

HOW CAN I PAY THIS BILL? THE ROLE OF SOCIAL  
INFLUENCE IN COMPLIANCE WITH MEDICAL BILL PAYMENT

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## ABSTRACT

In two pilot studies, and two full studies, I examined the use of two social influence tactics: 1) normative cues and 2) default option messaging in billing correspondence and its effect on patient compliance with medical bill payment. In the two main studies following my two pilot studies, I integrated social influence theory and behavioral economics to extend my findings and add to the literature on social influence and consumer behavior patterns in healthcare markets as it relates to behavioral economics. With respect to social influence, I utilized Cialdini's (2009) principles of social influence (authority, social validation, commitment, etc.) and the Elaboration Likelihood Model (ELM; Petty & Cacioppo, 1986) as my theoretical framework. The ELM posits that persuasive messages are processed by one of two routes: central or peripheral. Central processing occurs when an individual is thinking carefully about a persuasive message and considering the merit of the persuasive argument. This takes more cognitive energy and resulting changes in attitudes tend to be longer lasting. When a persuasive message is processed peripherally, individuals are paying more attention to cues accompanying the message such as: attractiveness of the influence agent and quantity of the arguments. Furthermore, an individual's own ability or motivation to engage in cognitive processing also affects which route people use to process social influence appeals. Social influence and behavioral economics, are both used as the theoretical framework for the four studies reported in this Dissertation..

In my first pilot study, I hypothesized normative cues would increase the number of payments from healthcare consumers by suggesting the use of available cash from Federal tax refunds (Cialdini & Goldstein, 2004). To examine this, the first pilot study used a correspondence letter utilizing a normative cue containing social validation information that stated: "Many people plan on using this year's tax refund to pay their bill. You may want to consider doing the same." Half the subjects – those in the experimental condition -- received the manipulation in a letter that arrived eight days before the actual invoice. All participants received the invoice without a normative cue. Results indicated that, experimental subjects were significantly more likely to pay relative to control subjects. In the second pilot study, experimental participants received the same manipulation as an invoice. Again, results indicated that experimental subjects were significantly more likely to pay relative to control subjects. These results suggested normative information can increase patient-consumers' compliance with medical bill payment and led to the design of two follow up studies that examined different cues and patient-consumer information (Study 1) as additional variables.

Thus, our first main study (Study 1) used normative cues suggesting patient-consumers make payments that varied by experimental condition. As with the pilot studies, the following three normative cues were used on invoice letters: "Most patients in your situation make a first time payment around \$115.00. Consider making a similar payment"; "23% of patients receiving this letter pay within two weeks"; and "Most patients in your situation make a first time payment within two weeks. You may want to consider doing the same". Our results revealed that patient-consumers complied more with payment in experimental conditions more often versus control,

although there were also significant differences between the experimental groups with the 23% group paying less than the other experimental groups. This is likely because this manipulation provided negative normative feedback that less than ¼ of people like them complied with the payment request.

The second full study (Study 2) utilized default options – a manipulation typically seen in behavioral economics studies (Beshears et. al, 2009). I expected to conceptually replicate the default effect reported in clinical research (Lowenstein, 2007; Halpern, 2007) and replicating the finding of the three previous studies. In this study, two correspondence letters sent to patients included either an opt-in or a control message for payment plan enrollment. In order to ease the medical debt burden and make payments more manageable, I predicted the opt-in enrollment for payment plans to increase patient-consumer compliance for accounts paid and/or enrollment in payment plans. Unfortunately, preliminary analyses indicated that the data were not properly randomized, but did yield outcomes consistent with previous studies, and inconsistent with the randomization failure, indicating the opt-in letter increased compliance of payment versus control. Overall, these studies provide new knowledge about ways to help consumers reduce medical debt by increasing their compliance regarding medical bills (Kahneman & Tversky, 1979; Hastie & Dawes, 2001; Thaler, 2004 ).

## LIST OF ABBREVIATIONS AND SYMBOLS

$a$	Cronbach's alpha, an index of internal consistency
$df$	Degrees of freedom: number of values free to vary after certain restrictions have been placed on the data
$F$	Fisher's $F$ ratio: A ration of two variances
$M$	Mean: arithmetic average or the sum of a set of measurements divided by the number of measurements in the set
$p$	Probability associated with the occurrence under the null hypothesis of a value as extreme as or more extreme than the observed value
$r$	Pearson product-moment correlation
$t$	Computed value of $t$ test
<	Less than
=	Equal to
$\beta$	Beta, the regression coefficient or slope of the regression line
Wald	In logistic regression, in which dependent variables are dichotomous, it is the significance of the beta.
$\chi^2$	The Chi Square statistic, which tests whether the distribution of dichotomous data is evenly distributed across the design.
Odds Ratio	The logistic regression test statistic , an association of exposure to outcome.

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## INTRODUCTION

A contemporary crisis is happening in healthcare, with most of the U.S. population maintaining very low levels of disposable income, and an aging “baby boomer” generation spending more money seeking necessary healthcare services (Himmelstein, 2007). Additionally, medical bankruptcy has become a real problem for the U.S. population. Alarming, in 75% of all medical bankruptcies, the individuals had health insurance and many of those who bankrupted had re-mortgaged homes in order to pay off medical debt. Considering the economic downturn in 2008, patient-consumers facing mounting debt have diminishing means of preventing inevitable bankruptcies. Finding ways to ease the balancing act of paying medical bills and maintaining a livelihood would be beneficial for both patient-consumer and provider. The current research investigates ways to ease the decisions made in this balancing act through the use of social influence appeals aimed at increasing patient-consumer compliance with medical billing.

### **Overview**

The factors that influence the financial decisions that people make are foci of research in behavioral economics, cognitive psychology, and social psychology. Of particular interest in social psychology is social influence. According to social influence theory, people change their attitudes owing to real or imagined pressure from others (Cialdini, 2009). Social influence processes can affect individuals’ attitudes and/or behavior and has predictable effects on consumer actions. Cialdini’s (2009) principles of social influence and the Elaboration Likelihood Model (ELM; Petty & Cacioppo, 1986) are important models within social influence theory. The present research relies on them as the primary theoretical framework. Cialdini’s principles of social influence (authority, social validation, commitment, etc.) provide further explanation for

social influence theory by examining trigger features for persuasion and compliance.

Additionally, the Elaboration Likelihood Model (ELM) explains how persuasive messages are processed through one of two routes: centrally or peripherally; and affects the strength of the resulting attitude change of the influence target (Cialdini, 2005; Goldstein, Cialdini, & Griskevics, 2007, Petty & Cacioppo, 1986).

Behavioral economics, on the other hand, defies traditional neoclassical economics and relies upon the insights of bounded rationality, self-interest, and willpower to make predictions about markets and the individual consumer (Jolls, Sunstein, & Thaler, 1998). However, there is a paucity of research that integrates these research traditions, particularly in the context of healthcare. Thus, the integration of social influence and behavioral economics has yet to be thoroughly investigated in the healthcare consumer market, especially in compliance with medical billing requests. Integrating the two theoretical perspectives holds promise in addressing current concerns in U.S. healthcare markets. Thus far, social influence research in healthcare has extended social influence theory and research by examining social influence processes on patient-consumers' likelihood of payment, rate of payment plan enrollment, and the increase of consumer satisfaction and bankruptcy protection (Schultz, 2007; Simonson, 1992).

The integration of behavioral economics and social influence research and application to healthcare could produce both basic and applied benefits to researchers and medical practitioners alike. These benefits include but are not limited to reductions in administrative costs due to collections; reductions in bad debt expense shouldered by healthcare providers and patient-consumers; an increase in assistance programs utilization by the patient-consumer; increased prevention of medical bankruptcies; and extend both theoretical perspectives into a new and relatively unexamined area of research. Below, I review literature applicable to social influence

and behavioral economics, report the results of two successful pilot studies, and report the results of two separate studies. All four studies test hypotheses generated by the integration of social influence and behavioral economics.

### **The Medical Debt Burden**

Medical debt is driving families into bankruptcy, and middle class Americans currently face great risk following care for a serious illness (Himmelstein, 2005). Considering the large amounts of consumer debt held by American families, a single medical bill could be financially disastrous (Crenshaw, 2000). Surprisingly, medical debt is a very common phenomenon; 1 out of 6 or roughly 29 million Americans under the age of 65 have medical debt (Seifert, 2006). Additionally, 17.6 million Americans with private insurance report substantial difficulties paying medical bills. Furthermore, in one study, 44% of medical debtors reported using all or most of their savings to pay medical bills. Medical debt, itself, is a health risk factor for Americans because it inhibits access to care; incurring medical debt can deter patients from seeking needed care. Although bankruptcy is the extreme resolution of holding medical debt, the dual problem of medical debt and access to healthcare due to a deterrence of medical debt is pervasive, damaging, and ultimately will result in an increase in cost of treatment for both the patient-consumer as well as the health provider (Seifert, 2006).

Himmelstein (2007) states that, of all annual bankruptcies in the United States, 62% were medical bankruptcies, and of those medical bankruptcies, 92% were for balances over \$5,000.00 USD. Only 20 years ago, the number of bankruptcies due to medical debt was only 10%, representing a sixfold increase medical debt bankruptcy (Himmelstein, 2005). Alarming, 75% of individuals who filed medical bankruptcies had health insurance. The majority of the people bankrupted by medical debt were well-educated with middle class incomes, owned homes, and

were gainfully employed; many of those bankrupted by medical debt had lost significant amounts of income due to illness, and had re-mortgaged a home in order to pay medical bills as a means of avoiding bankruptcy (Himmelstein, 2007). In 2008, the Commonwealth Fund surveys found that for Americans insured for a complete year, 16% were not able to pay their bills, 15% had been contacted by a collection agency, 10% were paying medical bills over time, and 10% reported changing their way of life to pay off medical debt (Doty, 2008).

Considering the economic downturn of 2008 and the resulting real estate market collapse, patient-consumers did not have the option of mortgaging a home in order to pay down the medical debt owed. “People with medical debt are often subject to legal judgments, wage garnishment, attachment of assets including bank accounts, or liens on their homes, which can lead to foreclosure” (Seifert, 2006). The problem has become so severe that Congress has instituted bills to lessen the burden of medical debt on the American citizen.

H.R. 901, for example, the Medical Bankruptcy Fairness Act, represents an important step forward to addressing this problem of debtors facing bankruptcy because of health care costs. The purpose of the bill is to increase the federal homestead exemption to \$250,000 and allows the debtor to choose the higher federal homestead exemption if it is higher than the state exemption (Member testimony, 2010). Essentially, this means the debtor would be less likely to pay federal income taxes and extends the tax deduction amount to add more security in case extra cash is needed to pay debt. As a response to the real estate crisis, the bill helps to protect the interest of homeowners and provides peace of mind for medically distressed debtors, preventing the loss of hard-earned home equity or income because of accident or illness.

