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Blood, sweat, and the influence of others: The effect of descriptive norms on muscular endurance and task self-efficacy

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ABSTRACT

Objectives: The primary purpose of this study was to examine the influence of descriptive norm information about others' performance on muscular endurance (plank hold). A secondary purpose was to examine whether descriptive norms could serve as a vicarious stimulus informing task self-efficacy.
Design: Using an experimental design, adults were randomly assigned to either a descriptive norm (DN; $n = 34$) or control ($n = 34$) condition.
Methods: Participants performed two maximum endurance planks separated by a rest period. Immediately after performing the first, all participants completed a task self-efficacy measure relating to the second plank. Following this, those in the DN condition received a verbal message stating that 80% of similar others held their second plank for longer than their first. Control received no message. Prior to performing the second plank, all participants completed the efficacy measure again.
Results: Results from two ANCOVAs revealed that those in the DN condition held their second planks for significantly longer (controlling for plank 1 time), $F(1,65) = 17.99$, $p < .001$, $\eta_p^2 = .22$, and reported significantly higher task efficacy (controlling for pre-message task efficacy), $F(1,65) = 35.08$, $p < .001$, $\eta_p^2 = .35$, than those in the control condition.
Conclusions: Results extend previous research by relating descriptive norms to a new objective activity, while controlling for past behaviour, and by finding a causal relationship between descriptive norms and task self-efficacy for a muscular endurance task.

Introduction

While there are many influences on an individual's physical activity, it has been known for some time that the direct or indirect influence of others (i.e., social influence; Turner, 1991) can have a powerful effect on activities that individuals select, and the duration and the intensity in which they engage in those activities (e.g., Prapavessis & Carron, 1997). While the subject of some debate historically, it has been become more accepted in recent years that social norms are truly a 'lever of social influence' (Goldstein & Cialdini, 2007) that guide people's actions.

Norms have been described as rules that are understood and acted upon by group members without the force of laws (Cialdini & Trost, 1998). Several conceptual frameworks have been put forward over the years to explain various types of normative influence. One that has received considerable support is the focus theory of normative conduct (Cialdini, Reno, & Kallgren, 1990). The focus theory has two main tenets. The first suggests that for norms to influence individual behaviour, they must be made salient/focal to the individual. If a norm is made more salient, it is more likely to impact behaviour. The second tenet of the focus theory suggests that it is necessary to differentiate between two types of norms (descriptive and injunctive) when examining the relationship between normative information and individual behaviour. In terms of the descriptive-injunctive distinction, Cialdini et al. (1990) propose that injunctive norms relate to an individual's perceptions about others' approval or disapproval of behaviour while descriptive norms capture perceptions about the actual behaviour of others. While these two norms might act simultaneously in many situations (e.g., what is approved of, is often what is typically done), Cialdini and colleagues highlight that they are distinct.

In terms of the descriptive norm element of the focus theory (Cialdini et al., 1990), there is growing body of evidence to support the notion that perceptions of how others typically behave (i.e., descriptive norms) are related to individual behaviour in a variety of settings. For example, descriptive norms have been related to important individual behaviours such as alcohol consumption (Rimal, 2008; Rimal & Real, 2005), environmental conservation

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(Lapinski, Rimal, DeVries, & Lee, 2007; Nolan, Schultz, Cialdini, Goldstein, & Griskevicius, 2008), and sun-protection (Mahler, Kulik, Butler, Gerrard, & Gibbons, 2008).

Emerging evidence within the physical activity literature also provides support for descriptive norms as captured by the focus theory of normative conduct (Cialdini et al., 1990). Recent studies suggest that perceptions about the prevalent behaviour of others positively relate to the self-reported activity of individuals. For example, norms about friends' physical activity has been correlated with individual physical activity in both university and office settings (Priebe & Spink, 2011). Further, using an experimental study, descriptive norms were found to relate to individual behaviour in office workers, with workers increasing their own stair use in response to email messages about their co-workers' behaviour (Priebe & Spink, 2012).

Examining a cognitive correlate

While results of these previous physical activity studies are promising, there are many ways to build upon the extant research. For example, one extension to previous literature concerns the consideration of other outcomes that might relate to norms. One possible variable that relates to both descriptive norms and behaviour is task self-efficacy.

