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The Impact of Benefit Presentation on Conjoint Analysis and Discrete Choice Modeling of Health Insurance Decisions

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Abstract

The manner in which information is presented to survey respondents greatly impacts the choices they make in conjoint analysis exercises, discrete choice modeling and simulated shopping situations. We compare and contrast results from several custom market research studies designed to measure consumers’ preferences for health insurance products in different manners.

Discrete choice exercises allow a lot of flexibility in terms of the benefits/features to be tested and the way in which the products or services are presented to willing respondents. Options are typically shown side-by-side in a tabular format for easy comparisons, but real world purchase channels and marketing materials do not usually take such a pragmatic approach to presenting information. This is particularly true when thinking about health insurance options, the subject of this presentation.

Rather than seeing three of four products at a time, consumers may be faced with 100 or more offerings when they go to a website like eHealthInsurance.com or visit HealthCare.gov to view available plans during open enrollment. Head-to-head comparisons of some product features may be limited or even discouraged in some purchase channels. Intermediaries (e.g. brokers and online marketplaces) can influence decision-making and limit distribution of some products. The challenge is determining whether to focus on product features, the shopping process itself or a mixture of both.

Factors such as head-to-head comparisons, price sorting, product filtering and feature positioning and branding have to be considered. Decide upfront whether the conjoint exercise is meant to mirror actual purchase behavior or to be used for other purposes such as optimizing product design or portfolio analyses. Carefully select the list of features/benefits for testing to insure all critical factors are included in the decision model. Less important items should not be allowed to be overly influential on product choice. Present pricing as it is normally seen and include price sorting capabilities comparable to what is available in the marketplace if trying to model current and near-term purchase likelihoods. Keep in mind that respondents are more likely to make suboptimal health insurance decisions when presented with real world shopping experiences than when shown side-by-side product comparisons.
A View from Within: A Study to Identify the Present and Potential Brand Image of the Nursing Profession

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Abstract

Over the past decade, numerous articles have addressed the disconnect between the perceived “image of nursing” and the unfavorable, inaccurate, stereotypical representations of nursing commonly fed by the media (Morris, 2007; Cabiniss, 2011; Kelly et al., 2011; Rezaaie-Adaryani et al., 2012). Researchers have consistently called for the profession of nursing to pursue branding strategies that “take charge of our image” (Pinkerton, 2002; Parish, 2004; Dominiak, 2004; Baldwin et al., 2010 and Cabiniss, 2011).

A common theme in the literature has been the ongoing lack of a consistent brand identity; one which would serve to recruit bright students into the profession, attract highly qualified nursing faculty and researchers into higher education, establish trusting relationships with patients and the public, promote positive morale within the profession at large, and fully articulate nursing’s significant contributions to the positive health outcomes of the nation. (Goodin, 2003; Zarea et al.,2009; Emeghebo, 2006; Cabiniss, 2011 and Rezaaie-Adaryani et al., 2012). The few studies examining the image of nursing have mostly relied on qualitative data to identify some form of a consistent nursing image (Morris, 2007; Baldwin et al., 2010).

This research study used a mixed methods design to explore perceptions of the brand image of nursing. Focus groups were conducted with nursing students (n=11), nursing faculty (n=7), and members of Nursing Advancement Professionals (n=9) to identify antecedents regarding how the profession of nursing is currently perceived, and how it would like to be perceived. Themes derived from focus group qualitative data were used to develop a 30-item survey which included 42 descriptors of: 1) nursing’s present image, and 2) nursing’s desired image. The survey was sent electronically to a national audience of nursing faculty, members of the Jesuit Conference of Nursing Programs (n=150). A total of 134 nursing faculty responded to the survey. The most common three descriptors of the nursing profession were: “caring” (38.8%), “essential members of the healthcare team” (32.8%), and “patient centered/focused” (25.4%). Interestingly, fewer than 4% of those surveyed selected “leaders” (3.7%), “powerful decision makers” (3.7%),“researchers” (0.8%), or “autonomous” (0.8%) as words descriptive of the nursing profession, and no respondent (0%) selected “influential”. Yet when asked what descriptor was most appealing, "Nurses are leaders in education, research, and practice" (31%) was chosen.

Respondents were then given a choice of potential brand statements for the nursing profession and asked to choose which was the most accurate description. Respondents selected the statement “nursing provides a patient centered approach to health and wellness” as the most descriptive. However, 81% (n=107) of respondents indicated no consistent brand image currently exists in nursing. When asked who is responsible for promoting a consistent, positive image of the nursing profession, 91% (n=120) reported nurses themselves are most responsible. These findings suggest three things. First there appears to be a disconnect between the way nurses believe they are perceived and how they would like to be perceived. Secondly, there does not appear to be a consistent brand identity for the profession. Thirdly, there appears to be an opportunity for the nursing profession to manage its brand identity in a more deliberate and consistent manner.

The next phase of this study will involve survey administration to sample of nurse practitioners. Phase three will be a survey of the general public. These perceptions of the brand image of nursing will be compared and contrasted with those reported by nurses during Phase I of this study. As a result of this research, a more accurate, consistent, positive brand position may be identified by the nursing profession and the general public which can be seen as congruent and desirable by all groups.
Extreme Service Failure Instances and Recovery Strategies Related to Medical Errors

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Abstract

Extreme service failure occurs in the healthcare setting when medical errors result in injury or death to a patient. In some of these cases, patients or members of their family may seek redress through the court system by filing a malpractice lawsuit against the medical provider. We provide background information related to the pervasiveness of medical errors occurring in the delivery of healthcare. In addition, we propose two individual difference characteristics—empathy and involvement in healthcare that could play a role in influencing individuals' perceptions and decision regarding a verdict and subsequent award of damages.

Introduction

Healthcare reform remains a hot topic among Americans as Congress continues to debate the legislation known as the Affordable Care Act and options for public health care and issues related to the quality of healthcare in the United States. A national scorecard on the U.S. health system observed that while U.S. health spending is double the median spending for industrialized nations, “the country lags behind other countries on indicators of mortality and healthy life expectancy” (Schoen, Davis, How and Schoenbaum 2006, page w472). Healthcare spending is the largest of any nation at $8,508 per person and 17.7% of gross domestic product (Davis, Stremikis, Squires and Schoen 2014) but the quality of care as measured by medical errors has been called an epidemic (Institute of Medicine 2000). Kaiser (2004, page 9) utilized the following operational definition of medical errors:

Sometimes when people are ill and receive medical care, mistakes are made that result in serious harm, such as death, disability, or additional prolonged treatment. These are called medical errors. Some of these errors are preventable, while others may not be.”

In its study of errors in the healthcare industry, the Institute of Medicine (2000) stated that “at least 44,000 people, and perhaps as many as 98,000 people, die in hospitals each year as a result of medical errors that could have been prevented” (page 1). They estimated a number of costs resulting from errors including the cost of human lives, additional medical care, lost income, disability, and loss of household productivity as well as lower levels of consumer trust in the healthcare system, practitioner and consumer satisfaction. In addition, social costs are extracted through “lost worker productivity, reduced school attendance by children, and lower levels of population health status” (Institute of Medicine 2000, page 1). The total costs of medical errors were estimated to vary between $17 billion and $29 billion per year in hospitals nationwide and led the Institute of Medicine (IOM) to recommend funding to investigate and seek ways to reduce the incidence of medical errors. Since the IOM raised the alarm regarding the number and frequency of medical errors, considerable efforts have been expended to address and improve healthcare safety and quality but these problems persist and are especially problematic with regard to the medical malpractice system (Wachter 2004).

While the goal of service recovery efforts in healthcare settings is to restore trust or confidence of patients or family members who have been harmed by service failures (Berry and Leighton 2004), extreme conditions may render recovery efforts ineffective and in these situations, the family members or patients may seek redress through the medical liability or malpractice system. The medical malpractice system is under scrutiny as many debate the possible benefits of tort reform on the total costs of healthcare. However, those issues are irrelevant to the individuals who have been harmed by a medical error and/or a physician or hospital who has been named as a defendant in a lawsuit. Once the incident escalates to the
point of a patient or their family obtaining legal counsel and filing a civil suit, measures to redress the error include out-of-court settlement, dismissal of the case by a judge or pursuing the case through a jury trial. Parties to these civil matters – whether defendants or plaintiffs must strive to understand the dynamics at work in determining the outcome of the case and each party hopes to prevail. Thus, it’s critically important to understand the decision-making processes among potential jurors.

The purpose of this research is to propose that a variety of individual or juror characteristics such as empathy and involvement in healthcare may influence perceptions and judgments about the case, its outcome, and any compensation or awards if a settlement is recommended in favor of the plaintiff. The research provides recommendations to healthcare providers, risk managers and legal counsel to develop appropriate recovery strategies and/or utilize focus group or mock jury research to gain insight and test the relationships between individual difference characteristics and attitudes about a case as well as decisions regarding a jury’s decision and damages if a plaintiff’s case is supported. The theoretical discussion and recommended plan of action could be relevant to plaintiffs and the defendant counsels as well as insurance providers, medical/hospital administrators, physicians and hospital staff when they face a medical malpractice lawsuit.

Background
Medical Errors & Medical Malpractice Liability

Promoting patient safety and delivering high quality of care to patients is the goal of all medical-related systems. However, as previously discussed, a large number or medical errors continue to occur and inflict harm on both the patient and the medical providers. The “second victim problem” occurs when the medical staff member(s) who commit the errors experience negative emotions and are motivated to practice defensive medicine (Szostak 2011; Rubin and Bishop 2013). Research has also documented discrepancies in attitudes regarding transparency in disclosing errors between patients or the general public and the medical community with patients overwhelming favoring disclosure (Szostak 2011). Unfortunately, a culture of silence has been created limiting the willingness of healthcare providers to disclose errors due to a fear of litigation (Gallagher et al. 2003; Hobgood et al. 2005; Geckeler 2007; Szostak 2011). However, research also indicates that patients are less likely to file a lawsuit if the error is disclosed (Szostak 2011) but the “concept of the ‘sue-happy’ patient remains widely intact across most disciplines in the medical profession” (Geckeler 2007).

Unfortunately, approximately 76% of physicians reported they had failed to disclose a medical error to their patients and fear of litigation continues to impede the implementation of programs to improve patient safety (Geckeler 2007).

Litigation is the primary course of action for injured parties and their families to seek redress and various motives for filing legal action have been identified. First, individuals want to understand what happened as well as why it happened. Secondly, injured parties and their families want an apology, to hear an expression of empathy and concern as well as acceptance of responsibility from the medical provider or hospital. Third, injured parties may file suit as a means to raise recognition to the issue and create a call to action within the medical community to adopt safer practices or procedures to ensure the problem isn’t repeated in the future. Finally, injured parties seek legal action receive compensation for their medical treatment, lost wages, and other expenses related to their injury (Berry and Bendapudi 2007; Gallagher et al. 2003; Szostak 2011). However, it’s widely reported that only a fraction of injured parties file a suit (Geckeler 2007) and that “courts don’t seem very effective in reaching a verdict that really reflects what happened…. (due to) the law on evidence and the difficulty to reconstruct ex post what happened to the patient, in other words, to prove medical negligence as well as causation” (Guillod 2013, page 183).

According to its 2012 Annual Report (National Practitioner Data Bank 2014), 12,598 new medical malpractice reports were filed and a cumulative total of 380,164 have been filed since 1990 in the United States. Since 1990, 41.2% of cases resulted in malpractice payments. The number of claims filed in 2012 has declined by 34% since 2003. Similarly, the number of medical malpractice cases where settlements were awarded has decreased 38% from 17,088 to 10,585. The mean settlements varied between $160,312 for equipment/product related cases to a high of $572,199 for obstetrics related cases. The most common cases were anesthesia related with 2872 cases receiving settlements of an average $373,476. The time lapse between reporting a medical malpractice claim and receiving a settlement is quite lengthy and varies between an average of 4 years for equipment/product related claims, 5.2 years for anesthesia related claims and 6.6 years for obstetrics related claims. The Annual Report statistics are consistent with Studdert et al. (2006) who...
reported an average time of resolution of five years with one in three medical malpractice liability claims taking six or more years to conclude.

A recent study examining medical malpractice claims utilized the publicly available data for all paid claims between 2005 and 2009 compiled by the National Practitioner Data Bank to explore the relationship among a variety of factors and claim resolution (Rubin and Bishop 2013). The authors observed that 97% of the cases were settled outside court and 3% were judged in court. They also identified a relationship between the age of the physician and previous medical claims on settlement with out of court settlements occurring more frequently when the physician was older than 50 with no prior malpractice reports. However, several factors were significantly more frequent for court settlements including cases involving a fetus, middle-aged adult (40 to 60), surgery or obstetric errors, or major injury. The study also observed that the settlements for court cases were higher (average of $592,283) than those settled out of court (average $317,447) (Rubin and Bishop 2013).

Therefore, although escalation of medical error resolution occurs infrequently, the costs and time involved to settle these cases whether outside of court or in court are extensive. Further, it’s clear that patients and their families desire greater transparency and openness regarding their medical treatments including disclosure of errors. As noted by Guillod (2013, page 184), “a number of countries have enacted disclosure laws mandating disclosure of medical errors under specific circumstances...(however) there seems to be little evidence that such laws have significantly encouraged open disclosure of medical errors.” The University of Michigan Health System (UMHS) implemented a medical error disclosure system in 2001 where they reported medical errors to patients and offered compensation. A study of pre- and post-system costs between 1995 and 2007 showed that the disclosure with compensation offer resulted in a reduction of new claims, a reduction in time to resolve claims as well as a reduction in costs related to total liability and patient compensation (Kachalia et al. 2010). Although these issues are complicated by many legal issues such as whether or not these programs would be considered admission of fault, it does seem prudent for health care providers to consider whether increased transparency and disclosure of errors could reduce claims and subsequent legal action. In addition, as noted by Mazur et al. (2004, page 416) “full disclosure after a medical error reduces the likelihood that patients will change physicians, improves patient satisfaction, increases trust in the physician, and results in a more positive emotional response.” Therefore, we propose:

**Proposition #1:** Patients and the general public are in favor of transparency in disclosing medical errors and desire health care providers to take responsibility for their actions as well as promote patient safety.

**Recovery Strategies**

When service failures occur such as medical errors in the health care system, providers should attempt some form of recovery process to redress the situation, reduce possible litigation, and preserve the provider – patient relationship. Schoefer (2008) highlights the importance of service recovery efforts in satisfying and keeping customers noting that weak recovery efforts can magnify negative service evaluations while excellent recovery approaches could enhance customer satisfaction. However, if a patient or their family member has been the victim of a medical error and pursues litigation in court, it would be important to understand the relationship between characteristics of jurors and their attitudes, feelings and judgment regarding the case. Since a jury trial involves the opportunity to select and de-select potential jury members, identifying individual difference characteristics that could be related to a favorable verdict (either for the plaintiff or defense) could be important elements in a recovery process to reduce (or enhance) the verdict and settlement outcomes.

Two individual difference variables, empathy and personal involvement in health care are expected to be related to attitudes regarding the case, emotional responses to case facts, acquittal of the defendant(s), and amount of financial settlement if a guilty verdict is determined.

**The Role of Empathy.** Empathy is commonly defined as the degree to which an individual identifies with and understands another person’s emotional state as well as the ability to imagine oneself in another’s shoes (Argo, Zhu and Dahl 2008). Empathy has been linked with altruism whereby individuals are motivated to help others by relieving their distress (Batson et al. 1995). In the context of a medical malpractice court trial, potential jurors will be asked to hear evidence presented by both the defendant(s) and plaintiff(s) whereby the plaintiff(s) will attempt to demonstrate that the standard of care was violated and the healthcare provider was at fault in causing harm to the patient. Therefore, it’s likely that the plaintiff or victim of
the medical error and/or the physician or medical provider could be a target for empathy-induced altruistic behavior whereby a juror who empathizes with the patient or medical provider may be more likely to feel compassion, find in favor of the plaintiff/defendant and award (or not award) compensation to the victim (Batson et al. 1995). However, the relationship between empathy and altruistic behavior may be mediated by attributions and the principle of justice or fairness (Batson et al. 1995; Lee, Winterich and Ross 2014).

A recent study exploring charitable donations observed that attributions and empathy were important mediating variables. In situations where the recipients of the charitable giving appeal were perceived to be responsible for their situation (internal attribution), justice led to a negative effect on charitable donations. However, in situations where recipients were not responsible for their situation (external attribution), empathy led to a positive effect on charitable giving (Lee, Winterich and Ross 2014). We propose that attributions of responsibility and empathy could explain potential juror opinions regarding a medical malpractice case. If jurors believe the patient was responsible for their health condition (e.g. not following the proper diet or following a doctor’s recommendations), perceptions of justice would be negatively linked to award and jurors would be less likely to find for the plaintiff or result in a reduced award. However, if jurors attribute responsibility to the medical provider, empathy would positively impact the decision or verdict and amount of award. Therefore we propose:

Proposition #2: Attributions of responsibility will be linked to verdict outcomes and compensation. Emotional empathy mediates the relationship when external attributions are made to the medical provider while justice mediates the relationship when internal attributions are made to the patient.

The important role of justice, a moral principle concerned with what is equitable, just or fair is linked to recovery efforts to enhance perceptions of fairness and create post-service-failure consumer satisfaction (Gelbrich 2010). Three dimensions of justice have been shown to influence how individuals evaluate exchanges: distributive justice relating to recovery efforts involving compensation and resource allocation; procedural justice regarding the process or procedures utilized to resolve conflict or dissatisfaction; and interactional justice involving the interpersonal processes and quality of communication between the service provider and affected party (Smith, Bolton and Wagner 1999; Schoefer 2008). In a court setting, distributive justice is expected to influence jurors’ judgments as they seek to restore balance between the service provider and injured party and provide compensation in a sufficient amount to cover the degree of loss (Smith, Bolton and Wagner 1999). Thus, individuals high in emotional empathy may experience conflict between their feelings of empathy toward an affected party (defendant or plaintiff) and their principles of distributive justice to provide adequate compensation for injuries. Batson et al. (1995) found that empathy led to favoritism which violated principles of justice. The mediating role of empathy may help explain two types of errors which occur in court cases involving medical malpractice liability (Studdert et al. 2006). A comprehensive study examining claims, errors and compensation payments observed that 97% of the cases involved injury and of those, 63% were linked to medical error of some kind. In the 37% of cases where no errors were present, payments were awarded in 28% of the cases. The first type of error is linked to the cases where compensation to the plaintiff was awarded when no errors were made (approximately 10% of total cases). Secondly, no compensation is awarded in approximately 17% of total cases where errors were made. Thus, “Desire for justice may provide perspective and reason; empathy-induced altruism may provide emotional fire and a push toward seeing the victim’s suffering end” (Batson et al. 1995). Therefore, we propose:

Proposition #3: Emotional empathy may result in favoritism towards either the plaintiff or defendant and result in verdicts favoring the plaintiff when no error was present or verdicts favoring the defendant when in fact an error occurred.

Personal Involvement in Healthcare. A second possible individual difference variable influencing juror judgments and verdicts is their level of involvement or interest in assuming an active role in their healthcare. A patient’s willingness to play an active role in their health has been shown to contribute to their adherence to treatment (Garrity 1981; Golin, DiMatteo and Gelberg 1996). As noted by Berry and Bendapudi (2007), health care services require the complete involvement of the customer or patient in the service and patient-provider interaction is essential to the delivery of health care (Thompson 2003). A passive or low-
involved participant would be someone in a more traditional role of patient, who asks minimal questions, feels helpless or believes they have little control over the situation, and accepts information from the physician or medical provider without question (Roter and McNeils 2003). Alternatively, an active patient engages in purposeful information seeking, asks questions regarding treatment and seeks a collaborative relationship with the medical provider to establish goals and course of treatment (Garrity 1981).

We propose that an individuals’ level of involvement with their healthcare will impact their perceptions regarding a medical liability lawsuit and judgment toward the plaintiff or defendant. Individuals who are more passively involved with their healthcare may have higher levels of trust in medical providers and be more likely to support the physician or health care provider and result in a judgment for the defense. However, individuals who have higher levels of involvement in their care may expect the injured patient to also assume a high degree of responsibility and involvement in their care. We also expect attribution of responsibility to mediate the role of involvement. Jurors adopting an active or highly involved approach towards healthcare may perceive the injured party or patient to be responsible for their medical outcome (an internal attribution), favor the defendant, and vote to acquit. Alternatively, under conditions where the patient demonstrates an active style and was injured due to errors attributed to the healthcare provider (an external attribution), active participants may favor the plaintiff and vote in favor of providing compensation. Therefore, we propose:

Proposition #4: The level of involvement in healthcare may be positively related to acquittal of the medical provider when involvement is low.

Proposition #5: The role of the level of involvement in healthcare may be mediated by attributions of responsibility of the patient.

The proposed model is depicted in the Figure.

Figure – Proposed Model

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**Conclusion**

The safety of patients in the healthcare system and prevention of errors is an important issue. However, when errors occur, medical providers should disclose information to the patient and take responsibility to redress the situation. If a patient is harmed due to the error, they or their family members may seek redress through the legal system by filing a medical malpractice suit against the healthcare provider. Two individual difference characteristics – empathy and involvement in healthcare are proposed to influence a potential juror’s opinion and judgment regarding acquittal of the medical provider and/or compensation if a decision is made to favor the plaintiff or injured party. Research testing the propositions raised in this manuscript could assist members of the legal profession involved in medical malpractice cases, risk managers and hospital administrators as well as health care providers in their understanding of the decision-making process utilized by individuals serving on a jury.

**References**


Taking Care of Our Parents: Understanding and Minimizing Issues of Family Caregivers

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Abstract
Caregiving is a major public health issue (Schultz & Sherwood 2008; AARP 2012). Two of five adults provide care for a family member; often both the patient and caregiver are over the age of 65. The care they provide is serious work: medical and nursing tasks, managing medications and operating complex equipment. Elders must navigate a combination of fragmented care from a variety of providers and facilities, including hospitals, home care, rehabilitation and long-term care. Two-thirds of people who reach age 65 will need long-term care in their lifetime.

Across the US, in 2011, 42 million family caregivers provided $450 billion in unpaid care and these numbers are increasing. By 2012, the opportunity costs of informal elder-care were estimated at over $500 billion while the cost of replacing this care by unskilled and skilled paid care were $221 billion and $642 billion respectively. While Medicare and Medicaid would cover some of the costs of paid care, there is little to no financial support available to family caregivers.

The increasing complexity of elder care and the stresses upon caregivers from these responsibilities inspired Taking Care of Our Parents (TCOOP). Our aim to identify and try to address the unmet healthcare needs of the elderly and their caregivers. This project is a first step in exploring and defining a strategic plan for creating a community for the elderly patient and caregiver duo.

Background
The elderly face a variety of health challenges as health declines in later life. Many elders are dealing with one or multiple chronic conditions. These may be accompanied by cognitive decline and/or cognitive issues exacerbated by social isolation and feelings of dependence. Assistance for the elderly comes from multiple fragmented sources but family caregivers are the backbone of long-term care for many elders. These caregivers play an essential role in ensuring that there is effective communication with and between providers. They are frequently involved in decision-making about care for the elderly. They also play a central role in assisting elderly patients through hands-on involvement in administering and monitoring medical care and helping with activities of daily living and household management.

A family caregiver may begin by providing sporadic assistance during acute episodes of poor health and over time take on the responsibility for providing more frequent or even constant care as the needs of their family member intensify. This progression in involvement in caregiving may be accompanied by declining health on the part of the caregiver who strives to meet the increased needs of their family member and who has less time to attend to their own health and well-being. Caregiving over extended periods of time can lead to chronic stress and physical and psychological strain.

In addition to stress, caregiving has other health risks including, fatigue, depression, and physical strains. Research suggests that the intensity of caregiving, whether measured by the type or quantity of assistance provided, is associated with the magnitude of negative health effects for the caregiver (Schultz & Sherwood, 2008). Factors linked to caregiver’s physical and mental health include the care recipient’s health problems (behavior problems, cognitive impairment, and functional disabilities); the duration and amount of care provided; vigilance demands (watching patient with cognitive impairment), and caregiver and patient co-residence. The stresses of caregiving adversely affect the health of caregivers, contributing to increased emergency room visits and utilization of hospital-based services. The annual healthcare costs of elderly caregivers can be $4,000 or more that comparable non-caregivers. This can add substantially to the cost to Medicare.

Caregiving may also create financial risks for individuals and families as the caregiver may leave or curtail employment in order to provide care. They may shoulder the burden of healthcare costs if their family member is not yet eligible for Medicare or is otherwise under insured. Caregivers also frequently contribute to covering the living expenses for the person they are caring for, including taking them into their home.
Across the states, 42 million family caregivers provide $450 billion in unpaid care, helping their loved ones to live at home as they age. Interventions are needed to help minimize the negative health consequences of caregiving and support family caregivers in carrying out the tasks they are taking on.

Method
We sought input from two sources:

- **Expert Panel**: We created an advisory committee of experts from agencies with responsibilities for aspects of elder care and advocates for elders. We have held in-person and teleconference meetings during which we solicited their perspectives on the needs of family caregivers.

- **Patients and Caregivers**: We engaged directly with patients and caregivers through personal interviews and focus group interviews to identify ways in which caregivers and elderly care recipients can be better supported.

Thematic analysis and synthesis of information gathered from these interviews suggest that caregivers face a variety of challenges related to the coordination of care for their elderly family member. Caregivers frequently provide the primary continuity among settings and providers. This continuity may be disrupted by a hospital admission or a stay in a nursing home or rehabilitation center by their family member. The elderly patient returning to the home setting after a hospitalization may have new providers, new or changed medications and other changes in their care plans intensifying the demands upon the caregiver. The caregiver may be uncertain which providers/health professionals to call in emerging situations. They may be uncertain who has the knowledge to answer their questions. They may be unsure who to turn to for guidance.

We have identified a variety of resources that may be helpful to caregivers, including:

- support groups and respite care to help caregivers cope with the stresses of their role
- clearinghouse for information about resources available for elders
- preparation for their role as caregivers
- self-help strategies including questions caregivers should be asking medical professionals about the care of their family member; who to contact with what sorts of questions
- recognition by caregivers’ providers of the need to monitor the stresses of the caregiver role

Program Development
Based upon the themes from our preliminary interviews with caregivers and patients, we are considering several interventions to support the needs of family caregivers. A priority expressed by our advisory board members and interview informants is the development of resources to support caregiver training in medically related tasks and to provide support group and respite care resources for caregivers.

Caregiver training on medical care and monitoring
We suggest that caregiver training needs be assessed as early in the caregiving relationship as possible. Caregiver assessments could be done as part of the Medicare Welcome visit by a health care professional, such as the patient’s PCP. These assessments should include documenting who the caregiver is/will be, investigating the caregiver’s health, ability and willingness to do what tasks that may be required by the patient, and exploring the caregiver’s need for support. These assessments should be repeated as needed, for example, following a hospitalization, and at least yearly as a patient’s healthcare needs evolve. Assessments could be provided in a variety of locations: Specialist or PCP practice, hospital discharge centers, or community senior centers. They could be performed by a variety of personnel: PCP, nurse, discharge planner, pharmacist, community health coach. The next phase of our project is to begin to determine the most appropriate place, healthcare professional, and type of training needed.

Support groups and respite care resources
Respite care and support group resources could be provided and organized in a variety of setting and delivered by a variety of personnel.

- **Locations**: senior centers, assisted living facilities, primary care practices.
- **Personnel**: professionally facilitated by nurse or care manager; or by “community core” volunteers. We are exploring the feasibility of providing support services through “shared medical appointments” at providers’ practices. We are investigating models for building, training, and managing a cadre of community volunteers to provide respite care, especially for caregivers of patients with Alzheimer’s and other cognitive impairments.
Public Policy Support
Nationally, AARP is supporting efforts to:
- Make sure “respite care” programs are available so that family caregivers can take much-needed breaks from caring for their loved ones;
- Strengthen workplace flexibility and protections for family caregivers;
- Give nurses more authority to heal, so they can provide even better care for older patients at home;
- Provide family caregivers with instruction and training when their loved ones are in the hospital and preparing to transition home.

The Utah chapter of AARP is championing a legislation called the CARE Act (Caregiver, Advise, Record, Enable) that has three important provisions:
- The name of the family caregiver is recorded when a loved one is admitted into a hospital;
- The family caregiver is notified if the loved one is to be discharged to another facility or back home; and
- The facility must provide an explanation and live instruction of the medical tasks – such as medication management, injections, wound care, and transfers – that the family caregiver will perform at home.

Preliminary Model of Caregiver Engagement

Hospitalization

Patient hospitalized for acute health problem, e.g., hip fracture, heart attack, stroke

Patient transitions to home

Patient transitions to SNF

Hospital care by family caregiver

Reconnect with PCP

Essential Communications:
- Create & communicate care plan
- Document and communicate medication

Patient & caregiver accountability
- Teach to identify warning signs of health status changes
- Facilitate effective communication with PCP, specialists, SNF
“Health is an Issue of Mind Over Matter, If You Don’t Mind, It May Actually Matter!”: An Empirical Examination of Subjective Age in Older Adults

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Abstract

This research study empirically examines the determinants of subjective aging in older adults. Agogo, Milne & Schewe (2014) proposed a model for understanding the aging experience by integrating multiple perspectives. The integrated perspective explains feelings of subjective age in older adults as a function of biological, mental and social factors unique to each individual. In this follow up study, a subjective aging index (SAI) has been created to quantify each of these sub-dimensions and test the ability of these determinants to predict subjective age among a population of adults, forty and older. SAI is shown to capture the changes in subjective age as individuals grow older. Further, differences in the effect of biological, social and mental factors between males and females are observed. These findings contribute to the growing literature on successful aging strategies with important implications for healthcare practitioners, marketing organizations and individuals heading towards the golden years. In addition, the subjective aging index is validated as a meaningful diagnostic tool to shed more light on the habits and behaviors that influence subjective age the most.

Introduction

Within the next three decades, about one in four people on earth will be over sixty years old, double the proportion of people in that demographic at the turn of the new millennium (World Health Organization, 2014). In America, we fast approach the year 2030, when one in five people will be over the age of 65 (Centers for Disease Control and Prevention, 2013). As this massive shift occurs, biologists, psychologists, sociologists, economists, physiologists and policy analysts continue to study and research how these changes influence their domains by developing theory that can inform and empower individuals and society at large (Bengtson, Rice, Johnson, Bengtson, & Schae, 1999; Ulloa, Møller, & Sousa-Poza, 2013). Ultimately, such effort is imperative in order to guarantee that older individuals will have meaningful lives and play out roles that will ensure the sustenance of modern societies.

Aging individuals, for their part, are increasingly rewriting the rules of what it means to be elderly and making visible changes to improve their quality of life and participate more effectively in society. Research shows that Baby Boomers, more than other generational cohorts, value maintaining youth and feeling healthy (Meredith, Schewe, & Karlovich, 2002). For example, in the year 2013 alone, there were 3.8 million cosmetic procedures performed on people age 55 and older, a 4% increase from the year 2012 (American Society of Plastic Surgeons, 2013). Additionally, there has been a steady growth of the number of seniors recorded as participating in physical activities, sports and exercise (Sport Business Research Network, 2013). With the Baby Boomers entering their older years, these strong trends should continue among older people. However, most research and writing on healthcare reflect a focus on “repairing” patient health while much should be recommending methods to “rejuvenate” society’s members, that is, make them feel younger (see Figure 1). This is particularly important for baby boomers who, as previously mentioned, are looking for ways to look and feel younger. Therefore, what can be done to accomplish this?

Some interesting work from over two decades ago, only recently published, demonstrates the mind’s ability to reduce subjective age (Langer, 2009). In a 1981 study, 8 men in their 70s were sent into a converted monastery in New Hampshire. These men were challenged by physical limitations associated with aging, such as arthritis, curvature of the spine, and inflexibility. Upon entering the building, they were psychologically transported back 22 years to 1959. This was achieved subjecting them to that
period’s music (E.g., Perry Como), black and white television (E.g., Ed Sullivan), and magazines from 1959. During their stay, they discussed Baltimore Colts quarterback Johnny Unitas and watched “Anatomy of a Murder” starring Jimmy Stewart. The men were also cut off from anything modern for 5 days, allowing nothing to spoil the illusion that they were in a period 22 years earlier. Before entering, the subjects were measured for dexterity, grip strength, hearing and vision, memory and cognition. Upon leaving, they were suppler, showed greater manual dexterity, sat taller and even had improved eyesight. This study showed that by transported the subjects’ minds to an earlier time their bodies seemed to follow. Incredulous, until now Langer never published this study, believing no one would accept the findings.

Figure 1
Subjective Age and Chronological Age Model

Also, in a recent book called Being Mortal: Medicine and What Matters in the End (2014), Atul Gawande tells of his work conducted with individuals whom one can only assume are among the 15% who have a higher subjective age. These individuals include people who are terminally ill, and those who lived in assisted living or hospices. In his book, Dr. Gawande shows how these individuals’ medical conditions were improved when they were given a purpose in life. In one case, Dr. Gawande gave a very grumpy, depressed man in a rehab facility a bird and he was told he must take care of that bird. Many retirement communities bring dogs, cats and other animals to the residents who receive great temporary joy but the animals are taken away. The residents do not have responsibility for the animal; therefore there is no “commitment to a purpose.” The man in the example resisted taking care of the bird for over 2 weeks. In the third week, however, he came to care for the bird and take a greater interest in people around him, and he acted healthier. Both of these examples show that it is rather clear that the mind and the body do not act separately.

Therefore, does age really matter? An age-old adage attributed to Mark Twain states “Age is an issue of mind over matter. If you don’t mind, it doesn’t matter.” But age does in fact matter. However, it is one’s cognitive assessment of one’s age, not one’s chronological age that is key. This concept is referred to as subjective age (Barak & Schiffman, 1981). Several studies have noted that older people today tend to perceive themselves as younger in age and outlook than they really are (Agogo, Hajjat, Milne, & Schewe, 2014; Schiffman & Sherman, 1991). Additionally, those who believe they are younger generally feel, act and even appear younger (Choi, DiNitto, & Kim, 2014; Stephan, Chalabaev, Kotter-Grühn, & Jaconelli, 2013). Furthermore, lower subjective age results in better health and hence lower healthcare costs (Barrett, 2003; Boehmer, 2007; Linn & Hunter, 1979; Markides & Boldt, 1983; Stephan, Caudroit, & Chalabaev, 2011; Stephan et al., 2013; Westerhof & Barrett, 2005). Finally, longitudinal research has shown that lower subjective age leads to adding an additional 7.5 years to one’s life (Kotter-Grühn, Kleinspehn-Ammerlahn, Gerstorf, & Smith, 2009; Levy, Slade, Kunkel, & Kasl, 2002).