Medical bankruptcies can be prevented by protecting against financial risk; health insurance stability, which the Patient Protection and Affordable Care Act (PPACA) provides,

offers the protection consumers need to prevent medical bankruptcy. As noted above, medical bankruptcies were often filed by the insured, a lapse in coverage two years before bankruptcy is highly correlated to an eventual medical bankruptcy event. The current recession has likely accelerated the amount of medical bankruptcies in the U.S., and can be explained by two reasons, both of which are related to unemployment. First, income shocks due to unemployment can often plunge consumers into medical debt if new work is not secured quickly. Second, if a consumer is unemployed or between employment, health coverage is lost or exorbitant (if the patient-consumer is lucky enough to qualify for COBRA coverage, and medical bankruptcy due to any medical event could be on the horizon (United States, 2009).

PPACA will extend insurance coverage to nearly 32 million U.S. citizens when implemented in 2014 (Graves, 2011). To combat lost coverage due to unemployment, PPACA helps avoid disruptions by extending coverage, which lowers administrative costs and increases continuity of care. Increasing the retention of the insured is an important goal preventing catastrophic medical debt and, ultimately, bankruptcy. Granted, there is great uncertainty about PPACA's ability to control for costs and, due to lack of evidence, it is still unclear how PPACA ought to proceed without evidence and guidance regarding proposed cost controls (Gruber, 2010). By 2016, healthcare expenditures are expected to increase 2% nationally, raising the 17% healthcare GDP by 1-2%. Because spending is likely to increase as well as healthcare coverage, and there is uncertainty about cost controls actually slowing the growth of healthcare costs and expenses, balances after insurance has paid (government coverage or private coverage) are likely to increase. With all other statistics on employment, wages, spending, and savings being equal, patient-consumers still stand to carry a debt burden. Although PPACA does a masterful job of



extending coverage, it will not eliminate the need to research practical answers to a growing medical debt problem.

Patient-consumers are more at risk for medical bankruptcy and accumulating medical debt in the current economic climate. The conventional wisdom for this increased risk points to the stagnation of the middle class' disposable income while total consumer expenditures on goods has increased. In five years between 2000 and 2005, wages increased 15% while the rate of inflation was 14% (Seifert, 2006). Additionally, while increased incomes in families are primarily due to a spouse entering the workforce, household expenditures have increased close to 75%. At the same time, savings rates have dropped to nearly 0%. In sum, all income is spent and nothing is saved (Torneden, 2009).

As healthcare costs continue to increase at current rates, premiums for health insurance and out of pocket health expenses will continue to rise. If this trend is not curtailed, it is bound to increase medical bankruptcies (United States, 2009)

At the beginning of the decade, employers' spending on health benefits for employees increased considerably to \$330.9 billion, a 51.4% increase since 2000 (Dranove & Millenson, 2006). As a result, employees pay higher contributions to benefit plans, have higher deductibles and co-payments, have fewer medications and medical procedures covered, and have had reduced retiree coverage. For instance, between 2000 and 2005, premiums for health insurance have risen 73% (Seifert, 2006). As these premiums continue to rise for employees, these additional burdens for deductibles, copayments, office visits, and prescriptions drugs must still be managed and add to the debt burden. While premiums and copays have increased and the costs of care continue to shift to the patient-consumer, real wages and salaries have declined. As a result, the market of insured people has shrunk because employees participating in more

expensive employee-sponsored health insurance have declined, increasing the numbers of uninsured.

Considering the risk of acquiring medical debt in the U.S., the decreases in employee sponsored insurance enrollment, reductions in healthcare access due to debt deterrence, and the aging U.S. population seeking more healthcare resources, researching patient-consumers' behavior regarding debt and medical billing is apposite. Forty million people in the U.S. are uninsured, but more than 20 million insured U.S. citizens report substantial difficulties keeping up with medical debt (Seifert, 2006). With medical costs on the rise, controlling these costs and protecting the consumer is tantamount to protecting the viability of the U.S. healthcare system and larger economy.

Together, the uninsured, underinsured, and medical debtors put a massive strain on medical systems and solvency across the U.S. healthcare market. Beyond the obvious financial strains posed by the statistics reported above, upholding the fiduciary role of the U.S. healthcare system is in serious question. By considering bills like the Medical Bankruptcy Fairness Act and the Patient Protection and Affordable Care Act, the U.S. government is taking action to combat the problems described above. Nonetheless, the more than 50% rise in employee spending for healthcare combined with increased inflation and unemployment with decreased savings rates is cause for accelerating the means of assisting patients and providers with mitigating the medical debt and bankruptcy problem (Dranove & Millenson, 2006; Seifert, 2006; Torneden, 2009).

This dissertation will examine the integration and application of social influence theory, behavioral economics on compliance with medical billing correspondence. Specifically, extending the social influence theory to guide patient-consumers' compliance with medical bill payment through the use of normative cues is the primary objective of this research.

## **Behavioral Economics**

Similar to social influence, behavioral economics develops and applies models of systematic human errors of cognitive reasoning; the human mind has cognitive limitations regarding decision making, and behavioral economics identifies and oftentimes applies tools to correct for these imperfections. In other words, behavioral economics uses information about human decision error and develops tools to guide consumers towards better decisions. Unlike traditional economic systems, behavioral economics does not rely on consumers to make perfect decisions dependent on market conditions. Instead, in any moment, a consumer makes decisions based on their psychological state, and this is known as status quo bias (Hastie & Dawes, 2001). Inherently, the status quo bias is conditional decision-making and is flawed. The status quo bias plagues decision makers, especially if the decision to be made includes the perception of losses incurred as a result of a decision, see below (Halpern, 2007).

### *Prospect Theory*

Losses are perceived as costlier than gains to individuals (Guadagno, Cialdini, & Evron, 2010). Individuals are not likely to give up the things which they have possession, even if the market dictates otherwise. As a result, losses are more unpleasant to an individual than a gain commensurate with the value of the loss. The aversion to loss is so strong that consumers are more influenced by the notion of a loss than by a gain (Kahneman & Tversky, 1984). In a study illustrating *loss aversion*, participants were given a lottery ticket or \$2.00. Once the gifts to the participant groups were given out, participants were offered to trade in the ticket for cash in place of the other item. The results of this study indicated that few participants were willing to trade their gift for the other item; they even reported liking their gift better (Knetsch & Sinden, 1984). The status quo bias influences the decisions of the consumer, because the consumer

aggressively avoids decisions that are perceived as losses (Hastie & Dawes, 2001). Individuals have a tendency to remain at the status quo of their perception because leaving their status quo is perceived as disadvantageous (Kahneman et. al., 1991).

In another study illustrating the loss aversion aspect of prospect theory, Kahneman (1991) examined 77 students regarding the buying and selling of mugs from the University bookstore. Four separate times, students were identified as buyers, choosers or sellers and prices were set in a make-believe market. Those identified as choosers were not given a mug, but asked to choose between receiving a mug or the established market price of the mug. Sellers were asked what price they would sell the mug for, and buyers were asked at what price they would buy the mug (within a range of set prices). After collecting answers from the buyers and sellers, a price was set for each condition. Note that, both sellers and choosers were in the same situation, they could have chosen between the mug or the established price of the mug determined by the group. Interestingly, sellers median price for selling the mug was \$7.12, choosers at \$3.12, and buyers were the lowest at \$2.87. This is suggestive of a status quo bias and strong loss aversion as the owner of the mug (the sellers) were reluctant to part with the mug; they perceived it had higher value because it was in their possession, whereas the buyers were unwilling to part with their cash for a mug.

According to prospect theory, the way information is presented, whether as a loss or a gain, is known as “message framing” (Kahneman & Tversky, 1979). For example, in the retail space, if retailers present a product as, “Two for the price of One!”, they are more likely to see the product sold in pairs as a result; shoppers do not want to lose the opportunity to gain two products for the same price. In another example of prospect theory and message framing, participants were presented with two choices regarding 600 people with a deadly disease. If

participants choose choice A: 200 lives are saved. If option B is chosen: there's a 33% chance of saving all 600 people and a 66% possibility of saving no one. Even though the expected value of both scenarios is 200 lives saved, 72% of participants will choose option A because Option A is framed as not as much of a loss as option B (66% of saving no one) It is only the framing that makes Choice B seem like a greater loss when it is not any different from A . People chose option A because they are loss averse.

Changing the framing for the delivery of information so a choice appears ,more or less, desirable can influence decisions in predictable ways (Cialdini & Goldstein, 2004). Framing information in terms of loss causes people to avoid the loss. The status quo bias is a type of message frame, which changes as perceptions change. As a result, decision-making over time remains in flux because the psychological state of the decision maker is dynamic. Message framing has relevance for medical debt, as the framing of medical bills has been largely unexamined. For instance, it is unknown whether patient-consumers expected to pay a lump sum view the payment decision as negatively framed because it is perceived as a loss.

When a bill is paid, money is lost, even though a service or a good was gained. When a payment is not made until long after the good or service is received (i.e., a medical treatment), the gain is often intangible. Ultimately, no matter how the information in a medical bill is framed, the patient-consumer who does not pay the bill is choosing to take a loss. If they pay the bill, the chosen gain is credit protection and bankruptcy avoidance. In essence, the amount of the loss experienced temporally can be changed by the payment options offered to the patient-consumer. For example, a bill always has the option to be paid in full with a lump sum, but other instruments (i.e., payment plans) exist which spread the loss out over time. It is possible that the patient-consumer is choosing between levels of losses, but prospect theory has not examined

such hypotheses. After all, patient-consumers do pay their bills, but loss aversion according to prospect theory dictates that the patient-consumer would be less likely ever to pay; simply, this is just not the case. Because bill payment represents a monetary loss, and the choice to pay any bill is not illustrative of loss aversion, prospect theory (Kahneman & Tversky, 1979) may not best explain the phenomenon I intend to assess. Thus, I expect that social influence theory and behavioral economics are more relevant models for the phenomenon I intend to capture.

## **Social Influence Theory**

### *The Elaboration Likelihood Model (ELM)*

The ELM is a dual-process model of persuasion that states that people's attitudes change via a central or peripheral route (Petty & Cacioppo, 1986). It is a theoretical explanation for how persuasive messages are to influence targets. Depending on the context in which the recipient receives the message, differing amounts of cognitive effort will be used in processing the message. The ELM, as a theoretical component of social influence, focuses on a change in attitudes (Petty & Wegener, 1999). When a persuasive message is cognitively processed, the processing is referred to as "elaboration". According to the ELM, high elaboration is linked to the central route of persuasion and low elaboration is linked to peripheral routes of persuasion.

