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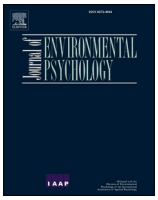

Regulatory focus and self-licensing dynamics: A motivational account of behavioural consistency and balancing☆

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ABSTRACT

People generally tend to stay consistent in their attitudes and behaviour, including proenvironmental actions. However, they can feel entitled to act less-than-virtuously when an initial "virtuous" (or proenvironmental) action provides an excuse to do so — a self-licensing effect. Drawing from goal setting and regulatory closure literature, we propose that regulatory focus influences whether people will show behavioural consistency or self-licensing. Four experimental studies ($N = 1184$) including one highly powered preregistered conceptual replication supported the hypothesis that regulatory focus moderates the impact of past proenvironmental behaviour (sanctioned by bogus feedback) on behavioural intentions. In a prevention focus, past positive behaviour weakened proenvironmental intentions in comparison with past negative behaviour and control condition (i.e., self-licensing) – an effect that did not appear in a promotion focus. Results contribute to the growing literature on factors moderating self-licensing dynamics. We discuss theoretical implications for regulatory fit and regulatory closure research, and specifically for the study of individuals' reaction to negative information in promotion focus. We also offer suggestions for designing effective individualised green consumption feedback and recommend that regulatory focus is used as a frame to effectively communicate personal 'green scores' and avoid potential rebound effects of positive feedback.

1. Introduction

Despite an inclination to stay consistent in their endeavours (e.g., Kiesler, 1971), there is evidence that people can use past behaviours as excuses justifying less-than-virtuous future conducts. This self-licensing effect (e.g., Merritt et al., 2010) echoes neighbouring phenomena of boomerang effect (e.g., Schultz et al., 2007), negative spillover (e.g., Truelove et al., 2014), and balancing (e.g., Fishbach & Dhar, 2005), which refer to similar alternating of positive and negative behaviours. Despite growing recent research, the circumstances under which people are more likely to demonstrate behavioural consistency versus self-licensing are not fully elucidated yet (Giurge et al., 2021; Mullen & Monin, 2016), especially in the environmental domain.

In the present paper, we rely on regulatory focus theory (Higgins, 1997) to suggest one of such possible moderators. More specifically, we propose that motivational orientation affects how people interpret their past behaviours and, consequently, whether these will trigger dynamics of self-licensing or behavioural consistency.

1.1. Consistency and self-licensing

Different lines of research suggest that past behaviour can either facilitate consistent future behaviour or encourage the adoption of opposite behaviour (i.e., inconsistency). On the one hand, people need consistency in their actions and beliefs (Festinger, 1957; Kiesler, 1971). According to self-perception theory (Bem, 1967), people act consistently with their past deeds as far as they have integrated them in their self-image. For example, people are more likely to act in an ecological-friendly way when they consider their past behaviour as more eco-friendly (Cornelissen et al., 2008; Whitmarsh & O'Neill, 2010). Past behaviour can thus increase the likelihood of performing consistent behaviour in the future, be it positive or negative (Schaumberg &

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Wiltermuth, 2014; Staw, 1976). In other words, initial pro-environmental behaviour might lead to further proenvironmental behaviour (Thøgersen, 1999; Thøgersen & Ölander, 2003; Xu et al., 2020).

On the other hand, people can also use past positive behaviours as credits allowing them to fulfil identity-related goals and subsequently relax their efforts in pursuing these goals — resulting in seemingly inconsistent behaviour. According to Effron & Conway, 2015, p. 32), "self-licensing occurs when evidence of a person's virtue frees him or her to act less-than-virtuously." A meta-analysis on 91 studies found the self-licensing effect to be reliable and of small-to-medium size (Blanken et al., 2015; see also Simbrunner & Schlegelmilch, 2017), although most recent considerations suggest the effect size could be smaller than initially thought due to a publication bias (Ebersole et al., 2016; Kuper & Bott, 2019). Although self-licensing was primarily framed as a moral phenomenon, the identification of similar dynamics in a variety of domains without the necessary reliance on a moral element suggests that self-licensing can apply to any domain that benefits from positive normative connotations (Effron, 2016), including the reduction of pro-environmental behaviours.

For example, Longoni et al. (2014) observed that participants who had received positive feedback regarding their proenvironmental behaviour were less likely to recycle DIY material in a subsequent task, as compared to negative feedback and control condition with no feedback. Similar findings arose in studies considering other pro-environmental behaviour, from wasting water (Geng et al., 2016; Zhang et al., 2020) and using more paper in a lab task (Catlin & Wang, 2013), to seeking information about one's carbon footprint (Gholamzadehmir et al., 2019) and petition signing (Lalot, Falomir-Pichastor, & Quiamzade, 2018), to household energy consumption (Schultz et al., 2007; Tiefenbeck et al., 2013), willingness to pay for organic products (Engel & Szech, 2020) and a variety of general and specific proenvironmental intentions (Geng et al., 2016; Lalot, Falomir-Pichastor, & Quiamzade, 2018; Lalot et al., 2019; Meijers et al., 2015). Self-licensing has been identified within specific categories of behaviour (i.e., in situations where the past behaviour serving to acquire credentials and the subsequent behaviour used as the dependent variable are similar, Catlin & Wang, 2013; Gholamzadehmir et al., 2019; Schultz et al., 2007) but also across categories of behaviour; for example from a sustainable groceries shopping task to wasting water (Geng et al., 2016) and failing to recycle DIY material in a subsequent lab task (Longoni et al., 2014), or from a household water use feedback to increased household energy consumption (Tiefenbeck et al., 2013). Hence, the effect of past behaviour seems to work in a spillover fashion, to the extent that the different past and future behaviours are conceived as contributing to the same superordinate (here, proenvironmental) goal (see Gollwitzer, 1986; Gollwitzer et al., 2013).

1.2. Moderating the consistency versus self-licensing effect

Given the apparent contradiction in the consistency and the self-licensing literature, the question arises as to when and how one dynamic is more likely to occur. Authors have recently started investigating moderators on the consistency versus self-licensing effect (see Mullen & Monin, 2016, for a review). We briefly review below the most notable moderators identified to date.

First, the way people monitor their behaviour (i.e., a progress-versus commitment-perspective) moderates consistency-balancing effects (Fishbach et al., 2009). In a commitment perspective, that is, when past behaviour informs about the value of the goal for the individual, people are more likely to demonstrate behavioural consistency. Contrariwise, in a progress perspective people are more likely to show balancing: sufficient progress will lead to a reduction of subsequent efforts and lack of progress will trigger compensation efforts (Fishbach & Dhar, 2005; Susewind & Hoelzl, 2014).

Second, construal level (Trope & Liberman, 2010) influences one's evaluation of their behaviour and the course of action subsequently adopted. For example, participants expressed higher intentions to engage in prosocial action when they had just recalled a moral behaviour they had performed in the distant past (i.e., more abstract) than in the near (more concrete) past (Conway & Peetz, 2012). In the same vein, Cornelissen et al. (2013) observed consistency when participants were oriented towards a "rule-based" ethical mindset (i.e., the *why* of action), but balancing when participants were oriented towards an "outcome-based" mindset (the *how* of action).

Third, social dynamics play a role. Lalot et al. (2018, 2019) found participants to report lower proenvironmental intentions after receiving proenvironmental credits when they perceived the environmental values as supported by a majority of their social group (which shaped the environmental goal into a duty or obligation from which one could disengage after showing minimal engagement; see also Schultz et al., 2007). Conversely, participants were more likely to show consistency when environmental values were supported by a social minority. Other evidence for social dynamics comes for example from Susewind and Walkowitz (2020) who showed that social recognition of the initial moral action is necessary for self-licensing to occur (see also Kristofferson et al., 2014).

Investigating such moderators is important as they are needed to correctly predict the conditions in which (or the people amongst whom) self-licensing is more likely to occur. The failure of some recent studies to find or replicate a self-licensing effect (Urban, Bahník, & Kohlová, 2019; Urban, Braun Kohlová, & Bahník, 2020) might be due to individual and contextual factors that tend to orient participants towards consistency (e.g., if the initial behaviour is interpreted as proof of commitment, or construed at an abstract level, or as not sufficiently recognised socially; we come back to this issue in the general discussion).

