



# Behavioural spillover in the environmental domain: An intervention study



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## ABSTRACT

This study tests hypotheses about behavioural spillover in the environmental domain as well as the impacts of monetary inducements and verbal praise on behavioural spillover by means of a field experiment. A sample of 194 students from a large university in Denmark were randomly allocated to a control group or to one of two experimental conditions where they were encouraged to purchase "green" products by means of either financial compensation and incentives or verbal encouragement and praise. Participants answered a baseline survey containing questions concerning a wide range of environmentally relevant behaviours and after a six weeks intervention period where they were requested to keep track of their purchases by means of a shopping diary they answered a second survey with the same content as the first. This allowed us to analyse the change in self-reported pro-environmental behaviours over the six weeks, to identify instances of behavioural spillover from "green" purchase behaviour to other pro-environmental behaviours and to investigate if such spillover was affected by the nature of the intervention. The study revealed a positive spillover from "green" purchasing to other pro-environmental behaviours. However, the spillover mostly affects low-cost behaviours. Not unexpectedly, the monetary inducement had a stronger direct impact on "green" shopping than verbal encouragement and praise. However, contrary to popular beliefs, the spillover effects of a monetary inducement on other pro-environmental behaviours are at least as strong as that of verbal encouragement and praise.

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## 1. Introduction

The possibility that one pro-environmental behaviour might lead to another has gained increased attention in recent years, both among scholars (e.g., Evans et al., 2013; Thøgersen & Crompton, 2009; Whitmarsh & O'Neill, 2010) and policy makers (Defra, 2008). "Behavioural spillover," as this is sometimes termed (Thøgersen, 1999), implies that acting in a pro-environmental way changes (i.e., increases or decreases) a person's likelihood or extent of performing another/other pro-environmental behaviour(s). Indeed, there is mounting empirical evidence suggesting that pro-environmental behaviours tend to be correlated in practice (e.g., Thøgersen & Ölander, 2006; Whitmarsh & O'Neill, 2010). Further, the evidence suggests that this relationship is usually positive (see also Berger, 1997; De Young, 2000; Frey, 1993; Maiteny, 2002; Marian, Chrysochou, Krystallis, & Thøgersen, 2014; Scott, 1977). However, despite growing research on this phenomenon, still no

consensus has been reached on the nature of spillover, its drivers, possible contingencies or practical relevance (Thøgersen & Crompton, 2009).

There is also no consensus about how long time it takes for eventual behavioural spillover to develop, although it seems obvious that behavioural patterns need time to be re-shaped, depending on the features of the specific activity (in terms of complexity, familiarity and salience for the individual, and so on). For example, a study of possible spillover effects of a carrier bag charge found no evidence of a behavioural effect, but a strengthening of participants' environmental identity was registered, which the authors speculated might lead to spillover to other pro-environmental behaviours in the longer run (Poortinga, Whitmarsh, & Suffolk, 2013).

It is an important weakness of research on behavioural spillover that the available evidence is mostly correlational. Among the noteworthy exceptions is a recent study by Evans et al. (2013) finding that participants in two experiments needing to discard a sheet of paper were more likely to put it into the recycling bin when environmental goals had been primed by another pro-environmental behaviour (car-sharing). Else, most of the

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experimental evidence pertaining to behavioural spillover has been generated within the so-called “foot-in-the-door” paradigm (Freedman & Fraser, 1966). Freedman and Fraser (1966) conducted two experiments, asking individuals to carry out a small request first and a larger one later. The experiments differed regarding whether the same or different person(s) asked the two requests and whether the requests were similar (except for their size) or different. In both experiments, people who carried out a small request were more likely to accept carrying out a larger request later. This “foot-in-the-door” strategy has been applied and tested in a wide range of contexts, often showing a positive effect (e.g., Burger, 1999; Cann, Sherman, & Elkes, 1975; Pliner, Hart, Kohl, & Saari, 1974; Snyder & Cunningham, 1975), also with regard to pro-environmental behaviour (e.g., Scott, 1977; Souchet & Girandola, 2013).

It has also been suggested that negative spillover is possible, for example if people perform a low-cost pro-environmental behaviour to get an excuse for not performing other (and perhaps more costly) behaviours (Diekmann & Preisendörfer, 1998). Broad goals such as the protection of the environment can be pursued by means of a wide range of different behaviours, entailing different financial, physical and/or psychological costs (Kaiser & Wilson, 2004). Arguably, it is rational for an individual striving to attain a specific goal to try easy behaviours towards that goal first, before more costly and inconvenient ones (Susewind & Hoelzl, 2014). Thøgersen and Crompton (2009) suggested that when the rational inclination to first do simple and easy things for the environment is combined with self-serving bias (a pervasive phenomenon, cf. Pieters, Bijmolt, van Raaij, & de Kruijk, 1998), the likelihood of performing more difficult behaviours after easy ones might dwindle.