For the central route of processing, the recipient thoughtfully considers the contents of the message; the recipient centrally processes persuasive messages only when s/he has both a motivation and the ability to do so. Also, the strength of the argument in the message significantly impacts the persuasive effect of the message (Cialdini & Guadagno, 2002). For example, in a towel reuse study informing hotel guests about the behavior of other hotel guests, the subject would use the message card information about towel reuse, as a heuristic indicating

that he or she ought to do as others do, thoughtfully considering the message (Schultz, Khazian, & Zaleski, 2008).

Peripheral processing of a persuasive communication occurs when a recipient is persuaded by the message due to non-message related cues associated with the message. The recipient, when peripherally processing a persuasive message, considers the credibility of the message source, the number of message arguments, attractiveness of the source, or the message length (Benoit & Smythe, 2003). For example, when a subject views a littered parking lot, the heuristic cue conveyed by the context is the litter on the ground, thereby establishing a littering norm. The presence of such a norm increases the likelihood that the subject will also litter (Cialdini, Kallgreen & Reno, 1990). Typically, the peripheral route is utilized when the message recipient is not fully engaged in thoughtful consideration of the message (low elaboration). For example, if the persuasive message argument is weak, subjects are likely to focus more on the messenger than on the message (Cialdini & Guadagno, 2002). Research in social cognition indicates that for most humans, this is our natural state, as we tend to be cognitive misers – primarily peripherally processing the world around us and only centrally processing when we have the cognitive resources, the message is compelling, and we have the motivation to do so (Fiske & Taylor, 1991). Central processing typically leads to long lasting attitude change, while peripheral processing typically leads to fleeting attitude change.

Behavior change through a shift of attitude is rare and difficult to produce, as the correlation between attitudes and behavior is surprisingly weak and heavily context dependent (Fishbein & Ajzen, 1980). Although the ELM provides an explanation for persuasion, Cialdini's (2009) six principles of social influence – all of which are peripheral cues -- explain the capacity for persuasive messages and their corresponding social cues influence behavior.

*Cialdini's (2009) Principles of Social Influence*

Cialdini has identified six principles of social influence: liking, reciprocity, social proof, consistency, authority, and scarcity. Each of these principles function as a heuristic about how to behave, and ELM would place each on a continuum closest to peripheral processing. They have all shown to have a strong influence on the behavior of others. The principle of liking is simply the idea that others are influenced by those they like. Our perception of similarity to others increases our compliance with requests from similar, likeable others. For example, the classic Tupperware parties of days gone by were successful because women purchased goods to please their friends, not necessarily themselves. If a woman liked the hostess, and/or felt similar to her, she was more likely to purchase Tupperware; hence, the advent and proliferation of Tupperware parties countrywide (Cialdini, 2001). Celebrity endorsements also exemplify this principle.

The second principle, reciprocity, indicates that people believe that they should give to others what they have received from them (Gouldner, 1960). For example, the Disabled American Veterans association doubled donations by including a small gift to recipients when mailed a donation request letter. Put simply, the act of giving a potential donor an inexpensive gift produced a feeling of obligation to reciprocate and this doubled donation rates (Cialdini, 2009).

The third principle, social validation, is easily explained as following the lead of others (Cialdini, 2009). Whenever a normative information norm is available, it is a powerful tool for behavior change (see both the litter and towel reuse studies described above). The effectiveness of social validation is enhanced when people are in a novel situation – in this case, they are more likely to imitate the behavior of similar others. Furthermore, social validation can be used to increase or decrease compliance. In one such study, Guadagno, Muscanell, Rice, and Roberts (2013), manipulated whether the social validation information indicated complying with a direct



request from the influence agent was the appropriate thing to do, refusing was the appropriate thing to do, or they did not provide participants with any social validation information, Results indicated that the social validation – manipulated by messages from other students who volunteered (or refused to volunteer) for a canned food drive – were successful in swaying the compliance rates of participants to match those of the others who responded to the request.

The fourth principle of consistency indicates that people tend to remain committed to their initial stance on a topic (Cialdini, 2009). Importantly, the public announcement of a commitment to donate money, for example, is more likely to secure a donation than those who do not make a public commitment. In other words, to the extent that commitment is either consistent with prior behavior or consistent with prior public commitment, people tend to stick with their initial commitment, when in the face of information suggesting their initial commitment was wrong (Dare, Guadagno, & Muscanell, 2013). More contemporary research suggests that consistency is not as universal as originally thought. Thus, some people are less interested in maintaining their consistency with prior behavior, beliefs, or commitments (cf. Guadagno & Cialdini, 2010).

The fifth principle is that of authority; people are likely to defer to experts when taking actions or changing behavior, this is suggestive of source credibility in ELM parlance (Wegener & Claypool, 1999). According to Public Opinion Quarterly, an expert opinion in the New York Times is responsible for a 2% shift in public opinion. In a startling study, compliance with exercise recommendations for patients of physical therapists jumped 34% simply by displaying diplomas and professional certificates in their offices (Cialdini, 2009). Furthermore, emerging evidence suggests that men are more sensitive to requests from authorities than are women (Okdie, Guadagno, Petrova, & Shreves, in press).

Finally, the sixth principle is scarcity. Basically, people want what is difficult to obtain. If something is unique or if information is exclusive to only a select few, the desire to gain the object or the information is strong. If someone realizes that the opportunity to obtain an object from a store is soon to end, this can quickly mobilize an action. For example, when beef purchasers were told that bad weather patterns would make Australian beef scarce, wholesale buyers increased their compliance when asked to make purchases. Profoundly, when the beef purchasers were told that nobody else had that information, purchasing compliance was increased by 600% (Cialdini, 2009). Thus, scarcity is a powerful means to gain compliance alone but when the scarce item or information is also offered exclusively, people find it even more desirable.

In total, the ELM and the six principles of influence outlined by Cialdini (2009) are interrelated. Social influence principles function best under conditions of peripheral processing, as individuals are more susceptible to being influenced to comply with a direct request and change their behavior. The ELM pertains more to attitude change. Thus, while they are interrelated, one model primarily affects attitudes, while the other primarily affects behavior. Since I plan to study compliance with medical billing, Cialdini's model of influence is more relevant to the present investigation.

### *Social Norms*

Social influence research indicates that people largely underestimate the role others play in influencing their choices (Cialdini, 2005). As indicated above, when the behavior of similar others influence our actions, this is a process called social validation (Cialdini, 2009). The influence of others' actions has been demonstrated in the context of littering, recycling, and energy conservation (Cialdini & Goldstein, 2004). When simple messages containing normative

information are directed toward consumers presented with a sentence or two about the behavior of others, this information is powerful enough to influence the typical consumer (Schultz, 2004).

The present study proposes to test the influence of medical bill messages embedded with social validation information on participants' compliance with payment requests. When subjects perceive the actions of others or are told about them, this provides normative information and indications as to the correct way to respond to a direct request (Cialdini, 2009). I demonstrate this in the studies reported below. Specifically, social norms can be described as either descriptive or injunctive. A descriptive norm refers to what is commonly done in a specific situation. For example, if a person views another person littering in a parking lot, the perceiver is more likely to engage in littering too. An injunctive norm refers to what is commonly approved or disapproved of within a specific culture or social group. For example, a littered parking lot is indicative of a social group that does not sanction the act of littering (Cialdini, Kallgren & Reno, 1990). In this context, a person given the opportunity to litter is more likely to litter as well if the environment is full of litter, which is indicative of a pro-littering injunctive norm.

In this, Cialdini et al.'s (1990) experiment, participants discovered a handbill on their windshields in a parking lot. The parking lot, for purposes of the experiment, was either littered or clean. To test the effectiveness of both descriptive and injunctive norms, a confederate either dropped trash into the environment in plain view of the participant or simply walked through it. Because the parking lot conditions were a littered lot or clean lot, the descriptive norm perceived by the subject was either to litter in public or not. Also, by observing the confederates littering pattern, participants' attention to the state of the parking lot (injunctive norm) further strengthened the descriptive norm indicating that littering behavior was either socially acceptable or unacceptable. More littering occurred when participants viewed a confederate drop the

handbill as litter, and most importantly, the least amount of littering occurred when participants viewed confederates dropping the handbill into a clean parking lot, upholding the injunctive norm (Cialdini, 2003).

Thus, as the above research illustrates, consumers are influenced by the actions others take (descriptive norm) and by their perception of what one ought to do in a given situation (injunctive norm). Injunctive norms are the “ought” norms; the things we ought to do describe the injunctive norm (Cialdini et. al, 2006). For example, the stop sign used for traffic control is an injunctive norm. All drivers ought to stop when encountering one (it is, after all, the law), but compliance with this injunctive norm is highly context dependent. If we are alone and it is late at night, people are far more likely to glide through the stop sign. If we observe others during the day ignoring the injunctive norm to stop at the sign, we are likely not to either – in this case the descriptive norm triumphs over the injunctive norm. If a police officer is parked by the stop sign, his or her presence reminds people that they must obey the stop sign -- the injunctive norm. Yet, people are more influenced by the descriptive norm, what people observe others doing, because of the principle of social validation (Cialdini, 2009). Hence, we behave and are influenced by others and the peripheral cues we pick up in our environment.

Consumers, if confronted with choices made by similar others, are likely to be influenced to make similar choices. Cialdini and Nolan (2005) reported that descriptive normative information influences towel recycling in hotels. Specifically, if hotel guests were told about the choices other guests made to recycle towels, roughly 30% more hotel guests were likely to make the decision to recycle towels. The information presented to subjects about others’ actions was influential in the choices subjects made. Another example revealed the choices of others -- the descriptive norm -- was shown to also be influential in an experiment to influence consumers’

choices to conserve energy. When consumers were told that it was common in their neighborhood to conserve energy, consumers responded to this appeal more so than any other kind of appeal to conserve energy (Schultz, 2007).

As the above literature illustrates, according to research on social validation, observing the actions of others or being informed about acceptable injunctive or descriptive norms (i.e., seeing a littered parking lot or reading an appeal about others energy conservation behavior) will influence people's behavior to act similarly. Considering this knowledge, what effect can normative information have on patient-consumers and their payment habits? The outcomes of the social influence studies reviewed above suggest that descriptive norms about the payment behavior of others will influence the behavior of the patient-consumer. In two studies described below, I offer the following hypotheses:

**H1, Pilot Study:** When presented with social validation information suggesting that the use of tax refunds to pay medical bills is a descriptive norm, patient-consumers are more likely to pay their bills (Cialdini, Kallgren & Reno, 1990; Cialdini, 2004; Cialdini & Goldstein, 2004; Cialdini, 2009; Guadagno, et al., 2013; Schultz, 2007)

**H2, Amount & Time:** When presented with descriptive normative information suggesting common payment amounts or time frames, patient-consumers are likely to pay the suggested payment amounts and make payments within the suggested time frames (Cialdini, Kallgren & Reno, 1990; Cialdini, 2004; Cialdini & Goldstein, 2004; Cialdini, 2009; Weber, 2004; Schultz, 2007)

**H3, Default Options:** By limiting barriers and directing choice, Patient-consumers are more likely to maintain enrollment in a payment plan if required to “opt-out” instead of “opt-in” (Gimbel, 2003; Lowenstein, 2007; Cialdini & Goldstein, 2004).

