



Less sitting and more moving in the office: Using descriptive norm messages to decrease sedentary behavior and increase light physical activity at work



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ABSTRACT

Objectives: The sedentary nature of office workplaces is an increasing concern (Marshall & Ramirez, 2011). One avenue through which sedentary behavior may be decreased and beneficial activity increased is through social norms. Previous research (e.g., Priebe & Spink, 2012) has demonstrated that perceptions about others' behavior (i.e., descriptive norms; Cialdini, Reno, & Kallgren, 1990) can influence physical activity. However, it is unclear if descriptive norms can be used to impact sedentary time. This study examined whether descriptive norm messages would impact sedentary behavior and light activity in an office setting. Given the possible importance of personal and contextual characteristics of the norm reference group, a secondary purpose was to examine messages that varied in reference group characteristics.

Design: This study utilized a pre-post experimental design.

Method: Office workers were randomly assigned to receive one of four email messages containing descriptive norms about co-workers' behavior. Sedentary behavior and activity were measured before and after message receipt.

Results: A repeated measures MANOVA revealed a main effect for time, $p < .001$, $\eta_p^2 = .316$. Those who received descriptive norm messages about co-workers' lower sedentary behavior and greater stair use and walking decreased their own sitting time while increasing stair use and walking at the office, respectively, p 's $< .05$. No differences emerged between participants receiving information about groups that varied in reference group characteristics, p 's $> .10$.

Conclusion: Results provide experimental evidence that descriptive norm messages may serve to decrease sedentary and increase light activity in an office setting.

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While it is generally accepted that most North Americans could improve their health by increasing physical activity levels (Cragg, Wolfe, Griffiths, & Cameron, 2007), less attention has been paid to the observation that individuals could benefit from decreasing their sedentary time (Marshall & Ramirez, 2011). This is surprising as studies have shown that sedentary behaviors, commonly defined as “behaviors that involve sitting and low levels of energy expenditure” (Marshall & Ramirez, 2011, p. 519), carry health risks independent of insufficient physical activity (Biddle, Gorely, Marshall, Murdey, & Cameron, 2004; Pate, O'Neill, & Lobelo, 2008).

Despite these health risks, the typical adult in Canada is estimated to spend about 9.5 h of waking time being sedentary, with most of it sitting (Colley et al., 2011). Further, adults in office jobs are likely sedentary for more time when compared to those in occupations such as the trades (Hu, Li, Colditz, Willett, & Manson, 2003). As such, both the World Health Organization (2008) and researchers (e.g., Chau et al., 2010; Marshall & Ramirez, 2011) acknowledge the need for more research examining ways to decrease sedentary behavior (sitting) in office settings.

It has been suggested that one practical way to reduce sitting time would be to break it up with light intensity activities (Chau et al., 2010; Marshall & Ramirez, 2011). Breaking up total sitting time appears to relate to health benefits as researchers have identified important health-related outcomes (e.g., improved metabolic profile) when individuals move from sitting to standing

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(Hamilton, Hamilton, & Zderic, 2004). Further, in a large population-representative sample, Healy, Matthews, Dunstan, Winkler, and Owen (2011) found breaks in sedentary behavior (independent of sedentary behavior) were beneficially associated with a known marker of health, waist circumference. In addition, these associations between breaks in sedentary time and health have been found independent of overall physical activity (Gilson et al., 2009), emphasizing the need to consider sedentary behavior as its own entity (Owen, Healy, Matthews, & Dunstan, 2010).

Descriptive norms and activity

Given the important links between physical activity, sedentary behavior, and health, there is a need for research understanding how we might change these behaviors, especially in an office setting. While there are a number of possible ways to target change in activity and sedentary behavior, one possibility is through social influence. One form that might hold particular potential in this area is descriptive norms. In focus theory of normative conduct, Cialdini, Reno, and Kallgren (1990) define descriptive norms as perceptions about the prevalent behavior of others. These norms have been examined with a number of behaviors (e.g., environmental conservation, Cialdini, 2003; alcohol consumption, Rimal, 2008; Rimal & Real, 2005), and recent research has emerged in the physical activity setting (e.g., Priebe & Spink, 2011, 2012).

