule an appointment to pick up your free meal."

Moderating Variables:

Moderating variables have an effect on the direction or degree of the independent variables' impact on the dependent variable (Baron & Kenny, 1986). The goal of our research, as stated in our hypothesis development, is to determine whether 1) there is a direct relationship between Default Effect and Utilization and 2) whether the additional construct of Patient-Provider Language Concordance, Patient-Provider Gender Concordance, and Annual Income moderates the relationship between Default Effect and Utilization.

When the patient primary language and the provider's spoken language matches then the patient-provider language concordance is considered a match (value of 1), whereas when the patient's primary language and the provider's spoken language is not the same then this is not considered a match (value of 0). An example of a language concordance match is when the patient's primary language is Spanish, and the provider's spoken language is Spanish (value of 1). Whereas, if the patient's primary language is Spanish, and the provider's spoken language is English then this is not a concordance match (value of 0).

Like language, when the patient's identified gender and the provider's identified gender matches then the patient-provider gender concordance is considered a match (value of 1),

whereas when the patient's identified gender and the provider's identified gender is not the same then this is not considered a match (value of 0).

Annual Income is a self-reported measured of the total annual income the members as stated in their annual tax return. This is a categorical number as stated in dollars ($).

Community Free Clinic Hypothesis Variable Definitions				
	Variable	Computation of IVs	Variable Type	Description
	Default-Free Choice	Randomly assigned to Default or Free Choice group	Dichotomous	0) Free Choice 1) Default
	Patient-Provider Language Concordance	Patient native language matches with provider spoken language then concordance = yes	Dichotomous	0) No 1) Yes
	Patient-Provider Gender Concordance	Patient identified gender matches with provider gender then concordance = yes	Dichotomous	0) No 1) Yes
	Annual Income	Self-reported annual amount in dollars	Dichotomous	Annual Income 0) < $16,000 1) >= $16,000
	Utilization	Patient arrived at the Food Pharmacy the week it was scheduled = arrived	Dichotomous	0) No-show 1) Arrived

Table 2: Summary of the dependent (DV) and independent variables (IVs) of the research

3.2 Data Collection

Participant Enrolment Process:

1. Patient agrees to be a part of the research and signs consent form

2. Assign Pt (in alternating fashion) to Free Choice or Default group

3. Note on master schedule which group pt is assigned (yellow=Free Choice) (blue=Default)

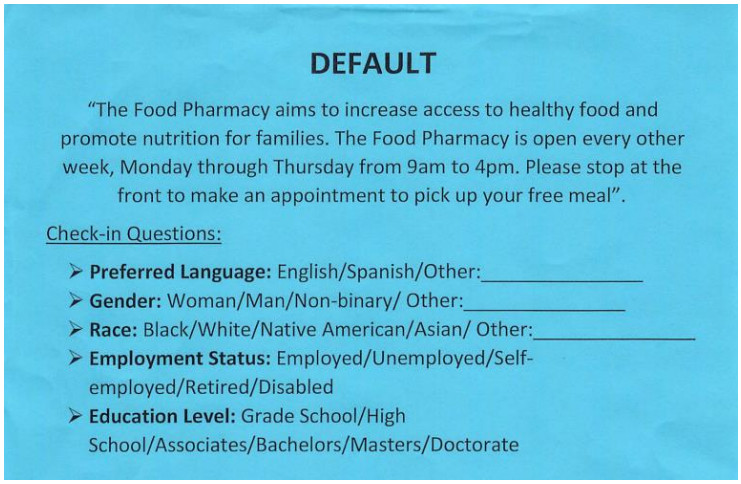
4. Staple ½ sheet corresponding to pts. Assigned group to the intake form

5. PI or CoPI completes demographic questions listed on the ½ sheet (Preferred Language, Gender, Race, Employment Status, Education Level, Income)

6. Pass chart w/completed ½ sheet to the provider as normal

7. Provider – give care as normal.

8. At the end of the appointment provider will follow process based on Default or Free Choice



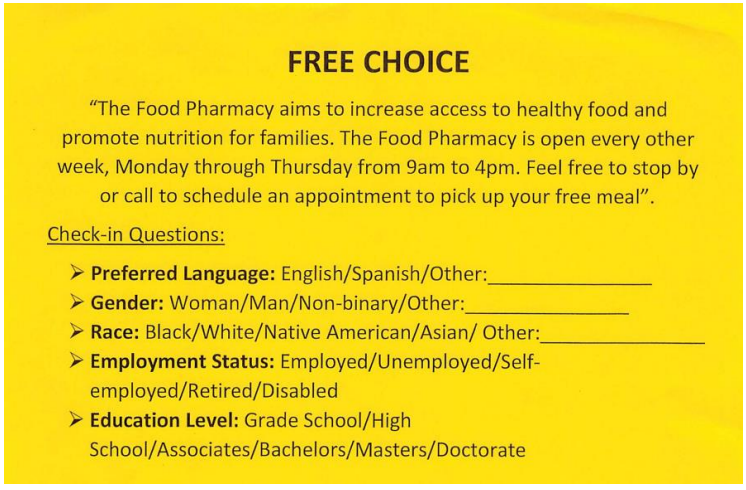
DEFAULT

"The Food Pharmacy aims to increase access to healthy food and promote nutrition for families. The Food Pharmacy is open every other week, Monday through Thursday from 9am to 4pm. Please stop at the front to make an appointment to pick up your free meal".

Check-in Questions:

- **Preferred Language:** English/Spanish/Other:_____
- **Gender:** Woman/Man/Non-binary/ Other:_____
- **Race:** Black/White/Native American/Asian/ Other:_____
- **Employment Status:** Employed/Unemployed/Self-employed/Retired/Disabled
- **Education Level:** Grade School/High School/Associates/Bachelors/Masters/Doctorate

Figure 2: Default Half Sheet



FREE CHOICE

"The Food Pharmacy aims to increase access to healthy food and promote nutrition for families. The Food Pharmacy is open every other week, Monday through Thursday from 9am to 4pm. Feel free to stop by or call to schedule an appointment to pick up your free meal".

Check-in Questions:

- **Preferred Language:** English/Spanish/Other:_____
- **Gender:** Woman/Man/Non-binary/Other:_____
- **Race:** Black/White/Native American/Asian/ Other:_____
- **Employment Status:** Employed/Unemployed/Self-employed/Retired/Disabled
- **Education Level:** Grade School/High School/Associates/Bachelors/Masters/Doctorate

Figure 3: Free Choice Half Sheet

Default:

a. “The Food Pharmacy aims to increase access to healthy food and promote nutrition for families. The Food Pharmacy is open every other week, Monday through Thursday from 9am to 4pm. Please stop at the front desk to make an appointment to pick up your free meal.”

b. Collect check-out sheet then put in daily folder.

c. Make Pt. an appt. for next Food Pharmacy Week

d. Give patient card with written date & time of appointment (appointment card attached)

Figure 4: Default appointment card

Free Choice:

a. “The Food Pharmacy aims to increase access to healthy food and promote nutrition for families. The Food Pharmacy is open every other week, Monday through Thursday from 9am to 4pm. Feel free to call to schedule an appointment to pick up your free meal.”

b. Collect check-out sheet then put in daily folder.

c. Provide patient with card with no space for written appointment (appointment card attached)

