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Feel good, stay green: Positive affect promotes pro-environmental behaviors and mitigates compensatory "mental bookkeeping" effects

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ABSTRACT

To counteract climate change people should adopt lifestyles consisting of numerous pro-environmental actions, across different domains, sustained over long time periods. Thus, it is important to understand how initial pro-environmental behaviors can impact the likelihood of subsequent behaviors. We tested the hypothesis that people use mental bookkeeping of past behaviors, allowing them to limit pro-environmental behaviors after having performed similar ones, and investigated the role of affect in this context. Participants read campaign messages framed affectively neutral (Experiment 1) or positive/negative (Experiment 2), followed by fictitious scenarios in which they could perform a second pro-environmental behavior after having shown a first one. Participants indicated a smaller willingness to act pro-environmentally if the behaviors were similar. Positive affect increased the likelihood of showing subsequent behaviors and mitigated negative spillover driven by behavioral similarity. However, the observed effect sizes are too small to be of practical relevance for developing efficient intervention strategies.

1. Introduction

Campaigns and interventions aiming at the promotion of environmentally friendly behavior are present in many situations in our daily life. While many campaigns target changes regarding one specific behavior, an effective reduction of CO_2 emissions requires people to switch to an overall sustainable lifestyle. More precisely, individuals will have to change their behavior not only in one single domain, but act pro-environmentally over a longer time period and across different domains (IPCC, 2014). To develop and evaluate efficient intervention strategies, it is thus important to consider sequences of behavior, taking into account the sequential consequences that the performance of one pro-environmental behavior (hereafter "PEB") can have on the performance of subsequent PEBs.

While environmental campaigns can indeed succeed in motivating people to perform a targeted PEB (Abrahamse, Steg, Vlek, & Rothengatter, 2005), it is often not taken into account that performing an initial PEB can increase or decrease the likelihood of showing subsequent PEBs (Thøgersen & Ölander, 2003; Truelove, Carrico, Weber, Raimi, & Vandenbergh, 2014). These effects are referred to as behavioral spillovers and comprise several related phenomena such as consistency and licensing effects (Lanzini & Thøgersen, 2014; Mullen & Monin, 2016). At best, performing an initial PEB can induce consistency effects that increase the likelihood of performing a second PEB, referred to as positive spillover (Lanzini & Thøgersen, 2014). At worst, an initial PEB is (mis)used to justify a later ecologically harmful behavior or the omission of a second PEB, which is considered as negative spillover (Truelove et al., 2014). Negative spillover effects relate at the psychological level to rebound effects observed at the macroeconomic level, in which improved energy efficiency, for instance, can lead to enhanced energy consumption, reducing the size of potential energy savings (Herring & Sorrell, 2008).

Social-psychological research suggests that behavioral spillovers may be the result of people's regulation of their moral self-image, which they try to balance at a certain level in order to be able to perceive themselves as a moral person (Zhong, Liljenquist, & Cain, 2009). People experience a heightened moral self-image after

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performing a moral behavior, and a reduced moral image after engaging in a non-moral behavior (e.g. Sachdeva, Iliev, & Medin, 2009). Based on this perception, they may feel obliged to perform a subsequent moral behavior after an immoral deed or, in contrast, feel entitled to forgo a subsequent moral behavior or even act immorally after a moral virtue (Higgins, 1996; Zhong et al., 2009). Empirical evidence supports the notion that performing an initial PEB can reduce willingness to engage in subsequent PEBs (Miller & Effron, 2010; Sachdeva et al., 2009). PEBs thus seem to be subject to some form of bookkeeping, in which individuals deposit and withdraw moral credits linked to specific behaviors on a "mental bank account". This assumption invites comparisons with the behavioral economics literature on mental accounting, which provides strong evidence for mental bookkeeping processes in the finance domain (Thaler, 1980; 2008).

One aim of the present contribution is to develop conceptual links between this body of literature and the literature on behavioral spillover and moral licensing. As we will outline in the next section, while the literature on moral self-regulation does not put much emphasis on the characteristics of a certain behavior (other than that it is perceived as moral or immoral by the actor), the literature on mental accounting is more action-focused. It addresses the important role played by different mental accounts to which transactions (i.e., actions) are booked based on their characteristic and their consequences for decisions and behaviors (Soman & Ahn, 2011). Integrating insights from behavioral economics on mental accounting into the conceptualization of spillover effects may thus be a promising approach to better understand how the characteristics of a sequence of PEBs may contribute to different spillover effects.