## THE PRESENT INVESTIGATION

Social influence theory is successful in obtaining compliance behavior change (Cialdini, 2005; Schultz, 2007; Pratkanis, 2007). Patient-consumers want to avoid loss when making decisions; proper framing of information and messages for patient-consumers may sway them to avoid perceived loss (Kahneman & Tversky, 1984). Influencing the patient-consumer requires framing gains of suggested decisions as positive as well as reducing the number of choices a consumer must make (Gupta, 2009; Schwartz, 2008). Ultimately, this leads to more satisfaction in the decision making process as well as less regret after the decision has been made (Simonson, 1992). Finally, default options, when other strong preferences are not present, can guide decision making without reducing consumer choices and may function as effectively as normative cues do in social influence theory (Halpern, 2007; Gimbel, 2003; Johnson & Goldstein, 2003). Thus, the impact of social influence and behavioral economics on consumers may be integrated and extended to the context of medical bill payment. The following four studies test this prediction.

## OVERVIEW OF THE PRESENT STUDIES

In this dissertation, social influence in the form of normative cues providing social validation information was examined in the context of medical billing correspondence in four separate studies. The indication from two pilot studies suggested that social validation was effective in both studies and prompted the design of two more studies. Experimental letters with three normative cues were tested on patient –consumers for compliance in medical billing requests. Additionally, default options were utilized in a second study to examine patient-consumers’ willingness to pay in response to a request to participate in a payment plan. I predicted strong positive effects for patient-consumers’ responses to normative cues in their billing statements as well as increased payment compliance due to the use of default options, integrating social influence theory with behavioral economics.



## PILOT STUDIES

I conducted two pilot studies to explore the feasibility of the proposed research. These studies also provided insight into ways of increasing compliance for patient correspondence and patient payment, and suggested further social influence studies were feasible. I applied social influence principles in order to persuade patient-consumers to pay their bill using available funds from tax refunds. Two methods were used: 1) a correspondence letter including normative information was sent to patient-consumers eight days before receiving the invoice and 2) a typical invoice was sent after service was rendered including the same normative cue. In these studies, outcomes were predicted to yield increased compliance rates for experimental subjects relative to those in the control group.

### **Pilot Study 1**

#### **Is there any effect of social influence in compliance with medical bill payment?**

Can social influence be effective in medical billing, as it has been shown to be in littering, energy conservation, and towel recycling? In a pilot study, a normative cue in medical billing was used to influence patient-consumers' medical bill payment compliance rates. A normative cue prompting the patient-consumer to use his or her tax refund to pay the outstanding medical bill was utilized in billing correspondence. In particular, this normative cue suggested the patient-consumer utilize a federal tax refund to pay the outstanding medical debt.

## **Method**

### **Participants**

In Pilot Study 1, subjects were 4,438 (1825 men, 2613 women) randomly selected recently discharged patients; 3,330 control letters and 1,108 experimental letters were sent. Because various hospitals were used with live patient data, some hospitals had higher volumes than others in the study. The hospitals were all in the same market service area to account for natural variability in populations; the algorithm used to assign random experimental letters and control letters was exercised by each hospital and not in aggregate, this resulted in a discrepancy in sample size.

### **Procedure and Design**

The experimental design was a two-group design (Pre-correspondence vs. No Pre-correspondence Control). In the Pre-Invoice Correspondence study, I employed a normative cue suggesting the use of participants' Tax Refund to pay down medical debt. The cue was highlighted in bold blue font, and it was enlarged and distinct from other verbiage in the correspondence (see Appendix A). Pre-correspondence letters included a normative cue with the following statement: "*Many people plan on using this year's tax refund to pay their bill. You may want to consider doing the same,*" and were delivered eight days prior to the bill. The control group did not receive a normative cue in the correspondence letter. Data was collected on the selected accounts 30 days after billing correspondence was sent.

## **Results and Discussion**

An analysis of variance (ANOVA) was conducted to examine the effect of the correspondence on subjects' payment responses. Additionally, a logistic regression was conducted to determine payment response rate differences between experimental and control conditions.

In pilot Study 1, for patient-consumers who received the pre-correspondence letter, a significant main effect for payment response was revealed,  $F(1,4576)= 221.45, p= < .001$ . The paid group compared to control was significant ( $M= \$265.36, SD= \$83.75$  vs.  $M= \$131.13, SD= \$163.36$  ).

For subjects receiving the pre-correspondence letter, a Logistic Regression predicting payment as a result of receiving the pre-correspondence letter revealed a significant effect for the presence of normative cues,  $\beta=1.20, Wald (1 df) = 196.7, p < .001, Odds Ratio = 3.33$ ; this determined a 30% increase in response rates with the inclusion of the pre-correspondence normative cue versus control. Specifically, of the 3330 control letters that were sent to the participants, 10.33% of these patient-consumers made a payment; whereas, of the 1108 experimental letters, which were sent to the participants, 29.33% made a payment.

Interestingly, the patient-consumers utilized in the studies were all uninsured and owed a balance from their service dates. Subjects in this study had received care within facilities in the last 30 days, therefore the debt was relatively new and repayment odds (because of the uninsured condition) were theoretically low. In terms of healthcare finance and revenue cycle these subjects were categorized as self-pay. With the pre-correspondence letters, the experimental group was three times more likely to pay than the control, a strong effect. This suggests, initially, that a pre-correspondence notification message suggesting the use of tax refunds to pay medical debt was

an effective cue to induce compliance with payment requests. Because of the success of this study, I conducted a second pilot study to test normative cues on the invoice of the bill itself.

## **Pilot Study 2**

### **Method**

#### **Participants**

In pilot Study 2, subjects were 4,703 (1864 men, 2839 women) randomly selected recently discharged patients; 3,537 control letters and 1,166 experimental letters were sent. Because various hospitals were used with live patient data, some hospitals had higher volumes than others in the study. The hospitals were all in the same market service area to account for natural variability in populations; and the algorithm used to assign random experimental letters and control letters was exercised by each hospital and not in aggregate, this resulted in a discrepancy in sample size.

#### **Procedure and Design**

The experimental design was a two-group design (Invoice vs. Control). In this second pilot study, an invoice was sent to participants with a normative cue or without (control). After the invoice information, a light blue box with bold letters was inserted directly underneath the invoice reading: *“Many people plan on using this year’s tax refund to pay their bill. You may want to consider doing the same”*. In line with descriptive norms (Cialdini et al., 1990) and the social validation (Cialdini, 2009) effect of “similar others”, the bill used the comparative wording of other patient-consumers using tax refunds to pay bills. Additionally, this study was

conducted in the spring when U.S. citizens are expected to receive tax refunds after a filing date of April 15<sup>th</sup>. The bill was the same as previously used in the pre-correspondence study except for the box and cue. Data were collected 30 days after billing correspondence sent.

## **Results**

In Study 2, a significant main effect for payment response was revealed,  $F(1,5807)= 67.9$ ,  $p < .001$ , indicating a high average payment when the normative cue was included in the letter for the experimental letter ( $M= \$10.36$ ,  $SD= 55.04$ ). versus control letter, ( $M= \$4.62$ ,  $SD= \$37.00$ ).

A logistic regression was also run,  $\beta= .150$ ,  $SEb= .009$ ,  $Wald (1 df) = 295.92$ ,  $p = < .001$  with an expected beta of Odds Ratio = 1.162. In other words, the addition of the experimental letter normative cue increased likelihood of payment by 16%. In the experimental condition, of the approximately 1439, 8.24% paid of the total patient-consumers; whereas, in the control condition, 3.96%, of the approximately 4278 patient-consumers paid of the total.

## **Discussion**

Consistent with predictions, results indicated that patient-consumers receiving payment requests with normative cues are more likely to comply with the request and make a payment on their medical bill. Subjects receiving the pre-correspondence letter were more likely to pay than those receiving the invoice with normative cue. Both experimental groups were more likely to make a payment compared to their respective control conditions. The present study adds to our understanding of Cialdini's (2009) principles of social influence within the healthcare payer market. Our findings suggest that normative cues placed in billing correspondence indeed increased compliance with medical bill payment requests. The results suggested the

experimental letters with social validation information guided consumers to act in a manner consistent with the request. This was the intended to benefit the patient-consumer and provider. Additionally, the pilot study reinforced the predictions for testing social influence in medical billing correspondence prompting us to move forward with the following studies.

## MAIN STUDIES

### **Study 1: Normative Cues in Billing: Influencing Average Payment Amounts and Timeframes**

#### **Overview**

With the results of the pilot studies described above, I expanded the variables for the design and procedure of the following study. If normative cues were successful in increasing the compliance with medical bill payment, would the effect hold true with three different normative cues targeting patient-consumers on payment time, payment relevance to others, and payment amount? Below, I describe how I used social influence theory in this study to examine additional effects using three different normative cues in medical bill compliance.

#### **Method**

##### **Design**

This study employed a 3 (Letter Type: Letter A: Pay \$115, Letter B: 23% pay within two weeks, Letter C: Most people pay in two weeks) X 3 (Credit Score: Subprime vs. Prime vs. Superprime) X 2 (ER Admission or Not) between subjects factorial. For the independent variables, I used gender, credit score (separated into three groups as subprime, prime, and superprime), and whether the patient-consumer entered the facility by ER admission or not. For dependent variables, I measured payment response (i.e., did they pay? Yes/No) and the amount paid and compared each experimental condition to the control participants.

When testing normative cues, using accurate information is necessary owing to several concerns (Cialdini, 2009). Participants expect accuracy and transparency in communication from

businesses. Failing to use accurate and truthful information erodes the long-term influence, causes reputation damage to the organization, and is not ethical practice. In accordance with these guidelines, the normative cues used in the present study were based upon actual historical data obtained from the company in which the study was conducted. These data indicated that patient-consumers are making an average first-time payment of \$115 dollars and that first-time payments are not typically made within two weeks after invoice is received.