Figure 5: Free Choice Appointment Card

Data			
	Data Category	Data Type/Limit	Description
	Age	Numeric Limited 18-65	Numeric age by years
	Preferred Language	Categorical	1) English 2) Spanish 3) Other
	Race	Categorical	Race/Ethnic Identification per Uniform Codes 1) White 2) Black 3) Asian 4) Native American 5) Other
	Patient Gender	Dichotomous	Gender identification per Uniform code 1) Male 2) Female
	Education Level	Categorical	1) Grade School 2) High School 3) Associates 4) Bachelors

	Employment Status	Categorical	Employment Status per Uniform Codes 1) Employed 2) Non-employed 3) Self-Employed 4) Retired 5) Disabled
	Household Income	Dichotomous	Household Income 1) < $16,000 2) >= $16,000
	Default Choice	Categorical	1) Free Choice 2) Default Choice
	Provider Language	Dichotomous	2) English 3) Spanish
	Provider Gender	Dichotomous	3) Male 4) Female
	Utilization	Dichotomous	2) Arrived/Show 3) No-Show

Table 3: Data Description

3.3 Methods of Analysis

In this research, the hypotheses were evaluated using independent sample proportion test. The tests were carried out using the most recent version of IBM SPSS Statistics software. In addition, additional measures were taken for data processing and interpretation. Then, a preliminary check was carried out to look for any missing or incomplete data (Creswell & Creswell, 2017). Second, bias tests were run on the data to determine if the variation was due to the technique or the measure (Creswell & Creswell, 2017; Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). There are continuing arguments in the literature that emphasize the issue of

determining the index of agreement values (Lance, Butts, & Michels, 2006). Finally, all independent and dependent variables in the research were evaluated with descriptive analysis. Each hypothesis was examined for statistical significance and if the findings supported the hypotheses presented in this dissertation. In Chapter 4 of this research, all findings are summarized and given in tables.

In statistical analysis, researchers often use hypothesis testing to determine whether there is a significant difference between two or more groups (Mason, Gunst, & Hess, 2003). The independent sample proportions test is a commonly used statistical test in research, particularly in the social sciences (Agresti & Franklin, 2007). This test is used to compare the proportions of two independent groups. The groups can be dichotomous, meaning that each participant can only belong to one group. The test is particularly useful when the sample sizes are large and when the outcome variable is categorical (Dodge, 2008).

In this research I wanted to compare the proportion of a default group and a free choice group to see who would utilize a clinical service, the Food Pharmacy. In this case, I collected data from two independent groups (default and free choice) and use the independent sample proportions test to determine whether there is a significant difference in the proportions of the two groups.

There are several assumptions that must be met for the independent sample proportions test to be valid. Firstly, the data must be collected from two independent groups. Secondly, each participant can only belong to one group. Thirdly, the outcome variable must be categorical. Fourthly, the sample sizes of each group should be large enough to satisfy the normal approximation. Finally, the expected cell counts for each category should be greater than five (Creswell & Creswell, 2017; Dodge, 2008). The null hypothesis for the independent sample

proportions test is that there is no significant difference between the proportions of the two groups. The alternative hypothesis is that there is a significant difference between the proportions of the two groups. The independent sample proportions test can be calculated using the following formula: SE0 = $\sqrt{\hat{p} * (1 - \hat{p}) * (\frac{1}{na} + \frac{1}{nb})}$

where: p1 and p2 are the proportions of the two groups, p is the combined proportion of the two groups, and n_a and n_b are the sample sizes of the two groups (Field, 2013). If the calculated z-score is greater than the critical value, the I can reject the null hypothesis and conclude that there is a significant difference between the proportions of the two groups. Otherwise, I must fail to reject the null hypothesis.

CHAPTER 4: RESULTS

This section provides the results of testing the four hypothesized relationships from our conceptual framework using Independent Proportions Testing. The purpose of this quantitative, experimental research was to determine if the use of default effect patient's utilization of services, also if the presence of language and gender concordance and income levels moderate the relationship between the default effect and utilization of services.

The chapter begins with a preliminary analysis that describes the sample, checks for bias in the sample, and evaluates the scales that measure each construct.

4.1 Descriptive Data

The total number of participants in this research study were 169, all were patients of the Free Clinic. Of the total participants, 111 identified as woman and 58 identified as man. The patient's native languages were as follows; 58 English, 106 Spanish, one Hindi, one Nepalese, one Turkish, and one Arabic. In the clinic three providers saw patients. 145 were seen by Provider A, 19 were seen by Provider B and 5 were seen by Provider C. Provider A and Provider B speak Spanish whereas Provider C speaks only English. Provider A and Provider B identify as woman and Provider C identify as man.

The purpose of the Pearson coefficient table is to provide a quick and easy way to visualize the correlation between two variables (Field, 2013). As seen in Table 4, the table is particularly useful when dealing with multiple variables, as it allows for a quick comparison of the degree and direction of correlation between different pairs of variables (Field, 2013). Table 4 show five variables Default Group, Show, Gender Concordance Yes, Language concordance Yes, and Annual Income. These variables were compared to each other to more five by five table. Participants in the default group has a positive correlation with all other variables other

than when gender concordance is present (Pearson r = -0.028). There were three correlation relationships that were significant at the 95% confidence level (sig <=0.05) or greater. Those were participants who had gender concordance with participants who showed, with participants who had language concordance, and with income. These were all positive relationships.

		Group Default	Show	Gender Concord Yes	Lang Concord Yes
Group Default	Pearson Correlation				
	Sig. (2-tailed)				
Show	Pearson Correlation	0.120			
	Sig. (2-tailed)	0.267			
Gender Concord Yes	Pearson Correlation	-0.028	0.292**		
	Sig. (2-tailed)	0.796	0.006		
Lang Concord Yes	Pearson Correlation	0.176	0.117	0.288*	
	Sig. (2-tailed)	0.102	0.277	0.007	
Annual Income	Pearson Correlation	0.107	0.234*	0.218*	0.122
	Sig. (2-tailed)	0.320	0.028	0.041	0.257

** Correlation is significant at the 0.01 level (2-tailed)
* Correlation is significant at the 0.05 level (2-tailed)
Listwise N = 88

Table 4: Pearson Coefficient Table

Independent Proportions Testing results:

4.2 H1: Default Effect

This section provides the results of testing the four hypothesized relationships from our conceptual framework using Independent Proportions Testing. The first proportions test measured the main effect which is the relationship between default and the utilization of services

compared to the free-choice option. The below Table 4 shows the percentages of default and free choice respondents who showed up to the Food Pharmacy.