Negative spillover might also occur because acting in a pro-environmental way makes people feel they have a “license” to some moral leeway afterwards (Mazar & Zhong, 2010; Monin & Miller, 2001). Mazar and Zhong (2010) found that participants in an experiment who had shopped in a virtual store with mostly “green” products were afterwards more likely to cheat and steal for private gain than individuals who had shopped in a store with mostly conventional products. They attribute this effect to “green” purchasing giving a “license” to behave in an immoral way afterwards. Gneezy, Imas, Brown, Nelson, and Norton (2012) added an important caveat to the Mazar and Zhong study, however, finding that “moral licensing” only occurs when the moral behaviour is costless. When acting in a moral way is costly, participants in their study were more likely than the control group to perform other moral behaviours afterwards: a positive spillover effect. Since pro-environmental behaviour usually is costly, the latter suggests that pro-environmental behaviour is unlikely to lead to moral licensing in practise.

In sum, the number of experimental studies documenting the possibility of behavioural spillover is still small, and they are mostly carried out in the artificial setting of the laboratory. Hence, there is a need for more experimental research, especially outside the lab, documenting the practical relevance of spillover for pro-environmental behaviour. It is the objective of this article to contribute filling this gap.

## 2. Theoretical foundations

Behavioural spillover has been studied as “response generalization” at least since the 1970s (Stokes & Baer, 1977), but these early studies were broader in scope and did not focus specifically on pro-environmental behaviours (e.g., Ludwig & Geller, 1991). Spillover between pro-environmental behaviours, as described above, is consistent with several theories in psychology, including various consistency theories (Thøgersen, 2004), learning theories (Bandura, 1986), and goal theory (Dhar & Simonson, 1999).

Goal theory (Dhar & Simonson, 1999) assumes that individuals have a set of broad underlying goals (e.g. living a healthy life, preserving the environment, enjoying pleasant activities) whose achievement requires the allocation of resources, both financial and others (e.g. time). It specifies that a person can make subsequent choices, for instance among multiple courses within a single meal, such that they reinforce each other and maximize their short-term effect on the achievement of a particular goal. An environmentally relevant example of applying this principle is the campaign to promote meatless days, which has been “described as an attempt to create and to highlight commitment to a shared, higher order goal” (de Boer, Schösler, & Aiking, 2014, p. 121).

As previously mentioned, Evans et al. (2013) found that participants in two laboratory experiments needing to discard a sheet of paper were more likely to recycle the paper when a prior task had made them think about a completely different pro-environmental behaviour (car-sharing). However, the increased inclination to recycle only happened when the task had primed environmental goals (i.e., not when it primed financial goals). This suggests that behavioural spillover can be the product of one’s pro-environmental actions priming broader environmental goals that, once activated, guide other behaviours (see also Spence, Leygue, Bedwell, & O’Malley, 2014). Hence, behavioural spillover can be the product of environmental goals that are relevant for a broad set of behaviours being activated by performing a pro-environmental behaviour.

An even more popular theory in current empirical research on behavioural spillover is self-perception theory (Bem, 1972). Self-perception theory assumes that people form attitudes by observing and inferring from their own past behaviour and the contexts in which the behaviour took place. For example, it has been suggested that the foot-in-the-door strategy is effective exactly because individuals use their behaviour as a cue to their own attitudinal dispositions (Scott, 1977). Self-perception effects have been observed in a wide range of domains, including pro-environmental behaviour (Chaiken & Baldwin, 1981).

Further, there is evidence that behaving pro-environmentally in a given domain might not only change the attitude towards that behaviour (Holland, Verplanken, & Van Knippenberg, 2002), but might also activate a general disposition in the individual, which might influence future behaviour also in other domains (Cornelissen, Pandelaere, Warlop, & Dewitte, 2008). That past behaviour influences a person’s pro-environmental self-identity which might next increase the likelihood of performing completely different pro-environmental behaviours is also supported by a panel study finding evidence of spillover between a fuel conserving driving style and (intention to reduce) meat consumption, fully mediated through environmental self-identity (Van der Werff, Steg, & Keizer, 2014). In sum, it seems that individuals use their own behaviour as a cue to their broader dispositions and therefore a specific behaviour can potentially affect broader behavioural patterns and spark a positive spillover across behavioural domains.

It has also been suggested that acting consistently across pro-environmental behaviours, leading to positive spillover from one behaviour to another, may be motivated by the desire to avoid cognitive dissonance and the uneasiness it bears (Thøgersen, 2004). According to Aronson’s self-consistency revision of cognitive dissonance theory, the most disturbing inconsistencies are those threatening important elements of one’s self-concept as a competent, moral, reliable person (Aronson & Carlsmith, 1962; Dickerson, Thibodeau, Aronson, & Miller, 1992; Thibodeau & Aronson, 1992). Moral standards may therefore influence whether an inconsistency is experienced as disturbing by the individual (Thøgersen, 2004). Other contingencies include specific constraints, either personal or contextual, on a specific behaviour (e.g., Guagnano, Stern, & Dietz,

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