Thus, the normative cues in the correspondence letters include the following:

Normative Cue Letter A:

***“Most patients in your situation make a first time payment around \$115.00. Consider making a similar payment”***

Normative Cue Letter B:

***“23% of patients receiving this letter pay within two weeks”***

Normative Cue Letter C:

***“Most patients in your situation make a first time payment within two weeks. You may want to consider doing the same”***

## **Participants**

Subjects were randomly selected from a pool of patient-consumers who recently obtained healthcare services. Subjects all had account balances less than \$1,000.00 dollars USD and were uninsured for the balances owed. Age ranges varied, but all participants were adults (age 19 and older). I included 55,961 subjects in this study which included 23,590 males and 29,751 females and 2,620 unknowns. Control group contained 27,623 participants while Letter A, B and C had 9,351, 9,390 and 9,597 participants respectively. Because of the algorithm used to randomize and send letters, the experimental group was broken down into three sections for Letter A, B, and C. As a result, the control group and experimental group in aggregate have nearly the same



amount of patient-consumers, but the breakdown by letter type (A, B or C) in the algorithm explains the smaller experimental sizes compared to control.

## **Procedure and Design**

Billing statements are normally sent for healthcare services obtained at affiliated facilities, but these statements were modified for the purposes of this study to include one of the normative cues listed above. Participants were randomly assigned to one of four different groups. In these groups, all letters were structured in the following way: no normative cue (control), normative cue Letter A (Most make a first payment of \$115), normative cue Letter B (23% pay within two weeks) or normative cue Letter C (Pay within two weeks). Envelopes remained the same across conditions -- the normative cues were only incorporated into the initial statements. Statements were sent after the date of service, and no more unique billing statements were sent after the initial mailing. After 30 days, normal mailings resumed during the course of the billing cycle. Once the 30-day post invoice period was over, data were processed and analyzed.

Dependent variables included the dollar amount of payments made and whether participants paid as dichotomous (yes/No) variable.

## **Results**

### **Data Analysis Strategy**

A between groups factorial analysis of variance (ANOVA) was conducted to explore the impact of the three different letters with three unique normative cues on payment amounts for patient-consumers, measured in US dollars (USD). Subjects were divided into three groups according to their credit score (Subprime: credit score < 620, Prime: credit score >620, and Superprime: credit score >700). These categories were based on prior research, which divided conditions by credit score (Bajari, Chu, & Park 2008). In this experiment, credit score was

broken down by condition Letter A, B, or C. Additionally, patient-consumers were also divided into both ER and non-ER groups. For example, an individual who was not admitted through the ER was identified as a non-ER participant. Thus, the overall design was a 3 (Letter Type: Letter A: Pay \$115, Letter B: 23% pay within two weeks, Letter C: Most people pay in two weeks) X 3 (Credit Score: Subprime vs. Prime vs. Superprime) X 2 (ER Admission or Not) between subjects factorial.

### **Primary Results**

*ANOVAs.* With regard to credit score, there was a significant main effect for credit score:  $F(2, 56099)=48.70, p = .001, \eta_p^2 = .006$ . Post hoc tests using Fisher's LSD revealed that individuals in the subprime category paid less money than both the Prime and Superprime categories (Subprime  $M = 8.52, SD = .96$  vs. Prime  $M = 10.21, SD = 2.15$  vs. Superprime  $M = 32.13, SD = 2.20$ ).

There was a significant main effect for type of admission,  $F(1, 56099)=36.20, p = .001, \eta_p^2 = .006$  indicating that participants admitted through non-ER alternatives paid more than participants admitted through the ER ( $M = 23.42, SD = 1.74$  vs.  $M=10.50, SD = 1.26$ ).

Additionally, there was a two-way significant interaction between credit score and ER admission (see Figure 1),  $F(2, 56099)=9.97, p = .001, \eta_p^2 = .006$ . Main effects revealed that those patient-consumers who were not admitted through the ER paid more money in response to the letters sent (Subprime  $M=13.21, SD=1.61$  vs. Prime  $M=11.026, SD=3.57$  vs. Superprime  $M=46.02, SD=3.5$ ) compared to those patients who were admitted through the ER (Subprime  $M=3.83, SD=1.82$  vs. Prime  $M=9.40, SD=2.40$  vs. Superprime  $M=18.25, SD=2.72$ ).

There was also a significant two-way interaction between credit score and letter groups (see Figure 2):  $F(6, 56099) = 4.94, p = .001, \eta_p^2 = .006$ . Simple effects revealed that Subprime patients receiving letter C ( $M = 13.15, SD = 2.10$ ) paid more than control ( $M = 8.88, SD = 1.22$ ).

The ANOVA also revealed a significant three way interaction between ER and letter condition when credit score is broken down by groups (subprime, prime, superprime),  $F(6, 56099) = 3.50, p = .005, \eta_p^2 = .006$  (see Figure 3). Simple effects revealed subprime patients reacted best to letter C (most pay in two weeks) ( $M = 13.15, SD = 2.08$ ) compared to control ( $M = 8.90, SD = 1.22$ ). For subprime participants in a non-ER group that received letter C (most pay in two weeks), participants paid a higher mean amount ( $M = 23.74, SD = 3.50$  vs. control  $M = 13.13, SD = 2.04$ ) (see Figure 4). Additionally, subprime participants coming in through the ER responded most favorably to letter A (pay \$115) ( $M = 7.65, SD = 2.25$  vs. control  $M = 4.63, SD = 1.33$ ).

Figure 1.