In the present research, we build on this previous research and link it with motivation and goal literature to suggest that regulatory focus could also moderate the consistency versus self-licensing dynamics. Indeed, regulatory focus is related to other identified moderators such as construal level (Semin et al., 2005) and majority versus minority status (Falomir-Pichastor et al., 2018; Moghaddam, 2004), which hints at the relevance of a motivational approach to better understand self-licensing effects. In a nutshell, we propose that self-licensing (vs. consistency) is more likely when people are oriented towards a prevention (vs. promotion) focus.

1.3. Regulatory focus and self-licensing

Regulatory focus theory (Higgins, 1997) defines two independent motivational systems: promotion and prevention. A *prevention* focus is related to security needs and the accomplishment of "ought" (obligations and duties). It increases attention to negative outcomes, involves vigilance-based strategies, and results in quiescence- and agitation-related emotions (Higgins et al., 1997; Shah & Higgins, 2001). A *promotion* focus is related to nurturance needs and the accomplishment of ideals (hopes and aspirations). It focuses on positive outcomes, involves eagerness strategies and results in dejection- and cheerfulness-related emotions. Individuals show a chronic orientation towards one focus (Higgins et al., 2001) but regulatory focus can also be influenced by contextual factors (Cesario et al., 2004; Freitas & Higgins, 2002). Message framing, task instructions, and many other contextual elements can temporally orient people towards one mindset or the other (Cesario & Higgins, 2008; Cesario et al., 2008). Both as a disposition or a contextual manipulation, regulatory focus has implications for all stages of goal pursuit, from action initiation (Crowe & Higgins, 1997) to final success or failure to achieve a goal (Baas et al., 2011). Crucially for the present research, it affects persistence in action, notably as a reaction to intermediate feedback.

Indeed, at some points in goal pursuit people need to assess how well they are doing with respect to a given goal and possibly adjust the

resources allocated to this specific goal. Realising they are making progress towards the goal can lead people to keep striving, or not (Kruglanski et al., 2002) — two ways of action that are reminiscent of consistency and self-licensing. In the latter case, people might be simply disengaging from the goal as a result of sufficient perceived progress (Fishbach & Dhar, 2005) and resulting sense of completion (Gollwitzer et al., 2009); or if the goal is construed as a subgoal connected to a superordinate goal, people can reprioritise, that is, shift to another subgoal (Thürmer et al., 2020). Crucially for our present purpose, there is evidence from different lines of research that regulatory focus influences these processes.

First, although both foci can imply attention to positive as well as negative outcomes, positive outcomes have more value in a promotion mindset while negative outcomes have more value in a prevention mindset (Halamish et al., 2008; Liberman et al., 2005). Therefore, people can react more strongly to positive goal-related information in a promotion (vs. prevention) focus. For example, Idson and Higgins (2000) measured participants' chronic regulatory focus before asking them to solve an anagram task. Mid-task, bogus feedback informed participants they were performing either better or worse than average. Participants continued with a second anagram task. In line with predictions, after positive feedback prevention-oriented participants invested less efforts in the second task than promotion-oriented participants (whereas the reverse was true after negative feedback). Similar results were found while manipulating regulatory focus through the framing of the task (e.g., Shu & Lam, 2011, 2016).

Second, experiencing success in a first task framed in promotion versus prevention ("regulatory closure") has specific effects on performance. In one set of studies (Baas et al., 2011), participants were asked to recall a past event where they had experienced promotion success (i.e., gain), prevention success (non-loss), promotion failure (non-gain) or prevention failure (loss), before performing a creativity task. Creativity performance dropped in one specific condition: after recalling a prevention success. The authors explained this by a specific deactivation of the motivational system when a goal is reached in the prevention focus: As the person experiences feelings of relaxation and relief, they are "deactivated" and feel no need to invest cognitive resources in any further task. In contrast, promotion success implies activating feelings of joy and cheerfulness and translates in higher motivation to perform in a second task. These results are consistent with work on approach and avoidance motives showing that specific emotions are related to the achievement of a goal depending on the motivational orientation: positive emotions related to approach are more activating or energising (e.g., happiness) than those related to avoidance, which are more deactivating (e.g., relief; Carver, 2006). In contrast, both promotion and prevention failure, indicators of non-closure of a goal, caused a continued investment of efforts (i.e., compensation efforts, Baas et al., 2011). These latter findings are consistent with research showing that an unfulfilled goal is associated with a discrepancy-related tension (Förster et al., 2005), indicating that the individual still needs to keep working towards the accomplishment of the goal (Gollwitzer et al., 1982, Gollwitzer et al., 2013; Wicklund & Gollwitzer, 1982).

Finally, the differential reaction to intermediate success in the task can also be approached through the conceptualisation of minimal-maximal goals (Brendl & Higgins, 1996). A minimal goal is a goal one absolutely wants to reach and whose non-realisation is of negative valence. It is "the lowest goal whose end state will still produce satisfaction" (Brendl & Higgins, 1996, p. 104). A maximal goal is an ideal goal one "hopes to approximate but does not necessarily expect to reach" (ibid.) and whose realisation is of positive valence. According to this distinction, a prevention focus increases the salience of a minimal goal, whereas a promotion focus increases the salience of a maximal goal (Higgins et al., 1994; Lalot, Quiamzade, & Falomir-Pichastor, 2018). Because of the differential magnitude between these goals, people reflecting on their past behaviour would be more likely to experience goal closure when the *minimal* goal is salient (prevention focus) than when the *maximal* goal is salient (promotion focus). In other words, the same level of past moral behaviour is more likely to translate in consistency dynamics under a promotion focus (because an unfulfilled maximal goal keeps the individual activated and motivated to pursue this goal), and in self-licensing dynamics under a prevention focus (because a fulfilled minimal goal deactivates the individual and incites to disengage from the goal). In sum, regulatory focus can activate versus deactivate the individual following success and, in turn, impacts the individual's motivation and investment of further efforts towards the relevant goal.

1.4. Overview and hypotheses

1.4.1. Hypotheses

We argue that regulatory focus may constitute an important moderator of consistency-licensing dynamics. Indeed, even if most of the research reviewed above considered the impact of regulatory focus on effort investment and performance in laboratory tasks, we propose that these effects can similarly apply to identity-related goals implying higher-level concerns. Therefore, we predict that past behaviour and regulatory focus will interact to predict behavioural intentions and derive the following specific hypotheses on simple effects.

First, we expect a simple effect of regulatory focus in the past positive behaviour conditions: weaker proenvironmental intentions would be observed for the participants in prevention focus as compared to participants in promotion focus. In addition, in prevention focus conditions we should observe weaker intentions following past positive behaviour, as compared to past negative behaviour or control condition where no past behaviour is made salient. In other words, we expect to observe self-licensing dynamics in prevention but not promotion focus.

Reaction to past negative behaviour in a promotion focus is less straightforward, as two theoretical accounts lead to opposite predictions. On the one hand, past negative behaviour may signal an overall state of goal discrepancy, irrespective of the focus. As such, the first response to the negative emotions associated to negative feedback is usually to try harder and compensate. Failure in promotion goals has also been found to elicit frustration and anger rather than dejection, i.e., different but equally arousing negative emotions as that of prevention failure, all indicating that more effort is still needed (Carver, 2004, 2006). We could hence expect individuals in a promotion focus to express strong goal-oriented intentions regardless of the level of past behaviour (Baas et al., 2011; Lalot et al., 2021). On the other hand, negative information and signals of failure are less relevant than positive information for promotion-oriented individuals (Higgins, 2009). We could hence, alternatively, predict that past negative behaviour fails to motivate participants in a promotion focus who would express weaker intentions, as compared to past positive behaviour (Idson & Higgins, 2000).

As these two opposing predictions (regulatory *closure* versus regulatory *fit*) are equally supported by the existing literature, we consider them in an exploratory way. To provide clearer evidence on potential null effects, we also conducted equivalence tests when key simple effects were found nonsignificant (Lakens, 2017). Results are reported in Supplementary Material.