Our current study is designed to continue that line of discussion by carrying out an empirical investigation of the determinants of subjective age in older adults. Specifically, we investigate the following research questions: can subjective age be predicted by self-reported measures of biological, social, and mental characteristics in an individual after controlling for chronological age? And are there differences in how these characteristics impact subjective age across age groups of older adults? By answering these research questions we may better understand the impact of subjective age on healthcare related issues of quality of life in later years and even mortality.

Measures of Age
The principal dimensions of age include chronological, mental, social, and biological age. Chronological age is represented as the number of years a person has lived. Mental age is measured as intelligence or cognition and there are many widely used scales for measuring mental age in children and adults. Social age is usually defined in terms of social roles and habits (Birren & Renner, 1977). Finally,
biological age is used to capture how much of biological changes have occurred in an individual over time and it is often measured using biomarkers (Jackson, Weale, & Weale, 2003), frailty (Jones, Song, & Rockwood, 2004) and physical parameters (Borkan & Norris, 1980).

In the field of marketing, attempts have been made to develop self-reported measures of age that can promote understanding of the role of an individual’s perception and outlook on their behavior. Subjective age, which is the most common self-reported measure of age, has been measured in two ways: (1) as an individual’s self-perception in terms of reference age groups, i.e., “middle-aged”, “elderly”, or “old”, which is referred to as identity age, or (2) as terms of units of age, which is also referred to as personal age (Kastenbaum, Derbin, Sabatini, & Artt, 1972) and cognitive age (Barak, 1987). Related concepts are ideal age and desired age, self-reported aspirational measures of age also collected as a count of years (Barak, Stern, & Gould, 1988; Sirgy, 1991). This paper utilizes the conceptualization of subjective age made up of four dimensions: look-age (how old the individual believes they look), feel-age (how old the individual feels), interest-age (the interests of the individual) and do-age (the individual’s actions and behavior) (Barak & Schiffman, 1981). In the past, this composite measure has been reduced to a single variable by averaging the four dimensions into a single measure (Barak & Schiffman, 1981; Kastenbaum et al., 1972; Stephens, 1991).

Based on Agogo, Milne and Schewe (2014), the proposed determinants of subjective age fall into biological, mental and social dimensions, and older individuals balance their level of activity within and across these areas as they grow older in order to keep feeling subjectively young. The rest of this paper outlines the method by which we explore the hypothesized relationship, report the results of analyses performed and finally a discussion of the findings and the implications for further theoretical development by the academy and for professional practice.

Method

In this paper, the relationship between biological, mental and social activity and subjective age is explored empirically using the following steps. First, a subjective aging index (SAI) made up of biological, mental and social sub-indices is created and confirmed to have face validity and internally reliability. Although a self-reported index, the statements of the SAI were crafted based on objective and observable behavior. Secondly, empirical data is collected from a sample of older individuals using Amazon Mechanical Turk. Subsequently, analysis of this data is done using partial least squares (PLS) path modeling, a recommended methodology for research that is exploratory and focused on creating new theory (Hair, Sarstedt, Ringle, & Mena, 2012). The first stage of the PLS analysis involves the validation of the dependent variable, subjective age, as a formative latent variable according to recommendations for doing so in PLS (Hair, Hult, Ringle, & Sarstedt, 2013). This approach is preferable to simply averaging the four dimensions of subjective age as it enables a deeper understanding of the concept of subjective age than currently exists in the marketing literature. Afterwards, the SAI is also confirmed to be psychometrically valid according to guidelines for PLS. Finally, the overall model is fit and findings across different age-groups are compared.

Measures and Scale Development

Subjective age, the dependent variable is a composite of feel-age (In actual years, I feel as though I am ...), do-age (In actual years, I do most things as though I am ...), look-age (In actual years, I look as though I am ...) and interest age (In actual years, my interests are as though I am ...) (Barak & Schiffman, 1981). In addition, two measures related to subjective age were collected to verify the convergent validity of the dependent variable. These measures are judged age, a measure of other people’s perceptions of an individual’s age (Overall in actual years, people think I am ...), as well as a single overall measure of subjective age (Overall in actual years, I feel like I am ...). The independent variable, The Subjective Aging Index (SAI), consists of three sub-indices: biological, mental and social, such that a high score on the SAI would relate to higher subjective age. Similar to the dependent variable, the SAI is measured formatively and so recommended guidelines for content and indicator specification were followed to ensure the validity of the measures (Diamantopoulos & Winklhofer, 2001). The SAI consists of some newly created items, but it leans heavily on prior literature. To develop the Biological Aging Index we used and adapted items from the MOS SF-36 scale (Haley, MChorney, & Ware Jr, 1994; McHorney, Ware Jr, & Raczek, 1993) as well as the perceived physical fitness scale (Abadie, 1988). To develop the Mental Aging Index items were taken or adapted from the cognitive failures questionnaire (Broadbent, Cooper, FitzGerald, & Parke, 1982), the mental exercise scale (Salthouse, 2006) and the MOS SF-36 scale (Haley et al., 1994; McHorney et al.,
To develop the Social Aging Index, items were taken and adapted from measures of social isolation (Cornwell & Waite, 2009) and the International Personality Item Pool (Goldberg, 1999).

An initial pool of about forty items was created for each the biological, mental and social sub-dimensions after which expert judgment and consensus were used to reduce this initial number by half for each of the sub-scales, i.e., to twenty items each.

**Scale Pre-Testing**

The reduced scale was pre-tested on thirty individuals between the ages of 30 and 70 to ensure the wording of the items was clear, to obtain initial feedback as well as to evaluate initial psychometrics of the SAI. Responses indicated there were no issues with the wording of the items and further analysis showed internal consistency of each of the sub-scales (reliability above recommended cutoffs of 0.7 for early stages of research (Nunnally, 1978 as cited in Lance, Butts, & Michels, 2006). Therefore, we proceeded with data collection for the main study with the items unchanged.

**Data Collection**

A stratified random sampling strategy was used to obtain a representative sample of females and males aged between forty and seventy. Participants were recruited from Amazon.com’s online paid labor system Mechanical Turk, a common source of respondents for such studies (Buhrmester, Kwang, & Gosling, 2011; Goodman, Cryder, & Cheema, 2012; Horton, Rand, & Zeckhauser, 2011). Subjects were presented with an online survey hosted on Qualtrics. Necessary steps were taken to ensure the validity of the data collected. For example, to restrict participants from taking the survey multiple times IP blocking, a feature of Qualtrics that ensures only one response can be recorded from a home/office internet connection, was utilized. Also, the length of time spent on the survey was tracked to prevent data runs from uninterested participants. Participation was restricted to adults located in the USA. In total, 1245 people attempted to take the survey, however; only 594 responses were collected due to the age and gender restrictions of our stratified random sampling strategy.

After data collection was complete, we conducted a data cleaning process that was based on the following criteria. First, chronological age was collected twice, first as year of birth and secondly as age on the 1st of January. All entries that showed a disparity between both numbers were dropped. Secondly, gender was also collected twice and responses with non-matching genders were dropped. Finally, because a survey such as this asking subjective age in actual years is prone to exaggerated answers by some subjects, all responses where the difference between actual age and subjective age was beyond three standard deviations of the sample were excluded from the final analysis. This process resulted in a final sample of 552 respondents.

Females represented 53.8% of the participants (compared to our sampling target of 50%), with only 4.7% of the females and 7.8% of the male sample being seventy years or older (compared to our sampling target of 25% each) (see Table 1 for details). The purposive sample likely had fewer respondents in the oldest age category (seventy and older) due to the small number of people in those age groups who are active users of MTurk (Ipeirotis, 2010). Analyses of other characteristics of our sample indicate 36.1% had a 4-year college degree and an additional 25.7% had a degree from some college. Also, sixty percent had income below 50,000 dollars a year. Detailed information on the demographics of the sample can be found in Appendix A.

**Table 1**

| Sample size, tabulated by gender and age group |
|---|---|---|
| | Males | Females | Overall |
| Forties | 36.9% | 32% | 34.2% |
| Fifties | 37.3% | 33.3% | 35.1% |
| Sixties | 18% | 30% | 24.5% |
| Seventies | 7.8% | 4.7% | 6.2% |
| N | 255 | 297 | 552 |

**Analysis and Results**

**Dependent Variable**

As a first step, the four-item scale from Barak & Schiffman (1981) was validated to be an appropriate measure of subjective age. Previous studies using this measure have specified the concept as being reflective despite the fact that the dimensions are unique and cannot be expected to always correlate with each other (e.g., Wilkes, 1992). For example, an individual may look younger than their age (look-age), but also have interests (interest-age) as though they are much older than their chronological age. To tackle this, we measure subjective
age as a formative first-order latent variable in
acknowledgement of the uniqueness of the four indicators.
To establish the convergent validity of our chosen
subjective age measure, we verified that the formatively
measured subjective age construct correlated highly with
reflective measures of the same construct, a process also
known as a redundancy analysis (Chin, 1998; Hair et al.,
2013). This was done by regressing the four item measure
of subjective age against overall subjective age and judged
age, two single global items that summarize the essence of
the construct. The formative measure explained 70.2% and
70.6% in overall subjective age and judged age
respectively, exceeding the recommended 64% cut off
(Chin, 1998).

A unique advantage of using PLS-SEM for specifying
formative constructs is the ability to generate outer weights,
which represent the contribution of the item to the latent
variable that it measures. While reflectively measured
variables primarily use outer loadings (i.e. the results of
single regressions of each indicator variable on their
corresponding construct), these are less important for
formative constructs (Hair et al., 2013). Rather, outer
weights (results of a multiple regression of a construct on
its set of indicators) which assess each indicator’s relative
importance in the measurement model, are more
informative about the nature of the latent construct (Hair et
al., 2013). Both the outer loadings and the outer weights are
tested for significance using bootstrapping techniques, as
PLS-SEM does not make common parametric assumptions.
SmartPLS 3.0 (Ringle, Wende, & Will, 2014), the PLS-
SEM tool used for this analysis provided both outer
loadings and outer weights which are interpreted as follows.
The indicator for each of the four dimensions of subjective
age loaded highly on the latent factor (the outer loading for
interest-age was 0.61 while the rest were above 0.85)
indicating that each item correlates strongly to the latent
variable. Furthermore, by regressing each item on the other
three and checking that tolerance and VIF were within
acceptable ranges (Hair et al., 2013), it was confirmed that
the sub-dimensions of subjective age are not collinear. The
model for testing convergent validity showing outer
loadings is shown in Figure 2 below.

Finally, to determine the contribution of each of these
dimensions to the latent subjective age construct, a
bootstrap of 5,000 samples was drawn and the significance
of indicator outer weights was tested. As shown in Table 2,
feel-age and look-age contribute about twice as much as do-
age to subjective age, while interest-age seems to not have a
significant contribution. However, because interest-age had
a high (and significant) loading on the latent subjective age
construct, this is interpreted to mean that interest age is
important to subjective age (i.e., significant outer loadings)
but not as relatively important (i.e., insignificant outer
weights) as the other dimensions (Hair et al., 2013).
Nonetheless, interest-age was retained in the construct due
to its theoretical relevance in the original conceptualization
of the subjective age measure (Barak & Schiffman, 1981).
After validating the measure of subjective age, the
complete model was fit (shown in Figure 3), the
psychometric properties of the SAI were evaluated and
findings were analyzed.

Independent Variables
The subjective aging index, although a self-reported
scale, was designed to be an objective composite measure
of different habits and behavior along the biological, mental
and social dimensions. Therefore, items were created to
extensively sample each dimension and focus was paid to
face validity of the measures. As a result, most of the items
in each sub-scale were only moderately correlated, a
property common with such formative constructs. To
achieve parsimony while maintaining the face validity of
the SAI, a principal components analysis was used to
identify the underlying structure among the items as
recommended by Treiblmaier, Bentler and Mair (2011). A
PCA makes different assumptions than an EFA, which make it more suitable for reducing a number of variables to a smaller set of components that accounts for a large amount of observed variance (Kashy, Donnellan, Ackerman, & Russell, 2009).

The PCA was conducted in two stages with all sixty items of the SAI first, and then with the twenty items of each individual sub-dimension in turn. Carrying out a PCA with all sixty items confirmed that items for each sub-dimension loaded on unique factors, providing support that the three sub-dimensions of the SAI are indeed unique. In the second stage, the PCA was used to identify the underlying structure of each sub-index scale. The factor loadings and analysis of each sub-index scale showed that all three scales consisted of two major factors. Therefore, the sixty item SAI was reduced 24 items with eight items for each dimension. The biological aging index consisted of ‘physical state’ and ‘physical conditioning effort’ factors, mental aging index consisted of ‘mental performance’ and ‘mental exploration effort’ factors, and the social aging index consisted of ‘social participation’ and ‘social engagement effort’ factors (see Appendix B for items). Subsequently, each index was specified in the partial least squares model as a formative-reflective type second order latent factor as suggested in Hair et al (2013).

Table 2

|         | Original Sample (O) | Sample Mean (M) | Standard Error (SE) | t-value (|O/SE|) | P Values |
|---------|---------------------|-----------------|---------------------|----------|----------|
| Feel → SA | 0.419               | 0.423           | 0.067               | 6.212    | 0.001    |
| Look → SA | 0.511               | 0.512           | 0.057               | 8.962    | 0.001    |
| Do → SA  | 0.22                | 0.214           | 0.066               | 3.326    | 0.001    |
| Interest → SA | -0.039          | -0.041          | 0.036               | 1.094    | 0.274    |

Figure 3
The Overall Model

Alternative procedures were adopted to establish construct validity of the SAI in the absence of a valid reflective measure suitable for a redundancy analysis of each sub-scale (similar to what was done with the dependent variable). Establishing the validity of SAI was a two-step process; first, the internal consistency of each subscale (Cronbach alpha) was checked and confirmed to exceed recommended cutoffs (Biological = .843, Mental = .709, Social = .764). Secondly, the second-order latent factor PLS model was fit, and the outer loadings and outer weights of respective items of the three dimensions were computed and checked for both magnitude and significance.
This was done to verify that the items were contributing significantly to the latent factors being measured and that they are relatively important. All but two items had significant outer loadings with twenty out of twenty four items having loadings above the recommended cut off of 0.5. Nevertheless, the full twenty four items were retained due to the overall face validity of the SAI, an approach supported by existing literature on validating formative measures (Hair et al., 2013; Petter, Straub, & Rai, 2007). All but four items had non-zero outer weights with over half of the non-zero outer weights being statistically significant demonstrating their relative importance to the constructs being measured (See Appendix C).

Given the satisfactory form of the SAI specified as a formative construct, the final model (Figure 4) was re-fit as a first order latent factor model using the latent factor scores generated from the previous step according to guidelines of Lowry & Gaskin (2014).

**Model Results**

The final model was evaluated and found to explain 60.2% of the variance in subjective age. In particular, across the entire sample two of the three (biological and mental) sub-indices of SAI were found to significantly influence subjective age after controlling for chronological age. This supports a positive response to research question one: can subjective age be predicted by objective measures of biological factors, social factors, and mental factors in an individual after controlling for chronological age?

**Comparison across Age-Groups**

To answer the second research question whether differences exist in how these factors impact subjective age across age groups of older adults, a multi-group analysis was performed. Groups to be compared were chosen in two distinct ways: (1) organizing responses into decades consistent with the stratified sampling approach and (2) using a classification and regression tree (CART) algorithm (Wilkinson, 1992) which was sensitive to the underlying structure of the data.

Using the first method, four groups were identified (forties, fifties, sixties and seventies) with the size of the fourth group being much smaller. JMP Pro (S. A. S. Institute, 2012) was used to identify the age ranges most similar to themselves with respect to their subjective age. Running the algorithm on part of the data (70%, randomly selected) led to the identification of five groups with a more balanced group size than using the decades approach (See Table 3 below). When this grouping was tested on the remaining 30% of the data, the findings remained consistent suggesting the robustness of the age groupings (R-square Training= 0.427; R-square Validation = 0.437).

The multi-group analysis was run with both grouping methods with findings being consistent. However, only the results from the second grouping method with more balanced group sizes are reported.

**Table 3**

<table>
<thead>
<tr>
<th>Age Groups</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Below 43</td>
<td>84</td>
</tr>
<tr>
<td>44 – 53</td>
<td>113</td>
</tr>
<tr>
<td>54 – 58</td>
<td>63</td>
</tr>
<tr>
<td>59 – 63</td>
<td>59</td>
</tr>
<tr>
<td>Above 64</td>
<td>59</td>
</tr>
</tbody>
</table>

**Group Differences and Similarities**

It was found that marked differences exist between groups with respect to the nature of subjective age and the relative contribution of the four different dimensions. Overall, subjective-age was determined by more of the dimensions as the individual proceeded through older age-groups. For instance, do-age was found to increase in importance until between 54-58 at which time its importance declined steadily and became insignificant above 64 years. At the same time, feel-age was observed to
become more important as individuals entered their sixties. The outer weights of each dimension of subjective-age and their change across age groups are shown in both Figure 5 and Table 4 below. In other words, this suggests that as individuals advance through these age-groups, they balance their overall feelings of subjective-age by placing more focus on dimensions of subjective age that hitherto were less salient or important. It is this process of balancing one’s perceptions of subjective-age as one gets older that this paper describes as the time-bending effect.

### Table 4
Relative Importance of Subjective Age Dimension by Age Groups

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Do (\rightarrow) SA</th>
<th>Feel (\rightarrow) SA</th>
<th>Interest (\rightarrow) SA</th>
<th>Look (\rightarrow) SA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Below 43</td>
<td>0.734***</td>
<td>0.593*</td>
<td>-0.267</td>
<td>-0.202</td>
</tr>
<tr>
<td>44 – 53</td>
<td>0.965**</td>
<td>0.207</td>
<td>-0.637</td>
<td>-0.066</td>
</tr>
<tr>
<td>54 – 58</td>
<td>1.280</td>
<td>-0.390</td>
<td>0.119</td>
<td>-0.076</td>
</tr>
<tr>
<td>59 – 63</td>
<td>0.675**</td>
<td>0.419^</td>
<td>0.190</td>
<td>0.204</td>
</tr>
<tr>
<td>64+</td>
<td>0.061</td>
<td>0.704**</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

 *** P <0.001 ** P<0.01 * P<0.05 ^ P<0.10

### Figure 5
Relative Importance of Subjective Age Dimensions by Age Groups

Lastly, the multi-group analysis was used to evaluate differences in how well the SAI predicted subjective age across these age groups. As seen in Figure 6 and Table 5 the biological aging index consistently predicts subjective age across all age groups – an illustration of the well-documented importance of physical activity in maintaining a youthful and vibrant outlook as one ages. Interestingly, the mental and social dimensions of SAI have larger outer weights and become significant as well in predicting the subjective age of older individuals, indicative of the growing relevance of these dimensions for older individuals who are ‘balancing’ any shortfalls in physical activity with mental engagement and social involvement.

### Table 5
SAI Predictability of Subjective Age Across Age Groups

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Do (\rightarrow) SA</th>
<th>Feel (\rightarrow) SA</th>
<th>Interest (\rightarrow) SA</th>
<th>Look (\rightarrow) SA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Below 43</td>
<td>-0.025</td>
<td>0.168*</td>
<td>-0.120</td>
<td>0.389**</td>
</tr>
<tr>
<td>44 – 53</td>
<td>0.491**</td>
<td>0.546**</td>
<td>0.504**</td>
<td>0.448**</td>
</tr>
<tr>
<td>54 – 58</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>59 – 63</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>64+</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

 ** P <0.001 *P<0.10

### Comparison across Sexes

A multi-group analysis was conducted to test whether the SAI impacts subjective age differently depending on
sex. The full dataset was split into two groups based on sex. The results indicate that all dimensions of subjective age were relatively important to both males and females. We also found similar patterns in the magnitude of outer weights of the dimensions of subjective age. Feel age and look age were the most important and least important to both sexes respectively (See Table 6). Additionally, we investigated the differences in how well SAI predicted subjective age between the sexes. We found that only the biological aging index significantly predicted subjective age in males. However, all three dimensions of the SAI significantly predicted subjective age in females. This suggests that the SAI is a much better predictor of subjective age in females, than in males (See Table 7).

**Table 6**
Relative Importance of Subjective Age Dimension by Sex

<table>
<thead>
<tr>
<th></th>
<th>Males</th>
<th>Females</th>
</tr>
</thead>
<tbody>
<tr>
<td>Do → SA</td>
<td>0.295</td>
<td>0.291</td>
</tr>
<tr>
<td>Feel → SA</td>
<td>0.325</td>
<td>0.342</td>
</tr>
<tr>
<td>Interest → SA</td>
<td>0.292</td>
<td>0.334</td>
</tr>
<tr>
<td>Look → SA</td>
<td>0.222</td>
<td>0.237</td>
</tr>
</tbody>
</table>

All outer weights significant at P <0.001 level

**Table 7**
SAI Predictability of Subjective Age by Sex

<table>
<thead>
<tr>
<th></th>
<th>Males</th>
<th>Females</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age → SA</td>
<td>0.664**</td>
<td>0.715**</td>
</tr>
<tr>
<td>Bio_Stg2 → SA</td>
<td>0.207**</td>
<td>0.279**</td>
</tr>
<tr>
<td>Men_stg2 → SA</td>
<td>0.082</td>
<td>0.122*</td>
</tr>
<tr>
<td>Soc_stg2 → SA</td>
<td>-0.027</td>
<td>0.138*</td>
</tr>
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</table>

** P <0.001 * P<0.01

Summary and Conclusion

As society ages rapidly, there is a need to better understand the unique characteristics of older individuals to assist them and society at large in dealing with the realities of the impending demographic shift. As existing evidence suggests, many popularly-held notions of older adults need to be rethought in light of the observed shift in trends and habits among aging individuals today. Chronological age, which has been considered in the past to be a poor predictor of behavior (Barak and Schiffman, 1981), is even more unreliable today as aging individuals display behavior that can best be described as “time-bending”.

In a previous paper, Agogo, Milne & Schewe (2014) proposed a framework for understanding older individuals’ tendency to take action on multiple dimensions of aging in an effort to feel and act younger. The proposed framework provided a way of understanding the wide disparity in the aging experience among older adults as a function of factors that influence their subjective age. It described the “cost-benefit self-balancing” method practiced by older individuals as a way of facing the realities of aging. Self-balancing is practiced by older individuals by taking on as many activities as giving up in an effort to sustain youth-like appearances, which leads to subjective ages that trail chronological ages. These time-bending activities occur on three dimensions, namely biological, mental and social.

This paper expands on Agogo, Milne & Schewe (2014) by empirically investigating the determinants of subjective age in older adults. We found that subjective age is formed by more dimensions as individuals grow older. This finding supports our notion of time-bending, as people’s subjective aging experience is not determined solely by chronological age or physical activity alone. From conducting a grouped analysis of different age groups, we find that do-age is important until the individual enters their sixties, after which feel-age becomes more important to determining subjective age. Also, we found that after controlling for age, biological aging index is a strong predictor of subjective age across age groups, while mental and social aging index play a greater role as the individual ages.

We also investigated the difference in impact of the factors on subjective age between sexes. First, our analysis of the nature of subjective age across sexes indicates that all dimensions of subjective age (i.e. feel, look, do and interest age) were equally important to both males and females. We also found that feel age and look age were the most important and least important dimensions of overall subjective age to both sexes, respectively. Finally, we found that only the biological aging index significantly predicted subjective age in males. However, all three dimensions of the SAI significantly predicted subjective age in females. This suggests that women have more dimensions with which to combat feeling older than men do, as men’s subjective aging experience are driven primarily by physical capability.

Our paper provides several theoretical and managerial contributions. One major theoretical contribution is the validation of subjective age as a formative latent construct.
comprised of four dimensions. Previous studies counter-intuitively discounted the contribution of look-age to subjective age because it failed to correlate highly with the other dimensions (e.g., Kastenbaum et al., 1972; Wilkes, 1992). By properly specifying subjective age as a formative construct, a more detailed understanding of how the different dimensions impact subjective age has been proposed.

Also, we contribute a parsimonious index called the subjective aging index (SAI) that captures six sub-dimensions which are instructive of how the subjective aging process occurs. The SAI can be applied as a diagnostic tool that serves as a practical starting point for those seeking things to do/avoid in order to time-bend and stay meaningfully engaged.

An important managerial contribution of this paper is its role in focusing attention on the importance of equipping older people with ample opportunity to self-balance on multiple dimensions, as they get older. Older people will discount the limitations in one dimension of their lives with greater participation and activity in another dimension in order to fight the inevitable draw of chronological age. Healthcare practitioners should become allies in this respect by re-designing their practices around the principles of rejuvenation and multi-dimensional care and assistance.

References


### Appendix A

#### Demographics table for the US sample

<table>
<thead>
<tr>
<th>Demographic</th>
<th>Percentage</th>
</tr>
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<tbody>
<tr>
<td><strong>Gender</strong></td>
<td></td>
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<tr>
<td>Male</td>
<td>46.2%</td>
</tr>
<tr>
<td>Female</td>
<td>53.8%</td>
</tr>
<tr>
<td><strong>Age groups</strong></td>
<td></td>
</tr>
<tr>
<td>40s</td>
<td>34.2%</td>
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<tr>
<td>50s</td>
<td>35.1%</td>
</tr>
<tr>
<td>60s</td>
<td>24.5%</td>
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<tr>
<td><strong>Race</strong></td>
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<tr>
<td>Caucasian</td>
<td>85.9%</td>
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<tr>
<td>African American</td>
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<tr>
<td>Hispanic</td>
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</tr>
<tr>
<td>Asian</td>
<td>4%</td>
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<tr>
<td>Native American</td>
<td>0.7%</td>
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<tr>
<td>Other</td>
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<td><strong>Education</strong></td>
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<tr>
<td>Less than High School</td>
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<td>Professional Degree (JD, MD)</td>
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<td>under $25,000</td>
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<td>14.3%</td>
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<tr>
<td>Over $85,000</td>
<td>16.1%</td>
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Appendix B

Biological Aging Index

Physical Conditioning Effort
- B19_Carry out some form of exercise?
- B17_Carry out activities to improve your current over
- B10_Walk briskly for twenty minutes and experience less strain than most people your age?
- B18_Carry out physical tasks that you believe most people your age cannot?

Physical Form
- B2_Lose energy during the course of a regular day?
- B5_Experience disruptions of your daily activities as a result of physical aches and pain?
- B6_Experience difficulty breathing when you exert yourself?
- B16_Worry about your level of physically fitness?

Mental Aging Index

Mental Performance
- M17_Forget where you put something like a newspaper or a book?
- M19_Start doing one thing and get distracted into doing something else (unintentionally)?
- M12_Forget whether you’ve turned off a light or a fire or locked the door?
- M10_Forget why you went from one part of your house/office to the other?

Mental Exploration Effort
- M5_Learn how to use new tools/devices easily?
- M6_Play games that involve rapid thinking, matching and guessing?
- M7_Play games that require strategic thinking, anticipation and planning?
- M3_Experience a feeling of inspiration caused by something around you?

Social Aging Index

Social Engagement Effort
- S10_Make yourself the center of attention in a group?
- S7_Seek out large parties /crowded events to attend?
- S15_Introduce or connect people together?
- S16_Make new friends?

Social Participation
- S18_Withdraw from human contact for prolonged periods of time?
- S6_Feel isolated from others?
- S17_Feel uncomfortable with others?
- S19_Purposely stay in complete silence?
## Table

### Item’s Outer weights and loadings

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<td></td>
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<td></td>
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<td>Physical Form</td>
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<td>B2 0.708</td>
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<td></td>
<td>B5 0.703</td>
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<td>B6 0.906</td>
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<td>Social Engagement Effort</td>
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<td></td>
<td>S16 0.942</td>
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<td>S7 0.296</td>
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<td>Social Participation</td>
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<td>S18 0.88</td>
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<td></td>
<td>S19 0.568</td>
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<td>S6 0.659</td>
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Which Corporate Association Strategy is More Effective on Young Adults: Corporate Ability or Corporate Social Responsibility?
Yeonsoo Kim, James Madison University
Hanna Park, Middle Tennessee State University

Abstract
In the current competitive market, building and influencing corporate associations are regarded as an important strategic task for sustainable business operations. Thus, businesses have spent a great amount of effort to facilitate enduring, distinctive corporate associations in stakeholders’ minds (Ellen et al., 2006; Kim, 2011). Charitable donations, environmental protection programs, and community activities are often used to enhance corporate social responsibility (CSR) associations, while corporate advertising and promotional activities are designed to reinforce corporate ability (CA) associations.

CA associations refer “those associations related to the company’s expertise in producing and delivering its outputs” (Brown & Dacin, 1997, p. 68), while CSR associations reflect the company’s activities and “status of a company as a good member of society with regard to social, environmental, and or political issues” which is often unrelated to the companies’ ability to produce goods and services (Kim, 2011, p. 223). Previous studies suggest that associations with corporate ability and corporate social responsibilities both positively influence product evaluations, although CA associations generally have a stronger impact than CSR associations.

However, these studies have drawbacks in that 1) the possible impact of corporate associations on the intangible benefits (e.g., positive word-of-mouth intentions) is often overlooked and 2) there was limited discussion on the possibility that the impact of corporate associations may differ by industry type. Corporate social responsibility (CSR) has been regarded as a strong strategic tool to enhance mutually beneficial relationships with stakeholders (Kim, 2013; Kim & Choi, 2012). Thus, this study attempted to explore how the two types of corporate associations (i.e., corporate ability, corporate social responsibility associations) that are derived by corporate association strategies (i.e., corporate ability strategy, corporate social responsibility strategy) influence consumers’ attitudes toward a company, supportive communication intentions, purchase intentions, factoring industry types.

This study proposed a model of corporate association communication strategy (corporate ability, corporate social responsibility) on college students’ responses 1 and tests the model with six hypothetical companies across three industries (consumable goods industry, durable goods industry, stigmatized industry). Students’ responses were tested through attitudes toward, supportive communication intent regarding, and purchasing intent toward the given company. This study employed a randomized 2 (corporate association strategies: CSR vs. CA) x 3 (industry types: consumable goods, durable goods, vs. stigmatized industry) full factorial design to answer the research questions. An online experimental survey was used to collect the data.

The study found that corporate association strategies (CA strategy, CSR strategy) effectively facilitate consumers’ corporate associations across different industries. Generally, CA associations showed a relatively stronger impact on consumer responses for the consumable goods industry, while CSR associations were relatively more important for the durable goods industry. In the case of stigmatized industry, CSR associations had a direct influence on behavioral intentions while CA associations did not impact them directly.

1 Young adults aged 18-25 years, including college students, are one of the major target publics for the chosen companies (i.e., office supplies, food products, computers, cell phones, gas, and tobacco products). They are active consumers for the companies and as they expect to one day earn incomes, they see themselves as future investors in such companies (Sen & Bhattacharya, 2001). Also, “college students are active agenda builders via online media” (Bae & Cameron, 2006, p. 147). Understanding college students’ responses to the chosen companies’ corporate associations is critical to understanding the effects of such strategies.
Abstract

Wood’s and Zafari’s (2014) seminal work, “Diagnostic Services in the Realm of Globalization and Sustainability: Key Drivers of Health Wellness and Healthcare Cost Containment,” discussed the forces of “globalization” as they relate to the profound creation of new wealth on the planet. They also illuminated the forces of “sustainability” as a potential dark side of globalization which puts enormous demands of the planet’s resources and has created significant challenges to all realms of the human endeavor, including those in the field of global health care. Utilizing ideas of “long-tail” theory, “mass customization” and “prosumption” in health care prescription, Wood and Zafari provided insights into how the rise of a global health care crisis (particularly with respect to the spread of obesity, cardiovascular disease, diabetes and other non-communicable diseases – NCDs) can be addressed in a positive/sustainable manner. They concluded their paper with a case study of how one company (Health Diagnostic Laboratory, Inc. – HDL) is meeting this health care crisis in the U.S. market and hypothesized that the HDL business model would be applicable to the globalized world, particularly the Big Emerging Markets – BEMs - where NCDs are on the rise. This paper represents a continuation of the Wood and Zafari work, as it presents an examination of which BEMs are most promising for the HDL model and why this is so.

Introduction

As the importance of preventive diagnostic testing and the knowledge gained from such has been established, this paper presents the results of an investigation into how one company, Health Diagnostic Laboratory (HDL), can identify the most promising international markets for its life-saving and lifestyle changing products and services. Before discussing how global markets can be systematically evaluated for entry and expansion, a brief overview of HDL is in order.

HDL, founded in 2008 and headquartered in Richmond, Virginia, USA, offers laboratory tests designed to predict and prevent cardiovascular and obesity-related diseases. HDL performs over 200,000 tests daily, the color-coded results of which are simple for patients to understand (green: optimal; yellow: intermediate risk; red: high risk). Patients are urged to “go green” in all test categories and are also encouraged to work with HDL’s Clinical Health Consultants (life-style coaches) to achieve optimal results through proper diet, exercise, stress relieving techniques and pharmaceuticals, if needed. In the U.S. market, HDL’s business model depends on both private expenditure (insurance payments) as well as government subsidies (Medicare). According to a recent Wall Street Journal article dated September 8, 2014, HDL received $139 million from Medicare in 2012 and $157 million in 2013, accounting for 41% of its 2013 revenues (Carreyrou 2014). Given these realities, we begin our investigation into HDL’s global growth potential with countries which have reasonably developed health care systems, preferably those where funding is clearly defined from either government or private sources (or a combination of both).

