

Encouraging Revolving Door Usage in a Mixed-Use Building: The Influence of Visual Prompts and Descriptive Social Norms

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This field experiment investigated effects of a descriptive norms-based sign combined with five footprint sticker decal prompts directing individuals to help save energy by using a revolving door, as opposed to a swing door, to exit a mixed-use building. We found that the percentage of individuals using the revolving door increased in both conditions (weekday and weekend day) after we implemented the sign and decals. Notable considerations in creating descriptive norms-based signage to encourage environmentally responsible behavior in mixed use buildings are discussed.

Keywords: environmentally responsible behavior, revolving door usage, visual prompts

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Numerous studies have been conducted on understanding and encouraging a wide variety of environmentally responsible behaviors, including recycling (Werner, Stoll, Birch, & White, 1998), litter reduction (Cialdini, Kallgren, & Reno, 1991), turning off lights (Sussman & Gifford, 2011), and towel reuse in hotels (Goldstein, Cialdini, Griskevicius, 2008). Although revolving doors save energy by reducing the amount of heated or cooled air that escapes buildings (Cullum, Lee, Sukkasi, and Wesolowski, 2006), there is a scarcity of research investigating the use of revolving doors as an energy-saving behavior.

Our search revealed only one study investigating revolving door usage. Cullum et al. (2006) examined people's behavior with regard to revolving door usage on the Massachusetts Institute of Technology (MIT) campus. In particular, the researchers were focused on habit formation and the identification of effective methods to modify habits. The researchers placed 8.5" x 11" signs on stands in front of the revolving doors that read "Please use the Revolving Door" in large print and "Help MIT Conserve Energy" in smaller print below. They found that these large signs with a simple message roughly doubled the number of individuals using the revolving door (Cullum, et al., 2006).

There are several variables that impacted the findings of Cullum et al. (2006) including, but not limited to, location of swing doors in relation to revolving doors, number of swing doors in relation to revolving doors, pushing as opposed to pulling swing doors open, traffic rates in and out of building, and automatic, as opposed to manual, revolving doors. We sought to expand upon the limited literature on revolving door usage by 1) utilizing a descriptive norms-based messaging approach and 2) adding footprint floor decal prompts leading individuals towards the revolving door.

According to Schultz (2014), several strategies contribute to environmentally responsible behavior such as prompts, commitments, feedback, social norms, incentives, and convenience. Depending upon the behavior, each one of these factors alone or in conjunction with others can greatly impact individual behavior. Simpler behaviors tend to rely on social norms, prompts, and convenience mechanisms to promote responsible behavior.

Norms-based messaging is frequently used in behavior change campaigns. In particular, descriptive norms have been especially effective in encouraging several environmentally responsible behaviors (Cialdini, et al., 1991; Schultz et al., 2008; Goldstein et al., 2008; Fornara, Carrus, Passafaro, Bonnes, 2011).

In addition to norms-based messaging, prompts can be an effective reminder to encourage specific environmentally responsible behaviors that individuals may forget to do (Schultz, 2014). In order for prompts to be effective they should be noticeable, self-explanatory, in as close proximity as possible to where the action is to be taken, and should encourage positive behavior as opposed to bringing attention to behavior that should be avoided (McKenzie-Mohr, 2010). They tend to work best when they focus on a specific, simple, and repetitive behavior requiring few steps (Schultz, 2014; Geller, Winett, & Everett, 1982). Furthermore, visual prompts, in addition to simple lettering, may make prompts more effective (Sussman & Gifford, 2011). Visual prompts have been used effectively to encourage a variety of proenvironmental behaviors (Werner, Stoll, Birch, & White, 2002; Austin, Hatfield, Grindle, & Bailey, 1993; Sussman & Gifford, 2011).

Our research attempts to address the question of how descriptive social norms-based messaging and visual prompts can impact individuals' decisions to use revolving doors in a mixed-use university building.

Method

Setting

Observations were made in a mixed-use private/public building on an urban New England university campus. The university owns the building and leases out the first floor to a variety of retail restaurants and shops. The top three floors consist of faculty and staff offices as well as academic classrooms. The building has three main entry/exit points—two in the front of the building and one in the rear of the building leading out into the parking lot behind the building. There is only one revolving door in the building—and in fact, on the entire campus—so our experimental methodology was dictated by the limitations of one revolving door. Four swing doors border the manual revolving door on both sides. Two of the four swing doors include a handicap accessible automatic door opener.

Method of Data Collection

We first collected pilot baseline data on the number of individuals using the revolving door and the swing doors while exiting the building. Although there is no existing sign on the inside of the building asking individuals to use the revolving door, there was an existing sign posted on the outside of one of the swing doors entering the building that stated “Please use the revolving door”. The text was extremely small (approximately 1 inch) and was posted on only one of the swing doors to the right of the revolving door. We also collected pilot data on the number of times someone held a swing door for a person behind them and attempted to classify these door holds as a “extended door hold” (person is 10 feet+ behind them) and a “brief door hold” (person is less than 10 feet behind them). We collected baseline data for two hours on four different days. Data was collected in person from a nearby discreet location.

