

2013 Russell Ackoff Doctoral Student Fellowship Proposal

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The Effects of Individual Monitoring and Mental Depletion on Compliance with Standards: Field Evidence from the Hand Hygiene Practices of Health Care Professionals

Research Objectives

Professional standards offer important guidance to practitioners in most occupations, from auditors and lawyers to reporters and researchers. Living up to externally-imposed standards is particularly critical for health care professionals because compliance failures can result in irreversible medical errors, which put both patients and health care professionals at high risk. However, health care professionals do not always comply with guidelines. For example, maintaining hand hygiene is widely accepted as one of the most effective means of reducing healthcare-associated infections, which affect one in 20 hospitalized patients and contribute to about 100,000 deaths in the U.S. each year (CDC, 2002; WHO, 2009). Nevertheless, systematic reviews of hand hygiene maintenance suggest compliance rates with professional guidelines are below 50% in most health care settings (CDC, 2002). Recognizing the importance of understanding situational and internal factors that influence health care professionals' compliance with medical guidelines, this research focuses on hand hygiene practices and aims to address the following two questions:

Question 1: What are the short-term and long-term effects of individual monitoring on hand hygiene compliance?

A substantial literature suggests that monitoring is likely to change how people behave within organizations; however, precisely how monitoring will affect behavior is somewhat controversial. On the one hand, people strive to create positive impressions in many social settings (Leary, 1996) and pay closer attention to their behaviors when they are observed (vs. unobserved) (Goffman, 1959). Also, monitored employees may have the lay belief that they can avoid penalties and seek rewards by complying with guidelines that are monitored, even when no incentives are explicitly stated. On the other hand, monitoring systems may convey managers' distrust and imply that managers expect unmonitored employees to shirk (Frey, 1993), which may backfire, generating employee reactance. Using a setting where health care professionals are first monitored anonymously at the group level and then monitored individually, we examine the impact of *individual* monitoring on caregivers' hand hygiene compliance over time and explore both the short-term (1-2 week) and long-term (1-2 year) effects.

Question 2: Does hand hygiene compliance change over the course of caregivers' shifts as a result of mental depletion?

Health care professionals make many important decisions and deal with emotionally-intense situations over the course of long shifts – conditions that past research suggests are likely to be depleting. Furthermore, complying with hand hygiene guidelines requires mental resources because caregivers first need to recognize the necessity of sanitizing their hands every time they enter or exit a room and then must avoid the temptation to “cut corners.” In line with research showing that mental depletion impairs executive function and self-control capacity (Baumeister et al., 1998; Muraven and Baumeister, 2000), we hypothesize that as health care professionals advance through their shifts, they will be more and more mentally depleted and thus deviate from hand hygiene guidelines to a greater degree.

Besides having practical implications for health care, this project also contributes to theories about decision processes and psychology. First, it speaks to the controversy about the effects of

monitoring employees in organizations and provides a clean examination of the short-term and long-term effects of individual monitoring in a novel and consequential setting. Second, it is the first field study to investigate the impact of mental fatigue on compliance with professional guidelines. In addition, the extant evidence that mental depletion matters comes almost exclusively from laboratory experiments, and the only exception (Danziger et al., 2011) has been criticized as potentially spurious (Weinshall-Margel and Shapard, 2011). This project seeks to corroborate prior laboratory research by showing that mental depletion influences consequential decisions in the field.

Method

We are collaborating with a company that provides hand-hygiene compliance monitoring services to 35 U.S. hospitals. Using customized, high-tech hand sanitizers, the company records the daily number of uses of each machine as well as the time of day when each caregiver at each hospital passes by each hand sanitizer and whether or not the caregiver in question uses the machine in question. The monitoring system was rolled out in all hospital units in two stages. First, the company installed high-tech hand sanitizers and tracked daily machine usage at the hospital unit level without identifying individual caregivers. This period captures baseline hand hygiene usage of caregivers under *group* monitoring. Several months later, the company turned on individual caregiver monitoring devices (tracking individual-level hand hygiene compliance). Therefore, we can evaluate the overall effectiveness of *individual* monitoring by comparing daily machine usage in the pre- versus post-individual-monitoring periods. We will use regression analysis to measure the individual monitoring effect both in the short- and long-term. In addition, we will investigate moderating factors, such as the function (e.g., Pediatrics, Dialysis), organizational culture, and leadership style of each hospital unit.