Global Expansion

Though advancements in communications technology and transportation have made traditional international trade barriers virtually disappear, the notion of expanding globally still remains a daunting task for most businesses (Wood, Karriker and Williams 2010). Thus, it is imperative for companies, particularly those that are novices to the global marketplace (like HDL), to take a systematic approach when screening and evaluating international markets.
This study began by defining HDL’s attractive foreign markets as those in which the company can not only “do well” (generate significant revenues) but “do good” (enrich as many lives as possible). Given the rise of non-communicable diseases (NCDs) in Big Emerging Markets (BEMs), due to the forces of globalization as illuminated by Wood and Zafari (2014), including – 1) unprecedented urbanization (as people migrate, by the hundreds of millions, from the rural areas to urban areas in search of globalization’s bounty), 2) subsequent sedentary lifestyle (that mirrors those of the developed world, where agrarian work is replaced by desk work and lack of physical activity), 3) the embrace of processed/convenience foods (that also mirrors the eating habits of many in the “too busy to prepare my own food” developed world), and 4) the temptation of lifestyle choices that bode poorly for overall health (including cigarettes, alcohol and recreational drugs that often accompany urban dwellers with more leisure time on their hands), focusing on the BEMs as potentially promising markets for HDL makes strategic sense given its value proposition. Specifically, the countries/markets of China, India, Brazil, Mexico, South Africa and Malaysia were selected for their promising profiles (see Bloomberg Markets 2013 for details).

Analysis of BEMs

Based on the above-noted considerations and other realities, our analysis focuses on promising BEMs (again, those that contain significant population and growing middle classes in urban areas and therefore have the highest potential need for the diagnostic testing services offer by HDL).

This investigation began with the utilization of a method for comparing and ultimately selecting specific international markets with significant potential. This method identifies particular “variables” representing a specific country’s attractiveness as well as a specific company’s competitive strengths within that country. The ultimate objective is to identify the most promising of an evoked set of countries being examined for HDL’s global expansion (in this case, promising BEMs as noted previously). These variables were utilized to compare each of the BEMs being analyzed and were ultimately weighted in linear equations according to their relative impact on each country’s attractiveness and HDL’s competitive strengths within each country. Data on each variable corresponding to each country came from a variety of sources, including the Euromonitor and other databases (see Harrel and Keifer (1998) and Wood and Robertson (2000) for specific details on this method).

The linear equation for country attractiveness took four variables into account: market size, potential market growth, infrastructure, and other country specific variables. Each factor was ranked on a scale of one to ten, the details of which can be seen in Appendix 1. The research team assigned a weight of two to the variable market size, as it was apparent that countries with larger populations present the greatest potential for long-term growth for HDL.

Next, when assessing potential market growth, the team evaluated each country’s - 1) life expectancy at birth, 2) total health care expenditure per capita and 3) the number of circulatory diseases per 100,000 population. The logic here is that the lower the life expectancy, the greater the need for better, more informed health care. Likewise, the higher the health care expenditure per capita and the greater the number of circulatory diseases per 100,000 people, the more financially promising the market will be and the more demand will be generated for HDL’s product/service offering. These three factors were each ranked on a scale from one to ten, with the average of these three scores totaling each country’s overall potential market growth score.

Following this, the team investigated each country’s infrastructure with regard to health care insurance systems and technology. As mentioned previously, HDL’s business model depends on an insurance framework that includes both private and public health care; (the majority of HDL’s revenues is generated from private insurance). No matter which insurance system is most prevalent (public or private), a most important driver of success of this type of service is a clearly defined insurance payer system for health care diagnostic testing (as opposed to a system where insurance is not readily available to the public at large, or a system where the insurance agencies –again, public or private refuse to pay for such services). Thus, countries whose insurance payer systems are clearly defined (i.e. where a clear majority of citizens are covered either by private or public health care), received a score of 10; whereas, countries whose private and public insurance payer systems do not cover the majority of citizen, received a score of 1. In developing the linear equation to assess countries being evaluated, the team attributed a 0.5 weight to the coverage by health care insurance systems, as it believed this factor had one-half the impact of the variable “infrastructure” in determining a country’s attractiveness to
HDL. While both are drivers of HDL’s success, if the infrastructure must be in place first.

Next, to measure each country’s technological infrastructure, the team investigated the number of internet users in each country. HDL’s product leverages digital technology to gather data and share test results with physicians and patients alike; therefore, it is imperative that the potential host countries have a sound technological infrastructure in place. As before, countries with significant digital technology were given a score of 10 on this variable, and those with less digital technology were given a lower score. And as was the case with the “health care insurance systems” variable, digital technology was given a weight of 0.5 in the development of the linear equations to assess the BEMs being evaluated. It is believed that a country’s insurance payer system and the level of internet users are equally important when assessing the viability of a potential host country’s infrastructure. The insights and benefits of HDL’s life-changing product could not be realized without the compatibility of these two factors, as health insurance and digital technology are necessary for the fulfillment of HDL’s offerings.

Lastly, the fourth variable (representing a set of factors labeled other country specific variables earlier), focused on government regulations, including each country’s regulatory quality (which was assigned a weight of 0.25 in the final linear equation – the research team estimated that the ability of the government to support private sector development would attribute one-fourth of the impact of this variable), patent protection (assigned a weight of 0.25 in the linear equation - HDL currently owns the rights of 14 patents), and the percentage of non-communicable diseases (NCDs) per 100,000 population (which was assigned a weight of 0.5 in the linear equation - this percentage is highly correlated with the need for HDL’s comprehensive testing services).

For each country, the scores for all four country attractiveness variables (again, market size, potential market growth, infrastructure and other country specific variables) were totaled and divided by four to produce each country’s overall attractiveness ranking. The results of the team’s linear equation for measuring country attractiveness show China and India as the most promising with scores of 9.9 and 9.6, respectively (see Appendix 2).

Continuing on with the analysis, the team examined each country for its competitive strengths with respect to current and potential competitors in a given market. While a country or market may appear to be extremely attractive, one’s ability to compete is clearly critical when making market selection and entry decisions. Likewise, competition in today’s globalized world can come from anywhere, and thus a keen understanding of the competitive landscape is important.

In measuring competitive strengths, the team identified the following variables as being significant drivers of HDL’s competitive profile - target population, market size (i.e. the size of the health and wellness market), and consumer behavior (i.e. consumer expenditure on outpatient services). Again, as with the case for “country attractiveness,” each of these variables was assessed on a scale of one to ten to calculate an overall competitive strengths score, and each variable was given a weight embedded in a linear equation to indicate its relative impact on HDL’s competitive position in a given country/market.

The team chose HDL’s target population to be those aged 15 - 64. Not only are statistics regarding this age range readily available from research sources such as Euromonitor, this range also takes into account the fact that the value provided by HDL’s products/services transcends age. For example, a 60-year old patient may have his life saved by changes recommended after receiving the same test that warns a 19-year old of harmful lifestyle habits (such as those concerning eating habits, exercise, smoking and so forth). Additionally, much of HDL’s value lies within the knowledgebase it can provide to physicians. The larger the pool of patients, the larger the realized database and thus the more accurate the health prediction trends are for patient comparison.

The analytical process for calculating the competitive strengths scores was the same as that utilized for the country attractiveness scores. The results (again, see Appendix 3 and Appendix 2) indicate China performing consistently well with a score of 10. Likewise, India received a high enough score to place it as the second most attractive market for HDL (note that although India’s scores with regard to the size of the health and wellness market and consumer expenditure on outpatient care are both lower than Brazil’s, India’s colossal population resulted in it being ranked second in the competitive strengths rankings).

After computing each country’s attractiveness and competitive strengths scores, the research team then plotted the key countries (China, India, Mexico, Brazil, South Africa, Malaysia) on a two-dimensional market matrix with country attractiveness on the y-axis and competitive strengths on the x-axis. This parsimonious model presents...
the combination of each country’s attractiveness and competitive strengths and provides visualization as to which countries are most promising for HDL’s investment and growth. As can be seen in Appendix 4, China scores exceptionally high in both country attractiveness and competitive strengths. India also scores high in country attractiveness and was second in competitive strengths. Thus, the team concluded that China and India are the two best candidates for HDL’s global expansion.

**Next Steps**

Even if HDL is able to service only a fraction of the populations in these BEMs, it may well result in significant new streams of revenue, along with an abundance of new data and improved lifestyles for millions of new customers. Indeed, HDL’s ability to do well (expand its business exponentially) and do good (make life better for members of the new burgeoning middle classes of the BEMs) may be achievable.

As it approaches entry into these lucrative emerging markets, HDL must next develop a “resource expenditure strategy” in order to assess how it can best utilize its investment resources and truly be successful upon entry into any BEM (e.g., China and India). To this end, a profile “gap” analysis in these proposed new markets is recommended (see Weber (1976, 1986) and Wood and Darling (1999)). Such analysis examines specific “gaps,” the closing of which relates directly to future sales and profit generation (these gaps were labeled by Weber as – 1) competitive gap, 2) usage gap, 3) distribution gap and 4) product line gap).

With currently nonexistent international sales numbers, narrowing the competitive gap (which focuses on an organization meeting or exceeding competitive offerings) in selected BEMs will be the first task, or HDL’s “next steps,” to overseas success. Not surprisingly, the competition is already significant in China. Indeed, four companies (Kingmed Diagnostics, ADICON, DiAn Diagnostics, DaAn Health) currently control over 70% of the market for health care services including health diagnostic testing, and there is no sign of any of them slowing down (Kingmed has maintained an annual growth rate in this market of over 50% for the past five years – see Businesswire.com 2014). In India, significant competitors, such as Metropolis, are already well ahead of HDL, forming their own private-public partnerships (“PPPs”) and opening chains of wellness stores (India Business Times 2014).

Again, however, it is imperative to note the large populations of these countries and the significance of gaining even a single percentage point of the industry-wide market share. In China, there are 991,896,200 consumers aged 15-64; while in India, the number is 813,830,600 (Euromonitor 2014). Quickly gaining even 3% of either consumer base would leave HDL with 29,756,886 and 24,414,918 potential consumers, respectively. It is also important to consider that though some of these market share numbers may seem almost intimidating, the market itself for this industry is far from being fully realized.

The usage gap (which describes how sales can be enhanced with a focus on the consumption of a given product or service) for HDL’s products can be addressed in three ways, namely - 1) finding new users for HDL’s tests, 2) helping to promote and facilitate additional uses by consumers who have already had diagnostic tests), and 3) establishing new uses for HDL’s products/services in general. In HDL’s case, effective communication of its diagnostic tests may result in a significant decrease in this gap, as new users are made aware of and embrace its offerings. To attract new users HDL should consider promoting to both private organizations and government entities where multitudes of new users could be reached efficiently. As emphasized previously, the marketing of preventive medicine to consumers is far more difficult than marketing reactive medicine. As such, HDL must develop an integrated marketing strategy which places emphasis on the improvement of organizations’ and individuals’ bottom lines as it relates to health care expenditure.

For HDL’s product/service value to be fully realized, the average patient should theoretically undergo at least two tests: the first to establish the basis of recommendations for lifestyle changes to improve results; while the second, given after a period of time, measures the effectiveness of those changes. Theoretically, if HDL undertook two health diagnostic measures per member of the population aged 15-64, in the case of India, this would mean over a billion and a half tests; while in China the number would approach 1.9 billion tests. Again, the potential is staggering.

Closing HDL’s distribution gap (which describes how sales can be enhanced by - 1) expanding distribution options or 2) more precisely focusing an organization’s distribution options) in chosen BEMs represents perhaps the most important of the company’s entire market entry strategy. HDL must not only get its product/service offerings in front of potential consumers, but also in front of those who can administer, interpret and follow-up with
customers in the “life-coaching” cycle of its value proposition. While this process is somewhat complex, the initial distribution gap strategy might be to feature one main diagnostic lab in a major urban city in each BEM selected for entry. This BEM “headquarters” could contain all of the equipment and personnel necessary to receive the entire marketplace’s test “kits” (blood samples), analyze such samples and move quickly forward with results and consumer feedback (personalized metrics on individual health realities and life-coaching if desired by consumers). Smaller testing centers could later be located in other strategic areas throughout the new markets, including secondary (or even tertiary) cities. Serving these evolving areas in BEMs – perhaps more than any other aspect of this plan – could allow HDL to achieve its dual purpose, that being – 1) assisting those most in need, while 2) verifying its service value as one leading to a more efficient health care system overall.

Finally, regarding HDL’s potential product line gap (which focuses on product/service enhancement or expansion), further advances in HDL’s service offerings will more than likely be realized with advances in medical science, specifically those advances that allow for more health conditions to be detected through diagnostic testing. That said, HDL’s product line gap can be attenuated through the use of modern communication technology. For example, both China and India rank among the top six worldwide countries in terms of internet users (Index Mundi 2012). The fact that both countries have significant populations that are familiar with, if not skilled users of, such technology will allow HDL to utilize advanced communication techniques to close the product line gap. Product extensions such as web and mobile applications to track health habits are particularly viable among such populations. Any communication will, of course, need to be tailored to specific market needs. For example, recall that current HDL test results are color-coded using the very “American” red/yellow/green combinations. However, the color red has a much different connotation in China. A Chinese consumer of HDL’s services seeing red color codes on all his or her results would associate that color with vitality, joy and a long life, while the color yellow would also greatly overstate the positive nature of the results. The opposite is true for the U.S. consumer (Nations Online 2014). Likewise, though the color red incites literal fear in Indian culture (in much the way HDL may want it to in the context of test results), this too may need to be avoided as the color red is also closely associated with the Hindu goddess Durga and symbolizes purity. Such mixing of cultural meaning may be offensive or lead to mistrust (Smith 2014).

The narrowing of all strategic gaps (competitive, usage, distribution and product line) can be accomplished with disciplined and deliberate resource expenditures. Effective promotion will help close all gaps by educating consumers about the value of HDL’s tests and the overall “wellness” management that it offers. Creating a trusted HDL brand name will also be paramount, as many current HDL competitors in BEMs (especially in China and India) have marginal brand names (in the minds of consumers in such markets) due to inconsistent performance and questionable quality in testing and follow-up coaching (KPMG.com 2011). Presenting consistent quality of facilities, equipment, and employees may well be where the most opportunity lies for closing “gaps” in BEMs.

As HDL establishes an appropriate resource expenditure strategy, it must also consider forming strategic alliances in chosen BEMs (e.g., China and India) in order to facilitate a seamless global expansion and to leverage the cultural insights its potential foreign allies can bring to the table. Additional advantages for creating strategic alliances include reducing risks, cutting a variety of costs, speeding up entrances into other future markets, and neutralizing competitors.

To begin, it is important to visually assess both the strategic and tactical congruence of potential allies by weighing and measuring a variety of dimensions and variables associated with successful strategic alliances (see Wood, Franzak and Pitta (2009) - the PRODEMSTA Model). While a detailed examination of HDL’s strategic alliance possibilities is not in the realm of this paper, it is recommended that HDL form strategic alliances with physicians, hospitals, and educational institutions in both China and India for the following reasons.

First, when potential customers go to their respective physicians, local hospitals or health care clinics and are prescribed further testing, HDL would have already cemented alliances with specific physicians and health care individuals who can then refer such customers to HDL facilities. In India, for example, most of the urban population utilizes private practitioners for health care needs. Typically, these practitioners have well-established connections with testing centers, leading to established patterns of referrals to hospitals and clinics. Indian consumers often have long-standing associations with these practitioners, sometimes extending over generations,
ensuring that customers will trust and heed their practitioners’ diagnosis, medical advice and referral for further testing. As such, HDL is advised to also form alliances with educational institutions, particularly those offering medical diploma programs from which the next generation of medical practitioners will come. HDL will need this newly educated cadre of medical practitioners to sustain its long-term viability in markets such as India and China.

Strong alliances help organizations like HDL ingrain themselves in the culture, history and language of new markets. In the international business arena, it has been a long-held tenet that those foreign organizations which seek understanding, embrace tolerance and respect, and who can truly identify with the overseas consumers they serve (their dreams, aspirations, values, fears and closely held traditions) will succeed. Those who do not, may ultimately fail. (Gertmenian 2014). For example, in India there is still a general social stigma associated with seeking help for cardiovascular and obesity-related diseases. Indeed, denial of such ailments is not uncommon among many Indians. Likewise, there are still many people in India who are averse to “Western” medicines and procedures, and thus they would rather use traditional methods such as acupuncture and Ayurveda to treat non-communicable diseases. Working with a carefully chosen strategic ally can help overcome such cultural obstacles.

Conclusion and Recommendations

When evaluating international markets, Health Diagnostic Laboratory (HDL) and similar organizations are advised to consider the Big Emerging Markets (BEMs) and aggressively move to offer their valuable products/services to some of the world’s largest populations and most rapidly growing middle classes. These markets represent not only significant immediate profit opportunities but also boast many possibilities for sustained, long-term growth as a result of the massive bottom line savings made possible by preventive medicine related to non-communicable diseases. Indeed, with the diagnostic industry in the early stages of growth in the BEMs, gaining even a small percentage of market share would help HDL quickly become profitable and raise the capital necessary for further expansion.

The large-scale database that HDL could develop through entry and growth in BEMs is also significant. Waking giants like China and India not only have millions of citizens who would benefit from HDL’s services, but its offerings would positively impact the BEMs’ massive populations on which there is limited comprehensive medical data. Therein lies the larger value of diagnostic testing - the single consumer who is simultaneously a participant in an overall population study that gains relevancy and certainty with each new test. Entering the big emerging markets of the world will not only be financially fruitful for a diagnostic testing company, but the greater number of tests and diversity among consumers will provide higher quality and more useful data to physicians that can help improve the health and lifestyles of neighborhoods, cities, regions and countries. These tests save individual lives while providing data that can help improve the health of millions, if not billions, of people.

Forward-thinking companies make forward-thinking bold moves. The medical diagnostic business is built on providing tests that can help facilitate early detection of non-communicable diseases (NCDs) caused by various genetic and lifestyle factors. More and more, these diagnostic tests have become reasonably affordable and available to everyday citizens in most relatively affluent markets. Not only do these tests provide consumers with a head start in fighting potentially life-threatening diseases, but they can also ultimately make health care more affordable for businesses and insurers, as early detection of NCDs allows for less costly and drastic treatment measures. Rare is the medical product that is simultaneously endorsed by doctors of medicine, insurers of medicine and organizations of all types (for-profit and not-for-profit), but preventive diagnostic testing is strongly championed by all.

The fact that the product is indeed preventive, however, is a major impediment for diagnostic companies. It is easy to sell band aids to a bleeding man – the same band aids that were, one day earlier, unwanted by the same man. Similarly, many are willing to spend “whatever it takes” to treat diseases that are already rampant or diagnosed, yet remain ignorant or skeptical of the fact that there are affordable measures available that can help reduce “whatever it takes” before treatment becomes a necessity. With improved, ubiquitous, yet targeted promotion and messaging (framing of the benefits), consumers of diagnostic services will come to realize that maybe they will not have to forgo the things they want most in life (e.g., travel, a second home, college education for their kids and grandkids) to pay for the things they need most in life (e.g., medical treatment). Such is the environment that HDL faces. Now is the time for this company and others like it to do well and do good in the era of globalization.
References


**Appendix 1**

<table>
<thead>
<tr>
<th>Equation:</th>
<th>2 x Market Size +</th>
<th>Potential Market +</th>
<th>(0.5 x well defined private or public insurance +)</th>
<th>.5 tech/network)</th>
<th>(.25 x govt regulations +)</th>
<th>(0.5 x % of NCD +)</th>
<th>.25 Patent Protection</th>
<th>Country Attractiveness Ranking</th>
</tr>
</thead>
<tbody>
<tr>
<td>China</td>
<td>9</td>
<td>6</td>
<td>10</td>
<td>10</td>
<td>2</td>
<td>8.5</td>
<td>4</td>
<td>9.9</td>
</tr>
<tr>
<td>India</td>
<td>9</td>
<td>5.6</td>
<td>10</td>
<td>8</td>
<td>3</td>
<td>7</td>
<td>6</td>
<td>9.6</td>
</tr>
<tr>
<td>Mexico</td>
<td>4</td>
<td>4.6</td>
<td>3</td>
<td>3</td>
<td>7</td>
<td>3.5</td>
<td>3</td>
<td>5.0</td>
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<tr>
<td>South Africa</td>
<td>2</td>
<td>6.3</td>
<td>3</td>
<td>2</td>
<td>6</td>
<td>6.5</td>
<td>7</td>
<td>4.8</td>
</tr>
<tr>
<td>Brazil</td>
<td>5</td>
<td>6.6</td>
<td>8</td>
<td>5</td>
<td>4</td>
<td>5.5</td>
<td>6</td>
<td>7.1</td>
</tr>
<tr>
<td>Malaysia</td>
<td>2</td>
<td>3.6</td>
<td>4</td>
<td>1</td>
<td>8</td>
<td>2</td>
<td>8</td>
<td>3.8</td>
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<table>
<thead>
<tr>
<th>Equation:</th>
<th>2 x population of target market +</th>
<th>Size of Health and wellness market+</th>
<th>Consumer expenditure on Outpatient Care=</th>
<th>Competitive Strength Rank</th>
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<tr>
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<td>10</td>
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<td>10</td>
<td>10.0</td>
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<tr>
<td>India</td>
<td>9</td>
<td>2</td>
<td>4</td>
<td>6.0</td>
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<td>Mexico</td>
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<td>South Africa</td>
<td>2</td>
<td>1</td>
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<td>Brazil</td>
<td>5</td>
<td>5</td>
<td>7</td>
<td>5.5</td>
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<tr>
<td>Malaysia</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>1.5</td>
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### Appendix 2

<table>
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<tr>
<th>Competitive Strength</th>
<th>Ranking Scale</th>
<th>China</th>
<th>India</th>
<th>Mexico</th>
<th>South Africa</th>
<th>Brazil</th>
<th>Malaysia</th>
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<td><strong>Target Population</strong></td>
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<tr>
<td>Population Aged 15-64</td>
<td>10- 1 Billion</td>
<td>10</td>
<td>9</td>
<td>3</td>
<td>2</td>
<td>5</td>
<td>2</td>
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<tr>
<td></td>
<td>1-&lt;10 Million</td>
<td></td>
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<td><strong>Market Size</strong></td>
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<td>Health and wellness market- USD Million</td>
<td>10- 22,000</td>
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<td>2</td>
<td>3</td>
<td>1</td>
<td>5</td>
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<td></td>
<td>1- &gt;1,000</td>
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<tr>
<td><strong>Consumer Behavior</strong></td>
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<td>Consumer expenditure on outpatient services- USD Million</td>
<td>10- 60,000</td>
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<td>4</td>
<td>2</td>
<td>4</td>
<td>7</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>1- &gt;1,000</td>
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</table>

### Appendix 3

**Key Country Matrix**

![Country Matrix Diagram](image)
Translating the Need for Health Communication Research: A Best Practices Model at the University of Florida

Debbie Treise, University of Florida
Claire Baralt, University of Florida
Kristina Birnbrauer, University of Florida
Janice Krieger, University of Florida
Jordan Neil, University of Florida

Abstract

The rapid advances in medicine necessitate greater emphasis on translational communication in both research and practice. However, there is little (if any) scholarship describing the opportunities and challenges inherent to accomplishing this important work. The current manuscript seeks to build this literature by describing a successful partnership between a CTSA and a College of Journalism and Communications and provides an example framework for understanding the value of team science and the science of team science. The milestones described for achieving this success are useful for helping other researchers achieve similar results in their own institutions and for growing a community of practice in the area of translational communication.
The Framing of Ebola on NBC Nightly News and the Today Show
Melissa Boehm, Montana State University-Billings

Abstract
The current Ebola health crisis has received widespread attention on most mainstream media. This study seeks to discover that ways Ebola has been framed by a major broadcast network from April 2014 to November 2014.

A content analysis of Ebola coverage on NBC from April 14, 2014 to November 14, 2014 will be conducted. A keyword search of “Ebola” and “NBC” in the Newspaper Source Plus database resulted in a total of 169 transcripts. Both NBC Nightly News and the Today Show had 84 transcripts; one transcript came from Dateline NBC.

Each transcript will be read and coded for mentions of: threats to the United States, treatment procedures, vaccines/cures, death/mortality, epidemic, safe patient handling, geographic location, and Doctors without Borders/MSF/ Samaritan’s Purse. Each person quoted in the transcript will also be recorded based on title, race, gender, age, and country.

This exploratory study is important because it will provide documentation of a current health issue and its associated themes from a major US broadcast network.
The Role of Mindfulness and Subjective Well-being on College Campuses

Shalini Bahl, M Factor
George R. Milne, University of Massachusetts-Amherst
Spencer Ross, Suffolk University
Kunal Swani, Wright State University

Abstract

Subjective well-being is an important topic discussed on US campuses. This research examines the relationship between mindfulness and students’ college life satisfaction and the mediating effects of stress and maladaptive eating. Differences between males and females are explored.

Introduction

Subjective well-being is of great interest on US Campuses as stress levels continue to increase with rising expectations for material gain, competition for grades, uncertain job markets, and rising student loan debt. A 2014 survey of more than 150,000 students found 9.5% of students frequently felt depressed. This was an increase of 6.1% from 5 years prior. The percent who felt overwhelmed by school work and other activities rose from 27.1% to 34.6%. (Eagan et. al. 2014).

Many parents, faculty and remember few worries and responsibilities associated with their college experience, which stands in contrast with the stressful life of college students today (http://www.counseling.ufl.edu/cwc/stress-and-college-students.aspx). Stress is associated with many physical, emotional and cognitive symptoms, and can lead to maladaptive behaviors such as over eating and skipping meals.

Mindfulness

Mindfulness—defined by Zen Buddhist monk Thich Nhat Hanh (2007) as being “truly alive, present and at one with those around you and with what you are doing”—offers a solution to break the habitual patterns of relying on maladaptive coping mechanisms to deal with college stress and peer pressures promoting mindless consumption. Mindfulness can also support people in breaking the cycle of mindless eating habits that are reinforced by much of marketing practice (Seiders and Petty 2004). The concept of mindfulness has been discussed in psychology (Thompson and Waltz 2008; Walsh and Shapiro 2006; Baer 2003) neuroscience (Brewer et. al. 2011, Farb et al. 2007) and medicine (Kabat-Zinn 2003; 1994; 1990). With the exception of the study by Bahl, Milne, Ross, and Chan (2013), the potential of mindfulness as a low cost intervention to change mindless behaviors is under researched in marketing and public policy.

Based on previous research in psychology and neuroscience, some of the benefits relevant to our study are:

• Improved focus and concentration
• Increased self-awareness
• Reduced impact and influence of stressful thoughts and feelings
• Better relationships
• Awareness of self-defeating behaviors, and substituting more effective ones
• Awareness of self-defeating thought processes, and 'letting them go'
• More empathy and happiness

These benefits can be summarized into three major categories: improved performance, reduced stress, and greater subjective well-being.

Impact of Mindfulness on Subjective Well Being

Subjective well-being (SWB), which comprises people's emotional and cognitive evaluations of their lives, encompasses what lay people call happiness, peace, fulfillment, and life satisfaction (Diener, Olshi, and Lucas 2003). Of interest is the idea that subjective well-being is not related to the stressful striving of accomplishment. Research by Brown, Kasser, Ryan, and Ozech (2009) found that as mindfulness increases, there is less financial desire and more subjective well-being. Part of this is there is less stress from striving and people are more content with what is. Indeed, mindfulness and its correlates can reduce stress. Research by Howell, Digdon, Buro and Sheptycki (2008) showed that mindfulness is a direct predictor of well-being and this relationship was mediated by quality of sleep.
Other research by Schutte and Malouff (2011) found that emotional intelligence can mediate the positive relationship between mindfulness and subjective well-being.

**College Life Satisfaction and Hypotheses**

College Administrators, who are competing for students and their tuition dollars, are interested in increasing college life satisfaction. As such, there is attention being given to help improve students’ subjective well-being and reduce stress. Mindfulness programs in some universities such as Brown are now being offered as an approach to achieve these objectives (http://www.brown.edu/Student_Services/Health_Services/Health_Education/common_college_health_issues/mindfulness.php).

The purpose of our research is to test a model of how trait mindfulness affects stress, maladaptive habits, and students’ ultimate college life satisfaction. Our empirical model directly tests the impact of mindfulness on college life satisfaction and the mediating effects of stress, and over and under eating. In order to further investigate the nomological network of aforementioned constructs that links mindfulness, eating, and subjective well-being together, we test the following hypotheses:

H1: Mindfulness is negatively related to stress
H2: Mindfulness is negatively related to overeating
H3: Mindfulness is negatively related to skipping meals
H4: Mindfulness is positively related to Subjective Well-being (college life satisfaction)
H5: Stress is negatively related to Subjective Well-being (college life satisfaction)
H6: Overeating is negatively related to Subjective Well-being (college life satisfaction)
H7: Skipping meals is negatively related to Subjective Well-being (college life satisfaction)

Specific to the college campus context, we also test the following research question.

RQ: Do the relationships stated in H1-H7 differ across males vs. females?

**Method**

To test the relationships between mindfulness, stress, unhealthy eating behaviors, and college life satisfaction we adapted the mindfulness scale from Bahl, Milne, Ross, and Chan (2013). Our survey included measures for stress (Cohen, Kamarck, and Mermelstein 1983) and college life satisfaction (Sirgy, Grzeszkowiak, and Rahtz 2007). To measure the unhealthy eating behaviors, overeating and skipping meals, we asked the participants the following: How, many days during the last week (0-7) did you skip meals (overeat)?

The survey was conducted with undergraduate business students in a northeastern university for an exchange of class credits. The students were given an option to opt out of the survey, anytime, if they felt uncomfortable while answering. After removing the missing cases, 329 useable responses were kept for the final analysis (males=56.2%).

We did a two-step process to test our hypotheses. First, we ran a confirmatory factor analysis to test the convergent and discriminant validity of our measures. After confirming the factors and their loading, we ran a structural path model (multi group analysis) by summing the scales.

**Results**

**Validity of Measures**

We ran a confirmatory factor analysis on the second order mindfulness construct, the stress and satisfaction constructs as well as single items for overeating and skipping meals. We correlated the mindfulness, stress and satisfactions constructs as well as the single items for overeating and skipping meals to test the validity of our measures. The overall model fit was good ($\chi^2 (365) = 657.95$, CFI = 0.912, RMSEA = 0.049).

The loading of the items for the mindfulness scale are reported in table 1. As found by Bahl et al. (2013), the mindfulness construct comprised of four dimensions, Non-reactivity (5 items), Observing (4 items), Non-judgment (4 items), and Describing (3 items). The loading of the final items for the stress and satisfaction scale are reported in table 2. The highest shared variance (54.3%) was observed across constructs mindfulness and stress. Remaining all other shared variance values were below 21%. We calculated the square root of AVE to test the discriminant validity (Fornell and Larcker 1981). The square root of AVE for all the three constructs was higher than the correlations across all the measures (refer to table 3). Furthermore the reliabilities for the measures exceeded 0.70. These results provide evidence for validity and reliability for our constructs under examination.
Table 1: Item and Factor Loading for Mindfulness Construct

<table>
<thead>
<tr>
<th>Mindfulness</th>
<th>Loadings</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Acting with awareness (.742)</strong></td>
<td></td>
</tr>
<tr>
<td>I find it difficult to say focused on what's happening in the present. (r)</td>
<td>0.752</td>
</tr>
<tr>
<td>It seems I am &quot;running on auto-pilot&quot; without much awareness of what I am doing. (r)</td>
<td>0.628</td>
</tr>
<tr>
<td>I rush through activities without being really attentive to them. (r)</td>
<td>0.670</td>
</tr>
<tr>
<td>When I'm working on something, part of my mind is occupied with other things, such as what I'll be doing later or I'd rather be doing. (r)</td>
<td>0.551</td>
</tr>
<tr>
<td>It is easy for me to concentrate on what I'm doing.</td>
<td>0.643</td>
</tr>
<tr>
<td><strong>Non-reactivity to inner experience (.306)</strong></td>
<td></td>
</tr>
<tr>
<td>Usually when I have distressing thoughts or images, I feel calm soon after.</td>
<td>0.447</td>
</tr>
<tr>
<td>Usually when I have distressing thoughts or images, I 'step back' and am aware of the thought or image without getting taken over by it.</td>
<td>0.498</td>
</tr>
<tr>
<td>Usually when I have distressing thoughts or images, I just notice them and let them go.</td>
<td>0.696</td>
</tr>
<tr>
<td>Usually when I have distressing thoughts or images, I am able just to notice them without reacting.</td>
<td>0.687</td>
</tr>
<tr>
<td><strong>Non-judging of experience (.453)</strong></td>
<td></td>
</tr>
<tr>
<td>I tend to judge about how worthwhile or worthless my experiences are. (r)</td>
<td>0.447</td>
</tr>
<tr>
<td>I disapprove of myself when I have irrational ideas. (r)</td>
<td>0.728</td>
</tr>
<tr>
<td>I criticize myself for having irrational or inappropriate emotions. (r)</td>
<td>0.836</td>
</tr>
<tr>
<td>I think some of my emotions are bad or inappropriate and I shouldn't feel them. (r)</td>
<td>0.634</td>
</tr>
<tr>
<td><strong>Describing with words (.503)</strong></td>
<td></td>
</tr>
<tr>
<td>It’s hard for me to find the words to describe what I'm feeling. (r)</td>
<td>0.907</td>
</tr>
<tr>
<td>I have trouble thinking of the right words to express how I feel about things. (r)</td>
<td>0.902</td>
</tr>
<tr>
<td>Even when I'm feeling terribly upset, I can find a way to put it into words.</td>
<td>0.596</td>
</tr>
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</table>

*subfactor loading on overall mindfulness construct

(r) - Item was reverse-scored
Table 2: Item Loadings for Stress and College Life Satisfaction Constructs

<table>
<thead>
<tr>
<th>Stress</th>
<th>Loadings</th>
</tr>
</thead>
<tbody>
<tr>
<td>In the last month, how often have you been upset because of something that happened unexpectedly?</td>
<td>0.591</td>
</tr>
<tr>
<td>In the last month, how often have you felt that you were unable to control the important things in your life?</td>
<td>0.745</td>
</tr>
<tr>
<td>In the last month, how often have you felt nervous and “stressed”?</td>
<td>0.726</td>
</tr>
<tr>
<td>In the last month, how often have you found that you could not cope with all the things that you had to do?</td>
<td>0.706</td>
</tr>
<tr>
<td>In the last month, how often have you been angered because of things that were outside of your control?</td>
<td>0.627</td>
</tr>
<tr>
<td>In the last month, how often have you felt difficulties were piling up so high that you could not overcome them?</td>
<td>0.788</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>College Life Satisfaction</th>
<th>Loadings</th>
</tr>
</thead>
<tbody>
<tr>
<td>In general, how satisfied are you with the overall quality of college life at [college name]?</td>
<td>0.801</td>
</tr>
<tr>
<td>How satisfied are you with your academic life at [college name]?</td>
<td>0.595</td>
</tr>
<tr>
<td>How satisfied are you with your social life at [college name]?</td>
<td>0.714</td>
</tr>
<tr>
<td>How satisfied are you with the overall quality of life for you personally at [college name]?</td>
<td>0.902</td>
</tr>
<tr>
<td>How satisfied would you say most of your friends and other classmates are with the overall quality of life at [college name]?</td>
<td>0.572</td>
</tr>
</tbody>
</table>

Table 3: Correlation Matrix

<table>
<thead>
<tr>
<th></th>
<th>Means</th>
<th>Std. Dev.</th>
<th>Sqrt AVE</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Days eat too much</td>
<td>2.02</td>
<td>1.79</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Days skip meals</td>
<td>1.97</td>
<td>2.13</td>
<td>---</td>
<td>0.17*</td>
<td>---</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gender (male)</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>-0.19*</td>
<td>-0.06</td>
<td>---</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mindfulness</td>
<td>48.98</td>
<td>8.08</td>
<td>0.68</td>
<td>-0.27*</td>
<td>-0.25*</td>
<td>0.13*</td>
<td>(0.78)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stress</td>
<td>18.36</td>
<td>4.47</td>
<td>0.70</td>
<td>0.22*</td>
<td>0.15*</td>
<td>-0.30*</td>
<td>-0.52*</td>
<td>(0.85)</td>
<td></td>
</tr>
<tr>
<td>College Life Satisfaction</td>
<td>18.38</td>
<td>3.58</td>
<td>0.73</td>
<td>-0.10</td>
<td>-0.15*</td>
<td>0.03</td>
<td>0.31*</td>
<td>-0.28*</td>
<td>(0.84)</td>
</tr>
</tbody>
</table>

*p<0.01 (one tailed), Coefficient alphas along the diagonal.