1.4.2. Studies overview

Four experimental studies tested the overall hypothesis that regulatory focus moderates the effect of past proenvironmental behaviour on people's willingness to engage in future proenvironmental actions. All studies focused on the environmental domain and all measures and manipulations pertained to environmental issues and proenvironmental behaviour. Regulatory focus was manipulated through a current-ought-or-ideal procedure (Studies 1 & 4) or a value-framing procedure (Studies 2 & 3). Past behaviour was manipulated through a bogus feedback paradigm (for similar methods, see e.g., Lalot et al., 2019; Longoni et al., 2014; Schultz et al., 2007; Toner et al., 2014). As such, the past

behaviour manipulation taps into rather frequent or habitual behaviour.[1]

Dependent variables included general pro-environmental intentions and goal setting (Studies 1 & 3) and intentions related to specific collective actions (Studies 2 & 4). Studies 3 and 4 additionally included a control condition with no feedback in order to better distinguish self-licensing to mere balancing dynamics (Mullen & Monin, 2016). All studies received approval by the Ethics Committee of the School of Psychology at the University of Geneva. All data is publicly available on the OSF page dedicated to the project: https://osf.io/3jb5q/.

2. Study 1

Study 1 aimed to test the hypothesis that regulatory focus moderated consistency versus licensing dynamics. We adopted a bogus feedback paradigm in which participants were informed that their past behaviour already fulfilled (or not) a prescriptive proenvironmental norm based on the recommendations of a fictitious national office (see Cialdini et al., 1990). Such feedback provides information that one is (not) doing well enough as compared to a given point of reference (Longoni et al., 2014; Toner et al., 2014). Moreover, it informs about how close one is from the maximum possible position. With respect to the minimal-maximal standards distinction (Brendl & Higgins, 1996), the feedback hence provides explicit information on one's position relative to both a *minimal* standard (the recommended threshold) and a *maximal* standard (the scale's maximum).

We started by investigating participants' reaction in terms of the level of proenvironmental behaviour they would set for themselves in direct reference to the feedback scale. The following studies would then turn to participants' concrete proenvironmental intentions.

2.1. Method

2.1.1. Participants

University students from various faculties were contacted by email to participate in the online study on a voluntary basis. One hundred fifty-eight participants completed the study, but we excluded eight respondents from analyses because they expressed suspicion about the feedback's veracity.[2] The final sample was $N = 150$ (53 male and 97 female) of a mean age of 23.1 years ($SD = 5.48$). Attrition rate was 15.8%, including 7.6% before the feedback procedure (prevention: 2.9%, promotion: 4.7%), and 8.2% after the feedback procedure (promotion/positive feedback: 1.2%, promotion/negative feedback: 4.1%, prevention/positive feedback: 1.2%, and prevention/negative feedback: 1.7%).

2.1.2. Materials and procedure

Participants were randomly allocated to one experimental condition in a 2 (regulatory focus: promotion vs. prevention) × 2 (feedback on past behaviour: positive vs. negative) between-subject design (promotion-positive: $n = 32$, promotion-negative: $n = 42$, prevention-positive: $n = 37$, prevention-negative: $n = 39$). They first completed the regulatory focus manipulation, before going through the bogus feedback paradigm. They finally reported their personal proenvironmental goal setting under the form of a numerical score and indicated demographics.[3]

2.1.2.1. Regulatory focus. We used the "current ideals or ought procedure" described by Freitas and Higgins (2002) (see also Guo & Spina, 2015) to manipulate regulatory focus. oOIn the promotion (vs. prevention) condition, participants read, "We will now ask you to perform a visualisation task. Please think about something you ideally would like to do [you think you ought to do]. In other words, please think about the hopes or aspirations [duties or obligations] that you currently have. Please spend at least 2–3 min to think about these hopes or aspirations [duties or obligations] as this is very important for the study." They then reported on one or two of such hopes (vs. duties). The questionnaire was configured so that it was not possible to continue to the next page before at least 60 s had elapsed. Participants spent a median time of 113 s on the task and wrote a median of 16 words (range: 2–137 words).

2.1.2.2. Feedback on past proenvironmental behaviour. Participants answered 20 questions inspired from the General Ecological Behaviour Scale (Kaiser & Wilson, 2004) assessing their daily-life green behaviours (e.g., "I eat vegetable protein sources instead of meat", "I favour companies with an ecological background"; 1 = Never, 5 = Very often or always). They then received bogus feedback allegedly based on their answers to these questions. The feedback defined the participant's position relative to an official standard (recommendations of the national Office of Sustainable Development), which allowed to qualify their past behaviour as either "positive" (exceeding the recommended threshold) or "negative" (falling short of the threshold). Depending on the experimental condition (past negative vs. positive behaviour), participants received a score of 35 vs. 65 points out of 100, respectively, depicted on a graph – the official standard being set at 50 (see Fig. 1). The webpage was programmed so that participants spent at least 10 s on the page before being able to continue.

2.1.2.3. Personal proenvironmental goal. Following the feedback, we asked participants to define their own general proenvironmental goal. Specifically, we provided them with a horizontal slider going from 0 to 100 (similar to the scale on which they had just received the feedback) and asked them, "Sometimes it is easier to represent things graphically. Using the scale below, please indicate where your personal goal regarding environmental issues lies." Answers ranged from 0 to 94 ($M = 66.3$, $SD = 19.0$).

[1] Interestingly, research suggests that habitual behaviours could be less likely to translate into credentials (and hence to lead to self-licensing) because people fail to use frequent behaviour as diagnostic cues for their self-image: "When the good deed is a habit, doing it again is unlikely to boost the relevant self-concept" (Clot et al., 2016, p. 496). However, this reverses when the frequent behaviour is made contextually salient. For example, Cornelissen et al. (2008) found that a "positive cueing" procedure, explicitly labelling frequent behaviour as proenvironmental, increased participants' proenvironmental self-perception (see also Gholamzadehmir et al., 2019). Crucially, making habitual proenvironmental behaviour salient is exactly what recent marketing strategies of *consumption feedback* do. By providing information on groceries shopping's degree of sustainability, or on the level of the household's energy or water consumption, companies lead consumers to realise that their habitual behaviour is (more or less) proenvironmental (see Lalot, 2019). In an applied perspective, it hence seems both valid and interesting to focus on credentials acquired through past habitual green behaviour, and investigate whether these lead to self-licensing or rather behavioural consistency.

[2] At the end of the study (and of all the following ones), just before the debriefing, we asked participants to share any thoughts or comments they had about the study, as well as any ideas about the 'real aims' of the study. Some participants expressed doubts about whether the feedback really reflected their behaviour and others even guessed that the study's aim was to investigate their reaction to a bogus positive or negative feedback. These participants were excluded from the sample before analyses.

[3] After the dependent measure, participants also completed an economic-decision task (rating the importance of several attributes when choosing between different products) which served as a pre-test for a different line of research and did not pertain to the present research question. In this study as well as in Studies 2 and 3, we additionally measured participants' pro-environmental self-identity before the experimental manipulations. The variable, however, played no role in subsequent analyses and will not be discussed further. The interested reader can access the full data via the OSF link provided in the studies overview section.

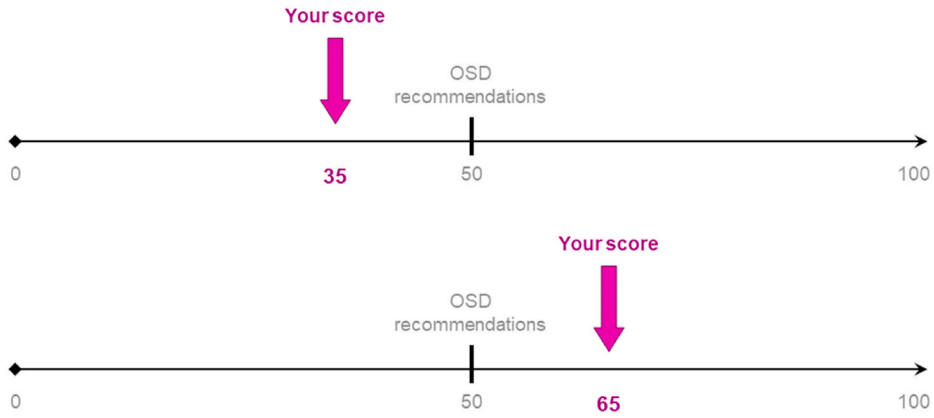

Fig. 1. Feedbacks provided to participants in Study 1. Top picture represents the negative feedback and bottom picture the positive feedback.