Following the in-person collection of pilot data, we gathered baseline data on revolving door and swing door usage via a campus security camera directed at the revolving door and four swing doors. The camera angle allowed us to watch as individuals approached the doors from approximately 15 feet away. We collected a total of 36 hours of baseline data: 6 hours per day on three separate weekdays and 6 hours per day on three separate Saturdays.

We conducted a reliability analysis for 8 hours of baseline data by comparing the in-person tallies of one observer with the campus security camera tallies of a different observer. Agreement data on the number of individuals using the revolving door and the swing door was 100%. However, due to a low agreement average of 66% on the number of “extended door holds” and “brief door holds” we did not continue to collect this data beyond the baseline data stage. Since choosing between walking through a held-open swing door or a revolving door may present a conflict between social norms (being polite) and environmental norms (wasting energy), we think this is a worthy variable to investigate in a future study.

Experimental Design

After collecting our baseline data we introduced the experimental manipulation of a well-placed sign approximately 20 feet from the set of doors exiting the building. We designed a brief informative message (“Using the revolving door saves energy”) wrapped around a green

footprint, and then a descriptive normative message reading “Please join members of our community in helping *University x* become more energy efficient by using the revolving door”. We also placed five footprint sticker decals (Figure 1) starting at the sign and leading up to the revolving door. The decals were intended to mark the path to the revolving door. Although we received permission to place the sign and the foot decals from the Buildings and Grounds department, we wanted to make sure the signage remained in place over the four-week period—especially the sticker decals. Next, we collected a total of 66 hours of experimental manipulation data: 6 hours per day on 8 separate weekdays and 6 hours per day on 3 separate Saturdays. The entire study lasted approximately six weeks.



Figure 1. Footprint sticker decal

Results and Discussion

In total, 7379 observations were made across all conditions. We calculated the baseline percentage of individuals using the revolving door over each of the three weekday baseline days. After the sign and sticker decals were posted we calculated the percentage of individuals using the revolving door. We performed the same calculations for the weekend days. We then aggregated the data across baseline days (weekday and weekend) and experimental days (weekday and weekend). After posting the sign with the footprint sticker decals, the percentage of instances of individuals using the revolving door to exit the building during the weekdays increased from 21% during baseline to 34% during the experimental condition. The percentage of instances of individuals using the revolving door to exit the building on a weekend day increased from 39% during baseline to 54% during the experimental condition.

The results show that the combined norms-based sign and sticker decals were effective in producing modest increases in the percentage of individuals using the revolving doors while exiting the building. The presence of four straightforward and relatively undemanding push swing doors (push to exit building; pull to enter building), including two with an automatic handicap button, and a manual, as opposed to automatic, revolving door, were potential barriers to a greater increase in revolving door usage as found in the MIT study (Cullum et al. (2006). It should also be noted that the limitation of only one manual revolving door on campus impacted our design approach. With multiple doors we could have three experimental conditions: 1) descriptive norms-based sign only, 2) visual prompt only (footprints walking towards revolving

door), and 3) sign and prompt. We are unaware of any research utilizing sticker decals on the ground directing individuals towards a targeted behavior. Future studies could isolate the effectiveness of these interventions.

Although we did not calculate the exact proportion of university community members and non-university community members passing through the building during a weekday and a weekend day, we speculate that there are a significantly higher percentage of non-university-affiliated individuals exiting the building during the weekend days. We were surprised that the baseline data was significantly higher on the weekends and were also taken aback that our university norms-based signage produced similar increases in revolving door usage during these days. We speculate that the discrepancy between baseline data may be due to more families with children passing through the building on the weekend. Through our observations, children seemed more curious and eager to pass through the revolving door and in many instances their parents followed them through the door. In addition, people tend to be rushing to class and meetings during the week and the swing doors may have been a better timesaving option.

As universities and other organizations rent, lease, or share buildings with retail, restaurants, and various other businesses, it is important to understand how descriptive norms-based messaging can target all of these constituents. Goldstein, Cialdini, and Griskevicius (2008) claimed that most of the social norms literature focuses on the importance of the social group while overlooking the spatial-physical setting of the targeted behavior. Of the work that has been done on the impact of various social norms on place-related behavior, studies seem to focus on individuals that share the same spatial-physical setting in which their individual behavior has collective implications (Fornara, Carrus, Passafaro & Bonnes, 2011). Our pilot research on mixed-use university campus buildings suggests that non-university community members may be as influenced by descriptive social norms as members of the university community. However, we speculate that this relationship is highly sensitive to the injunctive norms of the broader community around the university and therefore should be investigated in a multitude of geographical locations. For example, we are curious to see if these results could be replicated in a mixed-spaced environment, serving multiple communities with different injunctive norms.

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