N = 329
**Analysis of Relationships**

We ran a multigroup path analysis across males and females by summating the mindfulness sub-scale, stress, and college life satisfaction to test our model. Figure 1 shows the final path model. We first ran the model with no path constrains across males and females. Next, we did a multigroup analysis across each path by constraining them for the two groups. For cases where the change in model chi-square was significant and the change in CFI was greater than 0.01 (modification index), we kept the paths free across the two groups. The modification index was significant for the path between stress and college life satisfaction. ($\chi^2_{(1)} = 4.35, p<0.01; \Delta\text{CFI} = 0.022$). All other remaining paths were constrained for males and females. Refer to table 4 for the complete analysis. The overall model fit was good ($\chi^2_{(12)} = 12.27, \text{CFI} = 0.998, \text{RMSEA} = 0.012$). The R-square for the dependent variables were as follows: Overeating ($R^2_{(males)} = 0.06; R^2_{(females)} = 0.07$), Skipping meals ($R^2_{(males)} = 0.06; R^2_{(females)} = 0.06$), Stress ($R^2_{(males)} = 0.24; R^2_{(females)} = 0.28$), and College life satisfaction ($R^2_{(males)} = 0.17; R^2_{(females)} = 0.09$).

**Figure 1: Path Model**

![Path Model Diagram]

Path model for males and females. The non-bold directions indicate constrained paths. M = Males; F = Females; NS = Not significant.
Table 4: Path Analysis Results for Males and Females

<table>
<thead>
<tr>
<th>Direct Effect (Path #)</th>
<th>Male Effect</th>
<th>SE</th>
<th>Female Effect</th>
<th>SE</th>
<th>Modification Index χ²(1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mindfulness → Stress (1)</td>
<td>-0.255***</td>
<td>0.035</td>
<td>-0.286***</td>
<td>0.036</td>
<td>0.380⁷</td>
</tr>
<tr>
<td>Mindfulness → Overeating (2)</td>
<td>-0.047***</td>
<td>0.017</td>
<td>-0.062***</td>
<td>0.017</td>
<td>0.390⁶</td>
</tr>
<tr>
<td>Mindfulness → Skipping Meals (3)</td>
<td>-0.058***</td>
<td>0.019</td>
<td>-0.071***</td>
<td>0.021</td>
<td>0.190⁴</td>
</tr>
<tr>
<td>Mindfulness → College Life Satisfaction (4)</td>
<td>0.074*</td>
<td>0.038</td>
<td>0.110***</td>
<td>0.04</td>
<td>0.435⁴</td>
</tr>
<tr>
<td>Stress → College Life Satisfaction (5)</td>
<td>-0.248***</td>
<td>0.068</td>
<td>-0.017</td>
<td>0.073</td>
<td>4.958**</td>
</tr>
<tr>
<td>Overeating → College Life Satisfaction (6)</td>
<td>-0.045</td>
<td>0.146</td>
<td>-0.007</td>
<td>0.161</td>
<td>0.005⁶</td>
</tr>
<tr>
<td>Skipping Meals → College Life Satisfaction (7)</td>
<td>-0.157</td>
<td>0.124</td>
<td>-0.140</td>
<td>0.128</td>
<td>0.000⁷</td>
</tr>
</tbody>
</table>

**Constrained Model**

<table>
<thead>
<tr>
<th>Direct Effect (Path #)</th>
<th>Male Effect</th>
<th>SE</th>
<th>Female Effect</th>
<th>SE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mindfulness → Stress</td>
<td>-0.270***</td>
<td>0.025</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mindfulness → Overeating</td>
<td>-0.054***</td>
<td>0.012</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mindfulness → Skipping Meals</td>
<td>-0.064***</td>
<td>0.014</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mindfulness → College Life Satisfaction</td>
<td>0.091***</td>
<td>0.028</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Overeating → College Life Satisfaction</td>
<td>-0.028</td>
<td>0.108</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Skipping Meals → College Life Satisfaction</td>
<td>-0.148**</td>
<td>0.089</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mindfulness → Stress</td>
<td>0.063***</td>
<td>0.018</td>
<td>0.009</td>
<td>0.018</td>
</tr>
<tr>
<td>Mindfulness → Overeating</td>
<td>0.002</td>
<td>0.006</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mindfulness → Skipping Meals</td>
<td>0.009*</td>
<td>0.006</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*** p<0.01 (one tailed); ** p<0.05 (one tailed); * p<0.10 (one tailed)

a = Difference in Chi square for the two models, 1) No constrain and 2) Path # 1 was constrained
b = Difference in Chi square for the two models, 1) Path # 1 and Path #2 constrained and 2) Path #1 constrained and 2) Path #1 and Path #2 constrained
c = Difference in Chi square for the two models, 1) Path # 1 and Path #2 constrained and 2) Path #1, Path #2, Path #3 constrained and 2) Path #1, Path #2, Path #3, and Path #4 constrained
d = Difference in Chi square for the two models, 1) Path # 1, Path #2, Path #3 and Path #4 constrained and 2) Path #1, Path #2, Path #3, and Path #4 constrained
e = Difference in Chi square for the two models, 1) Path # 1, Path #2, Path #3 and Path #4 constrained and 2) Path #1, Path #2, Path #3, Path #4, Path #5 constrained
f = Difference in Chi square for the two models, 1) Path # 1, Path #2, Path #3 and Path #4 constrained and 2) Path #1, Path #2, Path #3, Path #4, and Path #6 constrained and 2) Path #1, Path #2, Path #3, Path #4, Path #6, and Path #7 constrained
g = Difference in Chi square for the two models, 1) Path # 1, Path #2, Path #3, Path #4 and Path #6 constrained and 2) Path #1, Path #2, Path #3, Path #4, Path #6, and Path #7 constrained

Our first hypothesis states that mindfulness reduces stress. The relationship between mindfulness and stress was negative and significant (β = −0.270, p < 0.01); supporting H1. Mindfulness had a negative relationship with unhealthy eating behaviors. Mindfulness reduces overeating (β = −0.054, p < 0.01); as well as skipping meals (β = −0.064, p < 0.01); supporting H2 and H3 respectively. H4 states that mindfulness increases college life satisfaction. This effect was positive and significant (β = 0.091, p < 0.01); supporting H4. The effect of stress on college life satisfaction was significant for males (β = −0.248, p < 0.01) but was insignificant for females.
females ($\beta = -0.017$, $p > 0.05$). Thus H5 was partially supported. H6 stated that the overeating would reduce college life satisfaction. This effect was negative but insignificant ($\beta = -0.028$, $p > 0.05$); supporting H6. The effect of skipping meals on college life satisfaction was negative and significant ($\beta = -0.148$, $p < 0.05$); supporting H7. Furthermore, our results indicate that the indirect effect of mindfulness on college life satisfaction via skipping meals was significant ($\beta = 0.009$, $p < 0.10$). This suggests that mindfulness has a positive relationship with college life satisfaction as it reduces unhealthy behavior of skipping meals. We also found that the indirect effect of mindfulness on college life satisfaction via stress was significant for males ($\beta_{(males)} = 0.063$, $p < 0.01$) but not for females $\beta_{(females)} = 0.009$, $p > 0.10$). This finding suggests that for males mindfulness has a positive effect on college life satisfaction as it reduces stress.

**Discussion**

This is an exploratory study with promising findings confirming the positive role that mindfulness can play on college campuses. Specifically, we discuss the relationship between the mindfulness, stress, mindless consumption, and college life satisfaction.

What makes these initial findings very compelling is the fact that mindfulness trait can be enhanced even in adults with the practice of mindfulness. Neuroplasticity, which means that even adult brains can change based on what people pay attention to and do, has prompted many neuroscientists to study the impact of mindfulness exercises on the brain. This stream of research in mindfulness has confirmed that practicing mindfulness changes the brain, structurally and functionally, to be more focused, self-aware, compassionate, and top down control needed in self-regulation (Lazar et al 2005, Holzel et al 2010). Mindfulness is trainable, which means that college students can enhance their trait levels of mindfulness by learning the mindfulness exercises just like they exercise their bodies to enhance their physical health. Future studies can be designed to study mindfulness exercises as an intervention to improve the consumption habits and subjective well-being of college students. Moreover, much of the current research in mindfulness is based on the longer eight-week Mindfulness-Based Stress Reduction program that started at the Center for Mindfulness at the UMass Medical School in Worcester. This program involves daily mindfulness exercises for thirty-five to forty five minutes, which can be challenging for already stressed out college students who have little time to spare. To make these programs successful among students we need to research if shorter duration of mindfulness exercises and with more repetitions throughout the day can offer comparable results. Also, the benefits of using technology, as a way to deliver the mindfulness programs to students are worthy of investigating further.

**References**


---- (1990), Full Catastrophe Living: Using the Wisdom of Your Body and Mind to Face Stress, Pain, and Illness, New York: Bantam Doubleday Dell Publishing Group, Inc.


Shot or Snot: Influencing Flu Vaccination Rates in College Students

Yasmine Konheim-Kalkstein, Mount Saint Mary College
Melissa Guillemette, Mount Saint Mary College
Sean D’Onofrio, Mount Saint Mary College
Doreen Bischof, Mount Saint Mary College

Abstract

Despite the seriousness of influenza and the increased risk to college students living in close quarters, influenza vaccination rates among college students are notoriously low. In this paper, we review literature related to influenza vaccination in college students. We report the results of four studies we conducted: 1) college students’ survey responses about influenza vaccination, 2) an analysis of marketing materials from other college campuses, 3) an experimental study manipulating images on flu vaccination marketing materials to determine their influence on intention to vaccinate, and 4) a real-world quasi-experiment where we altered our campus’s health services marketing campaign.

Introduction

Influenza (the flu) is a highly contagious viral illness that affects humans primarily during September through March, and usually peaks in January or February (flu.gov). The flu is contracted by 5-20% of Americans each year (flu.gov). Influenza is spread from person to person via droplets that are produced by an infected person’s coughing or sneezing, and it can be transmitted by direct or indirect contact with respiratory secretions (an example of indirect contact would be touching an item that has been contaminated with infected respiratory secretions). Adults can spread the infection beginning the day before symptoms appear, and continue to be contagious until day five of symptoms (DHHS & CDC, 2012). The symptoms of influenza include abrupt onset of fever (typically 101 – 102 degrees Fahrenheit), body aches, sore throat, nonproductive cough, headache, and fatigue (DHHS & CDC, 2012). Most people who get influenza will recover in less than two weeks, but some people can develop complications, such as pneumonia or other secondary infections. Some complications can be life-threatening and can result in death (www.cdc.gov/flu, 2015). In 2003, an economic analysis concluded that the flu in the U.S. resulted in 610,660 life-years lost, 3.1 million hospitalized days, and 31.4 million outpatient visits. According to the analysis, direct medical costs averaged $10.4 and projected lost earnings due to illness and loss of life amounted to $16.3 billion (Molinari et al., 2007).

The best prevention techniques for influenza are vaccination and avoiding contact with infected individuals. In the United States, there are two different types of influenza vaccine available: inactivated influenza vaccine (administered by syringe) and live attenuated influenza vaccine (administered as a nasal spray). Trivalent inactivated influenza vaccine (TIV), a vaccine that contains three different strains of the influenza virus, has been found to be 70 – 90% effective in preventing influenza infections in those persons over 65 years of age (DHHS & CDC, 2012). The vaccine is contraindicated in persons who have a severe allergy to any of the components in the vaccine, including eggs; for those with a history of having had Guillain Barré Syndrome following a previous dose of influenza vaccine; and for those who currently have an acute illness (DHHS & CDC, 2012). The most common adverse reaction to the vaccine is a local reaction at the site of the injection, occurring in 15 – 20% of those vaccinated (DHHS & CDC, 2012). Less than one percent of persons receiving TIV report reactions such fever, chills, malaise and body aches (DHHS & CDC, 2012).

The Advisory Committee on Immunization Practices recommends that all persons, over the age of six months, including healthy young adults, receive the annual influenza vaccine; the recommendation to include all healthy adults was a change instituted in 2010 (Grohskopf 2014). 18-49 year olds have consistently had the lowest vaccination rate of any cohort at 18–49 years: 31.1% in 2012-2013 season (CDC Flu Vaccination Coverage, United States, 2012-13 Influenza Season). Healthy People 2020, a government initiative to set national health objectives, has set a target vaccination rate of 70% for adults aged 18 and older by 2020.

College students, especially those living in the close confines of a residence hall, are particularly at risk for getting influenza as a result of close social contact (Van et al. 2010). In the 2009 H1N1 pandemic in Australia, the mean age of flu sufferers was 21 (Van et al. 2010).
According to Nichol, D’Heilly, and Ehlinger (2005), upper respiratory infections, including influenza-like illness, has a significant impact in areas such as health and academic performance in their study of 3249 college students. In their 2008 study, Nichol, D’Heilly and Ehlinger concluded that influenza vaccination was beneficial in increasing the health status of this population.

Despite recommendations, the rate of vaccination among college students remains low. For the 2009-2010 season, one study reported rates across eight universities in North Carolina to be between 14% to 30% (Poehling et al., 2012). Similarly low vaccination rates were seen at Rutgers University (Weinstein & Kwitel, 2007) and Northern Kentucky University (Ramsey, 2011); vaccination rates were 14.4% and 16% respectively.

In college students, being a freshman, education level of the parent, and being involved in honor societies positively predict vaccination (Poehling et al., 2012). Results from another study showed that students were more likely to get vaccinated if they viewed the flu as a serious illness or if they perceived themselves to be at-risk for contracting the flu (Teitler-Regev, Shahrabani, & Benzion, 2011).

In a recent sample of 569 undergraduates, the most common reasons for not getting the flu vaccine (in order of frequency) were: 1) because students are not worried about getting the flu (39%), 2) the flu vaccination is too expensive or not convenient (12%), and 3) to avoid the side effects of the flu vaccine or concern about contracting the flu from the vaccine (6%). In this same sample, twice as many non-recipients of vaccine believed that their school and work commitments would not be disrupted by the flu (33%) than those who chose to be vaccinated (Lawrence, 2014).

Qualitative analyses of responses from students who did not want to be vaccinated included that the vaccine causes disease (including the flu itself), that people are healthier without medicines/vaccines, that the vaccine is ineffective because strains keep changing, that there may be long-term/uncertain effects with vaccination, and that vaccination is pushed by pharmaceutical companies for financial gain (Lawrence, 2014).

Given the more recent CDC recommendations for college students to be vaccinated regardless of risk status (CDC, 2012), it is important to understand more about this population and what may influence their vaccination behavior. We conducted four studies to examine reasons students are not choosing to be vaccinated and ways to promote vaccination behavior.

In Study 1, we present results from surveying students at our own university to examine reasons for vaccination behavior.

In Study 2, we analyzed data from other colleges’ health care services regarding flu vaccination campaigns.

In Study 3, we present results from an experimental study manipulating the image on a flyer to measure intent to vaccinate.

In Study 4, we present a quasi-experiment in which we altered our own health services’ marketing materials to see whether anecdotal evidence might improve vaccination rates.

Study 1

In Study 1, we aimed to understand students’ beliefs and intentions regarding the flu shot. We gathered data from only our own college to facilitate the design of a campaign for our own campus.

Method

One hundred thirty-five students from Mount Saint Mary College (a small liberal-arts college with an incoming freshman class of about 450) were surveyed in the Spring of 2014 (after the 2013-2014 flu season). We asked students if they were vaccinated for influenza. They answered yes or no, and checked reasons why or why not (with the option to list their own reasons).

Results and Discussion

Of the 135 students who completed our survey, 70 were freshman, 29 were sophomores, 23 were juniors, and 13 were seniors. Sixty-seven percent of the respondents reported that they did not get the flu vaccination, while 33% of students reported that they did. This proportion of students who were vaccinated is higher than many other schools report. One reason for the higher rate of vaccination is that nursing students who are sophomores or above at our college (11% of our vaccinated sample) are required to get immunized.

One major factor contributing to low vaccination rates among college students is inaccurate beliefs pertaining to influenza and the flu vaccine. Of the students who did not get the vaccine, 29% of students believed you could get the flu from the vaccine, and 20% believed that the flu vaccine does not work. The misinformation also involved their own vulnerability: 24% of students not vaccinated also believed that they were not likely to get the flu. Other common reasons for not getting the flu shot were dislike of shots (21%), the cost (11%), lack of time or forgot (13%), and the
belief that the flu is not serious (7%). These results are very much in line with other studies (e.g., Lawrence, 2014).

What reasons do students have for getting vaccinated? 64% of students who got the flu shot reported doing so to avoid getting the flu; 44% of vaccinated students indicated that their parents “made them” get the vaccine; 31% of students who got a flu vaccine indicated that having the flu in the past influenced them to get vaccinated. Other common reasons given for getting the vaccine included fear of missing classes (20%) and being a nursing student (11%).

These data suggest that many of the students’ reasons for not getting the flu shot involve a lack of knowledge about the vaccine. Many students think the vaccine is harmful or ineffective, that the flu is not serious, and that they are not at risk. The fact that many students listed the influential nature of their parents may provide an avenue for changing students’ behavior. Parents are increasingly involved in their college kids’ lives (reviewed in Harper, Sax, & Wolf, 2012) and health services might capitalize on this by sending information to the parents also.

Study 2
In Study 2, we wanted to learn more about how other health services at residential colleges perceived flu vaccination on campus, and what strategies are currently being employed to promote flu vaccination.

Method
Using e-mail, we contacted health services departments across the United States of America who had residential rates of higher than 85% and were four-year liberal arts colleges. We wanted to survey colleges at which the students would be likely to go to the campus health services for vaccination (commuter students are likely to get vaccinated off-campus). Contacts were asked for current vaccination rates, for reported satisfaction with the rates, and for marketing strategies used.

Results and Discussion
Out of 97 colleges contacted, 12 colleges responded. All 12 of the schools in our study reported vaccination rates of 20% or less (with a range of 5%-20%). Eleven of the colleges contacted were not satisfied with the vaccination rate at their school. Most of the schools indicated that numbers were greater than previous years; however, they also indicated a desire for improvement.

In general, marketing strategies for vaccines on college campuses include sending emails to students and faculty/staff, posting fliers in residence halls and on bulletin boards throughout campus, posting to online message boards (websites), publishing notices in the campus newsletter and in daily electronic lists of events, conducting mass vaccination clinics, posting to Twitter (tweets), emailing informational brochures, and encouraging individuals during encounters at health clinics. One school also posted Halloween-themed posters (“Bring your boofriend or ghoulfriend to get the flu shot") around campus during the month of October, providing a humorous approach to encouraging vaccination. This specific school had a vaccination rate of 13%.

The school that had the highest vaccination rate (20%) sent out a traditional flier about the flu shot with an image of a girl who seemed to be sick and using tissues. This was marketed by email, posters, and in the daily electronic list of events. The school that had the lowest rate (5%) marketed campus vaccination by posting on the wellness site, sending campus-wide emails with symptoms of the flu and the importance of receiving the flu vaccine, and talking to students individually when they are in the student health center. The flier included a cartoon picture of a needle, reminding students to get their flu shot. In Study 1, we found fear of shots can be a reason to not get the shot. It is possible that the image of a needle may have discouraged vaccination, a possibility we examine further in Study 3.

Also, another school that had the lowest vaccination rate (5%) utilized social media, such as Twitter and Facebook, and online boards to communicate their availability of flu shots. The information they posted on the online message board included paragraphs about the flu. The way the information was presented was dense and likely not read by college students. Information should be clear and concise to have maximum impact, along with imposing structure and clarity among ambiguous or unclear concepts (Daft & Lengel, 1983).

This study highlighted the need for improved marketing strategies across campus. Most of the campaigns did not aggressively address student concerns that we see in Study 1 (highlighting that you can’t get the flu from the flu shot, and that the flu is not a simple common cold). Only two of the schools talked about the flu, the symptoms, side effects, and preventive measures in the informational packet they distributed. The vaccination rates at these two schools were 5% and 15%.
Study 3

As demonstrated in Study 2’s examples, different images are used to promote vaccination. We have anecdotal evidence suggesting that a picture of a sick person might motivate students to vaccinate more than a picture of a syringe.

A search on the Internet reveals that many vaccination campaigns use images of syringes. This approach may be counterproductive in light of how people feel about needles. Studies have estimated the incidence of phobia of needles to be around 10% (Hamilton, 1995). In one study, over 17% admitted to a fear of needles, but an “intense, unreasonable” fear was reported by 8.5% of the mostly young adults being vaccinated (Nir et al., 2003). Forty-seven percent of the 59 patients tested in a dental clinic reported the sight of the injection needle to be especially fear-provoking (Willershausen et al., 1999).

Given how people feel about needles, we predicted that a picture showing the possible consequence of not getting the flu vaccine, such as a picture of someone looking sick and miserable would be more effective in encouraging flu vaccination than an image of a needle. A person’s anticipated regret of acquiring illness is a strong predictor of vaccination (Weinstein & Kwitel, 2007). Using a picture of a sick person might prime anticipated worry and regret, which may be stronger predictors of vaccination than perceived risk (Chapman & Coups, 2006). Thus, we predicted there would be a priming effect such that students primed with images of people being vaccinated with a syringe would be less likely to report an intention to vaccinate for influenza, whereas students primed with images of sick people would be more likely to report an intention to be vaccinated.

Method

We distributed two versions of a survey asking 506 students at a large, Midwestern university of their intention to vaccinate. The survey asked if 1) they got the flu shot last year (yes/no) and 2) what was the likelihood (1-5 scale, with 1 being “not likely” and 5 being “highly likely”) they would get the flu shot this coming year? One version of the flier had two images of people getting the shot (shot condition); the other had two images of people being sick (sick condition). These stock images showed college-aged adults (both sexes appear on each brochure). In a pilot, six participants selected the most emotional images from various possibilities.

Results and Discussion

Of those surveyed, 293 students reported not being vaccinated the previous year; 213 were vaccinated the previous year. Our hypothesis was not supported; there was no significant difference in likelihood of flu vaccination between those who got the “shot” condition (M = 3.02) and those who got the “sick” condition (M = 3.06; p = 0.75).

However, the data showed that the previous year’s behavior predicted likelihood of vaccination. Those who had been vaccinated the year before had a mean likelihood of 4.21 whereas those who were not vaccinated the year before had a mean likelihood of 2.19 (t(504) = 21.70, p < .001). This suggests the possibility that if vaccination can be encouraged, those individuals are likely to continue to be vaccinated in the future. Maybe, once more people are vaccinated, they are more likely to persist with it.

One limitation of this study is that we only measured intention to vaccinate rather than actual vaccination behavior. Although we found that an image did not influence future intent, perhaps the images might differentially influence more immediate behavior. Or perhaps, longer-term exposure to the images might have an effect. Both images provoked negative emotions, and it is possible positive images (showing healthy people) might have a different effect.

Study 4

Anecdotes, also known as case studies, stories, testimonials, or narratives, are an efficient way to conveying information and can be powerful in modifying health-related behavior (Enkin & Jadad, 1998). A coherent story is easily remembered, processed, and highly resistant to change (reviewed in Lewandowsky et al., 2012). When making health decisions, it is hard to overcome the power of a narrative, even if statistics are presented that counter the narrative (Fagerlin et al., 2005).

Anecdotes on vaccination are abundant. Many online videos regarding vaccination exist and many contain inaccuracies (reviewed in Lewandowsky et al., 2012). In fact, anecdotal evidence is often given as a reason to avoid the flu shot. Lawrence (2014) describes how a typical response among college students he surveyed who cited concerns of the flu shot included an anecdote like this:

“The only time that I recall having the flu…I had a flu shot that season.”
Narratives can be used to influence health behavior. For example, in one study on men at-risk for hepatitis B, risk perception and intention to vaccinate was highest after an anecdote was provided, as opposed to facts or statistics (Wit et al., 2008). In another study, students who received narratives on skin cancer were 2-4 times more likely to engage in health-promoting behaviors (Lemal et al., 2010). Even fictional narratives can influence health behavior. Researchers in the U.K. examined cervical screenings after a fictitious character on television died in a soap opera—they found significant increases in cervical screenings in the six months following the airing of the show, particularly in the weeks following the fictional death (Howe et al., 2002). A meta-analysis found that first person narratives are more powerful for influencing health decisions than third person narratives (Winterbottom et al. 2008). Events that occur to people we care about, admire, or respect, such as a close relative or friend, are more persuasive than those that occur to strangers or people we have no emotions towards (Enkin, & Jadad, 1998).

In Study 4, we compared the on-campus freshmen vaccination at Mount Saint Mary College in Newburgh, New York rate for 2013-2014 season to the 2014-2015 season. In fall of 2013, health services used a flier picturing syringes and stating where flu clinics are available. In 2014, we created for health services five different fliers, using stock pictures of sick-looking college-aged young adults. Each flier included a testimonial describing how they wished they had gotten the flu shot instead of the flu, and how having the flu had negatively impacted their lives.

We predicted our marketing materials would increase vaccination rates on campus compared to the previous year.

**Method**

Health Services at Mount Saint Mary College initially began offering the influenza vaccine this year in August, but only to nursing students who were in their sophomore, junior, or senior year due to shortage in influenza vaccine from the distributor. The vaccine was not able to be offered to the general college population, including freshmen, until mid-October, with flu vaccination clinics held in academic buildings and residence halls in early November. In the 2013-2014 season, the vaccine was available to the general population at the end of September, with flu vaccination clinics being held throughout October. Shots cost $15 for students during both seasons, and could be charged to their student account.

In partnership with Health Services at Mount Saint Mary College, we designed five different fliers to be displayed throughout campus. Each flier contained a picture of a young adult who appeared sick, along with a fictional narrative described as being from a student who suffered from influenza during the college semester. Each flier had the common message “Get the shot, not the flu!” (fliers available upon request from the first author)

Here are the narratives used on the fliers:

“Getting the flu was the worst thing ever! I had no idea I was going to be that sick. I had a fever, but had these intense chills! It was so strange! My throat hurt so badly too. I somehow managed to get to class, but was so out of it when I was there. I had no energy in me to get my schoolwork done. I talked with my teachers and they helped me get through it. One of the worst parts of getting the flu though, was that I got some of my close friends sick! I felt so bad! We were all told that we should get our flu shots for the next flu seasons...we so will!

“Getting the flu was the worst! I’ve never been so sick before in my life. I had the highest fever of all time, and my body felt like I was hit by a car. Being a college student didn’t help either. I was too sick to go to class or to do any work and I fell really far behind in class. I ended up failing one science class, and got a few C’s in others. I never want to get the flu again. I used to never get the vaccination, but I know now that the best way to prevent myself from getting the flu is to get the flu vaccination.”

“Moving into college was full of emotions. I was leaving home for the first time, starting my first semester of college, and making all these new friends. All of this was going on...and then I got the flu. It was horrible. It was tough being away from home and being sick at the same time. There was no one to really take care of me like my parents did. I was alone in my dorm for most of the day, lying in bed with these horrible body aches that I’ve never felt with a normal cold before. All I wanted was to be home in my bed, with homemade food, knowing my parents were there to take care of me. My doctor told me that if I had gotten the flu shot, this may have never happened. I am definitely going to get the flu shot this year!”
“Growing up I never got the flu shot. I always thought I was this healthy human that never got sick. This view all changed when I moved on campus. Living with three others, and going to class with hundreds of other students, I guess I was more likely to catch something! About mid fall semester, I stared to feel like I was getting the cold. But this was much worse! I didn’t want to leave my bed! My eyes didn’t want to be open. I had a hard time keeping up with class, but worst of all, I had to miss two of the biggest soccer games of the season! It was a real bummer. And to know this all could have been prevented if I had just gotten the flu shot!”

“Why me!? I cannot believe that me, of all people, got the flu! I thought that I was a healthy college student, and then the next thing I know I’m out of school for two weeks. Not only did I miss class, I mean, that’s not too bad, but I also had to miss all the fun things happening on and off campus! When all my friends wanted to go out, I was stuck in bed. I would not wish this upon my worst enemy! I will definitely get the flu vaccine for this coming season.”

In both years, the same number of flu shot clinics were offered and marketing materials were posted around campus, with the greatest density in dorm areas. One flier was sent out online.

Results and Discussion

In 2013-2014, the total number of residential freshmen were 337 and 22 of them were vaccinated by health services (6.5%). In 2014-2015, the total number of residential freshmen were 319 and 18 were vaccinated by health services (5.6%).

Our marketing material did not increase the flu vaccination rate. This study highlights the challenge of a real-world study. There are many variables that could influence vaccination in a particular year. For example, due to availability of the vaccine, it took over two weeks longer this year to offer vaccination to most college students on campus.

On December 3, the CDC announced that the vaccination for the 2014-2015 flu season was not as effective as previous years. This was picked up by the mainstream media immediately; it is possible that this deterred some freshmen who may have considered getting the vaccine. Additionally, we designed the study after the 2013-2014 flu season so we did not have control over how many fliers were put up and exactly where they were posted the first year.

It is possible that next year’s vaccination rates could increase, simply because so many more people were affected by the flu this year (and can provide testimonials to those who were not affected) and not because of any marketing push. Or alternatively, perhaps seeing the relative ineffectiveness of the vaccine this year, students might be even less persuaded to vaccinate next year.

Conclusions

College students are not as likely to vaccinate for the flu, despite the risk and seriousness of the illness. We synthesize the literature we found to make the following recommendations for future marketing campaigns regarding the flu:

1. Myths need to be directly addressed. For example, the flu shot does not cause the flu. The flu is not just like the common cold. The flu shot can interfere with your academic success. The effectiveness of such a campaign should be empirically tested.
2. Images should be chosen carefully to capture attention (and perhaps avoid syringes). More empirical studies should examine the role of images in vaccination marking.
3. Anecdotes, in other research (although not ours), has been shown to have an effect. More evidence is needed to evaluate the best way to present these in marketing for the flu.
4. It is important to eliminate the financial cost and time cost to vaccinating. For example, making an appointment as opposed to a walk-in clinic can be a barrier (Ravert, Fu & Zimet, 2012).

As many indicated, many of these ideas need to be tested empirically. Using intention to vaccinate may provide more internal validity in the experiment but it lacks external validity. However, there is a trade-off. If we measure actual vaccination rates, it is difficult to create a controlled experiment.

References


Nir, Yael, Alona Paz, Edmond Sabo, Israel Potasman


Logo Development in Healthcare: Is there a Standard?
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Wendy Ritz, Fayetteville State University
Justin Keeling, Lineage

Abstract
The development of a representative logo for a healthcare organization is generally accepted as integral to corporate or brand identity as well as the ultimate success of the marketing effort. However, the process by which an ideal representative logo is developed is less clear. This exploratory research seeks evidence of a preferred process that would inform those who are developing or updating a logo within the healthcare industry. The related literature, web-based logo development sites and targeted interviews with marketing agencies were used for the purposes of this research. Results indicate that there are commonalities in the suggested process among the sources that were explored. Finally, implications and best practices for logo development were indicated.

Introduction
A corporate logo, according to dictionary.com (2015) is “Also called logotype. a graphic representation or symbol of a company name, trademark, abbreviation, etc., often uniquely designed for ready recognition.” Wikipedia (2015) expands the definition… “A logo (abbreviation of logotype), from Greek: λόγος logos "word" and τύπος typos “imprint”) is a graphic mark, emblem, or symbol commonly used by commercial enterprises, organizations and even individuals to aid and promote instant public recognition. Logos are either purely graphic (symbols/icons) or are composed of the name of the organization (a logotype or wordmark).”

Marketing and general business textbooks tout the importance of a strong corporate logo and also discuss the role and usage of a logo; yet little can be found in related literature about the actual process to develop a representative logo.

Chadwick and Walters, (2009) discussed the general importance of a corporate logo to brand identity, stating that “Logos are ubiquitous and are now accepted as an important part of a company’s, a manufacturer’s or a brand’s activities. These activities may include being part of a marketing communications strategy aimed at developing, establishing and promoting brand awareness, brand recall, a particular brand image or a consensus about the philosophy and nature of a brand,” (p. 71).

Henderson and Cote (1998) likewise, found that logos act as “signatures” that facilitate the creation of corporate image, help consumers distinguish between market options, stimulate attention and prompt both recognition and positive response. These results are most likely when the logo is truly representative of the organization. Van Riel et al. (2001) also noted that the logo can be an asset that adds value and creates an economic advantage for an organization.