3. Results

We regressed level of personal proenvironmental goal on regulatory focus (−1 = Prevention, 1 = Promotion), feedback on past pro-environmental behaviour (−1 = Negative, 1 = Positive), and their interaction (overall model: F (3, 146) = 6.86, $p < .001$, $R^2_{adj} = 0.105$). The analysis revealed a main effect of feedback, $b = 5.90$, $SE = 1.48$, t (146) = 4.00, $p < .001$, $d = 0.66$, 95% CI [0.33, 1.00], so that participants set a higher goal for themselves after having received positive than negative feedback. The main effect of regulatory focus was not significant, $b = 1.70$, $SE = 1.48$, t (146) = 1.15, $p = .25$, $d = 0.19$, 95% CI [−0.14, 0.52]. More importantly, and consistent with our hypothesis, there was a significant regulatory focus × feedback interaction, $b = 3.09$, $SE = 1.48$, t (146) = 2.09, $p = .038$, $d = 0.35$, 95% CI [0.02, 0.67] (see Fig. 2).

Tests of the simple effects revealed that following positive feedback, participants in prevention focus set lower goals ($M = 68.1$, $SD = 19.0$) than those in promotion focus ($M = 77.9$, $SD = 11.6$), $b = 4.79$, $SE = 2.17$, t (146) = 2.21, $p = .029$, $d = 0.37$ [0.04, 0.69]. Following negative feedback, participants set similar goals regardless of regulatory focus (prevention: $M = 62.5$, $SD = 18.7$; promotion: $M = 59.7$, $SD = 20.2$), $b = -1.39$, $SE = 2.00$, t (146) = −0.69, $p = .49$, $d = -0.11$, 95% CI [−0.44, 0.21]. Supplementary tests showed that when they had received positive feedback, participants in promotion focus set goals significantly higher than the level they were at (i.e., than their score of 65), $b = 12.7$, $SE = 3.18$, t (146) = 3.99, $p < .001$, $d = 0.66$, 95% CI [0.32, 0.99]. In contrast, the average goal set by participants in prevention did not differ from the level reached, $b = 3.11$, $SE = 2.96$, t (146) = 1.05, $p = .30$, $d = 0.17$, 95% CI [−0.15, 0.50].

When they had received negative feedback, both groups set goals higher than the (insufficient) level they were at (i.e., their score of 35); prevention: $b = 27.5$, $SE = 2.88$, t (146) = 9.54, $p < .001$, $d = 1.57$, 95% CI [1.20, 1.95]; promotion: $b = 24.7$, $SE = 2.78$, t (146) = 8.90, $p < .001$, $d = 1.47$, 95% CI [1.10, 1.84].

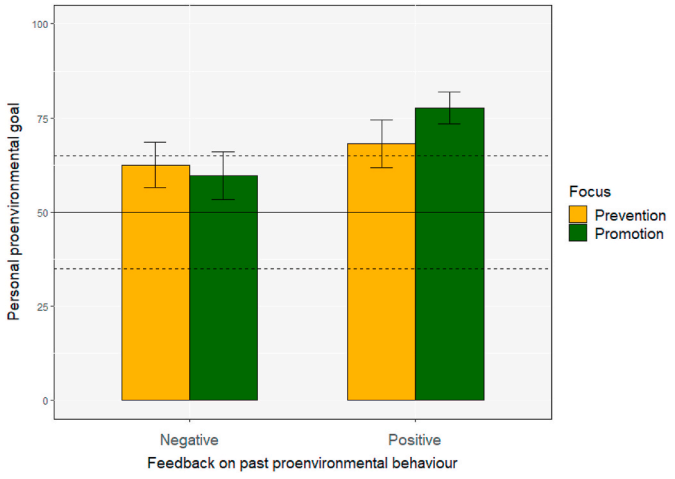

Fig. 2. *Personal proenvironmental goal as a function of regulatory focus and feedback on past behaviour (Study 1). Dashed lines represent the feedbacks given to participants (either 35 or 65) and the black line represents the threshold of official recommendations (50). Errors bars represent 95% CI of the mean.*

4. Discussion

This first study investigated how regulatory focus impacts reaction to positive (vs. negative) feedback labelling one's past behaviour as (in) sufficiently sustainable, and influences the level of the pro-environmental goal one subsequently sets for themselves. In accordance with our overall hypothesis, regulatory focus shaped reactions to the positive feedback: participants in promotion focus set higher goals for themselves whereas participants in a prevention focus were happy to merely maintain their goal at the level they had reached. In contrast, reaction to the negative feedback was not function of the focus, and all participants set a similarly higher goal for themselves. These results provide evidence for the regulatory closure hypothesis (energising people in promotion but deactivating people in prevention focus). Having established that the bogus feedback procedure could trigger different reactions as a function of the focus, we carried on to explore its impact on less abstract, more concrete intentions to engage in pro-environmental collective action.

5. Study 2

Study 2 built on the previous study and investigated the interactive impact of regulatory focus and feedback on participants' intentions to partake in a proenvironmental collective action. Since this study was run shortly before Christmas Eve, we presented an action revolving around the theme of a more sustainable holiday season, i.e., a "Green Christmas." We also turned to a different manipulation of regulatory focus. Indeed, as experimental manipulations often only pertain to certain aspects of the operationalized theoretical concept (Chen & Bei, 2017), conceptual replications with different manipulations are vital to ensure that the concept is indeed grasped — the respective shortcomings of each method cancelling each other out by force of repetition (Webb et al., 1966). For this study we hence utilised a value framing procedure (see details below).

5.1. Method

5.1.1. Participants

American participants were recruited through Amazon's online crowdsourcing platform Mechanical Turk. Following Oppenheimer et al. (2009)'s recommendations on research on potentially uninvolved participants, we included instructional manipulation checks (i.e., questions for which it is asked to tick a specific answer). From the original 157 participants recruited, seven failed to answer correctly to these instructional manipulation checks and were excluded from the analyses, resulting in a final sample of 150 participants (68 men and 82 women) with a mean age of 34.3 years (SD = 12.3). Attrition rate (5%) was limited to early quitters who dropped out before the first experimental manipulation.

5.1.2. Materials and procedure

Participants were randomly assigned to one experimental condition within a 2 (regulatory focus: prevention vs. promotion) × 2 (feedback: negative vs. positive) between-subject design (promotion-positive: n = 43, promotion-negative: n = 37, prevention-positive: n = 31, prevention-negative: n = 39). The procedure was similar to that of the previous study.

5.1.2.1. Regulatory focus. The manipulation aimed to put participants in a specific mindset (a value framing procedure; see Falomir-Pichastor et al., 2011, Study 3). Participants were asked to think about the pro-environmental values in either a promotion or a prevention mindset: They completed three short tasks that encompassed several theoretical aspects of regulatory focus: Depending on the condition (promotion vs. prevention, respectively), participants indicated on a Likert scale to what extent environmental values represented a personal ideal [obligation], then listed two positive [negative] consequences of [lack of] environmental actions and strategies allowing people to act in agreement [preventing people from acting in disagreement] with environmental values (in an open-ended response field; median response of 10 words, range: 2–99), and finally reported on Likert scales to what extent they would feel promotion- [prevention-]related emotions when acting in a pro- and anti-environmental manner.

5.1.2.2. Feedback on past proenvironmental behaviour. As in Study 1, participants rated the extent to which they adopted 20 (un)sustainable behaviour in daily life, on the basis of which they received feedback situating them either above or under the recommendations of a national office. No participant expressed suspicion about the veracity of the feedback they had received.

5.1.2.3. Intentions to participate in a proenvironmental collective action. Drawing from Lalot, Falomir-Pichastor, and Quiamzade (2018), a short text explained that the Christmas celebration's eco-footprint was huge (e.g., "$75 billion spent on Christmas gifts, 1.9 billion cards sent, and 20.8 million Christmas trees cut in the US alone") but that many different small actions could help reduce the impact on the environment. Four items measured participants' intentions to commit to a "Green Christmas" action (e.g., "Would you agree to spend more money to have a 'greener' Christmas (choose eco-friendly gifts, buy Christmas cards print on recycled paper)?") using 7-point scales (1 = Not at all, 7 = Absolutely). The four items loaded on a single factor and were aggregated into an intentions score (α = 0.84, M = 5.10, SD = 1.51).[4]

[4] According to opinion polls, almost all Americans celebrate Christmas (although admittedly not necessarily religiously). A Gallup poll showed 93% of Americans reported celebrating Christmas in December 2019 (Saad, 2019). We hence did not ask our respondents whether they celebrated Christmas themselves, nor did we exclude anyone from the sample on this basis.