- a proportion of p1 = 0.693 out of n1 = 88 participants in the Default Group and
- a proportion of p2 = 0.543 out of n2 = 81 participants in the Free Choice group

In this sample, the default group performed marginally better than the free choice groups. Nonetheless, sampling results often deviate somewhat from population results. Even if the whole default and free choice populations behaved equally, a minor sample difference may be discovered (Field, 2013). This might easily happen if participants were selected at random. The z-test seeks to disprove this notion, demonstrating that the populations do indeed perform differently (Field, 2013). The null hypothesis for a z-test for independent proportions is that the difference between two population proportions is zero (Andres & Mato, 1994). If this is correct, the difference in sample proportions should be close to zero. Results that are significantly different from zero are improbable, arguing against the null hypothesis. The assumptions for a z-test for independent proportions are independent observations and sufficient sample sizes (Andres & Mato, 1994). A sufficient sample suggest that the test results are sufficiently accurate if $p_a * n_a > 10$, $(1 - p_a) * n_a > 10$, $p_b \cdot n_b > 10$, $(1 - p_b) * n_b > 10$ where n_a and n_b denote the sample sizes of groups a and b and p_a and p_b denote the proportions of "successes" in both groups (Field, 2013). For computing the z-test, first compute the difference between the sample proportions as, dif = p1 − p2, this results in dif=0.693−0.543= 0.150. Now, the null hypothesis claims that both subpopulations have the same proportion of successes. That is the proportion of successes for both samples lumped together. That'll be, $p\hat{} = \frac{0.693*88+0.543*81}{88+81} = 0.6211$. The standard error for the difference under H_0 is

- $SE_0 = \sqrt{\hat{p} * (1 - \hat{p}) * (\frac{1}{na} + \frac{1}{nb})}$ $SE_0 = \sqrt{0.6211 * (1 - 0.6211) * (\frac{1}{88} + \frac{1}{81})}$ = 0.0747

The test statistic Z as Z = $\frac{dif}{SEo}$ or Z = $\frac{0.1500}{0.0747}$ = 2.0081. If the z-test assumptions are met, then Z approximately follows a standard normal distribution. From this one can calculate P = (Z < 2.0081) = 0.022 so the1-tailed significance is P (1 − tailed) = 0.022. As a result, the null hypothesis can be rejected. If the population difference is zero, then finding the observed sample difference or a more extreme one is likely. The data contradict the claim of default and free choice participants performing equally on the choice to use the Food Pharmacy.

H1: Default option shows greater utilization of services compared to free-choice option.

H1 - Default Effect

Row Labels	Attended/Show		No-Show		Grand Total	
Default Group	61	69%	27	31%	88	52%
Free Choice	44	54%	37	46%	81	48%
Grand Total	**105**	**62%**	**64**	**38%**	**169**	**100%**

Table 5: Default Effect Results Table

H1: Default Effect Independent Samples Proportions Group Statistics					
	Group	Successes	Trials	Proportions	Asymptotic Std. Error
Show = 1	= default	61	88	0.693	0.049
	= free choice	44	81	0.543	0.055

H1: Default Effect Independent Samples Proportions Group Statistics						
	Test Type	Difference in Proportions	Asymptotic Standard Error	Z	One-Sided p	Two-Sided p
Show = 1	Wald H0	0.15	0.074	2.008	0.022	0.045

Table 6: H1, Default Effect - Proportions Group Statistics Results

4.3 H2: Language Concordance,

As seen in Table 6, of the 169 participants in the study, 109 patients shared their native language with the provider. They were assigned to either the default group (61) or free choice group (48). Of these participants 44 (72%) in the default group showed up to the Food Pharmacy, whereas 31 (65%) of the free choice group showed up to the Food Pharmacy. When language concordance was present the difference in proportion was 0.075 with a p value > .05 (one sided p = 0.199), as seen on Table 7, therefore I failed to reject the null hypothesis that there is no difference between the proportions of default-choice and free-choice groups. Conversely, 60 patients did not share their native language with the provider. They were assigned to either the default group (27) or free choice group (33). Of these participants 17 (63%) in the default group showed up to the Food Pharmacy, whereas 13 (39%) of the free choice group showed up to the Food Pharmacy. When language concordance was not present the difference in proportion was 0.236 with a p value <= .05 (one sided p = 0.035), therefore I rejected the null hypothesis that there is no difference between the proportions of default-choice and free-choice groups.

The language concordance mitigates the default and free choice effect. The proportion difference between default and free choice is not present when language concordance is present. With language concordance the difference in proportion is 0.075 with p-value of 0.199 which is not significant. However, when there is no language concordance the difference in proportion between default-choice and free-choice is greater (at 0.236 with a one-sided value of 0.035).

H2: ***Patient-Provider language concordance moderates the relationship between default effect and utilization of services, such that presence of language concordance reduces the gap in service utilization between default option and free-choice option compared to absence of language concordance***

H2 - Language Concordance

Row Labels	Attended/Show		No-Show		Grand Total	
Default group	**61**	**69%**	**27**	**31%**	**88**	**52%**
Language Concordance = Yes	44	72%	17	28%	61	36%
Language Concordance = No	17	63%	10	37%	27	16%
Free choice group	**44**	**54%**	**37**	**46%**	**81**	**48%**
Language Concordance = Yes	31	65%	17	35%	48	28%
Language Concordance = No	13	39%	20	61%	33	20%
Grand Total	**105**	**62%**	**64**	**38%**	**169**	**100%**

Table 7: Language Concordance Results Table

H2: Language Concordance Independent Samples Proportions Group Statistics					
Concordance	Group	Successes	Trials	Proportions	Asymptotic Std. Error
= Yes	= default	44	61	0.721	0.057
	= free choice	31	48	0.646	0.069
= No	= default	17	27	0.63	0.093
	= free choice	13	33	0.394	0.085

H2: Language Concordance Independent Samples Proportions Group Statistics						
Concordance	Test Type	Difference in Proportions	Asymptotic Standard Error	Z	One-Sided p	Two-Sided p
Yes	Wald H0	0.075	0.09	0.844	0.199	0.398
No	Wald H0	0.236	0.126	1.816	0.035	0.069

Table 8: H2, Language Concordance Proportions Group Statistics Results

4.4 H3: Gender Concordance

Of the 169 participants in the study, 106 patients identified as the same gender as their provider. They were assigned to either the default group (54) or free choice group (52). Of these participants 40 (74%) in the default group showed up to the Food Pharmacy, whereas 32 (62%) of the free choice group showed up to the Food Pharmacy as seen in Table 8. As seen in Table 9, when gender concordance was present the difference in proportion was 0.125 with a p value > .05 (one sided p = 0.083), therefore I do not reject the null hypothesis. As seen in table 9, 63 patients did not identify as the same gender as their provider. They were assigned to either the default group (34) or free choice group (29). Of these participants 21 (62%) in the default group showed up to the Food Pharmacy, whereas 12 (41%) of the free choice group showed up to the Food Pharmacy. When gender concordance was not present the difference in proportion was 0.204 with a p value > .05 (one sided p = 0.053), therefore I do not reject the null hypothesis at 95% confidence, but the value is less than 0.1 which we can reject the null hypothesis at 90% confidence interval.

The gender concordance mitigates the difference between the default and free choice effect. The proportion difference between default and free choice is not present when gender concordance is present. With gender concordance the difference in proportion is 0.125 with p value of 0.083 which is not significant. However, when there is no gender concordance the difference in proportion is greater at 0.204 with a one-sided value of 0.053.

Similar to language concordance, the higher utilization of services of the default effect compared to free-choice is mitigated when there is gender concordance, i.e., when the patient and provider share the same gender. With gender concordance the difference in proportion is 0.125 with p value of 0.083 which is not significant. However, when there is no gender

concordance the difference in proportion is greater at 0.204 with a one-sided value of 0.053. Although p-value is > 0.05, it is < 0.10. Based on interpretation, it could be suggested to rejection or not rejecting the null hypothesis here.

H3: Patient-Provider gender concordance moderates the relationship between default effect and utilization of services, such that presence of gender concordance reduces the gap between in service utilization default option and free-choice option compared to absence of gender concordance.