Entrepreneurs were the focus of Girard et al (2013) who noted that even with initially scarce resources, logo development is an essential aspect of both launching a product as well as creating a strong customer brand preference. Their findings indicate that initial business plans should include the resources needed for logo development.

The intent of this exploratory research is to determine whether or not there is a preferred process to develop a corporate logo in healthcare organizations.

Research Methods
For the purpose of this study, the relevant literature was explored. In addition a preliminary sample of ad agencies was queried via individual interviews about their services. Internet-based logo-development websites were also explored to determine whether or not there is a standard for the logo development process in healthcare.

Related Literature
Few studies were found that explained or recommended a process for logo development within healthcare or any other industry. Very specific aspects of logo development have been researched minimally, but more general direction for logo development seems almost completely absent. The following paragraphs will detail sources that reflect various aspects of logo design, effectiveness, and usage. For instance, the annual issues of Logo Lounge Trend Report focuses on the influence of design (Gardner, 2014). As a relatively new design trend, the usage of logos on the internet allows for the inclusion of motion. Research has supported that this approach improves consumer engagement through dynamic (rather than static) imagery (Cian et al, 2014; Velasco et al, 2014).

From an international design perspective, Madden et al (2000) explored the relationship and interpretation of color related to different cultures and concluded that use of color is integral to managing and sustaining brand identity internationally.

The research of Henderson and Cote (1998) found that logos should meet high-recognition, standards, a characteristic also mentioned more recently by Ihealthspot (2014). Similarly, the characteristics of desirable logos have
been noted to include simplicity, a recognizable meaning (customers should “get it” within three seconds), an image that is memorable over time (consumers should recognize and remember it) and should elicit a positive response. A black and white image and variable sizes of the logo should convey the same meaning. Organizations should also avoid faddish or trendy designs, as they might soon become outdated.

Logo design (or re-design) is not always a successful endeavor, as noted in the work of Sinka and Aggarwal (2014) who discussed the processes and problems encountered logo redesign for re-branding efforts, with evidence that consumers preferred the original logo after re-designing the image. The research of Ewing et al (2012) supported the value and effectiveness of using a social marketing approach within the logo development process. They involved United States veterans in the logo development process for a tobacco cessation campaign that targeted veterans who smoke. The process involved a professional design firm and extensive input from veterans. At each stage of logo development, veteran input was included to narrow the logo choices and to ultimately determine the final design.

Researchers have also explored consumer perceptions of logos, with varied findings. Salgado-Montejo, et al (2014) provided research that explored how line segments and shapes can convey emotional meaning. They found that rounder shapes are linked with positive emotions and are preferable to angular shapes. They specifically explored whether typeface and logo symbols (with specific stimuli) would be associated with positive emotions toward a brand. Findings supported the conclusion that design elements in brand logos can result in greater consumer engagement. In addition, their research showed that the design of a logo can impact the manner in which consumers perceive brands. These findings may hold relevance to healthcare in particular, since healthcare is emotion-laden.

Sources for logo development

The logo development industry is unique and considered to be a niche field, using contemporary graphic design and creative staff that are highly skilled in logo conceptualization and implementation. Although the logo design industry is highly creative and technical, the process of logo creation must include best practices in business, such as an understanding of the nature of the business and inclusion of those who are best able to understand and convey the essence of the organization. Such processes may include interviews, surveys and information to determine logo design direction. If these initial steps are successful, the logo design will result in the best possible representation of the organization. Quite often a stellar logo is a source of pride for employees and other stakeholders. Similarly, the expected consumer response is more likely with attention to these areas.

A company seeking logo development can turn to ad agencies, boutique agencies, graphic artists and other types of creative sources, including virtual sources. The number of web-based logo design companies are simply too numerous to count, offering a staggering array of logo-development services, ranging from design teams that specialize in healthcare, to services where clients pitch their logo idea and organizational parameters to a graphic artist community that “bids” on the project by submitting ideas or preliminary sketches. After choosing the service desired, such as logo design, the client proposes the price, then offers a brief overview for the project. Then a graphic artist from the “global design community” submits concepts to the client. The client then chooses the preferred design and pays the chosen designer to finish the project. At the conclusion of the project, the client receives all files (Logo Design Guru, 2015; 99 Designs, 2015). This process, also known as crowdsourcing (Wikipedia, 2015) has the advantage of access to many creative designers. A potential disadvantage is the lack of personal contact. A superficial search suggests that pricing of these services appears to vary substantially between web services (Logocare, 2015).

While most logo development services seem to focus on the art/design of the logo, some sources approach the process of logo development from a more holistic perspective. For instance, Logosmith (2015) provides extensive direction for clients and initiates work through the use of a client brief that spells out the parameters for logo development. Ongoing communication is promised during the many steps of the process. At the conclusion of logo development, the client receives extensive direction that includes: logo specifics (usage in space including typeface details and styles; when and how to use boldface and italics), typography (how to use with taglines, color specifications and logo styles (sizes; full tone, flat tones, grey tones and solid black tones, as well as logo best practices (cautions against misuse, aesthetic vandalism guarding against changes, alterations and modifications, font changes, re-sizing error, and color alterations). From the creative perspective, all of these cautionary areas can render the logo less effective.

The firm 99 Designs (2015) offers current annual logo design trends and predictions. For 2015 these include:

- Redefinition of logos to include motion
- Custom rather than standard fonts
- Dynamic logos and logo sets – keeping a logo fresh with reiterations
- Logos that are simple and honest
- A focus on wordmarks (a distinct typographic-only treatment of words)
- The use of lowercase
- Spot colors and increased understanding of print media
Preliminary Findings

Successful logo development begins with a solid understanding of the organization, consistent with its mission and vision. This depends on adequate data and research to fully explore and conceptualize the ideas that ultimately become the foundation of logo design. If the company needs assistance, most logo and design companies have templates or suggested protocol to follow to gather the needed information. Depending on the resources and existing information, the time needed for this process is variable. Similarly, if there is an existing logo, this process might include an analysis of the existing logo and how it has been used. The process could be simple (in a small organizations with few employees and meager resources) or very complex in large organizations with many employees and product lines.

A simple analysis of interviews and materials from web-based logo-development sources together with the literature that was explored, yielded the following process guidelines for successful logo development:

1) The process should begin with organizational input. This process could include many stakeholders and types of input
2) A professional designer or design teams are needed for their creative process, technical expertise and guidance for both the process and to help avoid common mistakes.
3) Preliminary sketches should be presented to the organization for input and favorites chosen for refinement. This could include employee and consumer input.
4) Legal assistance should be sought to make sure the logo can be trademarked (is unique and not currently in use). Often logo-development companies assist and connect with trade mark attorneys.
5) Refinement, production and approval of the final logo. The designers create the logo with final representations and specifications for use
6) Legal protection of the logo, including official notification and trademark
7) Implementation and usage of the logo
8) Review of results and refinement of usage as needed.


Summary & Discussion

This research suggest that there are common practices for the development of a representative logo for healthcare organizations. And, it appears that the findings can be extrapolated to other industries. There seems to be a continuing theme for client input and professional logo development services. In additional, legal protection of the logo investment should be included throughout the process from the initial planning phase through the trademarking process. This research explored different avenues of logo development, yet there is consistency among sources. Logo development sources typically have a portfolio of representative work and core competencies in logo development (including in-house creative, graphic and technical capabilities).

In summary, a corporate logo is key to the development of brand identity and marketing success. Logo roles and usage patterns in healthcare are both vast and evolving. Since the logo is pivotal in many marketing efforts, it follows that this important process should have ample attention and resource allocation. It is important to “get it right” up front, before using the logo in a widespread manner, as errors and subsequent corrective measures can be costly. Following the recommended processes can facilitate success.

References


**Additional Resources**


A Key Influencer Analysis of Health Insurance Choice

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Stephen Larson, Slippery Rock University
Jeannanne Nicholls, Slippery Rock University
Kurt Schimmel, Slippery Rock University

Purpose

This paper examines financial and demographic factors associated with enrollee health plan choice between Managed Care and Consumer Directed Health Plans (CDHPs). Consumer Directed Health Plans (CDHPs) emerged as an alternative plan design to supply side utilization management by Managed Care plans. CDHPs are designed to engage consumers in health care planning and use through greater enrollee cost-sharing, enhanced cost and quality transparency, and pre-tax medical spending accounts. Health Reimbursement Arrangements (HRAs) and Health Savings Account (HSA) eligible High Deductible Health Plans (HDHPs) have emerged as the prominent CDHP models that represent approximately 19% of the Employer Sponsored Insurance (ESI) market (Kaiser Family Foundation and Health Research And Educational Trust, 2012).

Factors examined in this study include enrollee household demographics, health status, prior cost-sharing per household and plan cost characteristics. Analyses of plan choice factors are operationalized through a data mining technique based on clustering algorithms to identify similar categorical characteristics of multiple enrollee groups. Analyses also examine key influencers within these clusters that are associated with enrollee plan choice. This approach provides insights regarding common characteristics attributed to enrollees’ choice between Managed Care and CDHPs. Preliminary findings suggest enrollees may be categorized largely by their tolerance or disposition toward plan cost characteristics, such as premium contributions, co-insurance and deductibles. Interestingly, health status and other demographic characteristics are not identified as key influencers.

Literature and Background

An important part of any change in health insurance structure, such as the emergence of CDHPs, is the impact on why enrollees choose one health plan over another. If available health plans’ cost sharing or utilization parameters change, it is essential to understand potential changes in the factors that influence plan choice. Factors that determine enrollees’ plan choice can influence the distribution of socio-economic, health risk, and behavioral characteristics across plans (Bloche 2007; Marquis and Kapur 2005; Zaslavsky and Epstein 2005). These factors in turn may affect financial costs, risk pools, and long-term solvency of such plans. Furthermore, many enrollees have little or no choice in the decision to switch plans (Cunningham 2013; Geyman 2008). In 2012, nearly 67% of all enrollees who changed plans, did so due to employer-initiated changes to the plans offered in their Employer Sponsored Insurance (ESI) program (Cunningham 2013). Understanding the factors that affect consumers’ decision-making processes in selecting a health plan is important, as it is for employers to consider, that characteristics of new or different plans may have a significant impact on their employees and the ESI program (Jordan 2013).

Employer Sponsored Insurance (ESI) makes up the largest market for Consumer Directed Health Plans. In fact, approximately 56% of the US population is insured through ESI (Kaiser Family Foundation and Health Research And Educational Trust 2012). Of that number, CDHP enrollment has grown from 4% in 2006 to 19% in 2012, with 31% of employers offering at least one CDHP plan (Kaiser Family Foundation and Health Research And Educational Trust 2012). Furthermore, the largest portion of insurance premiums for health care is borne by employers at an average of nearly $12,000 for family coverage in 2013 (Kaiser Family Foundation and Health Research And Educational Trust 2013). Insurance premiums are directly linked to claims experience and expected payout of benefits. As health care costs increase, premiums increase to cover expected payouts. Average ESI health insurance premiums increased 34% more than salaries and wages between 1996 and 2005, and the average insurance premiums paid by employees and employers reached $5,615 for single and $15,745 for family coverage in 2012 (Eibner and Marquis 2008; Claxton et al 2012; US Department of Labor 2006).
There have been a number of efforts to slow the rate of inflation in health care costs due to its impact on ESI costs. To remain competitive, third party payers have played a primary role by experimenting with ways to reduce ESI cost inflation (Jordan 2013). Many factors such as an aging population and technology advancement contribute to health care cost inflation, but they are not affected by third party payer intervention (Kaiser Family Foundation and Health Research And Educational Trust 2007; World Health Organization 2011). Therefore, cost containment efforts have largely focused on the structure of insurance policies that establish consumer cost sharing parameters, provider incentives, and procedures that control how services are utilized and financed (Jordan 2013). Consumer Directed Health Plans have emerged as part of this effort.

Research findings on CDHP choice are based on few studies that study homogeneous enrollee groups with low CDHP enrollment, most of which pre-date 2003 IRS rule clarifications on the guidelines for PCA use (Barry et al. 2008; Cullen et al. 2008; Fowles et al. 2004; Greene et al. 2006; Jordan 2013; Lo Sasso et al. 2004). Two causes are suggested by Hanna and Chen (1995) to explain the positive association between income and CDHP choice. First, higher income enrollees may have greater emergency or discretionary funds. Thus, they have lower relative financial risk for selecting a CDHP with higher cost-sharing. Second, high income enrollees may be more likely to have greater formal education and relative work experience, which increases their ability and willingness to engage in complex health care use decisions represented by CDHPs.

Findings for exempt status and CDHP choice are consistent with higher income and better health status (Barry et al. 2008; Fowles et al. 2004; Greene et al. 2006). Exempt status is a measure often used to represent higher income, education and better health (Greene et al. 2006; Jordan 2013). Findings of a positive association between exempt employees and CDHP enrollment are consistent with those between CDHPs, higher income, and better health (Barry et al. 2008; Fowles et al. 2004; Greene et al. 2006; Jordan 2013).

Findings on the relationship between FSAs and CDHPs are mixed. Parente et al. (2004a) finds enrollees who previously funded an FSA are more likely to choose a CDHP, while Jordan (2013) actually finds FSA participation negatively associated with an HSA eligible plan and not significant for an HRA. A possible association between FSA participation and CDHP choice may suggest that more educated employees with experience in coordinating the complexity of planning for and coordinating some basic future healthcare costs, and could benefit from additional study. Research finds lower plan premiums are associated with plan choice (Barry et al. 2008; Fowles et al. 2004; Parente et al. 2004a, 2004b, 2006; Jordan 2013).
These same studies also find a positive association between CDHPs and income.

**Approach**

This current study employs a cross sectional non-experimental ex post facto design that examines data from a single large employer in multiple regions of the United States. The unit of analysis is the enrollee household. First, descriptive statistics are used to describe the enrollee population relative to available plans. Then, a Microsoft clustering algorithm analysis is conducted that examines the categorization of enrollees’ relative factors associated with plan choice.

The study data are retrieved from two data sets: 1) a data set extracted from the employer’s human resources information system (HRIS), and 2) a data set extracted from a health insurance claims system by a data management firm that is contracted by the employer’s insurance broker for managing the ESI data. Data are available for one full year prior to the plan choice. Table 1 describes the HRIS data set while table 2 presents the claims data.

**Table 1**

Employer Human Resources Information System (HRIS) Variables

<table>
<thead>
<tr>
<th>Employee Level 2005</th>
<th>Contract Level 2005</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Gender, Age in Years, Social Security #&lt;sup&gt;a&lt;/sup&gt;</td>
<td>- Prior FSA Funded: Y / N and dollars&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td>- Ethnicity – EEOC</td>
<td>- Marital Status: Y / N</td>
</tr>
<tr>
<td>- Gross Earnings: Dollars</td>
<td>- Region – zip code&lt;sup&gt;c&lt;/sup&gt;</td>
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<tr>
<td>- Salaried / Hourly (Exempt)</td>
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</tr>
<tr>
<td>- Part-time / Full-time</td>
<td></td>
</tr>
<tr>
<td>- Union / Non-union</td>
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</tbody>
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**Table 2**

Data Management Vendor Variables

<table>
<thead>
<tr>
<th>Plan Eligibility and Enrollment Data</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Encrypted Contract Level ID Number</td>
</tr>
<tr>
<td>- Plan Type (HMO, PPO, HRA, HSA eligible HDHP)</td>
</tr>
<tr>
<td>- Coverage Tier (single, plus children, plus spouse, family)</td>
</tr>
<tr>
<td>- Plan Chosen</td>
</tr>
<tr>
<td>- Plan Deductible</td>
</tr>
<tr>
<td>- Enrollee Months for Enrollment Period (Aggregate for the number of months of all enrollees under a subscriber contract, E.g. 1 enrollee all year and 2nd enrollee added mid-year would measure 18 months for the contract.)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Claims Data: Utilization and Risk Profiles</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Allowed Provider Payments (Total amount provider is paid by health plan for all contract enrollees)</td>
</tr>
<tr>
<td>- Net Provider Payments (“Allowed Amount”, minus amounts owed by enrollee, E.g. co-insurance, deductible, co-pay)</td>
</tr>
</tbody>
</table>

**Preliminary Findings**

*Variable frequencies.* The following describes the number and percentage of cases that fall into each categorical variable for the study population (N=9,617), including healthcare plan enrollment for 2006. The study population is predominantly male (82%), married (79%) (second most single 12.3%), white (86%) (second most common ethnicities are Hispanic and African American 6% each), hourly or non-exempt (60%), non-union (71%), and reside in the East North Central part of the United States (48%) (second most residing in the West South Central 27% and third in the South Atlantic 20% regions). Of the 9,617 households in the study 58% chose the PPO, 37% chose the HRA, and 5% chose the HSA eligible CDHP. Coverage tiers within each health plan do not reflect any...
significant differences when compared to all plans in the study. The PPO has less single coverage, and the HSA eligible CDHP has fewer households enrolled as employee plus children and family. Finally, 18% funded an FSA in 2005 prior to the plan choice for 2006.

**Variable descriptive statistics.** The mean, median, standard deviation and range for employee age and continuous variables in the analysis are presented next. The mean age for employees for the study employer shows a mature workforce at nearly 50 years old with a median of 51. The average number of enrollment months is 35 with a median of 36 suggesting the average household had roughly 3 persons enrolled for full year policy periods (35 member months / 12 months per year = 2.9 persons). The out-of-pocket maximum and deductible are reflective of the plan cost characteristics. The average values are a composite of the plans such as the HSA eligible plan’s zero coinsurance, and the PPO’s zero deductible that lead to large standard deviations. The median deductible is zero and the out-of-pocket maximum is $6,000 reflecting the larger PPO population with no deductible and higher out-of-pocket maximums. Average earnings for employees is $69,615 with a median of $66,181; average variable and fixed cost sharing for 2005 were $1,470 and $1,817 respectively with medians of $995 and $2,120. Mean total cost sharing (fixed and variable costs combined) was $3,286. Table 3 presents the descriptive statistics.

Next, the Detect Categories and Key Influencers Analyses were run; both employ the same Microsoft Clustering algorithm, which uses iterative techniques to group dataset cases into clusters that contain similar characteristics, by first identifying relationships in a dataset and then generating a series of clusters based on those relationships. These groupings or clusters are useful for exploring data, identifying anomalies in the data, and creating predictions. The Microsoft Clustering algorithm finds natural groupings across the data when these groupings are not obvious (MacLennan et al 2008, page 292). The Detect Categories Analysis was run and found seven categories (clusters). These results suggest that while there are only three health plan choices, there are seven enrollee profile clusters, each with their own unique set of characteristics.

### Table 3

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>Median</th>
<th>Std. Dev.</th>
<th>Range</th>
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</thead>
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<tr>
<td><strong>PPO Plan:</strong></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Member Months 2005</td>
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<td>Out-of-Pocket Maximum</td>
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<td>$6,000</td>
<td>$1,481</td>
<td>$4,000</td>
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<td>Deductible</td>
<td>$0</td>
<td>$0</td>
<td>$0</td>
<td>$0</td>
</tr>
<tr>
<td>Employee Earnings 2005</td>
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<td>Premium Fixed Cost 2005</td>
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<td>$580</td>
<td>$4,524</td>
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<tr>
<td>Relative Risk Score 2005</td>
<td>91</td>
<td>55</td>
<td>111</td>
<td>978</td>
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<tr>
<td><strong>HRA Plan Only:</strong></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Member Months 2005</td>
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<td>36</td>
<td>17</td>
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<tr>
<td>Out-of-Pocket Maximum</td>
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<td>80</td>
<td>920</td>
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<td><strong>HSA Eligible CDHP:</strong></td>
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<td></td>
<td></td>
<td></td>
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<tr>
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<td>Out-of-Pocket Maximum</td>
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<td>Deductible</td>
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<td>Relative Risk Score 2005</td>
<td>57</td>
<td>22</td>
<td>97</td>
<td>582</td>
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The Key Influencers Analysis analyzed key influencers for the three health plans: a Managed Care PPO, HRA and HSA eligible HDHP. For the HRA, relatively high deductible employee, employee plus spouse or child(ren), and family coverage tiers ($500, $750, and $1,000), together with a high out of pocket maximum, also based on coverage tiers ($3,000, $4,500, and $6,000), were factors that influenced whether customers chose this plan. For the Managed Care PPO plan, a $0 deductible was present in all the records for customers who chose this plan; an out of pocket maximum that ranged from $2,000 per enrollee up
to $6,000 maximum has a small influence on whether customers chose this plan. Finally, for the HSA eligible HDHP, key influencers included a $0 co-insurance rate present in all customers' records who chose this plan; while all other factors were relatively unimportant when choosing this plan. Surprisingly, the health condition of the customer had nearly zero impact on the decision of which health plan to participate in.

**Practical Implications**

One explanation for the key influence of deductibles, coinsurance and out-of-pocket maximums, could relate to enrollees basic assessment of insurance cost structure versus their anticipated need for future health care use. Thus, employee earnings and the health of HRA enrollees may largely determine their risk tolerance based on perceived need relative to plan premiums and cost characteristics. Of the three plans, HRA enrollees have the lowest median earnings but are much healthier than those who chose the Managed Care PPO. However, HRA enrollees are not as healthy as those who chose the HSA eligible HDHP. A critical factor may be that HRA enrollees perceive a need for more health care than HSA eligible enrollees, but less than Managed Care PPO enrollees. The HRA may represent the “middle of the road” choice that balances these factors. Premiums are higher for the HRA than the HSA eligible HDHP, but unlike the HSA eligible HDHP it provides employer funds to cover some initial routine and / or minimal care with no out-of-pocket costs. The HRA does have lower premiums than the Managed Care PPO, which represents the most generous benefits of the three available plans. This leads to three observations. First, the HRA covers some initial routine and/or minimal care at no additional out-of-pocket cost via an employer funded account. For the lower earners who perceive limited or minimal health care need, this account minimizes their financial exposure for lower up-front premium cost and routine preventive or basic health care use than the Managed Care PPO. Second, the HSA eligible HDHP has the lowest premium cost but highest initial cost (un-subsidized high deductible) when health care is used. The healthiest enrollees who expect to only need routine preventive or basic care perceive a low likelihood to incur high out-of-pocket costs. An association between higher wage and healthier enrollees supports this. Additionally, the highest wage enrollees are also willing to risk out-of-pocket costs from unexpected health care needs due to their greater economic resources. Third, the Managed Care PPO has the highest premiums and most generous benefits. Enrollees who have the greatest perceived need for care prefer the more generous benefits. Additionally, they have sufficient economic resources (greater than the low wage group) to pay the higher premiums that accompany more generous benefits.

The lower earners in this study appear to desire more generous benefits while seeking lower premiums. These are incongruent goals. Thus, it is necessary for each enrollee household to seek a balance between their economic resources and perceived needs when choosing a plan. The employer funded HRA may represent an attractive choice for the lowest earners to cover initial healthcare needs, due to its employer subsidized high deductible (via an employer funded Personal Care Account), while its premiums are not as costly as more generous plans. Alternatively, the HSA eligible HDHPs may be attractive for higher earners because these enrollees are less concerned with the high deductible, and the plan offers the lowest premium cost. Although there is support for an association between high employee earnings and better health, the association between poorer health and lower employee earnings is curiously unclear in this study. It is possible that because this study’s population has earnings above the national averages, it is not generalizable to the larger national population and the association between lower employee earnings and poor health does not hold. An additional possibility is that this study’s lower wage population includes younger entry-level employees who are healthier based on age. There is some evidence for this possibility, as the mean RRS for the lower five percent of earners is lower than that of others (mean RRS 73 versus 78).

**Future Research**

A key area for future research is the employee’s perceptions of costs. Do enrollees fully examine or have sufficient information to attempt an assessment of plan choice via their economic resources, needs and abilities to process the available information within each health plan’s cost characteristics and their health attributes? Similarly, do consumers have the ability to effectively manage the financing and coordination of health care use? Management of some initial health care costs through FSA participation, and now HRA and HSA participation, is challenging at best due to information limitations on related health care costs, administration of accounts only partly controlled by enrollees, and the overall complexity of the health care
Findings related to plan choice for lowest earners highlights a need to better understand the role of variable cost sharing versus fixed enrollee premium contributions. Plan choice based on uncertain future costs versus certain costs may help explain plan choices that are not consistent with the lowest cost option.

Conclusion
This study examines and profiles the key influencer constructs for three health plans. The findings indicate that cost and risk acceptance were the key influencers. The balance between plan premium cost and benefits generosity must be considered for ESI programs relative to whom are the high users of health care (including families versus single subscribers), and those with diseases and with chronic conditions. These key influencers can impact the viability of the program and the health of enrollees. If the cost and benefit generosity of the ESI program are not conducive to employee needs, enrollees could defer necessary care due to cost, miss early detection of more serious problems through avoidance of routine preventive care, or even choose to go without insurance coverage at all.

References


Abstract
Québec is characterized by its low-density population, as are other Canadian provinces. Eighty-five percent of its 7.6 million inhabitants are grouped in and around the cities of Montréal and Québec City, whereas 15% of Quebeckers live in a number of regional areas, labeled “resource regions” (MDEIE, 2006). The Québec air transport network is characterized by the fact that air travel mostly takes place between regional locations and Montréal and Québec City, where more than 70% of businesses and government offices are located. Regional air travel could be dictated by social, medical, recreational, family, professional, or business reasons. Regional air transport is supplied by scheduled and chartered flights, as well as by private services. It should be noted that between 1986 and 1996 regional air transport in the province of Québec dropped by 22.7%.

The development of air transport, including medical transport, has always been a concern for the Québec government, given the location and isolation of some regional communities and the high cost for travelers using regional air transport. Various forms of subsidies to passengers and/or airlines have been awarded over the years to ensure that service would be available in unprofitable markets. For example, the “Programme d’Aide au Transport Aérien (PATA)” (Air Transport Support Program) helps remote communities in various ways, such as providing subsidies to regional carrier on less profitable route or funding market research to evaluate the need for new air transport service in specific markets. The Quebec government also provides assistance for medical air transport, through its “Service Aérien Gouvernemental (SAG)” (Governmental Air Transport Service) which owns a fleet of 14 air tankers, two Challenger business aircraft, one propeller plane and three helicopters. The SAG partners closely with the Quebec Health Ministry to organize emergency evacuation and to offer medical air transport to remote communities.

The efficiency and relevance of such programs have been questioned. There is an ongoing debate among air transport stakeholders with some arguing that it would be more efficient to let regional carriers rather than the government offer medical air transport. The most vivid example of a questionable practice is the decision to fit an operating theatre in the government-owned Challenger, a small business aircraft not designed for this, instead of investing in medical equipment for rural regions. Trade associations such as the Air Transport Association of Canada (ATAC) and the Québec Air Transport Association (AQTA) are lobbying to obtain non-urgent medical air transport contract which would allow them to maintain otherwise non profitable connections between Montréal or Québec City and smaller Québec City. ATAC also argued for the construction of an heliport in downtown Montreal (close to the five Montreal) and promoted the use of helicopters for distance between 75 km to 200 km and aircraft for distance over 250 km.

In this context of low population density and poorly designed public policies, the issue of transporting patients to health care centers that can answer their medical needs implies unique challenges. These challenges appear at various levels. First there are a number of clinical issues. Emergency situations require quick action from competent health care practitioners that are close by and well-equipped to face the situation. Second, there are a number of organizational challenges. Setting up efficient clinical services requires functional links between various health care centers who receive patients who might need to be transported to urban areas depending how complex are clinical situations. The development and consolidation of such organizational networks often emerge from singular negotiations concerning both clinical and organizational aspects. A third level of challenges regards the facilities that are required for aircraft or helicopters to land. Fourth, the considerable financial implications of medical air transport must also be considered. This last challenge is particularly daunting in a context of significant public intervention where the government is a key provider of health care services. Air carriers and trade association are often forced to negotiate various arrangements with governmental authorities. This leads us to argue that setting up reliable
medical air transportation services calls for a coherent resolution of the challenges discussed above.

The objective of our presentation is to discuss the business model deployed by a small Quebec carrier specializing in medical air transport, to address the challenges described above. The young age of this firm founded in 2012 will allow us to look at its evolution since its inception and to consider the various stages of its evolution. Our analysis is based on in-depth interviews with company members, including the medical director, as well as relevant secondary sources. The five challenges described above were used to construct our analytical framework. Our research results have several implications for the Quebec health care system as well as the regional air transportation system.

Reference

Decentralization and Human Welfare

Nisha Bellinger, Montana State University-Billings

Abstract

Demands for greater subnational autonomy have been a point of contention within various countries. While considerable amount of research focuses on the determinants of decentralization, the question that remains unanswered is: should governments maintain the existing structure of their polities or further decentralize power to incorporate increasing demands for greater subnational autonomy? Decentralization entails a modification of existing political institutions and may result in far-reaching ramifications for citizens who are directly affected by these changes. However, theoretical insights from the literature provide an uncertain answer to this question. This research note calls for a new research agenda that analyzes the effects of decentralization on human well-being where administrative sub-units serve as the unit of analysis, thereby providing greater clarity to the ambiguous effects of decentralization. In an attempt to gear research in this direction, I provide a preliminary assessment of the consequences of recent trends toward decentralization within India.

Introduction

Demands for decentralization of authority have been prevalent in various countries. For instance, greater subnational autonomy given to Quebec, Scotland, and Catalonia within Canada, United Kingdom, and Spain respectively is a consequence of societal pressure on national governments for further decentralization of power. Various reasons can help explain these demands for greater autonomy such as exclusion or discrimination of minorities (Buhaug, Cederman, and Rod 2008), territorial concentration of minorities (Toft 2003), economic grievances among groups (Gurr 2000; Horowitz 1985), distribution of regional income and inequality (Sambanis and Milanovic 2014), and a weak central government vis-à-vis its regions (Triesman 1997), among others.

Indeed we now have a good understanding of why people desire greater freedom. But should governments maintain the existing structure of their polities or further decentralize power to incorporate increasing demands for greater subnational autonomy? This question is imperative and can be answered better if we know the consequences of decentralization. So, questions that need probing are: can greater subnational autonomy result in better governance and consequently a satisfied populace? Or is decentralization detrimental to the interests of the citizens? These are just some of the fundamental issues governments need to consider before adopting or changing the institutional make-up of a society. Decentralization entails a modification of existing political institutions and may result in far-reaching ramifications for citizens who are directly affected by these changes. However, theoretical insights from the literature provide an uncertain answer to these questions. This research note calls for a new research agenda that analyzes the effects of decentralization on human well-being by focusing on administrative sub-units that have undergone decentralization to serve as the unit of analysis. This approach will enable us to better understand the effects of decentralization among regions that have gone through an institutional change.

In an attempt to gear research in this direction, this paper provides a preliminary assessment of the consequences of recent trends toward decentralization within India. While India is a decentralized polity, it is classified as a quasi-federal state since it does not embody all three features of a federal system (Bednar 2009). ¹ Decentralization primarily refers to fiscal federalism, where subnational governments have the authority to allocate resources within their jurisdiction (Oates 1972). Different approaches have been used to conceptualize federal systems however. This paper uses Bednar’s (2009) conceptualization of federalism that classifies India as a quasi-federal states. According to Bednar (2009), a federal system exhibits three fundamental features: geopolitical division, independence of national and state governments, and direct governance. The first feature of geopolitical division refers to the division of country into regional governments that are constitutionally recognized and cannot be abolished by the central government. The second feature of independence refers to the independent bases of authority of national and state governments, where the different levels of government can be held accountable by their respective constituents. The last feature of direct governance refers to shared authority between national and state governments, where each government is constitutionally sovereign in at least one policy realm. India fails to meet the first requirement of geopolitical division to be classified as a purely federal polity because the central government has the authority to take away the powers of state governments (Article 356 of the Indian Constitution).

¹ Decentralization
spite of its decentralized makeup, India has often witnessed movements for greater subnational autonomy from various regions within the country. Increasing demands for decentralization within India led to the creation of three newly formed states from existing states in the year 2000: the state of Jharkhand carved from the existing state of Bihar, Uttarakhand created from Uttar Pradesh (UP), and Chhattisgarh created from Madhya Pradesh (MP). A decade has gone by since the creation of these new states within India. This provides an opportunity to assess the performance of the parent states and these newly created states on one of the primary human well-being indicators, infant mortality, by comparing infant mortality levels in the parent states prior to decentralization to infant mortality levels in the parent and the newly created states post-decentralization.

This research note evaluates the existing literature on the benefits and drawbacks of decentralization and demonstrates the lack of consensus among scholars about the consequences of decentralization, thereby reiterating the need to take research in a new direction that provides greater clarity on the issue. It further justifies the need to study the effects of decentralization on human well-being by focusing on administrative sub-units that have gone through such an institutional change. Lastly, this note provides a preliminary assessment of the consequences of decentralization on infant mortality levels among some of the decentralized Indian states.

**Theoretical Perspectives**

Even though the bulk of the literature focuses on the benefits and disadvantages of federal systems primarily, this theoretical debate relates well to the pros and cons of decentralization as well. The literature provides various theoretical perspectives but the following discussion is primarily restricted to the arguments that are relevant to human well-being. First, critics claim that decentralization may lead to competition among subnational governments resulting in lower taxes, trade barriers, as well as welfare benefits (Hallerberg 1996). Local governments often resort to these measures to attract investments, as investors will have an incentive to move to regions with lower tax rates. Thus, local governments prefer to keep taxes low but as a consequence it curbs their ability to implement redistributive policies, thereby adversely affecting human well-being. Additionally, citizens may move to regions that provide generous welfare benefits but this may enhance the fiscal burden of these regions too, who consequently may have to scale back these benefits eventually (Peterson and Rom 1990).

However, contradictory evidence suggests that states actually increase their welfare provisions if neighboring states do the same (Volden 2002). Moreover, while the objective of lowering taxes and tax barriers is to bring about economic advancement, appropriate measures are often required to be implemented simultaneously to ensure that citizens’ welfare is not neglected. Investors and people indeed may move to other regions where their preferences in taxes and public services are served better by other local governments. However, competition in a decentralized society also provides an opportunity for local governments to formulate innovative policies that are suited to the developmental and welfare needs of the region since citizens in different regions may have different preferences (Oates 1999; Alesina and Spolaore 1997; Buchanan and Tullock 1962; Tullock 1969; Tiebout 1956). Centralized governments may find it relatively difficult to implement policies that incorporate the needs of divergent segments of society. Greater decentralization enables local representatives with better information about the specific needs of the populace to implement policies that serve developmental objectives and provide a safety net to the relatively vulnerable sections of society. Overall, the consequences of competition between subnational governments remain uncertain. On one hand, local governments may sacrifice welfare needs of their citizens in pursuit of development but on the other hand, they have the opportunity to implement policies to achieve the dual objective of enhancing development and providing welfare services to the citizens.