Descriptive norms and sedentary behavior

As descriptive norm messages have shown some promise in the area of increasing light physical activity (stair use) in office workers (e.g., Priebe & Spink, 2012), it also might be important to extend this to examining norms for other types of light activity that might break up sedentary time (e.g., walking within the office and standing up during the work day). Also, as descriptive norms often are examined in relation to decreasing the prevalence of other negative behaviors (e.g., less alcohol consumption, Rimal & Real, 2005; less littering, Cialdini et al., 1990), using normative information to decrease sedentary behavior appears plausible (i.e., less sitting time).

The main purpose of this experimental field study was to examine the effect of descriptive norm messages delivered via email on sedentary behavior and light physical activity in an office worker population. It was hypothesized that descriptive norm messages about co-workers' lower sedentary behavior and greater light activity in the office would result in a decrease in sedentary behavior and an increase in light activity in individuals during work time. To be clear, by assessing both sedentary and light activity, we are taking the position of others that activity and sedentary behavior are not two sides of the same coin, but rather are independent behaviors that can co-exist in any given context (e.g., Biddle, 2007).

Characteristics of the norm reference group

While the existing correlational (Priebe & Spink, 2011) and experimental research (Priebe & Spink, 2012) supporting a relationship between descriptive norms and activity is promising, some important questions still remain unanswered. One relates to an examination of the characteristics of the norm reference group. Examining these characteristics might help explain results from past studies where the relationship between descriptive norms and behavior was only present when the reference group was framed as friends (Polonec, Major, & Atwood, 2006; Priebe & Spink, 2011). Consistent with the views of the social identity approach advocated

by Terry and Hogg (1996), it is possible that descriptive norms are only effective when they refer to groups where the individual feels some type of similarity (e.g., more similar friends compared to public service announcements conveying that others are active, where similarity to others is less clear). In addition to having a conceptual underpinning, empirical support exists for a stronger relationship between descriptive norms and physical activity in those who highly identify with their reference group (e.g., Rimal, Lapinski, Cook, & Real, 2005).

Personal and contextual similarity

Goldstein, Cialdini, and Griskevicius (2008) argue that normative research has focused on the personal similarity of reference groups (i.e., how similar they are in values, morals, characteristics), but suggest that contextual similarity in terms of proximity and situation also might be important. They found that normative messages about hotel towel re-use were most effective when describing group behavior that occurred in the setting most closely aligned with the individuals' immediate context (e.g., "the majority of guests who also stayed in this room reused their towels") when compared to normative messages about more distal groups (e.g., "other guests", "fellow citizens"). Based on the theory, empirical evidence, and the suggestions of Goldstein et al. (2008), one would expect descriptive norms about physical activity to be more effective when they refer to groups high in personal (e.g., same motivations) or contextual (e.g., same location) similarity when compared to less similar groups.

The secondary purpose of this study was to examine the effects of descriptive norm information about groups varying in personal and contextual similarity on sedentary behavior and light physical activity in an office worker population. Two secondary hypotheses were proposed: 1) There would be a main effect for similarity, such that descriptive norms about more contextually similar reference groups would result in lower sedentary behavior and greater light activity when compared to messages associated with less contextually similar groups. 2) There would be a main effect for personal similarity, such that descriptive norm messages about more personally similar reference groups would result in lower sedentary and higher light activity when compared to messages associated with less personally similar reference groups.

Method

This study employed a 2 (personal: low vs. high) \times 2 (context: low vs. high) pre-post-test independent groups design. Office workers were randomly assigned to one of four conditions (high personal/high contextual; high personal/low contextual; low personal/high contextual; low personal/low contextual) and reported sedentary behavior and light activity both before and after receiving descriptive norm email messages specific to their condition.

Participants

Participants ($N = 142$) were office workers employed in the head office of one large private company. Employees had jobs that required them to spend the majority of their workday at a desk (e.g., human resources, corporate affairs, information technology). In terms of final numbers for the analyses, 38 individuals did not complete all surveys and 8 participants did not recall receiving the manipulation message, leaving 96 participants (see Fig. 1 for flow of participants through experiment). Mean age of the final sample was 40.30 years ($SD = 12.02$), with 66% female and 34% male. Time with the company averaged 10.76 years ($SD = 10.68$).

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