H3 - Gender Concordance

Row Labels	Attended/Show		No-Show		Grand Total	
Default group	**61**	**69%**	**27**	**31%**	**88**	**52%**
Gender Concordance = Yes	40	74%	14	26%	54	32%
Gender Concordance = No	21	62%	13	38%	34	20%
Free choice group	**44**	**54%**	**37**	**46%**	**81**	**48%**
Gender Concordance = Yes	32	62%	20	38%	52	31%
Gender Concordance = No	12	41%	17	59%	29	17%
Grand Total	**105**	**62%**	**64**	**38%**	**169**	**100%**

Table 9: Gender Concordance Results Table

H3: Gender Concordance Independent Samples Proportions Group Statistics					
Concordance	Group	Successes	Trials	Proportions	Asymptotic Std. Error
= Yes	= default	40	54	0.741	0.06
	= free choice	32	52	0.615	0.067
= No	= default	21	34	0.618	0.083
	= free choice	12	29	0.414	0.091

H3: Gender Concordance Independent Samples Proportions Group Statistics						
Concordance	Test Type	Difference in Proportions	Asymptotic Standard Error	Z	One-Sided p	Two-Sided p
Yes	Wald H0	0.125	0.09	1.382	0.083	0.167
No	Wald H0	0.204	0.124	1.615	0.053	0.106

Table 10: H3, Gender Concordance Proportions Group Statistics Results

4.5 H4: Income Effect

The average annual income for the 169 participants in the study was $16,006. The median income for the participants were $14,400. 110 participants reported that they were unemployed with an average annual income of $12,376. 44 participants are employed with an average annual income of $26,544. Eight participants are retired with average annual income of $6,884. Four participants are disabled with average household income of $15,121. Three are self-employed with an average household income of $20,020. The highest earner was $69,333 and 68 people claimed $0 for their household income. This can be found in Table 10.

In the study, 81 participants made $16,000 or greater a year while 88 participants made less than $16,000 a year. Participants were randomly assigned to default group (88, 52%) or free choice group (81, 48%). The mean and median where considered when determining the value for the proportions test. The difference between the two was $1,606. When considering the high number of unemployed participants (110) and the number of people who claimed $0 for income (68) it was decided that the mean value would better represent this participant group. The proportions test with the median income did not change the findings.

When evaluating the proportion of participants who showed up to the Food Pharmacy and made less than $16K annually compared to participants who showed and made equal to or

more than $16K annually the proportion difference was -0.206 with one sided p = 0.003 as seen in Table 11. This demonstrated that participants who made more than $16K annually showed up to the Food Pharmacy at a higher rate than people who made less than $16K annually. This evaluated the direct effect of income on participants who showed up but not the relationship between default and free choice on utilization. In order to measure the moderation of income on default and free choice relationship on utilization I needed to measure the proportion of participants in the default group vs. free choice group that made less than $16K annually compared to the proportion of participants in the default group vs. free choice group that made equal to or more than $16K annually.

Of the participants making less than $16,000 a year, 23 (59%) in the default group showed up to the Food Pharmacy, whereas 23 (47%) of the free choice group showed up to the Food Pharmacy, as seen in Table 12. The participants who made less than $16,000 per year, the difference in proportion was 0.120 with a p value > .05 (one sided p = 0.119), therefor the I fail to reject the null hypothesis that there is not a difference between the default and free choice. Conversely, 81 participants claimed an annual income greater than $16,000. They were assigned to either the default group (49) or free choice group (32). Of these participants 38 (78%) in the default group showed up to the Food Pharmacy, whereas 21 (66%) of the free choice group showed up to the Food Pharmacy. When participants had an annual income of greater than $16,000 per year the difference in proportion was 0.119 with a p value > .05 (one sided p = 0.119), therefor I rejected the null hypothesis that there is not a difference between the default and free choice. In this study, income did not mitigate the default effect on utilization.

H4: Income moderates the relationship between default effect and utilization of services, with higher income associated with a stronger relationship between default effect and utilization of services.

H4 - Income

Row Labels	attended/show		no_show		Grand Total	
default	61	69%	27	31%	88	52%
< $16K	23	59%	16	41%	39	23%
>= $16K	38	78%	11	22%	49	29%
free_choice	44	54%	37	46%	81	48%
< $16K	23	47%	26	53%	49	29%
>= $16K	21	66%	11	34%	32	19%
Grand Total	**105**	**62%**	**64**	**38%**	**169**	**100%**

Table 11: Income Results Table

Proportion of Show by Income Independent Samples Proportions Group Statistics					
	Group	Successes	Trials	Proportions	Asymptotic Std. Error
Show = 1	< $16,000	46	88	0.523	0.053
	> = $16,000	59	81	0.728	0.049

Proportion of Show by Income Independent Samples Proportions Group Statistics						
	Test Type	Difference in Proportions	Asymptotic Standard Error	Z	One-Sided p	Two-Sided p
Show = 1	Wald H0	-0.206	0.073	-2.754	0.003	0.006

Table 12: Show by Income, Proportions Groups Statistics Results

H4: Income Independent Samples Proportions Group Statistics					
Income	Group	Successes	Trials	Proportions	Asymptotic Std. Error
<$16K	= default	23	39	0.59	0.079
	= free_choice	23	49	0.469	0.071
>=$16K	= default	38	49	0.776	0.06
	= free_choice	21	32	0.656	0.084

H4: Income Independent Samples Proportions Group Statistics						
Income	Test Type	Difference in Proportions	Asymptotic Standard Error	Z	One-Sided p	Two-Sided p
<$16K	Wald H0	0.120	0.106	1.123	0.131	0.261
>=$16K	Wald H0	0.119	0.103	1.18	0.119	0.238

Table 13: H4, Income Proportions Group Statistics Results

4.6 Results Summary

In Summary, chapter four presented the results of the study outcome and data analysis. Independent Proportions Testing was used to test the main effect and moderating effects of the study. The main effect was addressed in the first hypothesis on whether the default option showed greater utilization of services compared to free-choice option. The results, as shown in Table 13, supported this hypothesis (H1) that participants offering the default option utilized services significantly more compared to the participants in the free-choice group. The following three test evaluated the moderating effect on the relationship between default effect and utilization of services. Hypothesis 2 (H2) was supported by the data confirming that patient-

provider language concordance moderates the relationship between default effect and utilization of services, such that presence of language concordance reduces the gap between default option and free-choice option compared to the absence of language concordance. Hypothesis 3 (H3) was also supported by the data confirming that patient-provider gender concordance moderates the relationship between default effect and utilization of services, such that presence of gender concordance reduces the gap between default option and free-choice option compared to the absence of gender concordance. Lastly, the relationship of income between default effect and utilization of services were evaluated and the data did not support this hypothesis (H4).

The next chapter will discuss the theoretical and practical implication of this study. It will also describe the limitation that was identified and discuss future direction for this type of research.