In efficacy theory, Bandura (1997) suggests that self-efficacy, which is a person's beliefs in his or her capabilities, can be increased through four sources (mastery experiences, verbal persuasion, physiological/affective states, and vicarious experience). Of these sources, vicarious experience might be most associated with descriptive norms. Specifically, descriptive norms provide individuals with information as to what is appropriate behaviour (e.g., lots of others are doing it, so it must be the correct thing to do). If the task is challenging, recognizing that many others are doing this challenging task could possibly provide a vicarious experience that informs efficacy perceptions. For example, an individual may hear a normative message that the majority of similar others persevered on a physical task even though they were tired, and think, "If they can do it, I can do it". To date, one study exists supporting a correlational relationship between self-efficacy and descriptive norms (Rimal, Lapinski, Cook, & Real, 2005). Specifically, Rimal et al. (2005) included self-efficacy as an outcome variable in a study of descriptive norms for practicing yoga, and found support for a positive relationship between descriptive norms and self-efficacy. Further investigating this link also would be important from a practical perspective as task self-efficacy has been found to be an important correlate of activity performance (e.g., Focht, Rejeski, Ambrosius, Katula, & Messier, 2005).

Methodological limitations of previous research

In addition, the extant research is limited in a number of ways. First, the normative messages concerning the activity levels of others used in previous studies were generic messages generated for the purposes of each study. Being generic (e.g., 75% of students use the gym at least once per week), they did not take the participant's previous activity behaviour into consideration. Thus, the possibility existed in previous research that the individual's own past behaviour may have equalled or exceeded the behaviour featured in the message. For example, in Priebe and Spink's (2012) experimental study, regardless of their initial behaviour, all participants received a message that others took the stairs 4 times a day. As such, it was possible that individuals may have already been taking the stairs 5 or more times. In cases such as this, the message could have been interpreted as, "I'm doing more than the rest, so maybe I should do less". And, in fact, this so-called "boomerang effect" is what has been found in other areas examining this circumstance (Schultz, Nolan, Cialdini, Goldstein, & Griskevicius, 2007).

In addition, differences in pre-manipulation activity levels may have accounted for the differing results between a student population and an office worker population found in previous experimental research (i.e., only the office worker population increased their stair use in response to normative messages about others' behaviour; Priebe & Spink, 2012). Given that students often navigate stairs with some regularity when changing classes, it is possible that they already used the stairs more than the norm presented in the messages. This issue was addressed in the current study by having participants first perform the behaviour, then crafting the normative message that was delivered to be higher than the participant's previous performance.

Further, existing research has failed to measure norm perceptions. Descriptive normative manipulations are thought to work by altering individuals' perceptions about the prevalence of behaviour (Campo, Cameron, Brossard, & Frazer, 2004; Rimal, 2008). For example, if an individual has a perception that most others rarely engage in strenuous activity, they may believe they "fit in" by only being active at an easy intensity. Providing this individual with a message that the majority of other people actually engage in strenuous physical activity might change their perception and resultant behaviour as the individual tries to comply with the "new norm". To ensure that normative information in messages differed from pre-manipulation perceptions, the current research included an assessment of norm perceptions.

Purpose

Based on the gaps in the existing literature, the purpose of the current pre-post design experimental study was to examine the influence of descriptive norm information on both physical performance and task self-efficacy in a muscular endurance activity (operationalized as a plank hold task). A plank hold exercise task and self-efficacy for this task were chosen as the dependent variables as they best allowed for a controlled experiment building upon gaps in the existing literature and testing the tenets of focus theory.

Hypotheses

Based upon the principles of focus theory (i.e., descriptive norms would impact behaviour; Cialdini et al., 1990) and earlier evidence (Priebe & Spink, 2011, 2012), it was hypothesized that muscular endurance times would be higher in a descriptive norm condition than in the control condition. Second, based on Bandura's efficacy theory (1997), and preliminary findings in the normative literature (Rimal et al., 2005), it was hypothesized that self-efficacy would be highest in the descriptive norm condition.

Method

Participants and design

Adult participants were recruited from a local Pilates studio ($N = 68$). To control for a potential learning effect, only participants who had previous experience performing the specific muscular endurance task (plank hold exercise) were included in this study. Through random number generation, participants were randomly assigned to either a descriptive norm ($n = 34$) or a control ($n = 34$) condition. Using a pre-post design, participants in a descriptive norm condition received a normative message between the two muscular endurance tasks indicating that a majority of others had improved on their second plank, while those in a control did not.