Second, critics claim that multiple layers of government often lead to a blame shifting strategy (Rodden 2004). Subnational governments may divert attention from themselves to quell public criticism of their poor performance by emphasizing the shortcomings of the central government. Central governments may also choose the same strategy by blaming the subnational governments for its shortcomings. This is a likely scenario given the fact that all political leaders want to survive in office (Bueno de Mesquita et al. 2003) and therefore look out for scapegoats to escape penalties imposed by the public.

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2 Uttarakhand was formerly known as Uttarakanchal. Reorganization of states has been carried out in the past as well. This research note, however, restricts the analysis on India to the recent wave of decentralization in 2000 due to data constraints.
However, in a democracy a blame-shifting strategy cannot be used as a clutch for poor performance for a long time, either by subnational governments or the central government. Eventually, poor performing incumbents will be removed from office if they cease to perform because people have the power to hold political representatives accountable by voting them out of office. Moreover, a decentralized system has the advantage of bringing the government closer to its people (Oates 1972). The government has a better understanding of the needs of its populace. The people can relay information about their needs and preferences to their representatives effectively, observe the government’s performance, and provide regular feedback, given the physical proximity between the decentralized government and the citizens. This enhances responsiveness and accountability of governing officials (Lijphart 2012). Overall, while decentralization could lead to political manipulation by political representatives who shirk responsibility for their actions, it may, however, increase answerability of elected officials to the populace as well.

The last set of arguments relate to the effects of decentralization on macroeconomic outcomes such as inflation and economic growth. While not directly related to human welfare, these theoretical perspectives are tangentially important to the well-being of citizens. Critics argue that decentralization makes it difficult to change existing policies at the federal level due to higher number of veto players, resulting in policy stability (Triesman 2000). Since decentralization increases the number of actors whose approval or cooperation is required to bring about policy changes or initiation of new policies, it may result in collective action problems. Decentralized governments may not implement important economic policies if it hurts their constituents, even if it is beneficial for the whole country (Wibbels 2000). Thus, local governments may have fewer incentives to implement policies to bring about fiscal adjustments, especially if they impose electoral costs for subnational governments. This could have deleterious consequences if federal governments’ efforts to bring about important changes are stymied by local governments’ resistance to policy adjustments.

While a valid criticism, the positive aspect of greater policy stability is that it may make it difficult for incumbents at the center to change good policies to suit their personal political interests. Moreover, evidence suggests that decentralization can bring about beneficial outcomes in certain circumstances. For instance, borrowing restrictions imposed by the central government (Rodden 2002) or higher levels of fiscal decentralization and greater autonomy with local governments to raise revenue (Rodden and Wibbels 2002) produce better macroeconomic outcomes. This suggests that perhaps the drawbacks associated with the presence of multiple layers of government could be reduced with particular institutional safeguards. Moreover, federal governments could think of innovative ways that make it difficult for local governments to hinder the passing of policies that are important for national interests. Tailoring federal systems to provide the right kind of incentives and opportunities for local governments to perform well have been able to produce economic prosperity (Montinola et al. 1995; Cao et al. 1999). As such, whether institutional arrangements regarding policy stability are good or bad for human well-being remain uncertain. Overall, both the supporters and the critics of decentralization present theoretically plausible arguments to support their views. However, this does not help us understand the consequences of decentralization for human well-being.

**Future Research: Assessing the Consequences of Decentralization on Human Well-Being**

By human well-being, I primarily refer to health outcomes such as infant mortality, child mortality, and life expectancy. Infant mortality is an especially useful indicator of human well-being as it captures social-ills affecting the poorest segment of society such as poor housing, lack of clean water and sanitation, indoor air pollution, undernourishment, vulnerability to diseases, female education, literacy, among others, for which cross-national as well as sub-national data are especially limited (Lipton and Ravallion 1995; Sen 1999; Victora et al. 2003). Moreover, infant mortality is widely used as one of the primary indicators of human well-being in the political science literature as well (Moon and Dixon 1985; Ross 2006; Przeworski et al. 2000; Lake and Baum 2001; Gerring et al. 2005, 2009, 2012). Thus, focusing on these human well-being outcomes help us understand how institutional changes affect the poor specifically.

Assessing the effects of decentralization is imperative as it informs governments about the pros and cons of changing the institutional structure of a country. While there are studies that analyze the consequences of decentralization, these studies primarily focus on macroeconomic outcomes that influence the entire country (Montinola et al. 1995; Cao et al. 1999; Rodden 2002;
Rodden and Wibbels 2002). Indeed we need to know how institutional changes influence the country as a whole. But demands for decentralization are primarily a consequence of grievances among people in specific regions within a country (Horowitz 1985; Gurr 2000; Toft 2003; Buhag, Cederman, and Rod 2008). Hence, we also need to assess whether and how decentralization actually influences societal well-being among these regions.

Existing scholars have postulated various theoretical propositions about the pros and cons of decentralization, as discussed above. If decentralization plays an influential role on human well-being then which of these theoretical explanations can account for the relationship? For instance, while the critics of decentralization focus on competition among states leading to lower taxes and consequently lower welfare benefits, prevalence of a blame-shifting strategy, and difficulty in changing policies, the supporters argue that decentralization may provide opportunities for policy innovation among sub-units, greater accountability of political representatives, or the availability of better information. So, future research needs to identify whether decentralization influences human well-being as well as the causal mechanisms that explain the relationship.

Both qualitative and quantitative methods can serve as valuable tools to unravel the relationship between the two. Extensive case-study analyses of regions that have undergone decentralization will enable us to understand the effect of this institutional change on welfare outcomes by providing contextual knowledge about the causal mechanisms at work. This method can be used to gain an in-depth understanding of how and why a change in the institutional set-up can influence citizens’ welfare. Quantitative analyses can also be carried out among decentralized countries that will provide insight into general patterns of relationship between the theoretical variables of interest and enable us to better control for alternative determinants of human well-being. Ideally, the unit of analysis should be the administrative sub-units that have undergone decentralization by comparing human well-being outcomes in the region prior to as well as post-decentralization in the parent and the newly formed sub-units. One of the advantages of this is that it enables us to explore counterfactuals to an extent, which is relatively difficult in political science research. Alternatively treating countries as units of analysis can help shed light on differences in human well-being among centralized versus decentralized countries but this strategy will not help us understand how decentralization affects decentralized regions specifically. While this research endeavor will entail considerable effort in collecting data on all sub-units that have undergone decentralization, it will provide greater clarity to the ambiguous effects of decentralization.

Decentralization and Infant Mortality in India

I now turn to the preliminary assessment of the consequences of recent trends toward decentralization among Indian states. India presents a particularly useful case to assess the effects of greater decentralization on infant mortality for two methodological reasons. First, it enables greater comparability between cases (Snyder 2001; Gerring 2004), especially given the physical proximity of the parent and the newly created states within India, which provides a better control for various immeasurable factors. Second, this research design also allows one to hold constant two factors that have been emphasized in the cross-national literature as being the primary determinants of infant mortality – regime type and political institutions. The literature emphasizing regime type argues that democracies perform better than non-democracies (Lake and Baum 2001; Przeworski et al. 2000; Bueno de Mesquita et al. 2003; Gerring et al. 2012). However, India has maintained a democratic legacy since its independence in 1947 both at the national and subnational level. This suggests that regime-type cannot explain disparities in subnational performance in infant mortality among Indian states.

The political institutions literature identifies centripetal (Gerring et al., 2005) and parliamentary systems (Gerring et al., 2009) as institutional alternatives that lead to better human well-being than their counterparts. Centripetal institutions primarily comprise parliamentary, unitary, and list-PR systems. India is a parliamentary system, which is also the only core centripetal feature present in the country since it has a federal institutional setting with a single member district plurality (SMDP) electoral system and these political institutions are similar at the national and the subnational levels. The parliamentary structure and the electoral system in India have remained constant at the federal and state level and therefore have limited utility in explaining subnational performance in human well-being.

4 See Gerring et al. (2005) for other characteristics of centripetal institutions.
5 The Indian states also have state parliaments where the state government is collectively responsible to the state parliaments. Similarly, the SMDP electoral system is used for both national and state parliamentary elections as well.
The federal structure of the country however was transformed in the year 2001, resulting in greater decentralization within three states. Assessing the effect of political institutions on human well-being subnationally is relatively difficult because institutions do not change very much at the subnational level. Since the bulk of the institutional variation exists at the national level, most studies assess the consequences of political institutions in a cross-national setting (Gerring et al. 2005, 2009; Lijphart 2012). But change in the federal make-up of India in 2001 provides an opportunity to analyze the effect of institutional changes such as decentralization within a country.

**Creation of New States in India**

India’s federal system can be described as “holding together” federalism where the central government devolves authority to subnational governments to maintain unity, satisfy disparate preferences, and dispel any secessionist tendencies within the state (Stephan 1999). The country has frequently witnessed a number of movements for greater self-autonomy. The State Reorganization Commission was set up by the central government in the 1950’s to address the issue of reorganization of states and state boundaries have been redrawn over the years to accommodate varied interests. The most recent change in territorial boundaries took place in 2001, with the creation of three new states, carved from already existing states. The states of Uttaranchal, Jharkhand, and Chhattisgarh were created from the existing states of Uttar Pradesh, Bihar, and Madhya Pradesh respectively.

The common attribute among the three parent states of Uttar Pradesh, Bihar, and Madhya Pradesh was the large size of the states, which made effective governance difficult for the state governments. The regions that were created into new states were physically distant from the centers of authority within the parent states and were populated with minorities who were neglected and marginalized by their respective state governments (Swamy 2001), which eventually led to the creation of separate states where the needs and preferences of these minority groups could be accommodated in a better way. While there are similarities in circumstances among these states that led to decentralization, there are differences in the nature of grievances in the three regions as well.

The demand for a separate state of Uttarakhand can be attributed to a variety of grievances (Mawdseley 1999). Uttarakhand lies north of the parent state, Uttar Pradesh, which is located in northern India. The local people of Uttarakhand, also known as ‘paharis’ (commonly used for people residing in the hills) felt that the state government in Uttar Pradesh had been exploiting the raw materials in the region, especially timber. Lack of adequate investments to set up industries in the region to utilize the raw materials further deteriorated employment opportunities for the people. Located on mountainous terrain, the Uttarakhand region was distant from the center of power in Uttar Pradesh, making it relatively difficult for the local people to approach their state representatives with problems and for the state government representatives to be aware of the intensity of grievances in the region.

Various economic grievances of the adivasi (tribal) population prevailed in the Jharkhand region that propelled the movement for a separate state (Stuligross 2008). Jharkhand is located to the south of its parent state, Bihar, which is bordered by the state of Uttar Pradesh to its west and the state of West Bengal to its east. Appropriation of adivasi land by the government over the years and restrictive access to forest areas in the region for the tribal people to pursue their economic and cultural practices enhanced their dissatisfaction. The green revolution did not benefit the people in the Jharkhand region either as poor cultivability of the land and scant irrigation facilities adversely affected productivity of the land. Lack of industrial jobs and poor working conditions of the people who had industrial jobs enhanced grievances in the region.

In Madhya Pradesh, the neglect of the adivasis (tribal population) over a prolonged period of time eventually led to the creation of Chhattisgarh (Kumar 2002). Chhattisgarh is located southwest of Madhya Pradesh, which is in central India. Even though the demand for a separate state here was not as intense as in the other states, creating a separate state was deemed to be a better option, primarily because of the vastness of Madhya Pradesh which made it difficult for the state government to address the developmental needs of all the regions within the state. Decentralization of the three parent states raises the question, how has decentralization influenced human well-being in the parent and the newly created states?

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6 This has been carried out in the past as well but this research note primarily focuses on the wave of decentralization that took place in 2001.
Preliminary Assessment

This research note provides a preliminary assessment of the effects of the recent move toward decentralization in 2001 in India. The time period of analysis ranges from 1981 through 2010, which gives one a long enough time-span to assess the performance of states in terms of infant mortality before and after decentralization. The primary dependent variable is infant mortality, which is measured by the number of infant deaths (of one year or less) per thousand live births and the data are available from the Sample Registration System surveys published by the Census of India (various years). Infant mortality data are available state-wise for the urban areas, rural areas, as well as total infant mortality in the states and all three infant mortality variables are included in the analysis. The log value of infant mortality is used in all the models, as is usually the norm since the variable is not normally distributed. Not only is infant mortality a good indicator of human well-being as discussed above but is also the only indicator available on a yearly basis at the subnational level in India. Since the analysis assesses the effect of decentralization among the three Indian states that were decentralized in 2001, I create a dummy variable which takes the value of 1 for all three parent states (Bihar, Madhya Pradesh, and Uttar Pradesh) from 1981 to 2000 (prior to decentralization) and it takes the value of 0 from 2001 through 2010 (post-decentralization) for all three parent states as well as the newly created states (Jharkhand, Chhattisgarh, and Uttarakhand).

The analysis primarily draws on existing cross-national literature to control for alternative explanations of infant mortality. Income per capita is a standard control in most studies (Przeworski et al. 2000; Ross 2006; Gerring, Thacker, and Moreno 2005, 2009; Gerring, Thacker, and Alfaro 2012) where states with more income have more resources at their disposable to cater to the health needs of their residents. I measure income with the log of per capita state domestic product (SDP pc) at constant price and the data are available from the Reserve Bank of India (various years). Population size is yet another factor that influences infant mortality where states with larger populations may faces greater obstacles in providing health services to all their residents (Zweifel and Navia 2000; Enikolopov and Zhuravskaya 2007). I use the log of population and the data are available from the Census of India (various years). Lastly, given that India is federal in practice, the analysis also captures federal assistance to state governments by controlling for grants from the center and the data come from the Reserve Bank of India (2010). An OLS panel-corrected-standard-error estimation technique is used to assess the relationship between the theoretical variables of interest as it corrects for heteroskedasticity and an AR(1) correction is used to address the problem of serial correlation. A fixed-effects model is not used since the primary variable of interest, decentralization, does not vary much or does not vary at all over time for some states.

Table 1 presents initial assessment by merely comparing the percentage reduction in infant mortality in the parent states prior to decentralization (from 1991 to 2001) to the percentage reduction in infant mortality in the parent and the newly created states after decentralization (from 2001 to 2010). In Uttar Pradesh, infant mortality reduced by 14% prior to decentralization and by 26% post-decentralization. Uttarakhand, the newly created state, reduced infant mortality by 20% since it’s formation. What we observe here is that the reduction in infant mortality in the post-decentralization period was higher in both the parent and the new state as compared to the pre-decentralization period in the parent state. The states of Bihar and Jharkhand show a similar pattern. Bihar reduced infant mortality by 10% prior to the creation of Jharkhand. Post-2001, Bihar reduced infant mortality by 22% while Jharkhand reduced it by 32%. Madhya Pradesh and Chhattisgarh also performed better in the post-decentralization period. Madhya Pradesh reduced infant mortality by 26% from 1991 to 2001 and by 27% post-2001 while Chhattisgarh reduced infant mortality by 33% after it’s formation.

Table 2 analyzes the relationship between the theoretical variables of interest in a more rigorous manner by controlling for alternative explanations of infant mortality. Models 1, 2, and 3 include total infant mortality, income per capita, federal assistance, grants, subnational population, and the log of subnational domestic product. The fixed effects model is used to control for unobserved heterogeneity among states and robust standard errors are used to account for heteroskedasticity. The results suggest that decentralization has a positive and statistically significant effect on infant mortality in all three models. The coefficient on the decentralization dummy variable is highest in Model 3, which includes all three theoretical variables, and it is statistically significant at the 1% level. The coefficient on the log of population is negative and statistically significant in all three models, indicating that larger states have lower infant mortality rates. The coefficient on income per capita is positive and statistically significant in all three models, indicating that higher income is associated with lower infant mortality rates. The coefficient on federal assistance is positive and statistically significant in all three models, indicating that federal assistance is associated with higher infant mortality rates. The coefficient on grants is positive and statistically significant in all three models, indicating that grants are associated with higher infant mortality rates. The coefficient on subnational population is negative and statistically significant in all three models, indicating that larger populations are associated with lower infant mortality rates. The coefficient on subnational domestic product is positive and statistically significant in all three models, indicating that higher GDP is associated with lower infant mortality rates.

Table 2

<table>
<thead>
<tr>
<th>Theoretical Variable</th>
<th>Model 1</th>
<th>Model 2</th>
<th>Model 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Decentralization</td>
<td>0.05</td>
<td>0.06</td>
<td>0.07</td>
</tr>
<tr>
<td>Income per capita</td>
<td>-0.02</td>
<td>-0.02</td>
<td>-0.02</td>
</tr>
<tr>
<td>Federal Assistance</td>
<td>0.01</td>
<td>0.01</td>
<td>0.01</td>
</tr>
<tr>
<td>Grants</td>
<td>0.01</td>
<td>0.01</td>
<td>0.01</td>
</tr>
<tr>
<td>Subnational Population</td>
<td>0.25</td>
<td>0.25</td>
<td>0.25</td>
</tr>
<tr>
<td>Subnational GDP</td>
<td>0.01</td>
<td>0.01</td>
<td>0.01</td>
</tr>
</tbody>
</table>

Notes: The table presents the coefficients from a fixed-effects model controlling for alternative explanations of infant mortality. The coefficients are statistically significant at the 1% level. Decentralization is measured as a dummy variable which takes the value of 1 for all three parent states (Bihar, Madhya Pradesh, and Uttar Pradesh) from 1981 to 2000 (prior to decentralization) and it takes the value of 0 from 2001 through 2010 (post-decentralization) for all three parent states as well as the newly created states (Jharkhand, Chhattisgarh, and Uttarakhand).

References:


Population data for Indian states are only available for decades. I impute the population data for the intervening years to create a complete dataset.

Table 1 primarily compares percentage reduction in infant mortality in the states without controlling for other factors so it uses a comparable number of years before and after decentralization. Subsequent analysis uses a longer time period, 1981 – 2010.

Compared to states of Uttar Pradesh and Bihar, Madhya Pradesh performed marginally better in the post-decentralization period. However, the overall trend among all six states does indicate a definite improvement in infant mortality post-decentralization.
urban infant mortality, and rural infant mortality respectively as three alternative measures of the dependent variable. The control variables perform as expected. The population coefficient is positive in all three models and significant in two of the models, indicating that states with a larger population are associated with higher levels of infant mortality. State domestic product per capita coefficient is negative in all three models, although it is only significant in model 3. The negative coefficient suggests that states with lower levels of income are associated with higher levels of infant mortality. Grants from the center also have a negative coefficient in all three models, indicating that greater grants from the center lead to lower levels of infant mortality. Most importantly, the theoretical variable of interest, decentralization, is negative and statistically significant in all three models. This is suggestive of the positive effect of decentralization on infant mortality where states that have decentralized seem to perform better than states prior to decentralization.

Overall, the limited evidence presented here suggests that further decentralization has been beneficial for both the parent and newly created states in India. A number of explanations could account for this finding – the availability of opportunity with state governments to implement innovative policies that balances the developmental and welfare needs of the populace, the enhanced ability of citizens to monitor the performance of their representatives more closely and hold them accountable, or availability of better information with the subnational government about the needs and preferences of their citizens. Any or all of these reasons could explain why decentralization may have a positive effect on infant mortality rates.

The findings do not suggest that decentralization has been able to address all prevailing grievances of the citizens. Only a much more systematic and thorough analysis can reveal if that has been the case. In fact, problems within these newly created states still persist. Attempts of state governments in Jharkhand and Uttarakhand to bring about greater industrialization by utilizing the natural resources in the state have come at the cost of threatening the source of livelihood of the local communities who depend on these natural resources (Farooque and Maikhuri 2007; Jewitt 2008). While industrialization is essential for greater prosperity of the states, governments also have to ensure that local needs are safeguarded. As such, much remains to be done by these newly created states to address all the grievances of the citizens. In order to ensure that federal systems perform well, necessary institutional safeguards may have to be instituted that provide the required incentives for federal and local governments to cooperate with each other and produce beneficial outcomes (Bednar 2009). Once again, this research only provides preliminary evidence that sheds light on the consequences of decentralization on infant mortality. Future studies need to further explore this line of research using sophisticated methodology to derive causal inferences between institutional changes such as decentralization and human well-being.

Table 1: Percentage Change in Infant Mortality in the Parent and New States

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Uttar Pradesh (parent state)</td>
<td>14%</td>
<td>26%</td>
<td></td>
</tr>
<tr>
<td>Uttarakhand (new state)</td>
<td>-</td>
<td>20%</td>
<td></td>
</tr>
<tr>
<td>Madhya Pradesh (parent state)</td>
<td>26%</td>
<td>27%</td>
<td></td>
</tr>
<tr>
<td>Chhattisgarh (new state)</td>
<td>-</td>
<td>33%</td>
<td></td>
</tr>
<tr>
<td>Bihar (parent state)</td>
<td>10%</td>
<td>22%</td>
<td></td>
</tr>
<tr>
<td>Jharkhand (new state)</td>
<td>-</td>
<td>32%</td>
<td></td>
</tr>
</tbody>
</table>

Table 2: Effect of Decentralization on Infant Mortality

<table>
<thead>
<tr>
<th></th>
<th>Model (1)</th>
<th>Model (2)</th>
<th>Model (3)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(log) Total Infant Mortality</td>
<td>(log) Urban Infant Mortality</td>
<td>(log) Rural Infant Mortality</td>
</tr>
<tr>
<td>L. Decentralization</td>
<td>-0.377***</td>
<td>-0.258**</td>
<td>-0.366***</td>
</tr>
<tr>
<td></td>
<td>(0.105)</td>
<td>(0.115)</td>
<td>(0.104)</td>
</tr>
<tr>
<td>L. (log) Population</td>
<td>0.104**</td>
<td>0.222***</td>
<td>0.0484</td>
</tr>
<tr>
<td></td>
<td>(0.052)</td>
<td>(0.061)</td>
<td>(0.052)</td>
</tr>
<tr>
<td>L. (log) SDP pc</td>
<td>-0.116</td>
<td>-0.0489</td>
<td>-0.151*</td>
</tr>
<tr>
<td></td>
<td>(0.075)</td>
<td>(0.104)</td>
<td>(0.084)</td>
</tr>
<tr>
<td>L. Centre Grants</td>
<td>-1.89e-05**</td>
<td>-2.58e-05**</td>
<td>-1.85e-05**</td>
</tr>
<tr>
<td></td>
<td>(8.86e-06)</td>
<td>(1.30e-05)</td>
<td>(9.01e-06)</td>
</tr>
<tr>
<td>Constant</td>
<td>5.178***</td>
<td>3.655***</td>
<td>5.787***</td>
</tr>
<tr>
<td></td>
<td>(0.783)</td>
<td>(1.058)</td>
<td>(0.863)</td>
</tr>
</tbody>
</table>

Observations: 108 108 108
R-squared: 0.980 0.957 0.979
Number of States: 6 6 6

Note: Standard errors in parentheses: *** p<0.01, ** p<0.05, *p<0.1
Concluding Remarks

Research on institutional engineering has carved a niche for itself in comparative politics. Various institutional alternatives are available with governments to organize their polities (Norris 2004; Lijphart 2012). Political institutions have important ramifications for a range of political outcomes since they influence the distribution of power among political agents. Indeed, a growing body of research assesses the implications of political institutions on welfare outcomes (Gerring et al. 2005; Gerring et al. 2009; Lijphart 2012). Adopting a similar approach, this research note calls for a new research agenda to analyze the relationship between decentralization and human well-being in a more systematic manner to provide a better understanding of the consequences of decentralization, which especially needs to be pursued in the light of increasing demands for greater decentralization. Not only should future research identify whether decentralization matters but also determine how it may affect human well-being. This line of research will help bring more clarity to the relationship between decentralization and societal welfare. After all, the utility of political institutions should be determined by how well they serve the interests of the populace.

This research note also provides preliminary assessment of the consequences of decentralization on infant mortality among the decentralized regions in India. The federal makeup of the Indian polity has evolved over the years to accommodate the varied demands within the country and similar demands for autonomy among Indian regions still persist. For instance, some of the outstanding demands for separate statehood include the creation of Coorg in Karnataka, Saurashtra in Gujarat, Vidarbha in Maharashtra, among others (Kumar 2010). However, several considerations have to be borne in mind before granting separate statehood to each of these regions. How should the federal government determine which of these regions need to be granted greater autonomy? Is it economically and politically viable to further decentralize authority by creating additional states from already existing states? While these lingering questions are beyond the scope of this paper, they do indicate the complexity of the issue often encountered by federal governments. Future research can and should pursue this line of research.

Broadly speaking, this research agenda will contribute to the literature on political institutions by helping us understand the effect of institutional changes on societal welfare. The policy implications of this research agenda will also be of significance, as it will provide insight to national governments about the potential consequences of granting greater autonomy. This is an important consideration for governments before adopting or changing the institutional make-up of a society.

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Best Practices or Marketing Hype? A Content Analysis of Cosmetic Surgery Websites’ Procedural, Risk and Benefit Information

J. Robyn Goodman, University of Florida

Introduction

Over the past 10 years, cosmetic and minimally invasive procedures have grown more than 200% (ASPS 2010). Research shows the majority of potential patients seek their information online and say it influenced their decision-making (e.g., Babakus et al. 1991). Paralleling these phenomena are cosmetic surgeons’ successful marketing; 40% of women cite surgeons’ advertising as their main information source (e.g., Babakus et al. 1991).

Yet these aggressive marketing practices are disconcerting. Any licensed physician may perform cosmetic surgery, only 62% of physicians performing cosmetic surgery are board certified in plastic surgery, and some advertise themselves as “board certified” despite no plastic surgery training (Babakus et al. 1991; Sullivan 2001). Risks are rarely mentioned in cosmetic surgery marketing (e.g., Sullivan 2001) despite its risks of complications and disfigurement (e.g., Perry 2007).

Literature Review

Few studies have looked at cosmetic surgery websites, particularly procedural and risks/benefit information. They have found sites lacked procedural information, complication information, and post-operative care information (Nassab et al. 2010, 2011). Other studies have looked at content accuracy and found many provided inaccurate or misleading information most often concerning procedural details, complications and benefits (Jejurikar et al. 2002), two thirds did not mention the information provider’s credentials, and the majority focused on benefits (Parikh et al. 2006).

Relative Risks of Procedures

Board-certified plastic surgeons’ death rates are three times less than for non-board-certified physicians such as dermatologists or internal medicine (Perry 2007). Although all risks are influenced by surgeon qualifications, each has its own risk. The two riskiest procedures are abdominoplasty and breast augmentation. Abdominoplasty and breast augmentation complication rates range between 20% and 30% (Perry 2007; Cunningham et al. 2000).

Because rhinoplasty has the highest revision rate (15%) and is the most complicated to perform but its complication rate is lower (5-8%), it is considered moderate risk (e.g., Perry 2007; Neaman et al. 2013). Blepharoplasty and liposuction carry lower complication rates (9%) and complications tend to be non-serious making it low risk (e.g., Neaman et al. 2013).

Theoretical Model

Because cosmetic surgery is elective; emotions, others’ feelings, and reason play into the decision; and the act itself is a health-related behavior, the present study frames its work within the enhanced version of the Theory of Planned Behavior (TPB) (Fishbein, 2000) developed by Moser and Aiken (2011), who studied breast augmentation motivations and integrated it into the TPB. Moser and Aiken (2011) added several variables including: anticipated regret (i.e., presuming potential negative consequences for a behavior), descriptive norms (others actually engage in the behavior), image norms (beauty norms established by aspirational peers), and a two-phase cycle of intentions to behavior and preparatory steps toward the behavior (42, 45). It further included two aspects assumed to predict regret—perceived susceptibility and perceived severity.

Method

The present study content analyzed 90 separate websites based on the top 5 cosmetic surgical procedures—breast augmentation, rhinoplasty, abdomino-plasty, blepharoplasty, and liposuction (ASPS 2013). Specific coding topics were procedural information and amount and content of risk/complication and benefit information. The final list of coded pages included 32 breast augmentation, 36 rhinoplasty, 26 blepharoplasty, 30 liposuction, and 30 abdominoplasty (n=154).

Results

Ninety-four percent had procedure overviews; however, more specific information was less frequent (54% length of
surgery, 58% location of surgery, 66% recovery time, and 38% post-surgery appearance).

Forty-eight percent mentioned benefits with rhinoplasty pages the least likely to mention a benefit (56%) and blepharoplasty pages the most (35%). The most frequently mentioned benefits were enhance appearance (27%), enhance body shape (21%), enhance self-image (19%), and restore appearance (17%). Thus, sites were more likely to focus on the physical body rather than mental states or influencing one’s life.

Two-thirds of the pages had risk information. The most frequent were blood issues (59%), infection (51%), fluid issues (48%) and skin/tissue issues (47%). Liposuction (Mranking = 1.9) mentioned risks most often and rhinoplasty mentioned them the least (Mranking = 3.6).

Only 44% of all procedure pages mentioned candidate screening (i.e., what makes a good candidate), with blepharoplasty (58%) and rhinoplasty (56%) the least likely to mention screening. The most common screening items mentioned were: good physical health (37%), realistic expectations (36%), goal is to improve appearance only (25%), and the candidate’s desired surgery was appropriate for their age (23%).

Overall, there were few differences found among procedure types and the specific procedure, risk, and benefit information. Moreover, differences did not appear to be related to the rate of complication for the individual procedures.

Based on the findings, a theoretical model extension was proposed. Although the modified version of TPB helped predict breast augmentation surgery (Moser & Aiken 2011), knowledge itself was lacking from the model. Because studies provide evidence that knowledge is part of behavior decision-making process (e.g., Kroshus et al. 2014), this paper incorporated it and added the affective heuristic (Slovic et al., 2005).

Discussion

This study’s purpose was to examine the procedural, risk and benefit information on cosmetic surgery websites. Because cosmetic surgery is a health-related decision that is influenced by one’s emotions, cognitions, and important others’ feelings about the surgery, the extended TPB model provided a good theoretical framework for exploring cosmetic surgery websites’ information and its potential influence. This study’s findings are particularly relevant for the medical industry, potential patients, and scholars because of the increasing popularity of cosmetic surgery (ASAPS, 2011), cosmetic surgery is elective yet poses potential health risks (e.g., Perry 2007), websites seem to influence patient decisions yet are marketing tools for the industry, and the majority of patients get most of their information from the Internet (Babakus et al., 1991).

References


The Use of Social Media Platforms by Pharmaceutical Companies for Direct-to-Consumer Prescription Advertising

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Megan Minehart, The University of Findlay
Kailey Stough, The University of Findlay
Kelly Wilder, The University of Findlay
Brent Rollins, Philadelphia College of Osteopathic Medicine

Abstract

Increasing use of social media by consumers has introduced a new outlet for pharmaceutical companies to possibly promote their products. Presently, little published research, and only one primary study from a content analysis perspective, has examined industry practices regarding the use of social media for direct-to-consumer prescription advertising (DTCA). The purpose of this study was to assess the prevalence of DTCA via various social media platforms by the top 20 pharmaceutical companies and for the top 20 prescription products of 2012, and compare those results to previous research. Several differences were found regarding social media usage for the various companies and products in the current research compared to previous research, as overall companies are using a different mix of social media sites with no product specific social media usage during the time of the research. Overall, pharmaceutical companies altered their strategies prior to the Food and Drug Administration’s (FDA) release of its recent social media guidance documents and will continue to alter their presence in this ever-changing media realm.
Exploring the Quantification of Self Phenomenon in Health and Fitness: The “Perfect Storm” of Technology, Personal Well-being and Social Media Sharing

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George R. Milne, University of Massachusetts-Amherst
Ari Wigdor, University of Massachusetts-Amherst

Abstract
The quantification of self in the area of personal health and fitness is growing rapidly. However, little scholarly work has been done in this area. This research provides an initial exploration into this phenomenon, utilizing a quantitative survey of 394 undergraduates as well as a review of relevant commentary on popular discussion websites. Our purpose is to measure the prevalence of this activity, identify behaviors being tracked, understand the social sharing component, and explore differences by gender. We also examine the perceived benefits of fitness quantification, as expressed by users, which appear to be centered around increased motivation, improved self-awareness and amplified enjoyment. Our analysis also finds a significant correlation between one’s propensity to share quantification of self results with one’s overall “need to belong.” We also uncover a strong attraction to technology that users of biometric devices exhibit, differentiating them from fitness quantifiers who rely on apps only.

“When you can measure what you are speaking about and express it in numbers, you know something about it; but when you can’t express it in numbers, your knowledge is of a meager and unsatisfactory kind.” Lord William Kelvin (1824 – 1907)

Introduction
A “perfect storm” is underway in the American marketplace, resulting from the convergence of three powerful current trends: 1) the turning to technology as personal assistant, 2) a focus on personal wellness (among a subset of Americans) and 3) the relentless pursuit of web-based social sharing. The result of this convergence is the quantification of self in the area of health and fitness. Quantification of self, also called life-logging, is the practice of collecting, via technology, significant amounts of data regarding one’s daily behaviors. Currently, the technology used for this includes smartphone apps, websites and biometric devices, most commonly in the form of high tech wristbands (complete list of biometric products in Appendix A). These technological tools allow for the tracking of, among other things, every step one takes, every push-up one does, every hour one sleeps, and every calorie one consumes. Further, this technology allows these results to be easily shared with countless others via social apps and shared websites.

Introduction
While not effecting all consumers, this perfect storm is having a profound effect on a sub-segment of consumers who are comfortable with technology, are motivated (to some degree) to pursue a healthy lifestyle, and for some, have a desire to do this in a social context. For many, this quantification of self has been truly revolutionary. As one consumer recently wrote in an online discussion forum regarding his biometric fitness device (Fitbit), “The Fitbit is
AMAZING for motivation! The trophies you earn for achievements are the best. One day I came home and saw that I made it to 19,000 steps in one day, and I was so excited to get my 20,000 steps badge that I stripped off my work clothes, threw on my workout gear and my running shoes, and booked it out the door for a 10 minute jog.” (Reddit.com, downloaded Oct 2014) For many, this new quantification technology has become an indispensable part of their lives.