6. Results

We regressed intentions on regulatory focus (−1 = Prevention, 1 = Promotion), feedback (−1 = Negative, 1 = Positive), and their interaction (overall model: F (3, 146) = 2.92, p = .036, R^2_{adj} = 0.04). The analysis revealed a main effect of regulatory focus, b = 0.25, SE = 0.12, t (146) = 2.01, p = .046, d = 0.33, 95% CI [0.003, 0.66], so that intentions were stronger in promotion (M = 5.31, SD = 1.34) than in prevention focus (M = 4.86, SD = 1.66). The main effect of feedback was not significant, b = −0.19, SE = 0.12, t (146) = −1.52, p = .13, d = −0.25, 95% CI [−0.58, 0.08]. The expected feedback × focus interaction fell short of significance, b = 0.23, SE = 0.12, t (146) = 1.85, p = .066, d = 0.30, 95% CI [−0.02, 0.63]. Despite its marginal nature, we decomposed the interaction with respect to our hypotheses (see Fig. 3).

Decomposition of the interaction revealed a significant simple effect of the focus in the positive feedback condition, b = 0.47, SE = 0.17, t (146) = 2.70, p = .008, d = 0.45, 95% CI [0.12, 0.78], with lower intentions in the prevention (M = 4.40, SD = 1.77) than the promotion condition (M = 5.34, SD = 1.18). Intentions in the negative feedback condition were not function of the focus, b = 0.02, SE = 0.17, t (146) = 0.12, p = .91, d = 0.02, 95% CI [−0.31, 0.35], (prevention: M = 5.22, SD = 1.49; promotion: M = 5.26, SD = 1.53). Additionally, participants in the prevention focus condition expressed weaker intentions following positive than negative feedback, b = −0.41, SE = 0.18, t (146) = −2.31, p = .023, d = −0.38, [−0.71, −0.05]. In contrast, intentions in the promotion condition were not function of the feedback, b = 0.04, SE = 0.17, t (146) = 0.24, p = .81, d = 0.04, 95% CI [−0.29, 0.37].

7. Discussion

Study 2 replicated and extended our previous findings by showing that regulatory focus, in interaction to positive (vs. negative) feedback labelling past behaviour as (in)sufficiently sustainable, affected participants' intentions to partake in a proenvironmental collective action. In accordance with a regulatory closure hypothesis, intentions were the lowest when participants in prevention focus had received positive feedback (i.e., goal closure and motivational deactivation). Interestingly, this study seemed to indicate that intentions in promotion focus were *not* function of the feedback (which was further supported by significant equivalent tests; see Supplementary Material): participants reported high intentions after both positive feedback (presumably in a consistency dynamics) and negative feedback (presumably in an attempt to compensate the initial lack of positive behaviour).

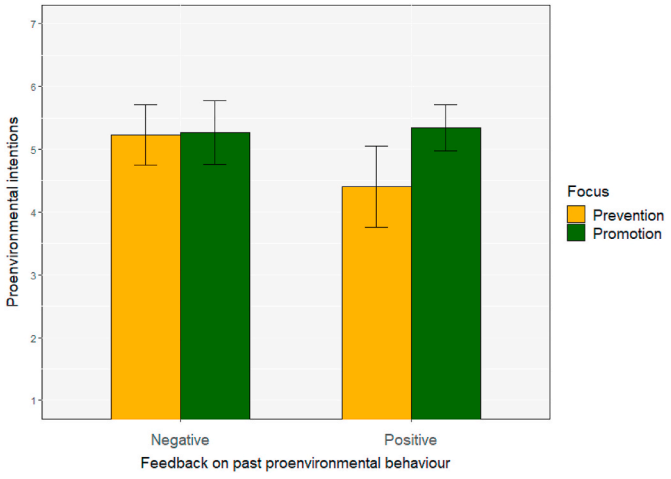

Fig. 3. Intention to partake in the "Green Christmas" action as a function of regulatory focus and feedback on past behaviour (Study 2). Errors bars represent 95% CI of the mean. (For interpretation of the references to colour in this figure legend, the reader is referred to the Web version of this article.)

However, these dynamics remain speculative. Indeed, merely comparing past positive to past negative behaviour cannot inform on the relative contribution of consistency dynamics and balancing dynamics. A control condition is needed in order to assess a baseline level of pro-environmental behaviour against which scores can then be compared. It was suggested that researchers should only claim to observe self-licensing effects when they obtain a decrease of moral behaviour (or intentions) following past moral behaviour *as compared to a control condition* (see Mullen & Monin, 2016, for a discussion of such "donut" designs). Given that past negative behaviour tends to induce compensation effects, comparisons between past positive and negative behaviour can only inform about balancing, but not about self-licensing per se. As such, an important limitation of these first studies is the absence of a control condition. To address this limitation, we conducted two additional studies that included conditions of past positive, past negative behaviour, and a control condition with no feedback on one's past behaviour.

In addition, it is likely that the first two studies were underpowered (Giner-Sorolla, 2018). Indeed, post-hoc power analyses aiming specifically to assess power for interaction effects (run on *R* with the *InteractionPoweR* package, Baranger, 2007) indicated an observed power for Studies 1 and 2 of 0.47 and 0.39, respectively (2000 simulations, $\alpha = 0.05$, code for the analyses is available on the OSF). In light of the analysis (close to a 50/50 chance), it might not be surprising that the interaction was found significant in Study 1 but not in Study 2. Given the results, we aimed to increase sample size in the following studies.

8. Study 3

8.1. Method

8.1.1. Participants

As in Study 1, University students from various faculties were contacted by email to participate in the online study on a voluntary basis. From the initial 478 students who clicked on the link to the questionnaire, 260 actually completed the study. However, we excluded from analyses 17 who expressed suspicions about the veracity of the feedback and 8 who reported weak proficiency in the language in which the survey was conducted. The final sample included 235 participants (85 male and 150 female) of a mean age of 24.83 years ($SD = 8.32$). A post-hoc power analysis indicated 0.82 power to detect the expected interaction ($\alpha = 0.05$). It can be noted that attrition rate was 45.6% but was mostly due to early dropout before the manipulations (34.8%); it was then 2.8% after the regulatory focus procedure (prevention: 1.8%, promotion: 1.0%), and 8.0% after the feedback procedure (promotion/positive feedback: 1.8%, promotion/negative feedback: 2.0%, promotion/no feedback: 0.4%, prevention/positive feedback: 0.8%, prevention/negative feedback: 2.0%, and prevention/no feedback: 1.0%).

8.1.2. Materials and procedure

Participants were randomly allocated to one experimental condition within a 2 (regulatory focus: promotion vs. prevention) × 3 (feedback: negative vs. positive vs. control) between-subject design (promotion-positive: $n = 40$, promotion-negative: $n = 39$, promotion-control: $n = 40$, prevention-positive: $n = 36$, prevention-negative: $n = 36$, prevention-control: $n = 44$). The procedure was the same as that of the previous studies.

8.1.2.1. Regulatory focus. We manipulated regulatory focus with the value framing procedure (Falomir-Pichastor et al., 2011) as in Study 2 and asked participants to write about the environmental values in a promotion (values as an ideal, positive consequences, approach strategies and promotion emotions) versus prevention framing (values as an ought, negative consequences, avoidance strategies and prevention emotions). The questionnaire was configured so that it was not possible to continue to the next page before at least 45 s had elapsed. Participants spent a median time of 250 s on the task and wrote a median of 26 words (range: 5–125).

8.1.2.2. Feedback on past environmental behaviour. As in Studies 1 and 2, participants rated a list of 20 daily-life green behaviours, then received feedback under the form of a score of 35 vs. 65 points out of 100 (negative vs. positive feedback) depicted on a graph with the official standard set at 50. Participants in the control condition rated their behaviour but did not receive any feedback.

