



Please turn off the lights: The effectiveness of visual prompts

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ABSTRACT

Two early studies showed that visual prompts can be effectively used to encourage people to turn off the lights in unoccupied classrooms, but they were methodologically limited. The current study used an ABAB-B design with an 11-week follow-up to investigate whether two different visual prompts (large and small signs) could be employed to increase “lights off” behaviour in 17 unoccupied washrooms. The odds were eight times higher that lights would be turned off in washrooms with signs than washrooms without, and large signs trended toward being more effective than small signs. Signs in washrooms with windows appeared to be the most effective, but this finding merits further research. Behaviour change persisted throughout the follow-up period, but reactance by a single washroom user resulted in some signs being removed. Compared to previous research, the current study used an improved methodology with a larger number of study sites. This study demonstrated that a simple, well-designed sign can effectively encourage energy conservation.

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1. Introduction

Over the years, climate researchers have amassed considerable evidence that global climate change is happening, and that it is at least partially a result of human activity (Intergovernmental Panel on Climate Change, 2007). The process of generating electricity for household use often results in the creation of “greenhouse gases” (e.g., CO₂) – the mechanism by which humans contribute to global warming. Given that the demand for household electricity is increasing (US Energy Information Administration, 2009), this source of greenhouse gas emissions is poised to become an even greater threat. Therefore, reducing household electricity use is an important environmental focus. One of the easiest ways to begin curbing the use of household electricity is to reduce waste by changing behaviours that minimally affect quality of life. The most common application of this idea is turning off the lights in unoccupied rooms. Because opportunities to engage in this behaviour arise many times daily for many people, the aggregate impact of the behaviour can be large, despite being small on an individual level. This is not the only solution to climate change, but rather one piece in the puzzle. Although other behavioural interventions could be

applied to encourage turning off the lights in unoccupied rooms, using visual prompts is one of the simplest.

1.1. Visual prompts

Signs mounted in public areas have been effectively used to encourage many behaviours. In the transportation domain, visual prompts have been employed to discourage the unauthorized use of reserved parking spaces (Cope et al., 1991; White et al., 1988), to encourage eyewitnesses to report traffic violations (Manstead and Lee, 1979), to promote safety belt use (Williams et al., 1989), and to decrease drivers' conflicts with pedestrians (Huybers et al., 2004). In the health domain, they have been used to encourage stair use rather than elevator use (Bungum et al., 2007; Russell et al., 1999; Van Houten, Nau, & Merrigan, 1981; Webb and Eves, 2007; Wogalter et al., 1997), to protect hearing by encouraging quiet use of headsets (Ferrari and Chan, 1991), to communicate the risks of high cholesterol (Goldman et al., 2006), to encourage proper posture while lifting heavy objects (Burt et al., 1999), to increase condom use (Amass et al., 1993; Honnen and Kleinke, 1990), and to promote sun safety (Mayer et al., 2001). In the leisure domain, signs have effectively enhanced visitor experience (Sanford and Finlay, 1988), reduced destructive “lawn-walking” (Hayes and Cone, 1977), and encouraged golfers to repair their “ballmarks” (Yu and Martin, 1987).

In the domain of pro-environmental behaviour, signs have mainly been used to reduce litter and increase recycling. Studies of littering in public places have found that signs may be related to

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lower rates in football stadiums (Baltes and Hayward, 1976), cafeterias (Craig and Leland, 1983; Durdan et al., 1985), movie theatres (Geller, 1973), parking garages (Reiter and Samuel, 1980), and high schools (Houghton, 1993). Litter may be substantially reduced if signs include feedback information (Dixon and Moore, 1992; Dixon et al., 1992), but this type of intervention is less popular because it requires regular input and, therefore, additional effort. Recycling of office paper and cafeteria polystyrene has also been shown to increase with the appropriate use of visual prompts (Austin et al., 1993; Werner et al., 1998).

Unfortunately, visual prompts are not always effective or they may not be as effective as other means of behavioural interventions (such as physical barriers or modeling, Jason et al., 1979; Van Houten et al., 1981), and in other cases they may actually have effects opposite to those that were intended. In one study, an anti-theft sign actually *promoted* the theft of certain items because the items were made more salient (Thurber and Snow, 1980). Similarly, a study of improved, “more readable,” signs in a zoo exhibit had the unintended negative consequence of reducing the number of visitors who looked at them (Louch et al., 1999). Therefore, signs must be carefully constructed and placed in order to maximize their effectiveness.