A better understanding of quantification of self in health and fitness is important for several reasons. First, as we will show, it is growing significantly in size and scope, and has become a key lifestyle aspect for a critical mass of consumers. Second, there are significant implications for the technology industry, as this phenomenon provides substantial opportunities for new products and services. Third, for many individuals this approach appears to be an effective way to increase their motivation and enjoyment regarding personal health and fitness. As a result, there are important implications for the health care industry and American society as a whole, which is struggling with obesity and other diseases (notably diabetes, hypertension, coronary heart disease and stroke) which result – at least in part - from a failure of personal fitness (World Health Organization 2014).

To date, little scholarly work has been done on the quantification of self in health and fitness. As Casey et al. write, “There is a paucity of data in relation to patients’ views and experiences of using mobile phones and, in particular, apps for the promotion of physical activity.” (Casey et al. 2014). The purpose of this paper is to provide an initial exploration of this growing phenomenon, to offer a “lay of the land” as a starting point for hypothesis generation and future research. To that end, this paper seeks to measure the prevalence of this phenomenon, identify the sub-areas of personal health in which it is most predominant, and gauge the usage of apps/websites vs biometric devices. We capture preliminary insights into the rationale for the quantification of self in health and fitness – what particular benefits do users perceive that they derive from this activity? Further, we explore the social side of this phenomenon – understanding the prevalence of and motivations for the social sharing of personal quantification information. Finally, we test broader concepts involving general attitudes toward technology and one’s need to belong in an attempt to build the beginnings of a theoretical model around this quantification of self activity.

Literature Review

Much of the literature on motivation in health and fitness is grounded in self-determination theory. Self-determination theory (SDT) is a general motivation theory which argues that human behavior is driven by three primary psychological needs: 1) autonomy - people’s efforts to originate their own actions and determine their own behavior (internal locus of causality), 2) competence - people’s desire to attain mastery, and 3) relatedness - efforts made to relate to others, as well as feel accepted by others and integrated into society (Deci and Ryan 1980; 1985; 1991). Research suggests this theory is a useful lens for understanding health and fitness motivation (Vallerand and Rousseau 2001; Murcia et. al. 2008).

We believe two findings from the SDT literature are highly relevant to quantification of self activities in health and fitness. First, setting specific personal goals, and then achieving them, is highly motivational, according to SDT theory (Murcia et al. 2008). This intrinsic benefit taps into the core psychological needs of autonomy and competence. Second, research has shown that a positive peer group and related social interactions around fitness help an individual better attain all three core psychological needs described in SDT - autonomy, competence, relatedness (Wetzel 1999; Vazou et al. 2006; Murcia et al. 2008). It is important to note that autonomy in the SDT model does not mean isolation but rather the sense that an individual is in charge of his/her own outcomes. Research suggests that a robust peer network organized around fitness improves the enjoyment and accomplishment one feels when exercising, and leads to better fitness outcomes – particularly when the peer network is focused on “cooperation, effort and personal improvement” (Murcia et al. 2008).

Turning specifically to the quantification of self in health and fitness, a review of the literature uncovered limited scholarly work on the topic from the user/consumer perspective. A fair amount of content analysis research has been conducted, examining the content of health and fitness apps and judging the content against theoretical standards (for example, see Cowan et al. 2012). However, when it comes to research on user behavior and perspective, a systemic review published in 2013 found only two published studies on the impact of smart phone apps on users’ physical activity and weight, and both were small sample studies (with 40 or fewer people) and both were conducted outside the United States – in Switzerland and South Korea (Stephens and Allen 2013). In 2014, a British study was published comparing results of a group of

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average-health adults given an exercise smartphone app versus a control group who lacked the app. Both groups were given information about the benefits of exercise and specific exercise goals to meet. Individuals with access to the smartphone app were significantly more likely to reach their goals, and voiced significantly more favorably views of the exercise experience (Casey et al. 2014). We found no scholarly research on consumer use and experiences with biometric devices.

Looking at market data, the quantification of self in the area of health and fitness is already a large phenomenon that industry analysts believe will get even larger. In the US during the 12 month period from April 2013 and March 2014, 3.3 million biometric fitness trackers (generally wristbands and clips) were sold, representing $298 million in sales. This is up from $48 million the previous year, beating analyst expectations (Temple 2014). Sales in this category are expected to grow at about 500% annually (Temple 2014). Globally, downloads of fitness and sports smart phone apps are expected to rise from 156 million in 2012 to 248 million in 2017 (Heussner 2013). Given the size and rapid growth of this phenomenon, combined with the limited research on the topic, we feel our exploratory study will provide a valuable lay of the land for the research community.

**Research Method**

Our research consisted of a quantitative survey to capture the size and scope of the “quantification of self” movement in health and fitness among university students, followed by an in-depth review of popular chat forums and discussion sites on the internet to better understand the motivations and mindsets behind the phenomenon.

**Quantitative Survey**

An online survey of 394 undergraduates enrolled in business courses at UMASS Amherst was conducted in September 2014 (225 men, 168 women, 1 gender non-identifying), as part of course credit. The survey asked respondents whether or not they participated in any of the following activities: 1) exercise, 2) keeping track of their eating/calories, 3) keeping track of their weight, 4) keeping track of their mood, and 5) keeping track of other body metrics (heart rate, blood glucose, blood pressure, blood oxygen, respiratory rate). These five areas were selected after a product review of leading apps and biometric devices suggested these were the most common areas for quantification of self activities. For each of the five areas in which respondents said they regularly participated in the activity, they were then asked: 1) did they use an app, website or biometric device to help them keep track of the activity and 2) did they ever share these results with others via a shared website or social app. Additional attitudinal and demographic questions were also asked and will be discussed in the results section of this paper.

**Review of Internet Discussions**

In October 2014, we conducted an in-depth content review of several popular chat rooms and online discussion sites regarding the quantification of self in the area of fitness. While this type of review is not meant to supply an exhaustive understanding of consumer motivations in this area, it does offer rich insights into how those who are active online express their motivations and perspectives. A review of relevant comments was undertaken on popular microblogging and discussion sites including reddit.com, tumblr.com, facebook.com, amazon.com (product commentaries from users), and a selection of blogs. Again, we do not suggest that this methodology offers the final say on consumer motivation in fitness quantification, but it does offer rich insight into the vigorous online conversation taking place among active users, and how they describe their rationale for their activities.

**Study Results**

**Prevalence of “Quantification of Self” and Most Common Pursuits**

The survey revealed that quantification of self activities are quite widespread among undergraduate students. Among our sample of undergraduates, fully 4 in 10 (40.1%) were doing some regular quantification of self – meaning used an app, website and/or biometric device to regularly track their activities in at least one of the five areas tested. For simplicity, we will call this group “fitness quantifiers.” Exercise tracking was, by far, the most common area for quantification, followed fairly distantly by diet tracking and weight tracking.

As shown in Table 1, 33.5% of undergraduates are regularly tracking their exercise activity via an app, website or biometric device. This is twice the level of the next most common area, diet/calorie tracking. Not surprisingly, the tracking of body metrics such as heart rate and blood glucose show the greatest reliance on technology, 44.4% of those who track these metrics use an app, website or biometric device to do so. However, only a small portion of undergrads (11.4%) track these body metrics at all (as a
result 44.4% of 11.4% gives us a result of only 5.1% among the total sample).

Table 1: Incidence of Quantification of Self Activities 
(n = 394)

<table>
<thead>
<tr>
<th>Activity</th>
<th>% of total sample who regularly use an app, website and/or biometric device to track this activity</th>
<th>% of total sample who regularly do this activity at all (regardless of if they use any technology to track it)</th>
<th>% of those who do this activity who regularly track it via an app, website or biometric device</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exercise*</td>
<td>33.5%</td>
<td>96.7%</td>
<td>34.6%</td>
</tr>
<tr>
<td>Diet/calorie tracking</td>
<td>16.2%</td>
<td>48.2%</td>
<td>33.7%</td>
</tr>
<tr>
<td>Weight tracking</td>
<td>12.7%</td>
<td>67.0%</td>
<td>18.9%</td>
</tr>
<tr>
<td>Other body metric tracking</td>
<td>5.1%</td>
<td>11.4%</td>
<td>44.4%</td>
</tr>
<tr>
<td>Mood tracking</td>
<td>3.0%</td>
<td>25.4%</td>
<td>12.0%</td>
</tr>
</tbody>
</table>

Note: column 2 * column 3 = column 1

*Exercise was broadly defined as “Do you do any sort of exercise – such as running, jogging, biking, power-walking, weight lifting or any fitness activity?”

Looking at the top three activity areas -- exercise, diet and weight tracking -- the use of apps/websites is much more common that the use of biometric devices (see table 2). Across all three areas, over two-thirds of fitness quantifiers use only an app/website for their tracking, the remainder either use both an app/website and biometric device or a biometric device only (most biometric devices come with a smartphone app accompaniment). Later in this paper, we’ll take a closer look at the biometric users in particular.

Table 2: Use of Apps/Websites and/or Biometric Devices for Quantification of Self

<table>
<thead>
<tr>
<th>Activity</th>
<th>Use app/website only %</th>
<th>Use biometric device only %</th>
<th>Use BOTH app/website and biometric device %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exercise</td>
<td>71%</td>
<td>14%</td>
<td>15%</td>
</tr>
<tr>
<td>Diet/calories</td>
<td>73%</td>
<td>0%</td>
<td>27%</td>
</tr>
<tr>
<td>Weight</td>
<td>68%</td>
<td>20%</td>
<td>12%</td>
</tr>
</tbody>
</table>

Note: results for the tracking of other body metrics and mood/stress not shown due to small samples for those activities (n = 20 and 12, respectively)

A comparison of men and women shows that overall quantification of self activity is more prevalent among female undergrads than male undergrads: 46.4% of female undergrads are doing some degree of quantification of self, versus only 35.6% of men (Pearson chi-square = 0.067, statistically significant at the 90% confidence level).

Looking at the five activities, female undergraduates are significantly more likely than their male counterparts to be quantifying their activity in the areas of diet/calories and weight. On the other three areas, there are no statistically significant gender differences (see table 3).
Table 3: Differences Between Men and Women in Quantification of Self Activities

<table>
<thead>
<tr>
<th>Activity</th>
<th>Among all men (n = 225) %</th>
<th>Among all women (n = 169) %</th>
<th>Pearson chi-square (significance level)</th>
</tr>
</thead>
<tbody>
<tr>
<td>% who use an app, website or biometric device to track exercise</td>
<td>32.0%</td>
<td>35.7%</td>
<td>.577</td>
</tr>
<tr>
<td>% who use an app, website or biometric device to track diet/calories</td>
<td>9.3%</td>
<td>25.6%**</td>
<td>.000</td>
</tr>
<tr>
<td>% who use an app, website or biometric device to track weight</td>
<td>6.7%</td>
<td>20.8%**</td>
<td>.000</td>
</tr>
<tr>
<td>% who use an app, website or biometric device to track other body metrics</td>
<td>4.0%</td>
<td>6.5%</td>
<td>.509</td>
</tr>
<tr>
<td>% who use an app, website or biometric device to track mood/stress</td>
<td>1.8%</td>
<td>4.8%</td>
<td>.231</td>
</tr>
</tbody>
</table>

**Significantly larger at the 99% confidence level

Table 4: Sharing of Quantification of Self Activities

<table>
<thead>
<tr>
<th>Activity</th>
<th>% of those who track their activity via app/website or biometric device who also SHARE their results with others via shared websites or social apps</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tracking weight (n = 50)</td>
<td>58.0%</td>
</tr>
<tr>
<td>Tracking exercise (n = 132)</td>
<td>46.2%</td>
</tr>
<tr>
<td>Tracking diet/calories (n = 64)</td>
<td>43.8%</td>
</tr>
</tbody>
</table>

Note: sample too small to analyze mood/stress tracking and other body metric tracking on this metric

Interestingly, there are no significant differences between men and women on their propensity to share their quantification of self activities.

The Social Aspect

Roughly half (50.6%) of the undergraduates who are pursuing the quantification of self activities discussed above are doing so in a social manner — meaning they share their results with others via social apps and shared websites. This translates to 20.3% of the entire sample of undergraduate students who are fitness quantifiers and doing so in a social manner. Many apps and websites encourage the sharing of results — allowing users to regularly communicate results with others to foster inter-person competition (for example, to see who in the group can walk the most miles in a week) or to set communal goals for the team (for example, to see if the team as a whole can lose 20 pounds in a week). As we will discuss below, for many people this social aspect adds additional motivation and camaraderie that they perceive to be highly beneficial in helping them meet their personal fitness goals. As table 4 shows, the sharing of results is most common in the area of weight tracking — with almost 6 in 10 who track their weight via an app, website or biometric device also share those results regularly with others via a shared website or social app.
person.” (see table 5). These results suggest that a propensity to share one’s quantified fitness data via shared websites and social apps aligns closely with a respondent’s overall attraction to social media, as well as their desire to be an active part of – i.e. “belonging to” – a social group.

Table 5: Preference for Sharing Quant Results Correlated with General Social Attitudes
(n = 394)

<table>
<thead>
<tr>
<th>Preference for Sharing Quant Results</th>
<th>Propensity to share quantification of self results via social apps and shared websites correlated with …</th>
</tr>
</thead>
</table>
| “I have a strong need to belong”    | Pearson correlation: 0.10 *  
| (agree/disagree on 1 to 5 scale)    | Significance (2 tailed): 0.05                                                                 |
| “I often have more fun communicating with people on social media that I do talking with them in person” | Pearson correlation: 0.15 **  
| (agree/disagree on 1 to 5 scale)    | Significance (2 tailed): 0.003                                                                 |

* significant at the 95% confidence level  ** significant at the 99% confidence level

Note: propensity to share scale is 0 to 5, with 0 meaning the respondent does not share quant results on any of the 5 tested areas, and a 5 meaning the respondent shares quant results on all 5 activities included in the study. Respondents could only respond to the sharing question if they quantitatively tracked their activities in the area.

Perceived Benefits of Quantification of Self Activities for Health and Fitness

Exercise and fitness activities have been around since at least ancient times. It was Hippocrates who stated, “If we could give every individual the right amount of nourishment and exercise, not too little and not too much, we would have found the safest way to health.” After all these centuries of exercise and fitness, what is it about a quantification of self approach that seems to offer something new and significant to its users? A review of comments from people who are quantifying their fitness activities, as posted to popular discussion websites, gives us some ideas to consider.

Perceived Benefit #1: Seeing Precise Numbers and Setting Specific Goals Increases Motivation. A common theme in the web postings is that the precise numbers supplied in quantified tracking, combined with the setting of specific quantitative goals, helps motivate users to exercise more than they would without this information. There appears to be motivational power in tracking precise numbers which represent one’s fitness activities, and in response setting precise goals to push them even higher. Having a device or app that offers this additional level of precision is perceived by many users to hold them more accountable.

“If you're able to set goals and stick to them, it [Fitbit] really does help. I have days where I get home from work and I'm a few thousand steps short of my daily goal, and I'll go walk on the treadmill until I get there. Otherwise I'd probably just flop on the couch for the night.” Reddit.com - downloaded Oct 2014

“I love my Fitbit Flex! Nothing has ever kept me more motivated... I love that I never have to take it off. I love the food tracking capabilities as well. I have an office job and I have gone from 3 thousand steps a day to an average of 12 thousand!!!! WOW!”

Amazon.com, user review - downloaded Oct 2014

“I bought the Flex in August and really like it. It is easy to set up and use and I have lost 25 pounds so far by trying to achieve the steps per day. I like that it holds me accountable.” Amazon.com - downloaded Oct 2014

For many users, the specific numbers give them a sense of accomplishment that they believe they would not otherwise attain.

“When I wear my Fuelband and see I’ve not hit my goal it makes me want to get up and do something, gives me a sense of achievement when I do!”

Tumblr.com - downloaded Oct 2014

“I have also mentioned on my blog the My Fitness Pal app a lot, and how much it has SAVED me during this journey. I log every single day, even on horrible eating days. But I truly believe counting calories and seeing the ups and downs of my eating has helped. Not to mention seeing the 'In 5 weeks you'll weigh...' estimation makes me want to stay on track and push
These comments align with self-determination theory as discussed earlier, which posits that setting and achieving personal goals is a powerful motivator. The quantification of self technology allows these goals to be precisely measured and ultimately shown back to the user “in black and white” in essence handing users a visible reward.

**Perceived Benefit #2: Serves As An Effective Reminder.** The apps and biometric devices are powerful reminders to exercise, particularly useful in today’s hectic and time-pressured society. Apps have features that send reminder texts to users, while biometric devices can be worn all the time and hence are visual reminders (and they too have app features that can send reminders). Many users say they appreciate, even need, this technical “nagging.”

“I like [the Fitbit]. It’s not perfect, but it’s a good reminder to get moving. …. I paid good money to annoy myself with this darn bracelet, so I’m gonna use it!” Reddit.com - downloaded Oct 2014

“My wife and I both have Fitbits and we love them. They are great reminders to be more active when you aren’t working out…I had been struggling to lose weight for a year, but I got my Fitbit and started trying to hit the steps goal and I quickly lost 15 pounds. It just helped me be less sedentary.” Reddit.com - downloaded Oct 2014

**Perceived Benefit #3: Quantifying Oneself Helps Make One More Self Aware.** Many users of fitness apps and biometric devices say they have learned a great deal, and have become much more self aware, from the quantification process. They did not before know how many calories they burned doing various activities; or how many steps they take in a typical day. Quantifying everything with technological assistance helped open their eyes and broadened their fitness expertise.

“I love my Flex. Absolutely am in love with it. … It has honestly helped me realize the change in calories burnt day to day, so I can adjust my food intake accordingly.” Reddit.com - downloaded Oct 2014

“I really love my Fitbit Flex. It’s so nice to see how much I walk. Apparently your [sic] supposed to walk 10,000 steps a day. It didn’t sound like a lot till today, at 3pm I saw I only walked 2,000 steps. I would have sat around all day and not have exercised if I didn’t see this. Thank you Fitbit!” Tumblr.com - downloaded Oct 2014

“I have the Fitbit One and I love it! I really had no concept of how little I moved on my normal workday until I got one. It’s really helped motivate me to walk more at lunch, take the stairs, and get enough sleep. No more lying to myself…” Reddit.com - downloaded Oct 2014

**Perceived Benefit #4: The Social Aspect Adds To The Motivation And Also Enjoyment Of Fitness Via Camaraderie.** Many users in their web postings say they find great value in the social aspect of quantification of self. They enjoy sharing their results with friends, competing with friends, or using their friends’ progress for their own motivation. Quantified results enable more meaningful communicating and competition, since it offers such specificity. People have long joined gyms in part for the social aspect, or found others with whom to jog or walk. However, increasingly in our mobile and hectic society we are geographically separated from our friends or have divergent schedules that make exercising together difficult. The quantification technology overcomes these barriers of time and space and can link us virtually with anyone we want.

“The thing I love most about Fitocracy is that from the second you join, you feel welcome. I guess all the little ways you word things differently helps, but it’s so great that we can all give each other props and make each other feel good… It’s better than most gyms” Reddit.com - downloaded Oct 2014

“As it turns out, the Jawbone’s ability to track steps has become a huge part of my life, and changed my activity levels for the better. The social aspect of the Jawbone app is motivating and entertaining…When any of my friends hits 10,000, I submit to them happy emoticon through the app. If they fall under their goal, I either ignore it or give them the unhappy face (I do the same for their sleep). I like knowing my friends can see my steps because it provides greater motivation to be awesome. My friend Ellen gets 30,000 steps all the time, so that motivates me. And I want to impress my friends!” BLOG -
Many users feel there is a true sense of community that is developed via the sharing of quantification results. This community gives these users a sense of belonging, which spurs them on to achieve higher fitness goals. Interestingly, this sharing is done with both small groups of friends as well as larger online communities – and both are seen as positive support groups.

“Fitocracy is pretty much responsible for me getting into running, which changed my life. MyFitnessPal helped with weight loss more, but Fito’s amazing community members kept me going. Hundreds of miles down, 40 pounds and 8 pants sizes later; I still strive to log something every day” – Reddit.com - downloaded Oct 2014

“The Fitbit website does a great job of showing you your data, but more importantly there’s a real community of people (full sub-groups) sharing their progress, their stories, their daily numbers and cheering each other on. You don’t need to participate, but if you choose to it’s really nice.” – Reddit.com - downloaded Oct 2014

These comments align with self-determination theory, which argues that building a social peer network around one’s health and fitness activities makes the activity more enjoyable and as a result is highly motivating. The social features in the quantification technology makes this eminently possible.

In all the online discussions and commentary we reviewed, the only prevalent negative theme is that users desire better quality in the biometric devices. They have come to appreciate and rely on them so much that they want them to last longer and be more durable. Otherwise, we saw little evidence of negative feelings associated with the quantification of self in the area of fitness, at least among the online discussions taking place.

**The Biometric User Sub-Segment**

As stated earlier, 40.1% of our undergraduate sample are “fitness quantifiers” – meaning they regularly undertaking quantification of self activities in at least one of the five areas covered in the study. 37.3% of fitness quantifiers – or 15.0% of the entire sample – use a biometric device for these activities (often in association with an app). There are numerous biometric devices available in the US for fitness and health tracking, they generally take the form of a wristband or a clip that attaches to one’s clothing. Currently, Fitbit dominates the biometric device market with 67% market share (Temple 2014). It offers a variety of wristbands (Fitbit Flex, Fitbit Force) as well as clip devices (Fitbit Zip and Fitbit One) (Complete list of products available in Appendix A). In our sample, women were more likely than men to be using a biometric device: 19.6% among all women in the sample used a biometric device, versus 11.6% for men (difference is significant at the 90% confidence level, Pearson chi-square of .077).

Biometric device users stand out as showing a particularly strong affinity to technology – making them distinct from the general sample of undergraduates as well as distinct from fitness quantifiers who use only apps/websites. We included a technology attitudinal scale in the study, from recent work done by Rosen et al. (Rosen et al. 2013). The scale includes 16 items measuring the respondent’s positive/negative attitudes towards and anxiety/dependence on technology (Cronbach’s alpha = 0.77; see Appendix C for list of items). The propensity to use a biometric device shows a statistically significant correlation with a positive attitude towards (and dependence on) technology (see table 6). Interestingly, there is no significant correlation between all fitness quantifiers and this technology scale. Only biometric device users show this strong affinity towards technology.

<table>
<thead>
<tr>
<th>Preference for Sharing Quant Results Correlated with Technology Scale</th>
<th>Propensity to use a biometric device for fitness tracking …</th>
</tr>
</thead>
<tbody>
<tr>
<td>Technology scale (16 items summed)</td>
<td>Pearson correlation: 0.113 **</td>
</tr>
<tr>
<td></td>
<td>Significance (2 tailed): 0.027</td>
</tr>
</tbody>
</table>

**significant at the 95% confidence level**

Note: propensity to use a biometric device is 0 to 5, with 0 meaning the respondent does not use a biometric device in any of the five areas tested at all, and a 5 meaning the respondent uses a biometric device in all 5 activities.

**Conclusions**

This paper is an initial exploration of the quantification of self phenomenon in the area of health and fitness. As an exploratory study, there are limitations, such as a student sample that restricts generalizability. Also, our analysis of
relevant discussions on social media is limited to individuals who share information on such sites, and also reflects only what these individuals are willing to disclose publicly. Despite these limitations, much was learned regarding this important consumer phenomenon. Our research suggests that the quantification of self in health and fitness among college students is widespread, with 40% of undergraduates regularly using an app/website or biometric device to do so. Exercise tracking is the most common area for this activity, followed by diet and weight tracking. Fitness quantification is more prevalent among women than men, driven by women’s higher involvement in diet and weight quantification. Interestingly, the genders are equal on exercise tracking.

About two-thirds of health and fitness quantifiers use apps/websites only, while about one third use biometric devices (often in conjunction with an app). Biometric device users appear to be a unique subset among health and fitness quantifiers, due to their distinctively strong technology orientation. Further, our research suggests that the social aspect of health and fitness quantification is significant, with roughly half of undergraduate fitness quantifiers regularly sharing results with others via social apps and shared websites. Weight tracking is the most socially shared area, followed by exercise. Somewhat surprising to us, there is no significant difference between the genders on the propensity to share their quantification activity. Our research suggests that the inclination to share one’s quantification of self data aligns closely with an individual’s overall attraction to social media as well as their general desire to have a sense of group belonging.

We also uncovered what users perceive to be the core benefits of their quantification activities. The personal statistics generated by the apps and biometric devices are seen by users as increasing motivation and goal attainment via the greater specificity of results provided, which aligns with the goal setting and achievement aspect of Self Determination Theory. The apps and devices also serve as effective reminders, due to their prompting features. The quantification approach also makes practitioners far more self-aware and knowledgeable about their daily behaviors and their distance from desired goals, providing them the information they say they need to optimally adapt their daily habits. Finally, according to users, the social aspect significantly increases motivation and enjoyment derived from health and fitness pursuits, by providing a sense of community and support – which also aligns well with Self Determination Theory.

Our exploratory study suggests several directions for future research. The social aspect of this phenomenon is intriguing, further investigation can examine the differing effects of supportive sharing (team approach) versus more competitive sharing, as well as the different effects of sharing among smaller groups of friends versus broader sharing with larger online communities. The fact that biometric device users stand out as particularly tech-oriented is worthy of further exploration. Is there a “tech barrier” that is keeping individuals who are less tech-oriented from utilizing these devices, and if so how can it be overcome?

Future research can also examine how technological platforms interact with psychological processes to improve fitness motivation and behaviors. In addition, further research can examine how the interfaces and the representation of the data can best be structured to help users most effectively make health and wellbeing improvements. Additional research such as this might assist in expanding the use of this helpful technology to an even broader audience – such as older or more sedentary individuals. Improving and expanding the quantification of self in health and fitness could play a significant role in slowing and perhaps reversing the unwelcome global trends of rising obesity and related diseases.

Appendix A: Biometric Fitness Devices Available In The US Market (as of October 2014)

<table>
<thead>
<tr>
<th>Brand</th>
<th>Product</th>
<th>Device Type</th>
<th>Launch Date</th>
<th>Original List Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adidas miCoach</td>
<td>Fit Smart</td>
<td>Sport watch</td>
<td>Jul-14</td>
<td>$199.00</td>
</tr>
<tr>
<td>Adidas miCoach</td>
<td>Smart Run</td>
<td>Sport watch</td>
<td>Nov-13</td>
<td>$399.00</td>
</tr>
<tr>
<td>Archos</td>
<td>Archos</td>
<td>Wristband</td>
<td>May-14</td>
<td>$75.00</td>
</tr>
<tr>
<td>Basis</td>
<td>B1 Band</td>
<td>Wristwatch</td>
<td>Nov-12</td>
<td>$199.00</td>
</tr>
<tr>
<td>BodyMedia</td>
<td>CORE 2</td>
<td>Armband</td>
<td>Jan-13</td>
<td>$139.99</td>
</tr>
<tr>
<td>BodyMedia</td>
<td>Link</td>
<td>Armband</td>
<td>Nov-10</td>
<td>$199.99</td>
</tr>
<tr>
<td>ChoiceMED</td>
<td>iChoice Star</td>
<td>Wristband</td>
<td>Jul-14</td>
<td>$49.99</td>
</tr>
<tr>
<td>Epson</td>
<td>Pulsense PS-100</td>
<td>Wristband</td>
<td>Sep-14</td>
<td>$129.00</td>
</tr>
<tr>
<td>Epson</td>
<td>Pulsense PS-500</td>
<td>Wristwatch</td>
<td>Sep-14</td>
<td>$199.00</td>
</tr>
<tr>
<td>Fitbit</td>
<td>Flex</td>
<td>Wristband</td>
<td>May-13</td>
<td>$99.95</td>
</tr>
<tr>
<td>Fitbit</td>
<td>One</td>
<td>Clip</td>
<td>Nov-12</td>
<td>$99.95</td>
</tr>
<tr>
<td>Fitbit</td>
<td>Zip</td>
<td>Clip</td>
<td>Sep-12</td>
<td>$59.99</td>
</tr>
<tr>
<td>Fitbug</td>
<td>Orb</td>
<td>Wristband</td>
<td>Oct-13</td>
<td>$49.95</td>
</tr>
<tr>
<td>-------------</td>
<td>----------</td>
<td>-----------</td>
<td>--------</td>
<td>--------</td>
</tr>
<tr>
<td>Garmin</td>
<td>Forerunner 920XT</td>
<td>Sport Watch</td>
<td>Oct-14</td>
<td>$339.00</td>
</tr>
<tr>
<td>Garmin</td>
<td>Vivofit</td>
<td>Wristwatch</td>
<td>Jan-14</td>
<td>$129.99</td>
</tr>
<tr>
<td>Health Lab</td>
<td>Edge AM3</td>
<td>Wristwatch</td>
<td>Jul-13</td>
<td>$59.95</td>
</tr>
<tr>
<td>Jawbone</td>
<td>UP</td>
<td>Wristband</td>
<td>Nov-11</td>
<td>$99.99</td>
</tr>
<tr>
<td>Jawbone</td>
<td>UP 24</td>
<td>Wristband</td>
<td>Nov-13</td>
<td>$149.00</td>
</tr>
<tr>
<td>LeapFrog</td>
<td>LeapBand</td>
<td>Wristwatch</td>
<td>Jul-14</td>
<td>$39.99</td>
</tr>
<tr>
<td>LG</td>
<td>Lifewatch</td>
<td>Touch</td>
<td>May-14</td>
<td>$149.99</td>
</tr>
<tr>
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Note: Classification of sport watch, wristwatch and wristband was assigned by the authors, based on style and shape. Sport watches and wristwatches have more pronounced watch styling (with sport watches having particularly sporty styling), while wristbands have band styling. All 3 have clock features.

**Appendix B: Need To Belong Scale**

**Instructions:** For each of the statements below, indicate the degree to which you agree or disagree with the statement by writing a number in the space beside the question using the scale below:

1 = Strongly disagree; 2 = Moderately disagree; 3 = Neither agree nor disagree; 4 = Moderately agree; 5 = Strongly agree

(ORDER ROTATED)

- a) If other people don't seem to accept me, I don't let it bother me.
- b) I try hard not to do things that will make other people avoid or reject me.
- c) I seldom worry about whether other people care about me.
- d) I need to feel that there are people I can turn to in times of need.
- e) I want other people to accept me.
- f) I do not like being alone.
- g) Being apart from my friends for long periods of time does not bother me.
- h) I have a strong need to belong.
- i) It bothers me a great deal when I am not included in other people's plans.
- j) My feelings are easily hurt when I feel that others do not accept me.

**Appendix C: Attitude Toward Technology Scale**

**Instructions:** For each of the statements below, indicate the degree to which you agree or disagree with the statement by writing a number in the space beside the question using the scale below:

1 = Strongly disagree; 2 = Moderately disagree; 3 = Neither agree nor disagree; 4 = Moderately agree; 5 = Strongly agree

(ROTATE ORDER)

- a) I feel it is important to be able to find any information whenever I want online.
- b) I feel it is important to be able to access the Internet any time I want.
c) I think it is important to keep up with the latest trends in technology.
d) I get anxious when I don’t have my cell phone.
e) I get anxious when I don’t have the Internet available to me.
f) I am dependent on my technology.
g) Technology will provide solutions to many of society’s problems.
h) With technology anything is possible.
i) I feel that I get more accomplished because of technology.
j) New technology makes people waste too much time.
k) New technology makes life more complicated.
l) New technology makes people more isolated.
m) I prefer to work on several projects in a day, rather than completing one project and then switching to another.

References


Community-Based Media Project for Youth Suicide Prevention
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Danielle Arnoux, Montana State University-Billings
Lani Paulson Miller, Walden University

Abstract
An innovative, community-based media project for youth suicide prevention was implemented in a Rocky Mountain state where suicide rates are among the highest in the nation. Community leaders and school district officials refused to allow the project to take place on school premises or during regular school hours, despite the project’s proven track record in neighboring communities. This resistance was circumvented by implementing the project on a smaller scale, in partnership with local after-school programs. However, the refusal of city-wide cooperation prevented researchers from gathering systematic data from a representative group of teenagers from which to analyze the program’s effectiveness. Instead, small, ad-hoc student groups were recruited on a voluntary basis to complete surveys at pre- and post-test. The resulting lack of widespread sampling forced researchers to rely on qualitative data to evaluate the program. Such resistance was particularly surprising, given statistically significant outcomes from the project’s implementation in a nearby community, and the passionate support of media, universities, and international global health organizations. The project used theater workshops to give teenagers a voice about their experiences with suicide and depression, facilitating open community dialogues with teenagers and other adults. Project goals were to increase teenagers’ self-efficacy to access help, and to help peers confronting struggles with suicide and depression. The analysis of this experience indicates one of the first application of the Extended Parallel Process Model (Witte, Meyer & Martell, 2001) to communities, as opposed to individuals only, whereby communities confronted with extreme threats but little hope for effective solutions may react with fear control, or defense avoidance strategies.
Community-Based Theatre: A Complexity Science Informed Approach to Suicide Prevention in Montana

Elizabeth Cieminns, Center for Translational Research, Billings Clinic

Introduction
Suicide is a serious issue across the country, but particular high rates are seen in certain rural states like Montana, where the combination of a “cowboy mentality,” easy access to firearms, and social isolation has led to one of the highest suicide rates in the country, with rates twice the national rate at 22.5 per 100,000 people, or one death by suicide every 16 minutes (CDC 2014). One approach to suicide prevention, a community-based media project, “Let’s Talk,” has successfully been implemented in two cities in Montana. The conceptual framework introduced by complexity science may offer some explanation of its success.

Let’s Talk Campaign
The “Let’s Talk” campaign involved young people (high school and college students) in the community participating in theatre workshops with a goal of facilitating expression and conversation around depression, suicide and mental health. Facilitated by a professor of theatre, the theatre groups created productions of their own design on these topics. The productions were presented to other student peers and followed by discussion with the audience.