8.1.2.3. Intentions to increase personal proenvironmental efforts. Following the experimental manipulations, we assessed participants' intentions through a single item, "Do you intend to make greater efforts for the environment?" (1 = Not at all, 7 = Very much; $M = 5.60$, $SD = 1.29$).[5]

9. Results

We first conducted a 2 regulatory focus × 3 feedback full-factorial ANOVA, with intentions as the dependent variable, which yielded a significant focus by feedback interaction, $F(2, 229) = 7.84$, $p = .009$, $\eta^2_p = .041$ (see Fig. 4). No other effect was significant, $F_s < 1.19$, $p_s > .30$. With respect to our hypothesis, positive feedback resulted in weaker intentions in prevention ($M = 5.08$, $SD = 1.40$) than promotion condition ($M = 5.78$, $SD = 0.95$), $b = 0.35$, $SE = 0.15$, $t(231) = 2.38$, $p = .018$, $d = 0.31$, 95% CI [0.05, 0.57]. No differences between promotion and prevention arose in the control condition ($M = 5.53$, $SD = 1.45$; and $M = 5.95$, $SD = 1.14$, respectively), $b = -0.22$, $SE = 0.14$, $t(231) = -1.53$, $p = .13$, $d = -0.20$, 95% CI [−0.46, 0.06], nor in the negative feedback condition (promotion: $M = 5.41$, $SD = 1.41$; prevention: $M = 5.81$, $SD = 1.22$), $b = -0.20$, $SE = 0.15$, $t(231) = -1.33$, $p = .19$, $d = -0.18$, 95% CI [−0.43, 0.08].

Second, we computed a set of two contrasts to verify the presence of a self-licensing dynamics. In the prevention condition, we expected the intentions to be lower in the positive feedback condition than in the negative feedback and the control condition. This resulted in the following contrast: Positive = −2, Control = 1, Negative = 1 (and its

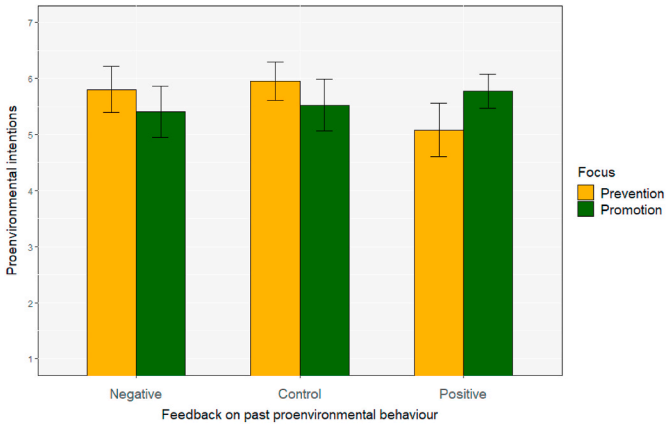

Fig. 4. *Intentions to increase one's proenvironmental efforts as a function of regulatory focus and feedback on past behaviour (Study 3). Errors bars represent 95% CI of the mean.*

[5] After the one-item intention measure, participants also completed another computer task (a lexical word-completion task), which pertained to a different set of hypotheses and did not fall within the scope of the present paper.

orthogonal contrast: Positive = 0, Control = −1, Negative = 1). We ran a linear regression model including regulatory focus, the two feedback contrasts and their respective interactions with regulatory focus (overall model: $F(5, 229) = 2.42$, $p = .036$, $R^2_{adj} = 0.030$). The model revealed a significant regulatory focus × contrast-coded feedback interaction, $b = -0.18$, $SE = 0.06$, $t(229) = -3.11$, $p = .002$, $d = -0.41$, 95% CI [−0.67, −0.15]. The regulatory focus × orthogonal contrast, however, was not significant, $b = 0.01$, $SE = 0.10$, $t(229) = 0.09$, $p = .93$, $d = 0.01$, 95% CI [−0.25, 0.27], nor was any other effect, $t_s < |1.38|$, $p_s > .16$.

Consistent with hypotheses, the contrast-coded effect of the feedback was significant in the prevention condition, $b = 0.27$, $SE = 0.09$, $t(229) = 3.12$, $p = .002$, $d = 0.41$, 95% CI [0.15, 0.67]: Intentions were lower in the positive feedback as compared to the negative feedback and the control conditions. The negative feedback and control conditions did not differ from one another, $b = -0.07$, $SE = 0.14$, $t(229) = -0.52$, $p = .60$, $d = -0.07$, 95% CI [−0.33, 0.19]. In contrast, no effect of feedback arose in the promotion condition; contrast of interest: $b = -0.10$, $SE = 0.08$, $t(229) = -1.25$, $p = .21$, $d = -0.17$, 95% CI [−0.42, 0.09]; orthogonal contrast: $b = -0.06$, $SE = 0.14$, $t(229) = -0.40$, $p = .69$, $d = -0.05$, 95% CI [−0.31, 0.21].

10. Discussion

This third study strengthened our previous findings by replicating the regulatory focus by past behaviour effect on intentions to increase one's proenvironmental efforts. Most importantly, the inclusion of a control condition (with no information on participants' past proenvironmental behaviour) allowed to clearly identify a self-licensing effect in prevention focus: participants expressed lower intentions following positive feedback as compared not only to negative feedback but also to the control condition. Hence, results support the hypothesis that past positive behaviour in a prevention focus triggers self-licensing dynamics (and not only balancing). Contrariwise, the direct comparison of negative feedback versus control indicates no evidence for balancing dynamics (which would have strengthened intentions following negative feedback). Participants in promotion focus showed neither balancing nor consistency but seemed to maintain rather high proenvironmental intentions regardless of the feedback received.

A limitation of this study is that the dependent measure consists in a single item assessing participants' general proenvironmental intentions, whose validity might be questioned. Hence, to ensure the findings' reliability, we conducted one final study with the same experimental design as in Study 3 but using a more concrete measure of proenvironmental intentions.

11. Study 4

Study 4 was designed as a highly powered and preregistered conceptual replication of the previous studies. The design, sample size, and planned analyses were registered through aspredicted.org (link to preregistration: https://aspredicted.org/df94p.pdf). As the study was run shortly before Christmas, we used the same Green Christmas action as in Study 2.

11.1. Method

11.1.1. Participants

Sample size was determined a priori based on a power analysis, using the size of the interaction effect observed in Study 2, which would be the closest in terms of measures and population, and aiming for 95% power (α = 0.05; see calculation details in the preregistration). The analysis recommended $N = 676$, which we rounded up to 680. American participants were recruited through the crowdsourcing platform MTurk. Unexpectedly, a number of incoming responses appeared to be fake, random responses generated by bots with spoof accounts. We later discovered than the heavy presence of bots was being investigated on MTurk (e.g., APS, 2018). To identify such answers, a judge blind to the experimental conditions read description of participants' goals in the current ought or ideal task (see below). Responses that clearly did not correspond to a human description of a goal were rejected, and slots were reopened for new participants.[6] A total of 680 (non-bot) participants completed the study but 31 failed to answer correctly to an attention check and were excluded from the analyses. This resulted in a sample of $N = 649$ (280 male, 367 female, and 2 undisclosed) of a mean age of 35.5 years ($SD = 10.6$). A post-hoc power analysis indicated 0.93 power to detect the expected interaction (α = 0.05). Attrition rate (13%) was limited to early quitters who dropped out before the first experimental manipulation.

11.1.2. Materials and procedure

Participants were randomly allocated to one experimental condition within a 2 (regulatory focus: promotion vs. prevention) × 3 (feedback: negative vs. positive vs. control) between-subject design (promotion-positive: $n = 115$, promotion-negative: $n = 117$, promotion-control: $n = 113$, prevention-positive: $n = 106$, prevention-negative: $n = 105$, prevention-control: $n = 93$). The procedure was the same as for previous studies.[7]

11.1.2.1. Regulatory focus. We manipulated regulatory focus with the "current ideals or ought procedure" as in Study 1, and asked participants to write about a current hope versus obligation of theirs. The content of the essays helped distinguishing bots from real participants. The questionnaire was configured so that it was not possible to continue to the next page before at least 45 s had elapsed. Participants spent a median time of 112 s on the task and wrote a median of 39 words (range: 6–206).

11.1.2.2. Feedback on past environmental behaviour. As in previous studies, participants rated their daily-life green behaviour, then received a feedback score. To increase reliability across studies and ensure against any material-related bias, we introduced two changes to the feedback procedure. First, participants were told the recommendations had been specified for their state of residence (which they had indicated at the beginning of the questionnaire amongst other demographics) instead of the whole country. Second, we changed the format of the feedback scale. Drawing from Longoni et al. (2014), scores were given on a horizontal axis going from 0 to 12, the official recommendations being set at 6.25. In the negative (vs. positive) feedback condition, participants received a personal score of 3.88 (vs. 8.63).