Direct Effect of Default Effect		
H1	**Default option shows greater utilization of services compared to free-choice option.**	**Supported**
Moderating effect on the relationship between Default Effect and Utilization		
H2	**Patient-Provider language concordance moderates the relationship between default effect and utilization of services, *such that presence of language concordance reduces the gap*** *in service utilization* ***between default option and free-choice option compared to absence of language concordance*.**	**Supported**
H3	**Patient-Provider gender concordance moderates the relationship between default effect and utilization of services, *such that presence of gender concordance reduces the gap*** *in service utilization* ***between default option and free-choice option compared to absence of gender concordance*.**	**Supported**
H4	**Income moderates the relationship between default effect and utilization of services, with higher income associated with a stronger relationship between default effect and utilization of services.**	**Not Supported**

Table 14: Research Hypothesis Results Summary

CHAPTER 5: DISCUSSION

This section contains a six-part explanation of the study's results. The first part summarizes the dissertation research. The results in relation to the hypothesis are described in the second part. The third section emphasizes the study's contribution to the literature, and practice. The fourth and fifth parts discuss limitations and potential research directions. The research is concluded in the last portion.

5.1 Overview

The purpose of this study is to better understand the effectiveness of Behavioral Economic interventions such as default effect and its relationship to utilization of health services such as the Food Pharmacy. The default effect, concordance of language, and concordance of gender are important ideas in healthcare that may be used to improve patient outcomes.

The default effect refers to people's tendency to remain with the default option or decision, even when additional choices are available (Chavez, 2020). The default effect has major practical ramifications in the workplace since it may contribute to inertia and resistance to change (Viktorija & Ljubomir, 2018). For example, if a firm has an obsolete or ineffective default policy, workers may be averse to change it because they are acclimated to the status quo. This may stymie organizational advancement and innovation. In healthcare, the default effect refers to the phenomena in which individuals prefer to continue with the default option offered to them, even though it is not always the best or most suited decision for their health (Cox et al., 2016). In healthcare, this might show up as patients continuing to take medication despite having bad side effects or the treatment not adequately treating their disease. Healthcare practitioners may take advantage of the default effect by selecting the most effective therapy or medicine for the patient's condition. To enhance patient outcomes, a healthcare professional may adjust the

default selection to the most effective prescription for a certain ailment rather than the cheapest or most usually given alternative.

Another factor that I studied in this research is patient-provider gender concordance and patient-provider language concordance and their respective effects on patient's utilization of healthcare services. Gender and language concordance, refers to the matching of persons of the same identified gender or spoken language to work together (Otte, 2022). In this research I studied the effect of language and gender concordance in a healthcare setting between the patient and the provider. In healthcare, concordance can impact a patient's and their healthcare provider's agreement and cooperation in making choices concerning the patient's treatment (Salimah H Meghani et al., 2009). It underlines the significance of taking the patient's choices, beliefs, and values into account while making recommendations such as treatments and services (Street et al., 2008). In practice, this implies that healthcare practitioners and patients should collaborate to design treatment regimens that are in line with the patient's objectives and values. Healthcare practitioners may increase patient happiness, adherence to treatment, and, ultimately, health outcomes by fostering concordance (Salimah H Meghani et al., 2009). The default effect and concordance are two related psychological phenomena that have gained a lot of attention in recent years. The default effect refers to people's inclination to accept the default choice when making decisions while concordance refers to how well people's preferences and decisions correspond with their values and beliefs.

The final factor I studied was the relationship of income on patients' utilization of healthcare services. The capacity of a patient to get healthcare treatments may be greatly influenced by his or her income (J. W. Lynch et al., 1997). Typically, people with greater earnings have more access to healthcare than those with lower incomes (Freeman, Kadiyala,

Bell, & Martin, 2008). This is because healthcare services, such as medical treatments and pharmaceuticals, may be expensive, and people with higher salaries are more likely to be able to pay these costs (Jin, Shah, & Svoboda, 1997). People with lower earnings may experience access hurdles to healthcare, such as a lack of health insurance coverage or excessive out-of-pocket payments (J. O. Arrow, 1996). Patients who may not have insurance may struggle to pay for important medical treatments, drugs, and preventive care services. Consequently, individuals may postpone or avoid obtaining treatment, which may lead to more significant health issues in the future. There are additional hurdles in receiving healthcare services such as, individuals may have limited transportation options, making getting to medical visits difficult (Jin et al., 1997). They may also have more rigid work schedules, making it harder to take time off for medical visits. Overall, a patient's capacity to get healthcare services may be significantly influenced by his or her income. Lower-income patients may experience a variety of obstacles to treatment, which may have substantial effects for their health and well-being. As seen in this study, participants who earned more than the average income ($16,000) showed up to utilize the Food Pharmacy services significantly more than those earning less than the average incomes. Although this was not a part of the original investigation it was a noteworthy finding.

5.2 Research Findings

This study answered a number of important research questions. Default option does effect service utilization. There was an effect on default choice and utilization when language concordance was present. There was an effect on default choice and utilization when gender concordance was present. Lastly, income did not significantly change the relationship between default choice and utilization when compared to the free-choice option.

The dependent variable in this study was the utilization of the Food Pharmacy service. The participants of this study either used the service or did not and was coded as show versus no-show. The independent variable was default choice or free choice. Participants who were provided an appointment, with date and time, to Food Pharmacy were in the default group. Participants who were not provided an appointment but were asked to call to schedule an appointment to the Food Pharmacy were in the free choice group. These two groups were tracked to see who showed up to the Food Pharmacy to utilize its services. Additionally, key data was collected from the participants such as their native spoken language, identified gender and income. The participants were assessed on whether their native spoken language matched the providers for language concordance. Also, if their identified gender matched that of the provider for gender concordance.

Hypothesis 1 proposed that a greater proportion of participants in the default group would utilize the Food Pharmacy service over the free choice group. This study supported this relationship. The default effect is a phenomenon in which people tend to choose an option that is presented as the default option (Eric J Johnson & Goldstein, 2003). This effect has been shown to have a significant impact on choice architecture, which refers to the design of the environment in which people make decisions (Richard H. Thaler, 2008). The default effect can be used to influence people's choices in a variety of settings by nudging them towards making a better or healthier decision. This study demonstrated that when the default choice is an easier and healthier options people will follow it. There has been many studies demonstrating this phenomenon as described in the literature review (Jachimowicz, Duncan, Weber, & Johnson, 2019; Leonard, 2008).

I did not find any studies however that looked at the moderating effect of gender and language concordance on default choice. Hypothesis 2 and 3 suggested that a concordance between the patient and provider on spoken language or identified gender would moderate the relationship between default choice and utilization. The results supported this hypothesis. I was surprised however, that when either form of concordance was present it mitigated the default effect on utilization. Whereas, when concordance was not present it amplified the default effect. I believe this offers theoretical and practical implications described in the next section.

H4 evaluated the relationship between income and the default effect on utilization. The data did not support this hypothesis. The study compared the proportions by average annual income of $16,000 by the default group compared to the free choice group. The differences were not statistically significant between the default compared to the free choice group for people make more or less than $16,000. When comparing the participants who showed up to utilize the Food Pharmacy by average income this did show a statistically significant difference. Participants who made equal to or more than $16,000 a year utilized the Food Pharmacy at higher rates than those who made less than $16,000 a year. However, this was not an effect I had originally tested for but could have practical and theoretical implications and could be a part of a future study.