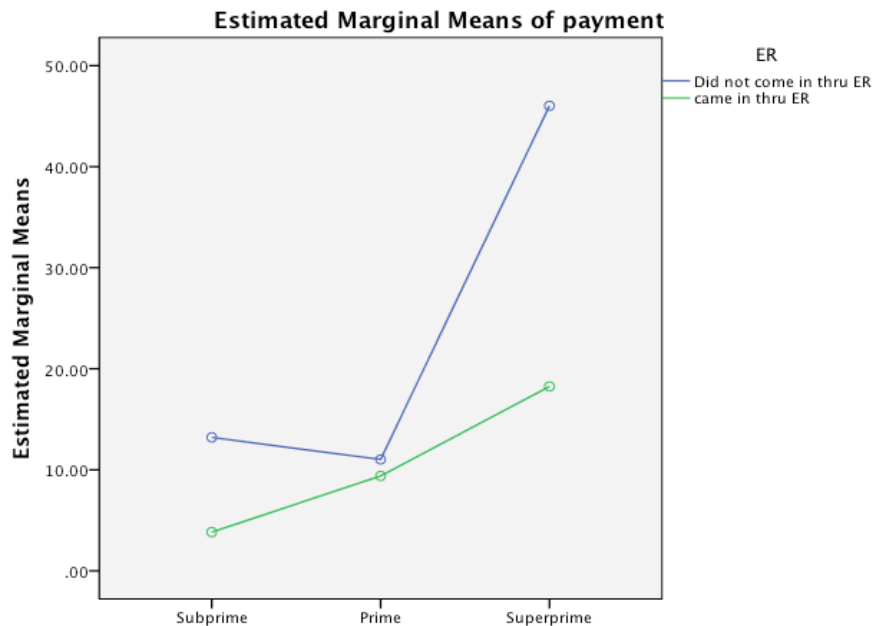


Figure 2

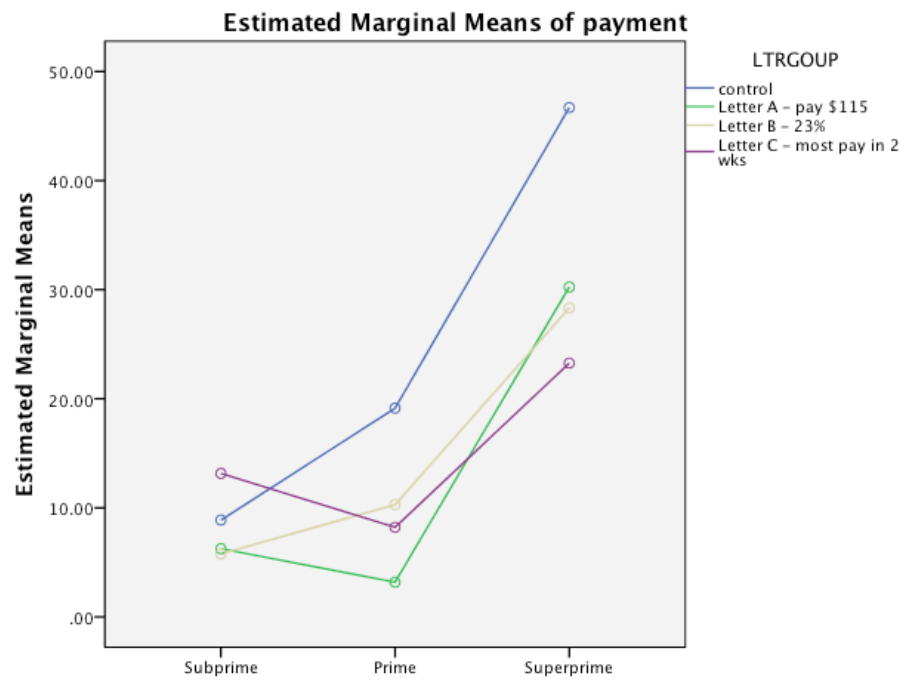


Figure 3

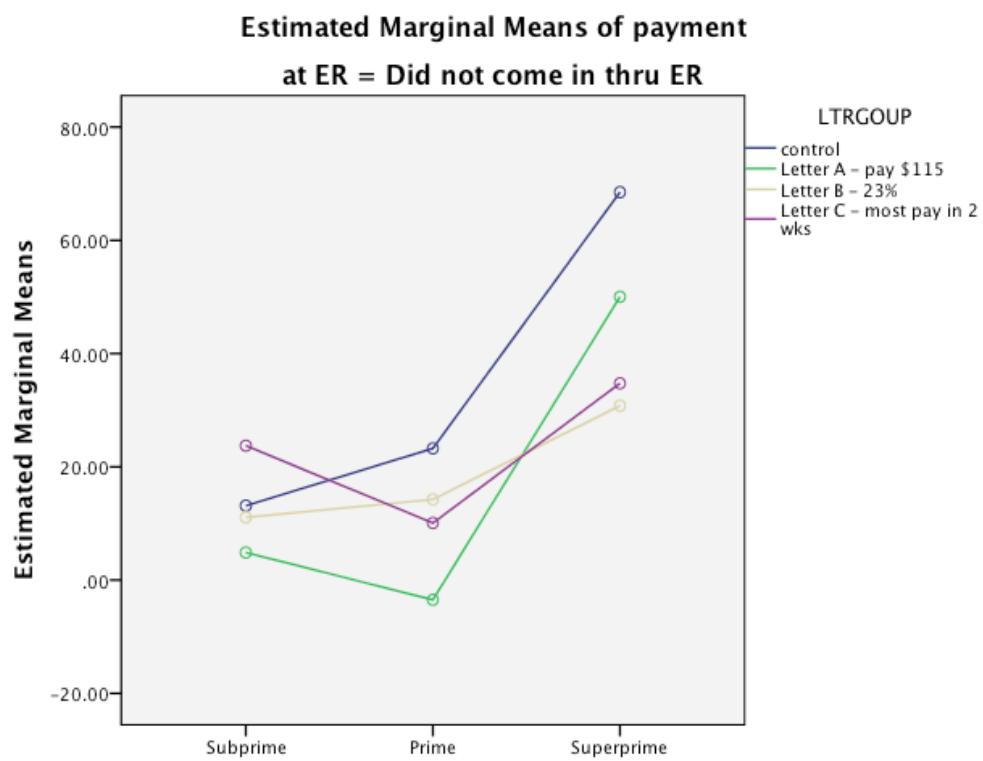
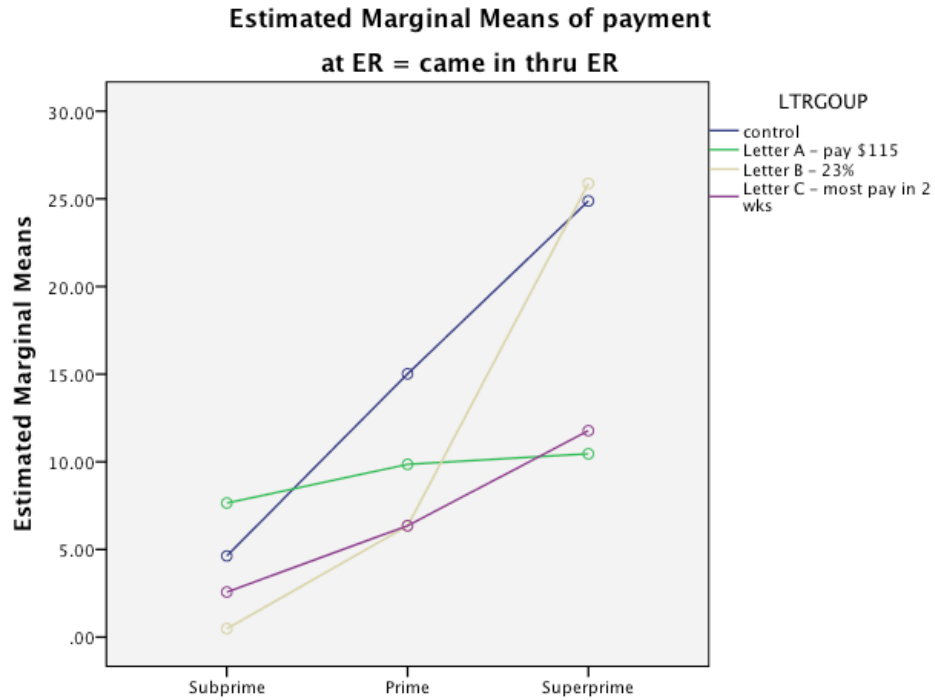


Figure 4



### Discussion

Overall, letter B (23% pay within 2 weeks) did result in lower average payments when compared to both the A and C letter. I interpreted this result as indicating that this cue functioned as a negative cue, deterring payment because it was representative of a minority percentage of payments that were received for this condition. Thus, much like the results of Guadagno et al., 2013, Letter B served as social validation information to refrain from complying with the payment request. Credit score was the best predictor of payment in response to receipt of a letter with a normative cue. Those participants coming through the ER paid less, likely because they represented a lower category of credit score, probably had less disposable income, and were not typically planning a visit to the ER when care was accessed. Patients who do not have insurance

and have difficulty making appointments with primary care doctors, use the ER as a primary care facility; EMTALA prevents these patient-consumers from being turned away (Rhodes et. al, 2013).

Interestingly, patient-consumers with subprime credit scores showed showed more compliance than the prime and superprime categories. In other words, patient-consumers with subprime credit scores complied more with persuasive messaging than patient-consumers with higher credit scores. With self-pay and uninsured populations on the rise, finding a means to increase resources and assist these patient consumers with bill payment is an exceptionally important finding. Because higher credit score subjects were more likely to take care of their bill for reasons associated with consumer responsibility and income, it was expected that normative cues would be less effective on these credit score groups than subprime groupings.

Women, when admitted through the ER were less likely to pay as much as males, but did respond favorably to Letter A and Letter C. Most likely, to account for the lower means of payment for women in the ER, a social consideration must be made. Women, more than men, are likely the caretakers of children. If women are using the ER as a primary means of care because they lack insurance, and are mothers, it is reasonable to presume less disposable income because of the needs of the children. Of course, further studies on the population are needed to make this confirmation, but it is not unreasonable to assume that the gender difference in control payment from ER vs. Non-ER (Men  $M= \$11.53$ ,  $SD= 1.94$  versus Women  $M= 6.77$ ,  $SD= 1.67$ ) patients is due to men being more likely to have disposable income due to payment inequalities and caretaking of children.

It was predicted that letters with normative cues would have an effect on payment outcomes, and not surprisingly, differences in payment by credit score were somewhat

predictable due to variables already used to predict consumer responsibilities built into the credit score calculation. Also, those who were electively coming to a facility for care can be presumed to be prepared to pay for a balance after insurance has paid or expected to pay their bill. People who enter the ER are admitted either because of an emergency case which they did not plan or because they are uninsured and are not able to seek care elsewhere.

For this subprime credit category of patient-consumers entering a facility through the ER, the letter effects are most interesting because these are people who may find managing healthcare bills more difficult than the populations falling into prime and superprime credit categories. Additionally, hospitals do not typically expect to collect payment from these subprime credit groups, especially if they are admitted through the ER. That being the case, a gentle nudge to the patient-consumer to pay some or all of their bill (or enter a payment plan or ask for some option of payment on their own) is ever the more important for both patient-consumer and hospital.

With the upcoming expansion of Medicaid coverage , and ER volume increasing dramatically (as well as access for all services), understanding which normative cues have effect on influencing compliance with payment requests is useful for hospitals attempting to maintain margins consistent with their fiduciary responsibility to the communities which rely upon them. As equally as important, as PPACA expands access and assists the middle class to grow, cues such as these used in this experiment can assist patient-consumers in maintaining good credit standing and lower debt in order for more Americans to reach or maintain a middle class status. If cues can prevent increased debt and bankruptcy by influencing patient-consumers to comply with paying medical bills, more efficient means of communicating with patient-consumers and creating useful payment options are possible. A consequence of not considering this research,



and Cialdini's (2009) principles of social influence, may be that hospitals will find margins slipping as well as their ability to uphold their missions. Similarly, without options for payment of an otherwise complicated medical bill, patient-consumers will continue to struggle with unfair loads of medical debt and risk bankruptcy, even as productive, hard working citizens of the U.S. People should not experience catastrophic loss because of health distress; devising billing structure using social influence theory and behavioral economics is key in this prevention.

If normative cues influence medical bill payment, even with populations which have traditionally been less likely to successfully manage their medical debt loads, combining default options theory from behavioral economics with social influence theory can further increase the likelihood of payment or enrollment into payment plans. With this in mind, the design of Study 2 investigated whether or not participants would comply with letters incorporating a default option for payment plans within patient-consumer populations.

### **Study 2: Default Options in billing: Social Influence by another name?**

#### **Overview**

Traditionally, medical bill payment has come in the form of a lump sum amount. A patient obtains services as needed, the insurance is billed (or Medicare Rate is negotiated for patient-consumers without insurance), and the patient-consumer receives a bill totaling the amount owed after insurance has paid. Sometimes, a bill will have a number to call for inquiries, but rarely does the bill offer options for payment or suggestions for how the bill can more easily be paid by the consumer (i.e., a payment plan).

In order to test that default options have an effect on payment for the patient consumer, a two-part study was designed to encourage payment by offering an opt-in and opt-out enrollment plan, similar to the opt-out organ donation enrollment plan study which increased compliance of

organ donation enrollment. Barriers, like actively requiring unenrollment from the organ donation plan, increased enrollment dramatically (Halpern, 2007; Johnson & Goldstein, 2003). Effectively, this study extends social influence theory by employing a technique from behavioral economics (default options) to function similarly as a normative cue (opt-in or opt-out message) (Beshears et. al, 2009).

Importantly, the effectiveness of a default option for decision-making is improved if a person does not have a strong preference one way or another about the decision being made (Lowenstein, 2007). People are more susceptible to influence if a social cue is not available, and without a preference, the consumer is likely to be influenced with a default choice (Cialdini & Goldstein, 2004). Effectively, the opt-in and opt-out statements in the experimental correspondence letters function as the normative cues to increase compliance with medical bill payment.

## **Method**

### **Procedure and Design**

The experimental design was originally a three-group design (Default Option: opt-out vs. opt-in vs. control). Because of legal constraints with the data collection from collaborating companies, an opt-out letter was not utilized by request. Default options influence decisions without eliminating choice, reducing the risk of choice overload. Although utilizing normative cues from social influence research shows promise, default options used as normative cues may affect patient-consumers' actions for payment plan enrollment and subsequent bill payment (Simonson, 1992). An opt-out letter creates a barrier for the consumer, and from what others studies have shown, increases compliance and enrollment into various programs (Halpern 2007; Gimbel, 2003; Lowenstein 2007). Because the opt-out letter was not utilized, the opt-in letter

functioned as a normative cue and increased the best-case choices available to consumers for paying their bill, making their final choice more satisfying and prone to less errors of commission (Schwartz, 2008)

As a result of collaborating companies request, the experimental design was a two-group design (Default Option: opt-in vs. control). The control letter was an original letter sent to patients, but it did not highlight the opt-in messaging created for this study in the experimental group. ER admission, and the other variables examined in Study 1, were excluded because of the small sample size. Dependent variables measured were beginning balances of those choosing payment plan enrollment, how much was paid as a result of the letters received, and whether they paid during the trial period (Yes/No).

### **Participants**

Subjects were randomly selected from a pool of patient-consumers who recently obtained healthcare services and included Medicare, Private, and Self-Pay insurance designations. Additionally, only 5 hospitals were included; this made for very slow data gathering because of data constraints. Subjects all had account balances with a minimum of \$250.00 USD either after insurance had paid or as a self pay account with credit scores no less than 500. Age ranges varied, but all participants were adults (age 19 and older). I included 42 subjects in this study in total, 22 (14 females and 8 males and age  $M= 59$ ,  $SD= 18$ ) in the experimental condition and 20 in the control condition (16 women and 4 men) and age  $M= 57$ ,  $SD= 11$ ).

### **Procedure & Design**

Participants were sent billing statements normally sent for healthcare services obtained at affiliated facilities, but these were modified for the purposes of this study to include one default option (opt-in) and a control option (the normal invoice sent to patient-consumers). Invoices

remained similar to previous correspondence, and correspondence envelopes remained the same, but verbiage was changed depending on the letter type used (opt-in or control).

Participants were randomly assigned to one of the two different groups. For the control billing type, the default choice is a payment of a lump sum and includes a number to call if the patient-consumer wishes to make a billing inquiry, but an option for enrollment into a payment plan is not made apparent to the patient consumer.