To strengthen the manipulation, the feedback was followed by a comprehension check: "To make sure you understand the meaning of those scores, please tick below the correct statement: *(a)* My environmental behaviour is HIGHER than the recommendations for my state; *(b)* My environmental behaviour is LOWER than the recommendations for my state." 97.9% of participants ticked the correct statement, suggesting the feedback was clear to most participants. Given the small number of wrong answers, we did not exclude any participants based on the comprehension check. Participants in the control condition rated their behaviours but did not receive any feedback.

11.1.2.3. Intentions to participate in a proenvironmental collective action. As in Study 2, a short text introduced the issue of Christmas celebrations' eco-footprint. We increased the number of items measuring intentions from four to six in order to improve reliability (e.g., "Would you waive some of Christmas traditions and reduce the size of outdoor lighting

[6] Admittedly, this represents a deviation from the preregistration since we did not anticipate we would be facing such an issue and would need to distinguish bot from non-bot answers.

[7] As indicated in the preregistration, participants also completed a measure of chronic regulatory focus before the experimental manipulations. The measure, however, is not discussed in the present report.

displays?"), andusied 7-point scales (1 = Extremely unlikely, 7 = Extremely likely). The six items loaded on a single factor and were aggregated (α = 0.80, $M = 5.26$, $SD = 1.11$).

12. Results & discussion

As in Study 3, we first ran a 2 regulatory focus × 3 feedback full-factorial ANOVA with intentions as the dependent variable, which yielded a significant focus by feedback interaction, $F(2, 643) = 6.06$, $p = .002$, $\eta^2_p = .019$ (see Fig. 5). No other effect was significant, $F_s < 0.59$, $p_s > .50$. As expected, positive feedback resulted in weaker intentions in prevention ($M = 5.10$, $SD = 1.26$) than promotion focus ($M = 5.47$, $SD = 1.02$), $b = 0.18$, $SE = 0.07$, $t(645) = 2.47$, $p = .014$, $d = 0.19$, 95% CI [0.04, 0.35]. No differences between prevention and promotion arose in the negative feedback condition ($M = 5.32$, $SD = 1.02$; and $M = 5.08$, $SD = 1.09$, respectively), $b = -0.12$, $SE = 0.08$, $t(645) = -1.56$, $p = .12$, $d = -0.12$, 95% CI [−0.28, 0.03]. Unexpectedly, a small but significant different arose in the control condition, with participants in prevention ($M = 5.46$, $SD = 1.01$) expressing slightly higher intentions than those in promotion ($M = 5.16$, $SD = 1.20$), $b = -0.15$, $SE = 0.08$, $t(645) = -1.98$, $p = .049$, $d = -0.16$, 95% CI [−0.31, −0.001].

We then used the set of two contrasts aiming to test self-licensing: Positive = −2, Control = 1, Negative = 1; and its orthogonal contrast: Positive = 0, Control = −1, Negative = 1. We ran a linear regression model including regulatory focus, the two feedback contrasts and their respective interactions with regulatory focus (overall model: $F(5, 643) = 2.74$, $p = .019$, $R^2_{adj} = 0.013$). The model revealed a significant regulatory focus × contrast-coded feedback interaction, $b = -0.11$, $SE = 0.03$, $t(643) = -3.47$, $p = .001$, $d = -0.27$, 95% CI [−0.43, −0.12]. The regulatory focus × orthogonal contrast was not significant, $b = 0.02$, $SE = 0.05$, $t(643) = 0.35$, $p = .73$, $d = 0.03$, 95% CI [−0.13, 0.18], nor was any other effect, $t_s < |1.03|$, $p_s > .30$. The contrast-coded effect of feedback was significant in the prevention condition, $b = 0.10$, $SE = 0.04$, $t(643) = 2.17$, $p = .030$, $d = 0.17$, 95% CI [0.02, 0.33]: Intentions were lower in the positive feedback as compared to the negative feedback and the control conditions. The negative feedback and control condition did not differ from one another, $b = -0.07$, $SE = 0.08$, $t(643) = -0.94$, $p = .35$, $d = -0.07$, 95% CI [−0.23, 0.08]. Finally, the contrast-coded effect of feedback also proved significant in the promotion condition, $b = -0.12$, $SE = 0.04$, $t(643) = -2.76$, $p = .006$, $d = -0.22$, 95% CI [−0.37, −0.06], but the direction of the effect was reversed: Intentions were *higher* in the positive feedback as compared to the negative feedback and the control conditions. The negative feedback and control conditions did not differ from one another, $b = -0.04$, $SE = 0.07$, $t(643) = -0.51$, $p = .61$, $d = -0.04$, 95% CI [−0.20, 0.12]. Hence,

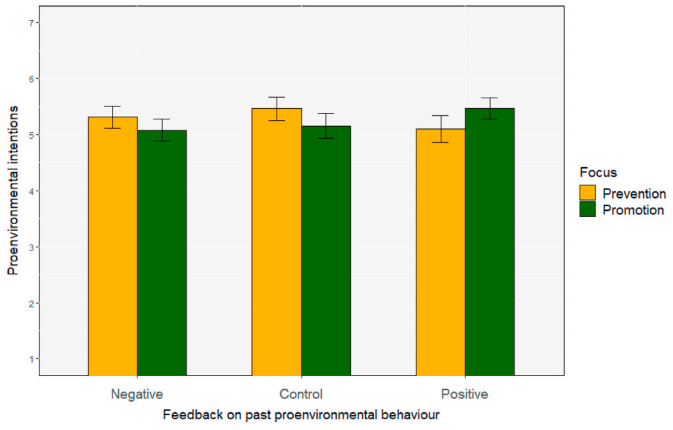

Fig. 5. Intentions to partake in the "Green Christmas" action as a function of regulatory focus and feedback on past behaviour (Study 4). Errors bars represent 95% CI of the mean. (For interpretation of the references to colour in this figure legend, the reader is referred to the Web version of this article.)

this final, highly powered and preregistered study replicated previous findings and showed that past positive behaviour translated into self-licensing in a prevention but not a promotion focus.

13. General discussion

Drawing from goal setting and regulatory closure literature, we hypothesised that regulatory focus would moderate the effect of past proenvironmental behaviour on the engagement in further pro-environmental conducts and influence whether people will show behavioural consistency or balancing. More specifically, we argued that only a prevention focus would result in self-licensing dynamics. Findings from four studies supported this hypothesis, showing that a prevention focus led to weaker intentions after past positive behaviour, as compared to past negative behaviour or a control condition. Moreover, the self-licensing effect occurred in prevention but not promotion focus: participants in the promotion focus condition expressed similarly high proenvironmental intentions regardless of the feedback they received. The inclusion of a control condition in Studies 3–4 allowed to determine that the dynamic at play was one of self-licensing solely (i.e., weakened intentions following *positive* feedback).

Interestingly, it also revealed that the negative feedback did not trigger any compensatory efforts as compared to the control condition without feedback. As participants in the control condition rated their proenvironmental behaviours (but did not receive any feedback on it), one possibility is that the mere filling of the scale activated the pro-environmental goal and created a motivational tension as participants might realise they were not doing a number of the actions listed in their daily life, hence triggering some compensation efforts by default. Future studies could aim to vary the manipulation of past behaviour and the nature of the control condition, to better disentangle these effects.

Similar effects appeared amongst different populations from different countries while using different operationalisations of the relevant constructs. This consistency across conceptual replications strengthens the validity of the present findings (Webb et al., 1966). As such, the present research offers insights for future research on the moderators of the self-licensing versus consistency effects.

13.1. Promotion focus and past negative behaviour

Different theoretical perspectives led to two opposite predictions regarding the reaction to negative feedback in a promotion focus. On the one hand, regulatory fit theory postulates that promotion-oriented individuals are more sensitive to positive information and increase their efforts following this type of information, in comparison to negative information (Higgins, 2009; Idson et al., 2000, 2004; Idson & Higgins, 2000; Shu & Lam, 2011, 2016; Van Dijk & Kluger, 2004, 2011) – yet, these studies focused on performance and persistence in different sets of cognitive tasks, but did not address intentions or behaviours related to a moral or higher-value domain. On the other hand, the regulatory closure hypothesis states that both success and failure in a promotion-framed goal would have an activating effect on the individual (the first because it elicits cheerfulness and elation and a sense of progress towards the higher-level goal, and the second because it elicits frustration and anger, and a sense of goal incompletion) and lead to similarly high commitment towards the goal (Ahn et al., 2020; Baas et al., 2011; Lalot et al., 2021; Scholer et al., 2014).