1.2. Sign design and placement

A number of studies have attempted to elucidate factors that may be important for designing signs. For instance, traffic sign and computer lab studies have found that noticeability, simplicity, and clarity are important aspects of sign design (Kline and Beitel, 1994; Manstead and Lee, 1979; Shieh and Lai, 2008; Williams et al., 1989). If a particular behaviour is targeted by the sign, then the sign should specifically focus on that behaviour (Geller, 1973). However, a thought-provoking sign may be best for encouraging recycling (Werner et al., 2009), and putting readers in a good mood may encourage recall (Bennett, 1998). However, humorous signs that are ambiguous or confusing may be less effective than plain signs that are direct (Horsley, 1988).

Adding a picture to a written communication may make the communication more effective (e.g., Houts et al., 2006; Perrine and Heather, 2000; Roberts et al., 2009; Van Meurs and Aristoff, 2009). For example, a picture over a donation box has been shown to increase donations, but a short written phrase in the same study (“Even a penny will help”) did not (Perrine and Heather, 2000). In tourism advertising, pictures are especially effective for attracting the consumer and arousing a behavioural intention, whereas text is most powerful for conveying information (Decrop, 2007). Generally, pictures appear to effectively improve signs unless there are so many that the message becomes clouded (Van Meurs and Aristoff, 2009). However, the image should be chosen carefully because a picture with incongruent text may confuse audiences (Jae et al., 2008).

Sign placement appears to be as important as sign design in affecting behaviour. A visual prompt that is read immediately prior to the opportunity to engage in the specific targeted behaviour is more likely to be obeyed than one read earlier (Geller et al., 1976). Thus, locating a sign in close proximity to the location where the behaviour is to be conducted (i.e., point-of-decision) increases the likelihood of behavioural compliance (Austin et al., 1993; Burt et al., 1999; Russell et al., 1999).

In some cases, an attempt to persuade others using a visual prompt (or any other technique) may be met with reactance – the desire to engage in the opposite behaviour to that being advocated as a form of protest (Brehm, 1966). For example, in one study a sign advocating water conservation was placed in a college shower room, and on at least one occasion, a user kicked over the sign and

took an extra long shower (Aronson & O’Leary, 1982–83). In the case of littering, positively phrased prompts were significantly more effective than negatively phrased prompts because the latter increased reactance (Reiter and Samuel, 1980). Completely eliminating reactance may not be possible, but using a positive and polite message may effectively reduce it.

Geller and colleagues (Geller et al., 1982) summarize the important aspects of an effective visual prompt: the target behaviour is convenient, the behaviour is precisely specified (or alternatives are specified if avoidance is the goal), the message is delivered as close to the behaviour as possible, and the message is stated in polite language (so as not to reduce the perceived freedom of the reader). Using these guidelines, a useful sign might be designed and implemented as part of a pro-environmental behavioural intervention.

1.3. Lights in the washroom

We used visual prompts constructed with the aforementioned design guidelines in an attempt to influence public washroom users to turn off the lights when the washrooms were empty after their departure. Two previous studies have found that posters can be used to increase the frequency of turning out the lights in unoccupied university classrooms (Luyben, 1980; Winett, 1977). The first small study examined three classrooms, and found that when one of the classrooms received a large sign (30 × 60 cm or 60 × 90 cm as opposed to 5 × 5 cm), the frequency of lights turned off was increased (Winett, 1977). The second focused on direct written communications, but also included the use of posters as a supplementary strategy (Luyben, 1980). The posters worked to improve compliance in both studies, but no significance test was reported in either study, and both studies employed a simple A-B design (with the B phase containing several interventions in succession), which limited their validity.

Point-of-decision signs have been used to influence other washroom behaviours, including hand washing (Johnson et al., 2003) and graffiti prevention (Johnson et al., 2003; Mueller et al., 2000; Watson, 1996). In all three of these studies, signs in the washroom were highly effective for changing users’ behaviour.

We hypothesized that washroom signs which suggested that users turn off the lights would significantly improve “lights off” rates, compared to baseline rates. Further, we hypothesized that larger signs would be more effective than smaller signs in doing so.

2. Method

2.1. Setting

Seventeen washrooms in five buildings were observed on a mid-sized Canadian university campus (18,000 full and part-time students). Five of these were for males, and all varied in size from two stalls (equivalent to one stall and two urinals in male washrooms) to four stalls. We did not include larger washrooms such as those in a university library because we expected them to be in use by at least one person almost all the time.

2.2. Observation

Seventeen volunteer observers (undergraduate students, graduate students, staff and faculty) checked the washrooms over the course of the study. Observations took place over 43 days, with an eight-day follow-up conducted 11 weeks later. No observations were recorded on weekends or during a one-week break in classes. In general, each observer checked the same washroom for the entire course of the study, but in a few cases one observer checked

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