For the experimental letter (opt-in), subjects were randomly selected from the same healthcare provider using several hospitals in a market service area. The opt-in option is used in the letter verbiage so patients may enroll into a payment plan and includes a phone number to call if the patient-consumer wishes to enroll (making the payment plan option apparent to patient consumers) see Appendix G:

You are eligible for enrollment in a payment plan to assist in payment of this bill. If you wish to enroll in a payment plan, please call customer service at the number above to discuss the payment plan terms we can offer. A statement outlining the payment plan terms will then be sent to you following enrollment. If you do not wish to enroll in a payment plan, then no action is required and your balance remains due and payable.

It was expected that the letters including the payment plan opt-in letter option would increase payments in full relative to the lump sum default cohort control letter.

## **Results**

### **Data Analysis Strategy**

A univariate analysis of variance (ANOVA) was conducted to examine the effect of the opt-in correspondence on patient-consumers' payment responses. I predicted that patient consumers, when faced with an option of an opt-in payment plan, would be more likely to pay

the bill compared to a default lump sum payment option due at one time (control letter). 30 days after billing correspondence was sent, the data was gathered and analyzed for results.

## **Discussion**

Unfortunately, because the experimental and control sample sizes were under 30, the data for this study represented a randomization failure.

*ANOVA*: Regarding beginning balances when experimental and control letters were sent to patient-consumers, there was a main effect for beginning balances:  $F(1, 41) = 7.98, p = .007, \eta_p^2 = .006$ . The differences between control beginning balances and experimental balances are as follows: experimental ( $M = \$291.90, SD = \$87.20$ ) and control ( $M = \$632.24, SD = \$83.14$ ). Thus, in addition to a small sample size, there was also a randomization failure. Nonetheless, the results for patient payments resembled the predicted effects of opt-in defaults:  $F(1, 41) = 3.81, p = .057, \eta_p^2 = .006$ . The differences between experimental payments and control payments were as follows: experimental ( $M = \$494.43, SD = \$674.45$ ) and control ( $M = \$201.12, SD = \$231.30$ ). Thus, despite the randomization failure in the opposite direction than predicted, a marginal main effect for payment was still obtained in the predicted direction.

Logistic regressions shows the following:  $\beta = -.088, SE\beta = .021, Wald(1, df) = 18.54, p < .001, Odds Ratio: .995$ . For experimental and control groups, percentages of accounts making a payment were 74% for experimental and 64% for control. Yet, keep in mind that the randomization error of data makes this finding interesting, but should be interpreted with caution.

## GENERAL DISCUSSION

All four studies in this dissertation were consistent with predictions and generally supporting the finding that normative information will increase compliance with bill payment by patient-consumers. Specifically, patient-consumers, in response to normative cues, were more likely to pay their medical bills. Experiments swayed patient-consumers to respond to their bill in a manner people similar to them would have likely done, even if the cue was suggestive of others not paying their bill (e.g., the 23% payment cue in Study 1). Compared to control conditions, the experimental conditions in all four studies were indicative of patient-consumers' increased likelihood to pay their medical bill than those receiving medical bills, which were not modified (control). In summary, social influence theory and behavioral economics theory combined to increase compliance in the patient-consumer by encouraging more payment activity with redesigned (experimental) letters compared to control (letters which had been previously used for payment communication). The following will discuss findings, implications, and limitations in more detail.

The present research contributes to our knowledge of social influence theory and its extension into compliance with medical billing options, and accounts receivable management in healthcare. Beyond known effects in Cialdini's (2009) principles of social influence regarding reciprocation, authority, scarcity, etc., the extension of this theory into behavioral economics (Thaler & Sunstein, 2003) is an important one, and the results in this research display this effect by increasing patient payments in experimental conditions. Additionally, by showing messages whose credibility (all studies included hospital letterhead) and relevance of the message source (Pilot Study 1 & 2, Main Study 2 & 3) influenced patient-consumers' behavior, I further extend social influence theory and behavioral economics. For example, in the pilot studies, a simple

suggestion of using a tax refund, relevantly placed on invoices during tax season greatly influenced the experimental subjects of the study to pay more frequently than control did. In the first pilot study, experimental participants were three times as likely to make a payment versus control; this points to the effectiveness of social influence theory because of the normative cue used. Because of the main effect size in these pilot studies, further experimentation on social influence theory and behavioral economics techniques was warranted.

In Study 1, utilizing three normative cue conditions on billing invoices netted some fascinating effects, but again supported a social influence interpretation – that normative cues are indeed effective for swaying payment behaviors of patient-consumers both in amount and frequency. Notably, patient-consumers who had a subprime credit score were most likely to respond to cues in the letters, especially the normative cue suggesting the time of payment. Also, men and women responded differently to the cues with payment amounts dependent on admission through the ER or regular admission. In general, patient-consumers not coming through the ER were more likely to pay higher amounts of their total bills; men, were more likely to pay more coming through the ER than women. I may be able to describe this effect by acknowledging women, especially those in credit classes necessitating utilizing the ER for basic care, may also have children to support, thus lowering disposable income available for payment. Granted, this is speculative, but further research in this area is certainly a useful endeavor.

Surprisingly, the cue suggesting a payment within two weeks of receipt of the invoice increased the likelihood of payment, but not the amount. As far as mechanisms are concerned for why this occurred, I am perplexed, but the outcomes cannot be decoupled from previous studies of Cialdini's (2009) principles of social influence and their effectiveness. Not surprisingly, the cue in Study 1 describing a minority of patient-consumers pay their bill (23% of patient pay their

bill within two weeks) acted in accordance with known effects of social influence and produced the least payment amount, but this further supports social influence theory and its power in healthcare billing. Of course, credit score also had a strong main effect, but as described above, this can be expected for those already categorized into subgroups of financial responsibility. Therefore, gender, admission through the ER, and credit score categories most strongly affected payment outcomes for letter conditions; yet, the minority cue used did also support social influence theory by showing a negative compliance effect compared to control and the other two letter conditions.

Third, the final study on default options in billing encountered a randomization error, but results did show a marginal main effect for an opt-in normative cue in the billing verbiage. Additionally, a logistic regression also showed an increased likelihood of payment compliance compared to control when a normative opt-in default cue was utilized. In order to test this further, a larger sample size must be used and a comparison made to opt-out normative cue default options. Because of legal reasons, this study was not able to compare an opt-out normative cue to the opt-in normative cue, which would have connected social influence theory to behavioral economic studies done by Gimbel (2003) and Johnson & Goldstein (2003) and popularized studies of default option theory in the behavioral economics literature.

Of the experiments in this dissertation, all outcomes were consistent with predictions. This research extended and integrated social influence theory with behavioral economics studies on choice; however, much more research must be accomplished to link the two more concretely.

Practically, replicating these compliance effects can change how industries in medicine are approaching the billing structure, the wording used, and hopefully the choice options available for patient-consumers to make payment on medical debt. PPACA and extension of access for a



majority of Americans will flood the medical market and place financial pressures upon the industry previously unseen in the U.S. As such, using this research to increase the frequency of payment, amount of payment, and possibly enrollment into payment plans can reduce bad debt incurred by hospitals and health systems; also, it may reduce or prevent the possibility of bankruptcy and credit deterioration for the patient-consumer. The purpose of medicine and its chief aim is to do good, and this does not end with the clinical application of modern medical science. In order for policies like PPACA (whose purpose is to increase medical access and quality) to be effective, we must extend our knowledge of patient payment behavior so that we may continue the healing of the body without ruinous consequences for seeking medical care. Keeping the middle class solvent with their credit, maintaining disposable income, and ensuring the middle class continues to act as agents in the U.S. commercial market are important policy considerations for PPACA and medical access equality in the US. These studies can be replicated and expanded upon in order to prevent a decline of middle class Americans operating as economic agents, a deleterious and unintended effect of PPACA legislation. Also, policy considerations for hospitals and healthcare entities to engage in tools to prevent payment defaults and to increase payment options for consumers assist not only the country's economic health at large, but also the health of the healthcare entity and patient-consumer's financial health, and accomplishes another chief aim in the medical industry, benevolence.

Social influence theory and behavioral economics not only have had positive effect on medicine regarding organ donation and vaccination programs, but this dissertation's experiments show it can be extended into an important piece of the clinical health cycle of the patient; the medical debt that has become burdensome and disastrous for all people. With further study with patient-consumers, and policy considerations therein, real progress can be made to not only open

healthcare access to all citizens (which PPACA attempts to do), but make it truly affordable for all economic parties (i.e., hospital, provider, consumer, insurer).

Granted, limitations to the research do exist, mostly in the form of controlling variables of the subjects at hand. Using credit scores as a variable helps to reduce this issue, but the variability of economic scenarios patient-consumers find themselves in are infinite, and these studies are not likely to be able to fully control for these. Also, access to patient-consumer information with payment responses is rare, and likely, will remain only proprietary information. Gaining access to the databases of live information from healthcare companies to share with researchers will remain a massive challenge. Additionally, who will own the knowledge once gained? Can a patent destroy the cross usage of these discoveries, even if funded by U.S. tax dollars? These are considerations that must be addressed in order to make extensions of this kind of research useful to the medical industry at large. Finally, a limitation found in all of science is attaching mechanisms to the outcomes of my research. Atchinstein (2005) informs us of the limitations of evidence if we are unable to attach a high probability of explanatory connection to it- a mechanism, which is difficult to do with uncontrolled variables in these experiments and subsequent experiments.

The patient-consumer benefits from this research and findings, and deserves future research and attention on the medical debt burden and its careful management. PPACA has focused the attention of the medical community on the costs of care encountered by the healthcare system, but the focus on balances incurred by patient-consumers because of increased insurance coverage is not being discussed. This research is the beginning of a discussion the medical community desperately needs to have about the financial health of the patient-consumer after care is rendered. Opening access to care for all citizens cannot be argued against, but this access does

not eliminate the medical debt that comes along with it. As this topic is researched further, the patient-consumer benefits from accumulated knowledge regarding tools, theories, and applications that have greatest effect on patient-consumers debt management behavior. It is imperative for the patient-consumer to have access to care through legislation and policy like PPACA, but this benefit is lost without research studies like these. Total care for the patient-consumer is not complete after care is rendered; it is only beginning.

Where shall we go from here? The cost of medical care is not going to decrease in the foreseeable future. Keeping a hospital solvent to maintain its fiduciary responsibility is massively important for the care of the U.S. citizen, but so is assisting the patient-consumer in maintaining his or her financial status and ability to move financial classes if able without the fear of ruinous financial consequences of seeking healthcare in the U.S. healthcare market. Further studies using default options, the creation and research of experimental payment options, researching the behaviors of subprime, prime and superprime credit groups, and a focus on further research connecting Cialidini's (2009) social influence principles with behavioral economics to assist patient-consumers manage healthcare financial debt is the future direction of this research. The nexus of social influence theory and behavioral economics in healthcare billing cycles is clearly an important one, and these experiments show us promise with both theory and practicality for the medical industry.