5.3 Contributions

Theoretical Implication

The default effect and patient-provider concordance are two significant areas of healthcare research with considerable theoretical implications. Following are some of the important theoretical implications of this research:

Default Effect:

The default effect refers to people's inclination to choose the default option when making decisions, even if it is not the greatest option for them (Jachimowicz et al., 2019). The default effect research has various theoretical consequences, such as the power of defaults: Research has shown that defaults can have a powerful effect on behavior, often leading people to make choices that are not in their best interest (Richard H. Thaler, 2008). This highlights the importance of carefully designing defaults to promote positive health behaviors. Another theoretical implication could be the role of decision-making biases. The default effect is driven by several decision-making biases, including status quo bias and omission bias. Understanding these biases can help healthcare providers design interventions that overcome these biases and promote better decision-making (Eric J Johnson, Hershey, Meszaros, & Kunreuther, 1993).

Patient-Provider Concordance:

The degree of agreement between patients and healthcare professionals on many elements of care, such as gender or language, or treatment objectives, and decision-making, is referred to as patient-provider concordance (Street et al., 2008). Theoretical implications of patient-provider concordance research can elevate the importance of patient-centered care. Patient-provider concordance is a key aspect of patient-centered care, which prioritizes the needs and preferences of the patient. This approach to care recognizes that patients are experts in their own experience and that healthcare providers need to work collaboratively with patients to achieve the best possible outcomes (Epstein & Street, 2011). This research can further the understanding of communication effectiveness. Effective communication is essential for patient-provider concordance. Patients who feel that their healthcare providers are listening to them and taking their concerns seriously are more likely to be engaged in their care and to adhere to treatment

recommendations (Oates, Weston, & Jordan, 2000). Other theoretical implication is recognizing the importance of shared decision-making. Patient-provider concordance is closely linked to shared decision-making, which involves patients and healthcare providers working together to make decisions about treatment. This approach to care has been shown to improve patient satisfaction and adherence to treatment (Elwyn et al., 2012).

Practical Implication

The default effect refers to the tendency for people to choose the default option or to stick with the status quo, rather than making an active decision, while gender/language concordance refers to the alignment of an individual's gender/language with the gender/language of others in their environment, such as their supervisor or colleagues. There are practical implications for both default effect and concordance in business. If this was applied to a business with consumers, offering a good or service where the default option is given likely more people will show up compared to leaving it as a free choice. However, if the default option is not available or the desire is to have more free choice people to show up, then introducing a language concordance, such as the consumer and the sales representative who speak the same native language, could increase the chances of people showing up. Or another way to look at it is, when there is not an opportunity to have the consumer and the representative speak the same language (language concordance), then offering a default option will likely increase participation.

Default Effect:

One practical implication of default effect in the workplace is increase participation rates. By using the default effect, businesses can increase participation rates in programs such as wellness programs. For example, by making enrollment in a wellness program the default option for new employees, businesses can increase the number of employees who participate in the

program (Viktorija & Ljubomir, 2018). Another implication is improving decision-making by using the default effect to nudge customers towards choices that are in their best interest. For example, a new software setting. In many workplaces, employees use software applications for various tasks. Setting default options for these applications can increase efficiency and reduce errors. Employers can simplify decision-making by presenting a default option therefor achieve a more desired outcome. This can be particularly helpful in complex industries such as healthcare or finance, where too many options can lead to decision paralysis.

Overall, the default effect can be a powerful tool for businesses looking to influence customer behavior in a positive way. By understanding how defaults shape our decisions, businesses can design products and services that help customers make better choices (Ebeling & Lotz, 2015). Some restaurants default to offering healthier meal options as the default option, rather than unhealthy ones. Many fast food chains now offer kids meals with a juice and fruit and vegetables as the default versus soda and fries (Samek, 2019).

In healthcare, vaccinations adherence could be improved through the use of default effect (Cox et al., 2016). Patients can be automatically scheduled for vaccinations based on their age or other demographic factors. This can lead to high vaccination rates among those who may not have otherwise chosen to get vaccinated, but it can also lead to people receiving vaccines that may not be the best fit for their specific health needs. Another use could be medication adherence is one practical use of the default effect and concordance in healthcare. While picking a treatment plan, healthcare practitioners may utilize the default effect to set the default choice to the most effective drug for a patient's condition, while increasing concordance by addressing the patient's preferences and values (Lamprell, Tran, Arnolda, & Braithwaite, 2021). Behavioral treatments, such as reminders and incentives, may also be used by healthcare practitioners to

encourage patients to keep to their treatment plan and increase drug adherence (Mitesh S Patel et al., 2016). Another use could be electronic medication order submitted to the pharmacy after a physician visit versus a prescription given to the patient. Often after the visit with the doctor prescribes medication. Providing a default option to have the medication automatically sent to the pharmacy so that it is ready when the patient picks it up would increase the medication adherence and reduce multiple visits to the pharmacy (Roseleur, Harvey, Stocks, & Karnon, 2019). . Healthcare practitioners may assist improve patient outcomes and promote greater health by adopting these principles into their practice.

Gender Concordance:

Gender concordance may also have practical consequences in the workplace, especially in terms of team relationships and cooperation. If workers prefer to work with people of the same gender, this might lead to gender homophily, or the inclination for people to associate with others who are like them. It can impact an individual's sense of belonging and motivation within the workplace. Research has shown that women are more likely to experience a sense of belonging and higher levels of motivation when they have female supervisors and colleagues. Therefore, organizations can promote gender diversity and inclusivity by prioritizing gender diversity in hiring and promotion decisions and providing opportunities for women to connect and collaborate with other women within the workplace through affinity groups such as Company Resource Groups.

In healthcare increasing the gender diversity of the provider workforce can lead to better patient satisfaction and health outcomes. Our medical workforce must better represent the gender mix of our total patient group to achieve gender concordance in clinical practice. Organizations can boost the number of women in our workforce pipeline by implementing a series of

comprehensive interventions that directly target the current implicit and explicit prejudices that restrict women's prospects in medicine (Stahl, Maznevski, Voigt, & Jonsen, 2009). More mentorship and early exposure to the practice of medicine, both inpatient and outpatient settings, would help (Chao, Badwan, & Briceño, 2022). Healthcare organizations increasing the efforts to change the culture to accommodate families and women are critical for recruiting and retaining more women in medicine. Increase the number of women in positions of leadership in medicine (Boulis & Jacobs, 2017). Diversification of leadership fosters innovation and growth in patient care, research, and health care delivery, therefore attrition of women in the leadership pipeline should be explicitly addressed via sponsorship, mentoring, and flexible career routes (Rivera & Tilcsik, 2019; Stahl et al., 2009).

Language Concordance:

Language concordance in healthcare refers to the match between a patient's language and their healthcare provider's language (Rayan et al., 2014). In the workplace, language concordance can be important for employees who speak languages other than English. Providing language concordant support, such as translation services or bilingual staff members, can help these employees better understand essential information and feel more included in the workplace. Language concordance can have implications for diversity and inclusion in the workplace. Employers can take steps to promote diversity and inclusion, such as offering multiple options for retirement plans or providing language support for employees who speak languages other than English. Language concordance can also impact communication and productivity in the workplace. When employees can communicate effectively with each other, they are more likely to work well together and achieve their goals (Viktorija & Ljubomir, 2018).

Providing language support can help ensure that all employees are able to understand valuable information and participate fully in workplace activities.