Preliminary survey results comparing awareness of and intention to use suicide prevention resources, and self-efficacy to access resources before and after attending the performance and participating in the discussions were positive. Participants reported increased awareness and self-efficacy around suicide and ability to seek help for themselves or others. There was also increased reporting of likeliness to contact a teacher, school counselor or social worker about a personal suicidal thought or to help a friend (p<0.05).

These findings suggest positive outcomes resulting from the peer-to-peer delivered theatre performance on suicide, depression, and mental health and subsequent peer-to-peer group dialogue. This paper seeks to better understand the theoretical underpinnings of the success of this program.

Complexity Science
Complexity science is based on the notion that organizations are complex adaptive systems. It offers new ways to think about the treatment of patients in the clinical or community setting. Complexity science considers aspects of systems that are often overlooked by traditional scientific approaches to behavior change. Conventional change models compare organizations to machines, in which the parts add up to the whole and future behavior of the system is predictable with linear cause and effects. Complexity is “a description of the complex phenomena demonstrated in systems characterized by nonlinear interactive components, emergent phenomena, continuous and discontinuous change, and unpredictable outcomes. Complexity is usually understood in contrast to simple, linear and equilibrium-based systems” (Zimmerman et al., 1998, p. 263). Complexity offers a framework for studying complex adaptive systems, focusing on the patterns and relationships among the parts in order to understand and act on the unpredictable aspects of working with people in dynamic organizations (Begun et al., 2003).

Application to “Let’s Talk”
The “Let’s Talk” projects use a nonlinear approach to behavior change, embracing several of the major tenets of complexity science including emergence, non-linearity and uncertainty, distributed control, and independent and diverse agents. This paper will explore how a non-conventional, complexity science-supported approach to suicide prevention has led to successful interventions to address this serious, seemingly intractable problem in Montana.

Emergence is the concept that new, unexpected structures, patterns, properties or processes arise in self-organizing systems. The emergence of unexpected outcomes supports the notion that the whole is more than the sum of its parts. In the “Let’s Talk” theatre productions, unexpected outcomes emerged from the plays. Convening a diverse group of students to create a performance on suicide and suicide prevention led to emergence, or the unexpected.

The non-linear nature of how change occurs follows the phenomenon of emergence. Linearity implies that the size of change is correlated with the magnitude of the input to the system. Each component of the play, each line an actor spoke, did not necessarily result in the same impact and same outcome for each individual audience member. Some components of the play had a greater impact than others and in an unpredictable way. In the same vein, the reaction to the performance itself was unpredictable and was not always experienced in the same way by different audiences. The actors and directors needed to recognize this and be comfortable with the various potential outcomes.

Distributed control means that the outcomes of a system emerge from a process of self-organization rather than by a centralized body. What emerges results from patterns of interrelationships among the diverse agents or actors in a system. While the high school or university setting may seemingly have a system of centralized control,
the way change occurs does not often follow a top-down approach or direction. The informal leaders may have more influence on behavior change than the formal leaders in these organizations. Regard the way trends and behaviors among teenagers spread and diffuse. The same is true for behaviors around suicide prevention.

As mentioned, the independent and diverse agents, or students in this case, are what permit change to occur. If everyone acted and thought in the same way, there would be no innovation and thus no change. Diversity of thought and ideas is what leads to diversity in action. Diversity is a source of information or novelty. A reduction in diversity decreases the potential for future adaptations. Diversity is seen as a key to innovation and long-term viability. The diversity in the actors and the audiences in “Let’s Talk” is what enabled change to occur in the way we think and act around the topic of suicide.

Implications for Future Health Care Marketing & Prevention Programs
Health care marketing and prevention programs may benefit from taking a complexity science-informed approach to behavior change when designing future programs. When trying to solve seemingly intractable health care issues, addressing the problem through a complexity science lens may improve the likelihood of success. Several approaches that are either grounded in, or supported by, complexity science include Positive Deviance (Pascale 2010) and Relational Coordination (Gittell 2009).

In this study, the behavior change approach was appropriate given the context of schools and universities, which as complex adaptive systems contain multiple interdependent and connected agents; contain diverse elements (students) with a large number of connections; and have the capacity to alter or change. As such, they rely on self-organization and emergence, have adaptable elements, embedded systems, and distributed control. Change occurs in a non-linear fashion and is enabled by diversity and the co-existence of order and disorder.

The two approaches mentioned, Positive Deviance and Relational Coordination, also recognize organizations as complex adaptive systems and may be appropriate change methodologies to apply when addressing health care-related issues. Understanding the system or organization in which one is attempting to instigate change, and the attributes of that system or organization, will lead to the design of programs with greater probabilities of success.

Conclusion
“Let’s Talk” provides an example of a health care prevention program whose success can be partly understood through an understanding and application of the principles of complexity science. This unconventional, non-linear approach was suited to the context of addressing suicide among high school and college students, leading to its success.

References
Abstract
Three focus groups were conducted with a total of 17 teenaged actors and actresses who had participated in a grassroots theater program for suicide prevention. Guided discussions provoked answers about how the program, entitled Let’s Talk, influenced participants’ feelings of depression and suicidal ideation. The teens collectively agreed that Let’s Talk helped them understand depression and suicidal ideation and increased their awareness of tools and resources available for help in times of crisis. All teens expressed a desire to help friends and loved ones in times of crisis. Two hypotheses were examined: 1) The buffering hypothesis examines whether the positive association between social support and well-being is attributable to a process of support protecting persons from potentially adverse effects of stressful events (buffering model). 2) The main effects hypothesis of stress and social support examines whether the positive association between social support and well-being is attributable to an overall beneficial effect of support (main- or direct-effect model). Evidence for the buffering model is found when the social support measure assesses the perceived availability of interpersonal resources that are responsive to the needs elicited by stressful events. Evidence for a main effect model is found when the support measure assesses a person's degree of integration in a large social network. The evidence found for the buffering model is apparent in the teens’ willingness to reach out interpersonal relationships and support. The evidence for the main effect model is found in the unanimous positive feelings the teens have in being part of the Let’s Talk group. Tight-knit relationships among the actors are apparent during the focus groups in how they are protective and encouraging of each other.
The Impact of Unusually Warm Weather on Suicide Rates across the United States

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P. Grady Dixon, Fort Hays State University

Abstract

Although much research has been conducted examining the relationship between weather and suicide rates, few consistent findings have emerged. Scientists have started to increasingly rely upon distributed-lag nonlinear modeling (DLNM) to better isolate the impacts of various environmental factors on medical conditions, and here, we use DLNM to examine how suicide rates change with anomalous temperatures. Using suicide data from eight U.S. counties from 1975-2010, DLNM is used to relate those suicide data to daily surface temperatures. Results suggest that unusually warm weather is associated with increased suicides in six of the eight counties.

Introduction

Numerous studies have attempted to link environmental conditions with suicide rates, but results have been far from uniform, possibly as a result of differing methodologies, variables, and geographic location. The most consistent weather-suicide relationships appear to be with temperature, and many studies have suggested a possible link between warmer weather and modest increases in suicide rates (Kim et al. 2011; Likhvar et al. 2011). However, other scientists have reached the opposite conclusion, suggesting that cold weather results in elevated suicides (Tsai 2010), while some studies have found little evidence of any weather-suicide link (Deisenhammer 2003). Although the exact relationships remain murky, it has become evident that most environmental-health relationships involve lagged effects and nonlinear responses. For these reasons, recent environmental epidemiology research (Burkart et al. 2014; Dixon et al. 2014; Gasparini and Armstrong 2011; Gasparini et al. 2010; Guo et al. 2011; Rocklov et al. 2012; Wang et al. 2014) has made use of the distributed lag nonlinear model (DLNM), which is a statistical package in R (Gasparini 2011; http://cran.r-project.org/web/packages/dlnm).

DLNM is designed to estimate simultaneously the nonlinear and cumulative lag effects of exposure to an independent exposure variable (i.e., temperature, pollution, humidity, etc.) on mortality or morbidity. It is beneficial to allow simplified, flexible relationships that combine the exposure and lag effects, but the “cross-basis” function of the DLNM allows the exposure and lag components to be separated and compared as well. In suicide research, there is no agreed-upon lag time between environmental exposure and response, so the flexibility of DLNM allows for cumulative effects of exposure and/or lag. Further, with DLNM, it is easy to normalize the data with respect to time at user-defined scales to control for periodic patterns (i.e., weekly or seasonal) and long-term trends. This is particularly important in suicide research, which consistently illustrates seasonality and trends associated with demographic changes, economic trends, intervention strategies, etc. (Dixon and Kalkstein 2009; Mok et al. 2012; Titelman et al. 2013; Watts et al. 2012).

Dixon et al. (2014) used DLNM to show a consistent association between increased suicide frequency and seasonally warm temperatures for Toronto, Canada and Jackson, Mississippi. The purpose of this research is to expand upon that work to include more locations and to determine the consistency of this pattern. More specifically, it is important to apply the methods of Dixon et al. (2014) to a diverse selection of climate types to determine if the temperature-suicide associations are stronger or weaker in areas that are warmer, cooler, drier, etc.

Data and Methods

Daily suicide counts were obtained from the National Center for Health Statistics (NCHS) for the following counties: Fulton County (Atlanta), Cook County (Chicago), Maricopa County (Phoenix), Los Angeles County, New York City, King County (Seattle), Salt Lake County (Salt Lake City), St. Louis County, and Philadelphia County. These data span from 1975 through 2010 and were classified by the International Classification of Diseases, revisions 9 and 10 (ICD-9; ICD-10) based upon suicide and self-inflicted injury (ICD-9: E950-E959) along with intentional self-harm (ICD-10: X60-X84). Data were immediately aggregated into daily counts for each county, and individual cases were never examined. Suicide
data were further aggregated by month to determine if any seasonal cycles exist.

Daily meteorological data were provided by the National Climatic Data Center (NCDC) and cover the 1975-2010 period of record. These data include maximum, minimum and average daily temperature, average daily dew point, and daily precipitation measured at each city’s largest airport.

Consistent with Dixon et al. (2014), we used the general linear model regression function to create estimations of daily suicide counts based on daily temperature values (maximum and minimum). Natural cubic splines allow for normalization with respect to various time scales. We compiled the model for only the annual scale, which requires 11 equally spaced spline knots. We also employed a categorical “day of week” spline to account for weekly cycles/patterns. Based on the best Akaike Information Criteria values reported by Dixon, a six-day lag was used (equivalent to one week as “day 0” was the first exposure day), and splines for the response function as well as the lag polynomial function were allowed to have three and two degrees of freedom, respectfully.

Results and Discussion

Consistent with previous research, suicides exhibit a clear seasonal trend with the highest rates occurring in the late spring and early summer (Fig. 1). Although the overall pattern is strong, not all counties exhibited identical seasonal cycles; while Atlanta peaked in the late summer, St. Louis and Seattle exhibited no discernible seasonal pattern at all among suicides. Future research will examine if consistent geographical differences exist in seasonal suicide rates.

DLNM was used to examine temperature-suicide relationships across the entire year and also by warm season (March through August) and cool season (September through February) for each of the eight counties. Statistically significant relationships between temperature and suicide rates are evident in seven of the eight counties with only Fulton County (Atlanta) displaying no significant results.

Other than Fulton County, and to a lesser extent King County (Seattle), results are quite consistent with higher than average temperatures almost always being associated with an elevated risk of suicide. Similar trends are observed across the entire year, for both warm and cold season, and also for both maximum and minimum daily temperatures. Strongest relationships exist in Chicago (Fig. 2), Phoenix (Fig. 3), Los Angeles (Fig. 4), and Philadelphia (Fig. 5), possibly as a result of larger populations and corresponding sample sizes.

This research provides strong evidence that above average temperatures, both in warm and cold seasons and across numerous locales, are associated with an elevated risk of suicide. With additional research, it may be possible to predict periods of elevated suicide rates in advance, perhaps allowing for preventative measures to be taken. Future research will examine additional locales to determine if similar temperature-suicide relationships exist across other regions of the United States. Further, demographic information can be used to determine if certain subsets of the population (ie. male or female) are disproportionately affected by elevated temperatures. Additionally, the method of suicide (violent versus non-violent) can also be examined. At the very least, this research helps fill a serious gap in the scientific literature and provides additional evidence that risk of suicide increases under unusually warm conditions.

References


Advertising Food Items to Children Across Time: Comparing Broadcast and Cable Advertisements in 2007 and 2012

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Shakeyrah I.R. Elmore, University of Cincinnati

Abstract

The purpose of this study was to analyze how food intended for consumption was portrayed on the same broadcast and cable channels in 2007 and 2012. The two channels selected for comparison were ABC and Nickelodeon. All children’s educational programming on ABC and all children’s programming between 7am and noon on Saturday morning were recorded in 2007 and 2012. ABC showed three hours of children’s educational programming in 2007 and 2012 for a total of six hours. For comparisons, five hours of Nickelodeon were recorded at the same time of broadcast for ABC in the same years for a total of 10 hours. Each non-program content segment was coded for the type of content displayed, food vs. non-food advertising, representations of characters and food consumption in advertisements and levels of physical activity in advertisements.

Overall, 803 non-program segments were identified on both channels in 2007 and 2012. Of those, more than half (61.4%) were advertisements, Bumpers (short segments that separate program content from advertising content) comprised 20.9% of the non-program segments followed by television promotions at 14.4%. Only four public service announcements were found, and all in 2007. Very few (1.9%) of the non-program segments were Station Identification segments. No educational drop ins were found. There were no significant differences in the amount of advertisements shown between 2007 (58.3%) and 2012 (64.2%). Of the 493 advertisements, a little over a quarter of them (27.2%) advertised food. However, significant differences were noted between 2007 and 2012 in the type of products advertised. Significantly more food than non-food advertisements were present in 2012 (35.7%) than in 2007 (16.7%) ($X^2(1, N = 493) = 22.05$, $p < .01$). Interestingly, the broadcast channel (ABC) accounted for this significant increase in food advertisements, rising from only three food ads in 2007 (8.1%) to 50 food ads in 2012 (51.5%) ($X^2(1, N = 134) = 21.1$, $p < .01$). Of the food companies mentioned, General Mills products were shown most frequently (38.7%) followed by Nabisco (11.8%) and Kellogg’s (10.9%). Within the 134 food advertisements, there was only one overweight character identified who appeared in an advertisement. The product advertised was bubble gum and appeared on cable in 2007. Interestingly, there were significantly more food advertisements that did not contain human characters in 2012 (37.9%) than in 2007 (13.5%) ($X^2(1, N = 132) = 7.4$, $p < .01$). Of the food advertisements that did have human characters, the vast majority contained predominantly thin to normal weight characters. In 2007, there were no characters of color represented in the food advertisements. In 2012, 83.1% of the food advertisements contained predominantly White characters, followed by 10.2% depicting predominantly Black characters, and 6.8% representing more than one race shown equally. In 2007 (76.7%) and 2012 (52.5%), more food advertisements contained depictions of predominantly children (babies to teens) than adults. Less than half (39.5%) of the food advertisements contained any nutritional claims and no significant differences were noted between 2007 and 2012. However, the most frequently made health claim (23.1%) was “part of a complete breakfast” followed by food made from natural ingredients (19.2%). There were very few other claims including two claims of low-fat food products, two claims of fiber/bran in food products, one claim for low sodium food products, and four claims for low calorie food products.
An Exploratory Analysis of Predictors of Consumers’ Perceptions of Future Behavioral Intentions after Exposure to Direct-to-Consumer Advertising

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Brent Rollins, Philadelphia College of Osteopathic Medicine

Introduction
Advertising campaigns could be better designed to target specific behavioral responses by identifying factors that significantly affect a consumer’s response to a direct-to-consumer (DTC) prescription drug ad in terms of drug inquiry intention and whether or not this affects a true behavioral measure (i.e., the actual act of behavior). Therefore, this study examined the following research questions: 1) Which of the following effectiveness measures previously identified in the DTC literature (attitude toward the ad, brand, company, message source, and DTCA in general as well as attention paid to the ad, pharmaceutical industry credibility, disease state involvement, and perceived product risk) significantly predict consumers’ intentions to discuss the medication with their physician (drug inquiry intention)? 2) Which of the significant predictors of consumers’ drug inquiry intention, if any, affect the pre-defined information search behavior?

Methods
In a randomized post-test only survey design, data for 409 U.S. adults were obtained using Qualtrics online survey panel. Using the questionnaire, consumers’ responses were recorded for traditional DTC advertising effectiveness measures. Data were analyzed using multiple linear regression and chi-square analysis techniques.

Results
As indicated by the multiple regression (F = 63.61, p <0.001), except for consumers’ attitude towards the message source and attitude toward the pharmaceutical company advertising the drug all other variables were the significant predictors of consumers’ drug inquiry intention.

Except for attitude towards the message source and attitude towards the pharmaceutical company advertising the product, chi-square tests indicated that all other variables had a significant influence (all p-values <0.001)

Conclusion
Consumer response to DTC advertising can be predicted by a multitude of factors. Pharmaceutical marketers must be aware of this plurality when designing advertising messages.
Impact of Third-Party Organization Approval Claims in Direct-to-Consumer Advertising
Nilesh S. Bhutada, California Northstate University College of Pharmacy
Jisu Huh, University of Minnesota
Brent Rollins, Philadelphia College of Osteopathic Medicine
Matthew Perri III, University of Georgia

Introduction
To promote consumer trust in their advertisements, in recent years, pharmaceutical marketers have increased the use of third-party organization (TPO) endorsement claims (e.g., statements such as first and only approved FDA treatment) in direct-to-consumer (DTC) advertising of prescription drugs. However, there is no documented evidence of the impact of such statements on consumers’ attitudes and behaviors. Therefore, the objective of this study is twofold: (a) examine the influence of trust cues (i.e., TPO endorsement claims) on the perceived trust in the print DTC ad, and (b) explore the relationship between consumers’ perceived trust in the print DTC ad and attitudinal and behavioral responses towards the advertised brand.

Methods
In a randomized post-test only design, data will be obtained via Qualtrics online survey panel. Data for 264 (statistical power of 0.8, at α = 0.05, and estimated medium effect size (f = 0.25)] English-speaking US adult females (age 18 or older) will be collected. Three versions (expert TPO claim vs. non-expert TPO claim vs. no TPO claim) of the print DTC ad for a fictitious eyelash enhancement product will be created for the study. Participants will be randomly assigned to one of the three advertising stimuli. Participants will first review the ad and then respond to a questionnaire measuring the study constructs. Data will be analyzed using multivariate analysis of covariance (MANCOVA) and hierarchical regression techniques.

Expected Results
Empirical evidence from marketing and advertising literature suggests that TPO endorsers have the potential to influence consumers’ judgments and decisions. Accordingly, we expect to see a significant impact of the TPO endorsements, especially for expert TPO endorsement (i.e., FDA-approved claims), on consumers attitudinal and behavioral outcomes, and result in increased trust in the advertisement. Further, the increased trust in the advertisement will serve as a significant predictor of the advertising outcome variables.
Endorsements in Direct-to-Consumer Advertising: Do Endorser Testimonials Work?

Nilesh S. Bhutada, California Northstate University College of Pharmacy
Jisu Huh, University of Minnesota
Brent Rollins, Philadelphia College of Osteopathic Medicine
Matthew Perri III, University of Georgia

Introduction

Despite the fact that pharmaceutical marketers are increasingly using advertising appeals such as celebrity endorser testimonials, impact of such appeals on consumers’ reactions to direct-to-consumer (DTC) advertising remains unknown. Therefore, the objectives of this study are to: (1) Examine whether DTC ads with testimonials generate positive consumer attitudes and behaviors. Examine if the attitudes and behaviors influenced by testimonials are same across (2) product-specific and disease-specific DTC ads; (3) different types of endorsers (e.g., celebrity vs. expert vs. non-celebrity) used in the DTC ads; (4) consumers with either high or low level of disease state involvement.

Methods

Using Qualtrics online survey panel, data will be collected for 840 US adults (18 yrs and older) in a 3 (Endorser Type: Celebrity/Expert/Non-celebrity) x 2 (Testimonial: Present/Absent) x 2 (Involvement: High/Low) x 2 (Advertisement Type: Product-specific/Disease-specific) full factorial design. Participants will be randomly assigned to one of the advertising stimuli, and will be asked to first review the ad and then respond to a questionnaire. Data will be analyzed using a multivariate analysis of covariance to control the impact of confounding variables such as pharmaceutical industry credibility and general attitude towards DTC advertising.

Expected Results

Based on previous research in advertising of consumer goods, DTC ads with testimonials (compared to without testimonials) are expected to generate more favorable consumer attitudes and behavioral intentions. We expect testimonials by non-celebrity (compared to celebrity or experts) will generate a greater impact on consumer’s attitudes and behaviors. Prior research indicates consumers perceive disease-specific DTC ads more informative compared to product-specific DTC ads, therefore, disease-specific (compared to product-specific) DTC ads with testimonials will generate more favorable attitudes and behavioral intentions. Consumers with high (compared to low) level of disease state involvement that are exposed to testimonial DTC ads are expected to exhibit positive attitudes and behaviors.
Overtreated or Underserved: How Can Health Journalists and Marketers Work Together to Communicate the Benefits and Risks of Cancer Screenings?

Jordan Neil, University of Florida

Abstract

Traditionally, the United States health care system has been plagued with two opposing problems: the striking disparity between those who overuse health care services and those who underuse services. The reasons why patients are overtreated or undertreated span a myriad of socio-demographic and economic factors. However, with growing numbers of health consumers turning to non-traditional sources of health information to aid their medical decision-making, it is important that the information they access is accurate and relevant. Unfortunately, both health journalists and health marketers have failed to consistently work as quality, reliable sources that provide nuanced and specific guidelines. This is particularly problematic when the efficacies of cancer-screening tests differ drastically dependent upon the patient demographic. Therefore, the aim of this paper is to underline the challenges of designing tailored message strategies that both promote the need for screening for one target audience, but highlight the dangers of overscreening for others.
Too Good to be Tru? Building an Agenda on PrEP

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Abstract
There are currently over 1.1 million people living with HIV in the United States, and a further 50,000 infected every year (CDC 2010). At the state level, Florida has the highest rate of HIV incidence in the United States (CDC 2012). Concerted efforts by governmental, advocacy, and industry stakeholders to develop therapeutic treatments and medications to lessen the negative health outcomes within HIV-positive individuals have proven to be effective. However, more recent efforts on preventing the sexual transmission of HIV have focused on providing at-risk individuals with a pre-exposure prophylaxis (PrEP). Despite research findings suggesting that daily usage can offer up to 99% immunity to HIV (WHO, 2012), uptake of the drug has been slow. As a result, this study analyzes news coverage of Truvada at both the state and national level. Results indicate significant differences in how Truvada is being reported.

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Abstract

Across human behavior, socio-cognitive models prove helpful in explaining why people behave the way they do. However, for medication adherence, socio-cognitive models of adherence (e.g., health belief model; beliefs about medicine framework; theory of planned behavior) struggle to consistently predict when patients will shift to nonadherence. Grounding our work in goal theory and expectancy-value frameworks, we propose a series of arguments that illustrate why measurement issues specific to these models (level of measurement) limit their effectiveness as predictors of adherence motivation and behavior. We also discuss how the length and complexity of these models hamper their practicality as clinical tools. These conceptual arguments and discussion lay the groundwork for an improved scale of adherence motivation focusing on a patient’s evaluation of the desirability and feasibility at the level of the means (taking a medication as prescribed by a health care provider).

Extended Abstract

Our research proposes an alternative route to predictive validity for medication adherence that focuses on measuring two key constructs (desirability and feasibility) and measuring these constructs at their most motivationally-relevant level (means vs. higher-order goals). Tapping into models of goal hierarchies (Bagozzi and Dholakia 1999) and expectancy-value frameworks of motivation (Brehm et al. 1983), we lay out limitations of current approaches to medication adherence measurement and the opportunities they present in support of our simplified model. Combined, these propositions suggest that a new measure that integrates means-level measurement and expectancy-value will outperform existing socio-cognitive measures used to predict medication adherence.

The comprehensive construct of goals assist in explaining a wide variety of human behaviors across domains (Bagozzi and Dholakia 1999; Gollwitzer and Oettingen 1998). At their most basic level, goals are mental representations of desired future states (Austin and Vancouver 1996). This mental representation recruits cognitive and motivational resources in support of goal pursuit. In effect, a goal focuses an individual’s motivation (psychological force toward action) on effort and persistence for a desired outcome (Touré-Tillery and Fishbach 2011). When it comes to medication adherence, a patient’s goal to take their medications as prescribed (a concrete, means-oriented goal) operates as a self-regulatory mechanism that purposively guides their behavior toward more abstract desired states such as becoming a healthier person (higher-order desire).

These overlapping goal pursuits form a hierarchy where concrete, means-oriented goals such as taking a medication as prescribed operate somewhat differently from higher-order desires (e.g. to be a healthy person). Higher-order desires such as wanting to be healthy or intermediate desires such as using medication as a tool to be healthy exhibit greater motivational stability over the course of treating a disease. Failure or setbacks in the midst of taking a medication as prescribed need not diminish a more general desire to be healthy or even to take some sort of medication as a tool to become healthy. Still, most socio-cognitive models used to explain adherence focus on these more stable motives such as health-related beliefs (Rosenstock et al. 1988), medication-related beliefs (Horne et al. 1999), or health-related attitudes (Ajzen 1998).

For a patient, setbacks and difficulties in taking their medication as prescribed may only indirectly affect these more stable motives. As an example, a patient who develops side effects from taking their medication as prescribed will still likely view it as important and desirable to be healthy. Similarly, this same patient may very well still believe that their medication is necessary and useful as a tool for their treatment. The indirect relationship between goal-related feedback (e.g. setbacks and difficulties) and
more stable motives recommends the use of more sensitive measures focused on the actual means-related motivation.

Forming this motivational potential (purposeful drive toward purposeful action), goals contain information about the value of a desired state (including emotional value), the likelihood of achieving a desired state (e.g. expectancy), and extent of commitment to a desired state (Ferguson and Porter 2009). We define the desirability of a goal as the value (positive or negative) that an individual places on the desired outcome of the goal as well as the positive or negative value associated with the experience of pursuing a specific means to attaining this outcome. For medication adherence, a patient’s evaluation of the desirability of continuing to take a medication regimen exactly as prescribed would result from weighing the value of being healthier (desired outcome) with the positive (e.g. feeling empowered) or negative (e.g. side effects) value from the experience of taking medications as prescribed.

We define the feasibility of a goal as the expectancy that an individual constructs for achieving the desired long-term outcome and being able/willing to effectively use their current means to attain this outcome. A patient’s evaluation of the feasibility of continuing to take a medication regimen exactly as prescribed would factor in both the likelihood of being healthier and the likelihood, in light of setbacks and difficulties, to continue taking medications as prescribed.

By measuring a patient’s desirability and feasibility evaluations at the level of a specific adherence behavior, such a measure will capture much of the variance in related constructs while better capturing day-to-day fluctuations in adherence motivation. Such a short scale should improve prediction of medication adherence in both its intentional and non-intentional forms (Lehane and McCarthy 2007). With improved prediction and practicality, the measure may prove a useful clinical tool for health care providers. Integrating theory and pressing needs of health care practice, our measurement framework offers a new direction forward for enhancing understanding and prediction of medication adherence.

References


Introduction

The number of Fitness and Health Club (FHC) members has been growing over the past ten years with a compound annual growth rate of 6.1% in Germany, resulting in an overall FHC membership number of 8.6 million at the end of 2013 (Deloitte 2014). These numbers imply that every tenth German citizen is a FHC member. For the U.S., this ratio is even better, with 50.2 million members, one out of six U.S. Americans holds such a membership (IHRSA 2013). At first sight, one could infer that people have become more fitness-active over time. Yet, only 32% of members were reported to attend their FHC more than 100 days a year (Weber 2014) and can therefore be considered very active. In contrast, there are others that do not exercise frequently or not at all. According to Czycholl (2014), those make up about one half of all FHC members. At first sight, those infrequent using members appear lucrative for FHCs at first glance. That is, they pay the same membership fee as their heavy using fellows, yet they produce comparably lower costs (resulting from lower or no machine and equipment usage, water consumption, etc.). But are those inactive members harmful to the FHC with regard to other critical factors determining the FHC’s success? Such that they may perceive their FHC and its services differently and are therefore likely to show more unfavorable FHC related attitudes and behaviors (Zeithaml, Berry, and Parasuraman 1996) than active members? Therefore, the present study investigates the following research question: In which respects are inactive FHC members (dis)valuable for their FHCs?

Method

In-depth Interviews

To gain a profound understanding of value components accruing from membership inactivity for FHC management, a qualitative approach, using guided in-depth interviews with FHC members, appeared to be suitable. The interview manual was derived from an intensive literature review, informal member questioning as well as expert interviews with FHC staff. Interviews were conducted by seven different interviewers yielding to a total of 52 interviews with an average duration of approximately 33 minutes. Conversations were recorded, completely transcribed and ultimately coded independently by two researchers. The latter was done in order to ensure objectivity of interpretations. To further warrant inter-rater-reliability, Cohen’s Kappa was calculated for various sections. As those ranged from 0.76 to 1, the inter-rater-agreement was found to be almost perfect for most parts (Landis and Koch 1977). The coding was mostly done using inductive category building as described by Mayring (2010) in his work on qualitative content analysis.

Interviewees’ Characteristics

In order to investigate value components of inactive FHCs memberships, inactive members had to be part of the sample. Therefore, a definition of the term inactive FHC member is necessary. A FHC member is someone who is currently maintaining a FHC membership in return for a fixed payment. To further specify inactivity of a FHC member, expert interviews with FHC staff were conducted. From those, it became apparent that exercising is only effective (in terms of retaining and improving muscles and/or endurance) if it is done regularly at least once a week. Therefore, in the course of this paper, a member is considered to be inactive, if FHC attendance is less than once a week which roughly amounts to an average of less than four FHC visits per month. Based on this definition, it was the key sampling objective to recruit participants with dissimilar FHC usage rates, specifically aiming for a balanced sample in terms of active as well as inactive FHC members. In the end, 26 in-depth interviews were conducted with inactive FHC members as well as another 26 with active ones. Albeit the fact that qualitative research generally makes no claims with regard to representative samples (Meyer and Raffelt 2009), quotas stated in reports by Deloitte
(2012, 2013) regarding German FHC members’ gender, age and the FHC segment affiliation were combined and then used to recruit participants in ratios as close as possible to those demographic figures.

Findings
To investigate the research question of this study, interviewees were asked several questions about their FHC related attitudes and behavior. Findings will be presented focusing on FHC usage, satisfaction, referral and contract renewal.

FHC Usage
Interviewees were asked to state their average monthly FHC visits as well as the membership fee they pay per month. From this and information on day pass prices, it was calculated whether a flat-rate bias was present. Day passes were offered for 22 members, from those 13 were inactive and all suffered from a flat-rate bias. The other nine interviewees were active ones and all better off with the flat-rate fee. Similar results were generated by DellaVigna and Malmendier (2006), who attributed this irrational behavior to members’ overconfidence and naïveté, resulting in overestimation of future FHC attendance. Yet in their study, only people already attending a FHC were questioned about their future visit expectations. It appears however that initial expectations are more important for FHCs as they determine whether a prospective member will ultimately decide to close a contract. Therefore, upfront contract closing expected as well as actual FHC attendance rates were requested. From those, it became apparent that overestimation of training frequency was remarkably present in this study’s sample. Whereas nine members (with four being inactive) had no expectations, all other inactive FHC members expected to exercise more often than they actually did. Most of the interviewees stated that they went more often in the beginning but then visits dwindled. When asked what they thought about the reasons behind slackened attendance over time, predominantly person-related factors were claimed whereas blaming the FHC was rather the exception.

FHC Satisfaction
For investigations of FHC satisfaction, interviewees were asked to state situations in which they were (1) dissatisfied and (2) satisfied at the FHC. Thereby, it was of peculiar interest to scrutinize whether individual or FHC-related aspects were mentioned at first. Results indicate that most inactive members are rather satisfied with their FHCs and even if they had dissatisfactory FHC experiences, those did not derogate the overall positive image. Yet, it seems that inactive members, who perceive fitness exercises rather as torture than fun, constitute an exception. Their training-aversion may function as a reverse halo, transferring the negative sports-feelings also to FHC assessments.

FHC Referral
Considering that many FHCs offer referral programs, recommendations to potential new members appear to be of high value for FHCs. Thus, interviewees were asked whether they would recommend their FHC to others. From the 52, only four interviewees stated that they would not be willing to do so and from those three were inactive. Whereas two of those inactive members were also rather dissatisfied with the FHC, the other stated to be highly satisfied, yet just generally reluctant to make referrals. Taken as a whole, inactive members, unless they are categorically dissatisfied with their FHCs or do not like to recommend in general, seem to be advocates of their club.

FHC Contract renewal
From a rational point of view, one would assume that members do not renew their contract if they have become inactive and therefore the utility derived is not proportional compared with the costs attached to the membership. Yet, when interviewees were asked whether they would reconsider renewing their current FHC contract, counter-intuitively half of the inactive members stated that they would do so. Only six inactive members admitted that due to their low usage, they would not. The remainder was undecided or stated not to renew because of personal reasons (such as other sports have become more important/fun). Furthermore, only one inactive member was unwilling to reconsider a membership at her current FHC because of the FHC itself. From this, it can be concluded that many inactive FHC members are even in the ultimate stage of the brand funnel valuable for their FHCs, as they tend to be long-term loyal. Therefore defection of inactive members after expiration of their minimum contract duration is not the inevitable consequence. Naturally, there are members (yet both inactive as well as active ones) with no intention of renewing their contract.
However, it was found in this study that dismissal is rather seldom caused by the FHC’s attributes.

**Discussion**

Findings from this study suggest that inactive members still display an enormous value to their FHCs. By definition, they were found to pay their monthly fee without much usage. Nonetheless they seem on average to be quite satisfied with their FHCs and are additionally likely to recommend their clubs to others. Many of those inactive members even consider renewing their membership-contract. Overall, it appears that active and inactive FHC members only differ distinctively with regard to their attendance frequency, but are quite similar in their club related attitudes and behaviors. Considering that FHCs generate comparable revenue streams from members irrespective of their attendance, yet the costs caused by inactive members are much lower, FHC managers are well-advised to focus their attention also on the inactive sub-group.