1.1. Mental accounting of pro-environmental behavior

In the behavioral economics literature, *mental accounting* refers to the fact that people create symbolic mental linkages between specific acts of consumptions and specific payments, which can have large impacts on consumer decisions. Expenditures are grouped into budgets (e.g., food, housing, entertainment), income is divided into categories (e.g., regular, windfall), and wealth is allocated into accounts (e.g., checking, saving, pension fund; see Thaler, 1999). Research has demonstrated how slight variations in the naming, allocation or organization of mental accounts can influence decisions. The influence of mental accounting on decisions was illustrated for the first time in Tversky and Kahneman's (1981) theatre ticket experiment. They asked half of the participants whether they would be willing to purchase an additional theatre ticket worth $10 after they had lost an already bought ticket. The other half of participants was asked whether they would be willing to purchase a ticket worth $10 after they had lost a $10 bill. Willingness to buy the ticket was higher when participants envisaged having lost the $10 bill as compared to the loss of an already bought ticket. This finding was interpreted as illustrating that participants who had lost the theatre ticket placed those costs in a mental "theatre ticket account". In this group, purchasing the theatre ticket again increased the costs of visiting the theatre from previously $10 to $20, while participants from the other group placed the two expenses in separate mental accounts.

One important observation from the domain of financial decision-making is that mental accounting mechanisms lead to a violation of the classic economic notion of fungibility of money. That is, according to mental accounting theory, a credit allocated to one mental account is not a perfect substitute for a credit in another account (Tversky & Kahneman, 1981). For instance, money won in a football bet is more likely to be spent on a dinner in a restaurant, whereas a tax refund is more likely to be used to settle an invoice. This illustrates that people have a tendency to match the source of a credit with the domain in which it will be spent again (O'Curry, 1997). Moreover, people strive to keep an account balanced in the plus zone. In a financial context, this strategy reduces the risk of exceeding an implicit or explicit budget (Soman & Ahn, 2011; Thaler, 1999). However, it can lead to negative consequences, for instance when investors in the stock market are reluctant to sell losing stocks, because it would result in negative closing results for the respective mental account (Odean, 1998).

If similar mental bookkeeping mechanisms exist for the mental organization of moral – including pro-environmental – behaviors, moral credits should be booked on different mental accounts depending on the characteristics of previously shown actions. In line with this idea, Girod and de Haan (2009, p. 34) suggested that individuals use separate accounts for keeping track of different environmental behaviors, such as the number of flights per journey and the purchase of organic food. Similarly, Schütte and Gregory-Smith (2015) suggested separate mental accounts for holiday-related and sustainable behaviors at home. Such a mental bookkeeping of PEBs would suggest that similar PEBs that are booked to the same account are morally fungible, whereas PEBs that are booked to different accounts are not. For instance, moral credit related to performing a first specific PEB, such as recycling a plastic bottle on the way home, may be deposited on a specific account. If afterwards the occasion arises to show a highly similar PEB, such as recycling a plastic bottle at the workplace, moral licensing should arise, given that moral credit has already been booked to this account. However, if the occasion arises to show a different PEB, which would be booked on a different account (e.g., using a lid when cooking to save energy), no licensing should be observed.

The potential role of similarity on behavioral spillovers has been examined by Bratt (1999) as well as by Thøgersen (2004). Results of both studies show higher positive correlations between the likelihood of showing similar PEBs (e.g., *limiting residential heating* and *limiting residential use of warm water*) than between less similar PEBs (e.g., *limiting residential heating* and *attention given to environmental information on everyday items*). While at first sight this seems to contradict our hypothesis that an initial PEB should lead to a lower probability of showing a similar subsequent PEB, note that both studies focus on the likelihood of performing certain PEBs in general, rather than in a sequence of conducted behaviors. Based on the motivation to avoid cognitive dissonance (Festinger, 1954), people agreeing to the item "Would you recycle a plastic bottle at your workplace?" are likely to also agree to the item "Would you recycle a plastic bottle on your way home?", as they try to avoid appearing inconsistent in their general behavior. Thus, a positive correlation between the two items would be expected, given that both represent a general tendency to act. However, when the items are put into a behavioral sequence, "Would you recycle a plastic bottle on your way home after having done so at your workplace?", balancing effects might occur. Thus, we assume that behaviors occurring over a relatively short-time period are more likely to be linked to each other. This is similar to the payment depreciation effect observed in the financial domain, which describes the observation that the mental linkage between specific costs and benefits gets stronger with increased temporal proximity (Soman & Ahn, 2011).

Based on this reasoning, in the first experiment reported here, we tested the hypothesis that individuals are less likely to show a second PEB after having performed a first PEB if the two behaviors are similar, compared to when the behaviors are different. A further objective of the research presented here was to investigate how a reduction in PEBs due to mental accounting mechanisms can be mitigated. To this end, in the second experiment, we examined the impact of affect on the willingness to act pro-environmentally and