In healthcare, increasing the diversity of provider to include their spoken languages is important for improving access to care, addressing health disparities, and enhancing the quality of care for all patients (Fernandez et al., 2011). Enhancing provider diversity may ensure that patients have access to culturally and linguistically relevant healthcare treatments. This is especially relevant for those from disadvantaged populations who may experience hurdles accessing healthcare owing to language or cultural issues. Patients may feel better at ease expressing their healthcare needs and concerns with doctors who share their cultural background. This may result in increased communication, trust, and, eventually, better health results. In the United States, health disparities, or discrepancies in health outcomes depending on characteristics such as race, ethnicity, and socioeconomic level, exist (Cooper & Powe, 2004). By ensuring that all patients have access to high-quality care, increasing provider diversity may help address these inequities.

Healthcare organizations must guarantee that their recruiting procedures are clear of biases to improve provider diversity. This may be accomplished by examining job descriptions and criteria to ensure that they are inclusive and do not exclude eligible individuals from varied backgrounds accidentally. Businesses might also explore cooperating with community groups to widen their reach to more diverse applicants. Healthcare organizations may promote diversity and inclusion objectives by providing customized training and development programs. Mentorship and sponsorship programs, cultural competence training, and leadership development for underrepresented groups are examples of such programs. To recruit and keep a diverse staff, healthcare institutions might provide incentives. Offering signing incentives or debt

payback schemes to healthcare practitioners from underrepresented groups, as well as attractive compensation and benefits packages, might be examples of this (Verma et al., 2016). Healthcare organizations should make an effort to foster a culture that embraces and promotes diversity. This might involve offering diversity and inclusion training to all employees, forming employee resource groups, and fostering open and honest communication about diversity and inclusion concerns.

Overall, understanding and addressing the default effect and gender/language concordance can help create a more inclusive and productive workplace. Diverse providers may contribute various talents and views to healthcare, which may enhance overall quality of treatment. Providers who have worked with diverse groups, for example, may be more qualified to comprehend and treat the special health needs of those communities. This study also pointed to the moderating effect that concordance may have on the impact that default option has on utilization. When there is no default option considering language or gender concordance could enhance the desired outcome. Especially, with a low-income population. Another way to look at it is, when gender or language concordance is not possible, one can consider introducing a default option to allow the path of least resistance a desired outcome.

Income:

The effect of income on default choices can have significant practical implications for individuals and society as a whole. For example, individuals may miss out on opportunities to save or invest in more profitable options or make healthier decisions if the default option is not beneficial for the individual (Richard H. Thaler & Benartzi, 2004). This can result in a lower financial security or worsening health in the long run. Additionally, the income and default effect can exacerbate existing wealth and health inequality, as those with lower incomes are more

likely to stick with the default option, which may not be the best choice for their situation (Sulka, 2019). The income and default effect can be mitigated by providing individuals with information about their options and offering.

Overall, the income and default effect are a complex phenomenon with significant practical implications for decision-making. By understanding this phenomenon and implementing effective strategies to mitigate its negative consequences, individuals and society can work towards decisions that lead to better lifestyle.

5.4 Limitations

The contributions of this study should also be evaluated considering its limitations. The limitations include the following: the limited number of diverse providers, the limited variables available, the small sample size, and the amount of time to run the research.

The first limitation was the number of providers available. One provider saw most of the patients. Future research should include more providers seeing an equal proportion of patients. The second limitation is the diversity of the provider's background. There were two Hispanic female providers and one Caucasian male provider. Future research should include more gender, racial and ethnic backgrounds to further study the effect of concordance on behaviors.

The number of variables available to assess in this research was the another constraint. A richer dataset with additional variables to control or differentiate the observations with a more balanced classification should be used in future study. This may allow for alternative analysis using analysis of variance techniques to compensate for the above-mentioned characteristics, which could more effectively identify and assess the precise source of variation. A possible variable could be patient ethnicity to compare the difference between language and ethnicity concordance relationship on behavior.

Another limitation was small sample size and the amount of time to conduct the research. Although there were 169 participants in the study a larger samples and diversity in participants backgrounds, gender, ethnicity and language would provide greater confidence in the results achieved (Alvarez et al., 2021). Future research should be conducted longer to include more participants with greater diversity in gender, ethnicity, language, and education level.

5.5 Future Research

Future research on the default effect and concordance could explore several different directions, including factors that influences concordance. While there is evidence based on this research that concordance is associated with greater utilization of services, we know relatively little about the factors that influence concordance. Future research could investigate the role of patient characteristics (such as age, gender, and ethnicity), healthcare provider characteristics (such as training and experience), and contextual factors (such as time pressures and resource constraints) in shaping concordance. This study primarily looked at utilization of services, a future study can examine the impact of concordance on health outcomes. Concordance between patients and healthcare providers is associated with better health outcomes, but more research is needed to understand the causal relationship between concordance and health. Future studies could investigate whether interventions to increase concordance, such as communication skills training for healthcare providers, lead to improved health outcomes for patients. Given the potential negative consequences of the default effect and lack of concordance, it is important to identify interventions that can help people make better decisions. Another future research could explore the effectiveness of different interventions, such as nudges or decision aids, in reducing the influence of defaults and improving concordance.

5.6 Conclusion

This is one of the few experimental studies that assess default effect on health service utilization for the low-income population, uniquely evaluating the moderating relationship of patient-provider concordance and income. The results were obtained through the observations of 169 participants supporting three of the four hypotheses established in the study. This study expanded the understanding of default effect and contributed an additional dimension to the body of knowledge of Behavioral Economics.

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APPENDIX A: Food Pharmacy Pick Up Calendar

Food Pharmacy Calendar | **2023**

January 2023

S	M	T	W	T	F	S
1	**2**	**3**	**4**	**5**	6	7
8	9	10	11	12	13	14
15	**16**	**17**	**18**	**19**	20	21
22	23	24	25	26	27	28
29	**30**	**31**				

February 2023

S	M	T	W	T	F	S
			1	**2**	3	4
5	6	7	8	9	10	11
12	**13**	**14**	**15**	**16**	17	18
19	20	21	22	23	24	25
26	**27**	**28**				

March 2023

S	M	T	W	T	F	S
			1	**2**	3	4
5	6	7	8	9	10	11
12	**13**	**14**	**15**	**16**	17	18
19	20	21	22	23	24	25
26	**27**	**28**	**29**	**30**	31	

Food Pharmacy Pick Up Week

Figure 6: Food Pharmacy Pick-up Calendar.