## REFERENCES

- Ajzen, I., & Fishbein, M. (1980). *Understanding attitudes and predicting social behavior*. Englewood Cliffs, NJ: Prentice-Hall.
- Achinstein, P. (Ed.). (2005). *Scientific evidence: Philosophical theories and applications*. JHU Press.
- Bajari, P, Chu, C.S., & Park, M. (2008). An empirical model of subprime mortgage default from 2000 to 2007. NBER Working Paper Series. National Bureau of Economic Research.
- Benoit, W. L., & Smythe, M. J. (2003). Rhetorical theory as message reception: A cognitive response approach to rhetorical theory and criticism. *Communication Studies*, 54(1), 96-114.
- Beshears, J., Choi, J. J., Laibson, D., & Madrian, B. C. (2009). The importance of default options for retirement saving outcomes: Evidence from the United States. In *Social security policy in a changing environment* (pp. 167-195). University of Chicago Press.
- Cialdini, R. B. (2001). The science of persuasion. SCIENTIFIC AMERICAN-AMERICAN EDITION-, 284(2), 62-67.
- Cialdini, R. B. (2001). Harnessing the Science of Persuasion. (cover story). *Harvard Business Review*, 79(9), 72-79.
- Cialdini, R. B. (2003). Crafting normative messages to protect the environment. *Current Directions in Psychological Science*, 12(4), 105-109.
- Cialdini, R. B., & Goldstein, N. J. (2004). Social influence: Compliance and conformity. *Annual Review of Psychology*, 55(1974), 591-621.
- Cialdini, R. B., & Nolan, J. (2005). Basic social influence is underestimated. *Psychological Inquiry*, 16(4), 158-161.

- Cialdini, R. B., Demaine, L. J., Sagarin, B. J., Barrett, D. W., Rhoads, K., & Winter, P. L. (2006). Managing social norms for persuasive impact. *Social Influence*, 1(1), 3-15.
- Cialdini, R. B. (2009). *Influence: Science and practice*, Boston, MA: Allyn & Bacon. (5<sup>th</sup> ed.)
- Cialdini, R. B., Reno, R. R., & Kallgren, C. A. (1990). A focus theory of normative conduct : Recycling the concept of norms to reduce littering in public places. *Journal of Personality and Social Psychology*, 58(6), 1015-1026.
- Cialdini, R. B., Trost, M. R., & Newsom, J. T. (1995). Preference for consistency: The development of a valid measure and the discovery of surprising behavioral implications. *Journal of Personality and Social Psychology*, 69, 318-318.
- Crenshaw, A.B. , “Study Cites Medical Bills for Many Bankruptcies,” Washington Post, 25 April 2000
- Dare, B. A., Guadagno, R. E., & Muscanell, N. L. (2013). Commitment: The Key to Women Staying in Abusive Relationships. *Journal of Interpersonal Relations, Intergroup Relations and Identity*, 6, 47-54.
- Dranove, D., & Millenson, M. L. (2006). Medical bankruptcy: myth versus fact. *Health Affairs (Project Hope)*, 25(2), w74-83.
- Fiske, S. T., & Taylor, S. E. (1991). *Social cognition*. New York: McGraw-Hill.
- Gimbel, R. W., Strosberg, M. A., Lehrman, S. E., & Taft F. (2003). Presumed consent and other predictors of cadaveric organ donation in Europe. *Progress in Transplantation*, 13(1), 17-23.
- Gouldner, A. W. (1960). The norm of reciprocity: A preliminary statement. *American sociological review*, 161-178.
- Graves, J. A., Curtis, R., & Gruber, J. (2011). Balancing coverage affordability and continuity under a basic health option. *The New England Journal of Medicine*, 44(1).
- Gruber, J. (2010). The cost implications of health care reform. *The New England Journal of Medicine*, 362(22), 2050-1
- Guadagno, R. E., Cialdini, R. B., & Evron, G. (2010). Storming the servers: A social psychological analysis of the first Internet war. *Cyberpsychology, Behavior, and Social Networking*, 13(4), 447-453.
- Guadagno, R. E., & Cialdini, R. B. (2010). Preference for consistency and social influence: A review of current research findings. *Social Influence*, 5(3), 152-163.

- Guadagno, R. E., & Cialdini, R. B. (2002). Online persuasion: An examination of gender differences in computer-mediated interpersonal influence. *Group Dynamics: Theory Research and Practice*, 6, 38-51.
- Guadagno, R. E., Muscanell, N. L., Rice, L. M., & Roberts, N. (2013). Social influence online: The influence of social validation and likability on compliance. *Psychology of Popular Media Culture*, 2, 51-60.
- Gupta, R., Duffa, M. C., Denburga, N. L., Cohenb, N. J., Becharac, A., & Daniel, T. (2010). Declarative memory is critical for sustained advantageous complex decision-making. *Neuropsychologia*, 47(7), 1686-1693.
- Hastie, R. K., & Dawes, R. M. (2009). *Rational Choice in an Uncertain World: The Psychology of Judgment and Decision Making* 2<sup>nd</sup> ed. Thousand Oaks, CA: Sage.
- Halpern, S. D., Ubel, P. A., & Asch, D. A. (2007). Harnessing the power of default options to improve health care. *The New England Journal of Medicine*, 357(13), 1340-1344.
- Himmelstein, D. U., Warren, E., Thorne, D., & Woolhandler, S. (2005). Illness and injury as contributors to bankruptcy. *Health Affairs*, 24, W5-63-W5-73.
- Himmelstein, D. U., Thorne, D., Warren, E., & Woolhandler, S. (2009). Medical bankruptcy in the United States, 2007: Results of a national study. *The American Journal of Medicine*, 122(8), 741-746.
- Johnson, E. J., & Goldstein, D. (2003). Do defaults save lives? *Science*, 302, 1338-1339.
- Kahneman, D., & Tversky, A. (1979). Prospect theory: An analysis of decision under risk. *Econometrica*, 47(2), 263.
- Kahneman, D., & Tversky, A. (1984). Choices, values, and frames. *American Psychologist*, 39(4), 341-350.
- Kahneman, D., Knetsch, J. L., & Thaler, R. H. (1991). Anomalies: The endowment effect, loss aversion, and status quo bias. *The journal of economic perspectives*, 5(1), 193-206.
- Knetsch, J. L., & Sinden, J. A. (1984). Willingness to pay and compensation demanded: Experimental evidence of an unexpected disparity in measures of value. *The Quarterly Journal of Economics*, 99(3), 507-521.
- Loewenstein, G., Brennan, T., & Volpp, K. G. (2007). Asymmetric paternalism to improve health behaviors. *JAMA : The Journal of the American Medical Association*, 298(20), 2415-2417.
- March, J. (1994). *A primer on decision-making: How decisions happen*. New York: Free Press.

- Markus, H. R., & Schwartz, B. (2010). Does choice mean freedom and well-being? *Journal of Consumer Research*, 37(2), 344-355.
- Member testimony on the medical bankruptcy fairness act, plus rule 2019. (2010). *American Bankruptcy Institute Journal*, 29(6), 10-87.
- Okdie, B. M., Guadagno, R. E., Petrova, P. K., & Shreves, W. B (in press). Social influence online: A tale of gender differences on the effectiveness of authority cues. *International Journal of Interactive Communication Systems and Technologies*.
- Petty, R., & Wegener, D. (1999). The elaboration likelihood model: Current status and controversies. In S. Chaiken, Y. Trope, (Eds.). *Dual-process theories in social psychology* (pp. 37-72). New York: Guiliford Press.
- Petty, R., & Cacioppo, J. (1986). *Communication and persuasion: Central and peripheral routes to attitude change*. New York: Springer-Verlag.
- Pratkanis, A. R. (Ed.). (2007). *The science of social influence: Advances and future progress*. New York: Taylor & Francis.
- Reno, R. R., Cialdini, R. B., & Kallgren, C. A. (1993). The transsituational influence of social norms. *Journal of Personality and Social Psychology*, 64(1), 104-112.
- Rhodes, K. V., Bisgaier, J., Lawson, C. C., Soglin, D., Krug, S., & Van Haitma, M. (2013). "Patients Who Can't Get an Appointment Go to the ER": Access to Specialty Care for Publicly Insured Children. *Annals of emergency medicine*.
- Seifert, R. W., & Rukavina, M. (2006). Bankruptcy is the tip of a medical-debt iceberg. *Health Affairs (Project Hope)*, 25(2), w89-92.
- Shang, J., & Croson, R. (2009). A field experiment in charitable contribution: The impact of social information on the voluntary provision of public goods. *The Economic Journal*, 119(1), 1422-1439.
- Simonson, I. (1992). The influence of anticipating regret and responsibility on purchase decisions. *Journal of Consumer Research*, 19(1), 105-118.
- Schultz, P. W., Nolan, J. M., Cialdini, R. B., Goldstein, N. J., & Giskevicius, V. (2007). The constructive, destructive, and reconstructive power of social norms. *Psychological Science*, 18(5), 429-434.
- Schultz, W. P., Khazian, A. M., & Adam, C. (2008). Using normative social influence to promote conservation among hotel guests. *Social Influence*, 3(1), 4-23.

- Schwartz, B., Ward, A., Monterosso, J., Lyubomirsky, S., White, K., & Lehman, D. R. (2002). Maximizing versus satisfying: Happiness is a matter of choice. *Journal of Personality and Social Psychology*, 83(5), 1178-1197.
- Thaler, R. H., & Benartzi, S. (2004). Save More Tomorrow<sup>TM</sup>: Using behavioral economics to increase employee saving. *Journal of Political Economy*, 112(S1), S164-S187.
- Thaler, Richard H., and Cass R. Sunstein. 2003. Libertarian Paternalism. *A.E.R. Papers and Proc.* 93 (May): 175–79.
- Torneden, R. L. (2009). Will devaluation of the dollar pull the US out of depression once again? *Chapman's Journal of Law & Policy*, 1-20.
- Tversky, A., & Kahneman, D. (1974). Judgment under uncertainty: Heuristics and biases. *Science*, 185(4157), 1124-1131.
- Weber, J. M., Kopelman, S., Messick, D. M., Weber, J. M., & Messick, D. M. (2004). A conceptual review of decision making in social dilemmas: Applying a logic of appropriateness. *Personality and Social Psychology Review*, 8(3), 281-307.
- Wegener, D. T., & Claypool, H. M. (1999). The elaboration continuum by any other name does not smell as sweet. *Psychological Inquiry*, 10(2), 176-181.
- United States: Medical bankruptcies spur health reform. (2009). Oxford Analytica Daily Brief Service 16 June 2009