To address our second research question, we have begun to analyze individual-level hand hygiene practices. Essentially, our model predicts a caregiver's probability of complying with hand hygiene guidelines (by sanitizing her hands when entering or exiting a room), as a function of how many hours the caregiver has been working during a shift. Preliminary analysis supports our mental depletion hypothesis, but more refined analysis is needed for well-grounded conclusions. We will explore moderating factors, such as caregivers' roles (e.g., physicians, nurses, nurse assistants) and each shift's workload intensity. In addition, we will examine the effect of taking (long vs. short) breaks between shifts on overcoming mental fatigue and improving hand hygiene compliance.

Reasons for Seeking Funding

We anticipate our results will interest a broad audience including psychologists, organizational behavior researchers, and health care practitioners. I hope to present this work at two relevant conferences: the Annual Meeting of the Academy of Management and the Society for Judgment and Decision Making Annual Conference. I also plan to visit our corporate collaborator to facilitate our collaboration. The Russell Ackoff Fellowship will be used to support conference attendances, company visits, research assistants and the purchase of statistical software to support my analysis. I appreciate your consideration of my proposal and welcome any questions related to the currently proposed research.

Advisor: Professor Katherine L. Milkman



Budget Description

Items	Estimated Cost	Note
Research Assistants	\$500	Research Assistants will help with cleaning up data (estimate: 50 hours in total)
Company Visit (Birmingham)	\$450*2	<ul style="list-style-type: none">• Roundtrip flights: \$300• Accommodation (one night): \$150
Academy of Management Annual Meeting (Orlando)	\$700	<ul style="list-style-type: none">• Registration fee: \$200• Roundtrip flights: \$300• Accommodation: \$200
Society of Judgment and Decision Making Annual Meeting (Toronto)	\$600	<ul style="list-style-type: none">• Registration fee: \$100• Roundtrip flights: \$300• Accommodation: \$200
Total	\$2,700	

Any incurred expenses that the Russell Ackoff Doctoral Student Fellowship does not cover will be paid out-of-pocket or by travel funding provided by the Operations and Information Management Department (\$800 per student per year).

Summary of the Research Project Supported by 2012 Ackoff Fellowship*

The Fresh Start Effect: Breaking Points in Life Motivate Virtuous Behavior**

Project Objective

People frequently make tradeoffs between maximizing their long-term utility and satisfying their immediate desires. This research examines naturally-arising points in time when people are particularly motivated to behave in line with the dictates of their far-sighted, ideal self. This research contributes to a growing literature examining how a decision's context can facilitate far-sighted decision making and highlights moments when people may be most effectively "nudged" to make virtuous decisions.

Current Progress

In the past year, we conducted four laboratory experiments and analyzed two archival data sets. We demonstrate that many transition points in life and on the calendar (e.g., a promotion, the beginning of a new week/month) demarcate the passage of time, creating numerous breaking points in each year. Our studies consistently show that these breaking points generate fresh start feelings, which are stronger at meaningful discontinuities and motivate virtuous behavior such as exercise and dieting. We further show that the motivational effect of breaking points, which we refer to as *the fresh start effect*, originates from (a) the psychological disassociation between a person's current self and her past self and (b) a person's belief that she is more like her ideal self at the beginning of a new period.

This paper is currently under review at *Management Science* and has been presented at the CMU-Penn Roybal Retreat. It will be presented at the 2013 Society of Consumer Psychology Conference (San Antonio) and has been submitted to several others conferences as well (e.g., 2013 Academy of Management Annual Meeting, LBS Trans-Atlantic Doctoral Conference, etc.).

Budget Justification

The 2012 fellowship has been used for the following purposes:

- Software and book purchases (e.g., Stat Transfer, Endnote)
- Supporting conference attendance: Behavioral Decision Research in Management (Boulder), Academy of Management Annual Meeting (Boston) and Society of Judgment and Decision Making Annual Meeting (Minneapolis)
- Paying participation fees for lab experiments

* I applied for the 2012 fellowship with a research project examining whether a celebrity's diagnosis with cancer motivates people to take cancer screening tests. I changed my direction mid-way (at the guidance of my advisor) and began a new, related project (also examining health outcomes) to determine whether naturally-arising breaking points motivate people to make healthier, far-sighted decisions. Thus the 2012 fellowship has been primarily used to support the new project summarized below, under the supervision of Professor Milkman. The celebrity research is ongoing, but data was difficult to obtain (I received it approximately 6 months later than expected), which is why I focused on an alternative but related project.

** Dai, H., Milkman, K. L., & Riis, J. (2013). The Fresh Start Effect: Breaking Points in Life Motivate Virtuous Behavior, *Working Paper*, University of Pennsylvania and Harvard Business School.