APPENDIX B: H1 PROPORTION TEST CALCULATION

Input from analyst		
Confidence Interval %	CI%	95%
Assumption check		
Sample Sizes Assumption Met?	Check	Y
Null Hypothesis Test		
Difference between Sample Proportions	Dif	0.1500
Estimated Population Proportion under H_0	π_0	0.6211
Standard Error Difference under H_0	SE_0	0.0747
Z-Value	Z	2.0081
Significance Level	P(2-tailed)	0.0446
Confidence Interval Population Difference		
Standard Error Difference under H_a	SE_a	0.0740
Lower Bound CI Population Difference	LB	0.0049
Upper Bound CI Population Difference	UB	0.2951

Table 15: H1 Proportion Test Calculation

APPENDIX C: MODERATOR CHART

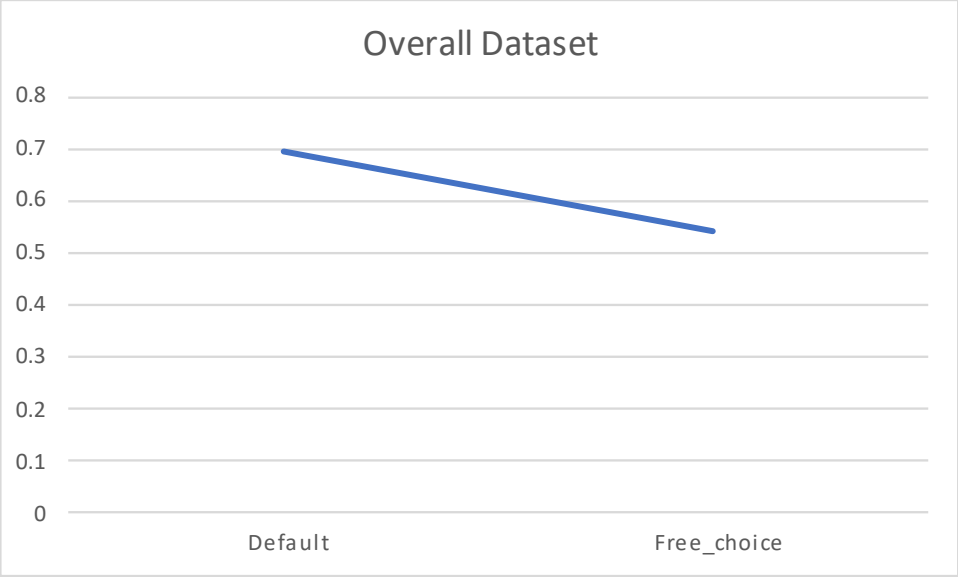

Figure 7: Main Effect – Default and Free Choice

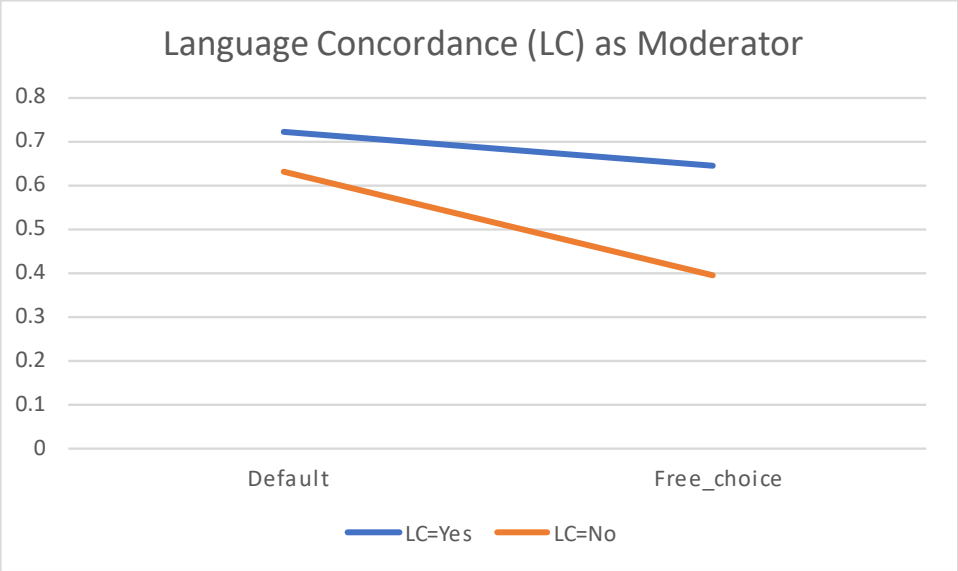

Figure 8: Language Concordance as Moderator

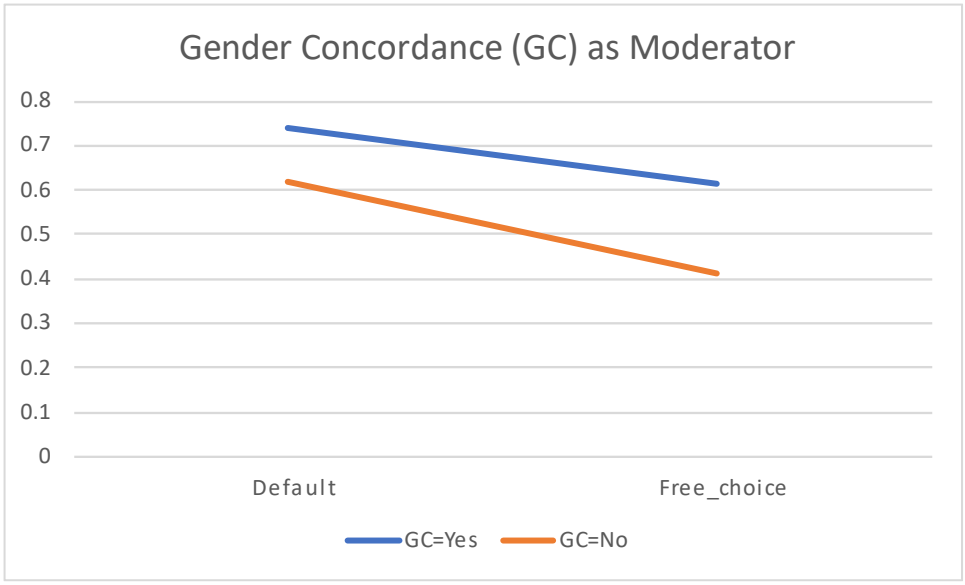

Figure 9: Gender Concordance as Moderator

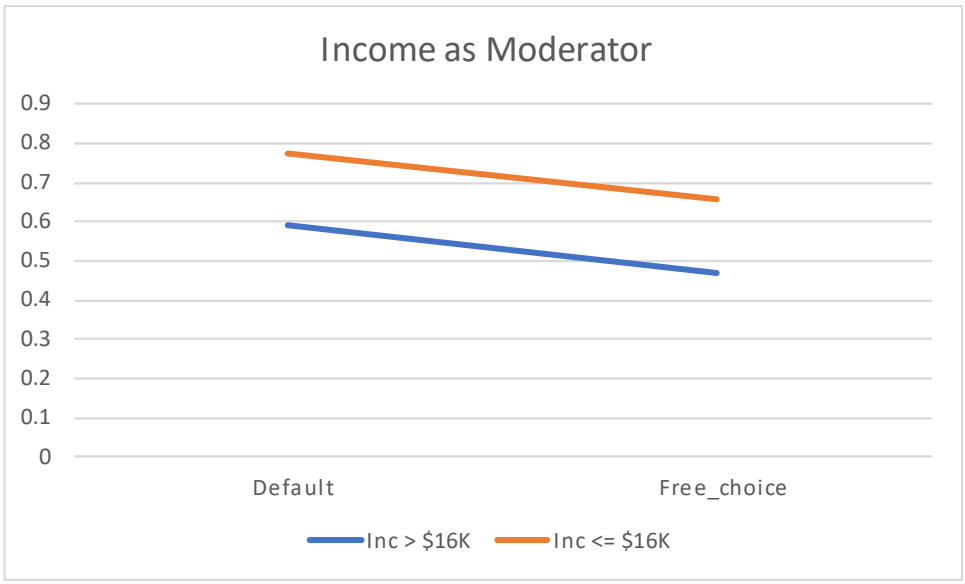

Figure 10: Income as Moderator