The present results mostly support the regulatory closure hypothesis as no significant differences between conditions of feedback arose in a promotion focus in Studies 2–3. Equivalence tests additionally confirmed that the conditions were *not* different from one another (significant equivalent tests; see details in Supplementary Material). However, Study 4 which benefited from the largest sample size and greatest statistical power, did find stronger intentions following positive feedback in promotion focus, supporting a regulatory fit hypothesis. Equivalence tests for the simple effects of negative feedback (i.e.,

equivalence between promotion and prevention) were not entirely conclusive: they significantly supported equivalence (i.e., no difference between conditions) in Studies 1–2 but not in Studies 3–4. Therefore, the present results cannot fully conclude about the relative validity of both hypotheses, each of which was supported in some of the studies. It seems that reaction to past negative behaviour in a promotion focus is not straightforward but depends on other moderators that were not presently identified.

Perceived discrepancy between the actual state and the goal might provide a plausible explanation. According to goal discrepancy literature, the distance between the actual and desired position is crucial in determining future action, and people can disengage from goals they consider too difficult or impossible to reach (Brehm & Self, 1989; Carver, 2006). Interestingly, this might be especially true for promotion-oriented individuals. Indeed, for goals of high value at least, promotion-oriented people base their action upon judgements of expectancy to a greater extent than prevention-oriented people (who tend to pursue high-value goals regardless of expectancy, Shah & Higgins, 1997). Therefore, we can reasonably assume that goal discrepancy impacts judgements of expectancy to reach this goal, and that distance to the goal might be especially relevant in a promotion focus. Congruently, in his study of emotions related to the behavioural approach system, Carver (2004) suggests that people would experience anger (i.e., an activating emotion) if the discrepancy is small but sadness (i.e., a deactivating emotion) if the discrepancy is large. This suggests that promotion-oriented individuals could either try and compensate or give up their efforts in the aftermath of past negative behaviour, depending on whether they perceive the goal as reachable or not. Future research is needed to test this possibility.

13.2. Regulatory focus and other moderators of the self-licensing effect

Previous work had identified construal level and progress-commitment perspective as two independent moderators of the consistency versus self-licensing effect (Conway & Peetz, 2012; Susewind & Hoelzl, 2014). Recent work has also highlighted the role of majority-minority social support for the moral (or proenvironmental) values. Interestingly, regulatory focus, construal level, progress-commitment, and majority-minority support seem connected to some extent. First, construal level and progress-commitment perspective are related. Fishbach et al. (2006) showed that temporally distant (vs. near) actions were more likely to be perceived as proof of commitment (vs. progress) towards a goal. Moreover, a commitment perspective focuses on the reasons underlying the action, i.e., the *why* component. Conversely, a progress perspective focuses on the attainment of the goal, i.e., the *how* component (Zhang et al., 2007).

Second, regulatory focus is related to construal level: a promotion (vs. prevention) focus facilitates more abstract (vs. concrete) thinking (Lee et al., 2010; Semin et al., 2005). As such, even if this has (to the best of our knowledge) not been investigated, one could envision that promotion leads to a focus on commitment to the ideal goal, whereas prevention leads to a focus on progress towards the mandatory goal.

Thirdly, majority-minority influence dynamics can be related to regulatory focus. Moghaddam (2004) argues that social minorities are more focused on rights and ideal values whereas social majorities are more focused on duties and moral obligations — a distinction not dissimilar to promotion versus prevention goals. Indeed, empirical research showed that when a social value (in this case, the value of equality and non-discrimination) was supported by a majority (versus minority), prevention (versus promotion)-related emotions predicted participants' equalitarian attitudes (Falomir-Pichastor et al., 2008).

If parallels can be drawn between these different constructs, it is not clear whether one factor mediates the other (e.g., if progress-commitment perspective, or prevention-promotion focus, or majority-minority support, induces a concrete or abstract thinking, or the other way around) or if they operate through similar mechanisms. In sum, these four concepts seem intertwined: they could share similar mechanisms, or they could to a certain extent constitute each other's mechanism. Future research will need to elucidate these issues.

13.3. The future of research on self-licensing

Despite an initial enthusiasm for self-licensing research, as depicted by an exponential growth in publications from 2001 to the late 2010s and positive conclusions from two meta-analyses (Blanken et al., 2015; Simbrunner & Schlegelmilch, 2017), some doubts have recently been casted over the validity of the effect. A large-scale Many Labs project replicated the self-licensing effect but found it to be twice as small as suggested by the meta-analysis (Ebersole et al., 2016), while others suggested that the field could suffer from a significant publication bias leading to an overestimation of the effect (Kuper & Bott, 2019). Newest publications in recent years have failed to find or replicate the expected self-licensing effect (Giurge et al., 2021; Portmann et al., 2020; Rotella & Barclay, 2020; Urban et al., 2019, 2020).

Yet, this does not mean that self-licensing does not exist. Indeed, considering the extent of the literature on *consistency*, one should clearly not expect to observe self-licensing at all time, when consistency is just as likely to occur. Instead, the variety of findings strongly suggest that self-licensing dynamics are subject to boundary conditions, the extent of which is not fully grasped yet. The field is starting to identify moderators of the effect (see above), but how much they matter and how they might interact remains to be fully explored. Some of the aforementioned research might have failed to identify self-licensing, or even trigger consistency dynamics, because the initial behaviour was actually interpreted by the participant as a proof of commitment and not progress (Giurge et al., 2021), or was not sufficiently socially recognised, for example in online paradigms (Rotella & Barclay, 2020). It might also be that spillover is less likely from one domain to another unrelated one (e.g., from environmental behaviour to dishonesty) than between behaviours contributing to the same superordinate domain (Urban et al., 2019). Other moderators not yet discovered might also come into play. We join Giurge and colleagues who stated that "despite some advances on this front, the literature currently offers little consensus about moral licensing's boundary conditions, [… and we need more studies] to understand how common and generalizable moral licensing really is" (Giurge et al., 2021, p. 9). We believe the present research contributes to this general direction.

13.4. Limitations and future directions

Despite its contribution, this set of studies presents some limitations that must be addressed in future research. Notably, the studies can be criticised for only including measures of attitudes or behavioural intentions and not behaviour per se. This, of course, is explained by material constraints and the greater practicability of online questionnaires with self-reported measures (although recent advances, notably in behavioural economics paradigms, suggest ways to measure real-stake behaviour online, see e.g., Berger & Wyss, 2021). However, neither attitudes nor intentions equate to behaviour and a gap can persist in between them (Sheeran & Webb, 2016; Webb & Sheeran, 2006). Hence, given the claim that self-licensing constitutes a relaxation of behaviour following an initial moral action, it would be important to ensure that the present findings also apply to behaviour (for notable exceptions of studies of self-licensing on actual behaviour outside the lab, see e.g., Meijers et al., 2015; Schultz et al., 2007). In this respect, future research might want to rely on observational data, for example with a diary study, which could provide interesting insights on actual (self-reported) behaviour. Such a study could also, through a longitudinal design, sheds light on more dynamic processes of self-licensing, showing for example whether people choose to cumulate credentials for a period of time before "spending" it on one anti-environmental action, or whether they successively alternate small pro- and anti-environmental actions.

The set of studies also cannot fully assert the exact mechanism(s) underlying the moderating effect of regulatory focus. Literature supports the idea that regulatory focus influences the point of reference most salient to interpret one's past behaviour (i.e., minimal or maximal standard; Brendl & Higgins, 1996) as well as the state of motivational (de)activation following the positive feedback (Baas et al., 2011) but those remain to be experimentally tested. For instance, future research could use eye-tracking to investigate where participants focus their attention when presented with the graphical feedback scale (i.e., on the minimal standard in the middle of the scale or on the maximal standard at the top of the scale). Studies could also use physiological indicators of activation and effort mobilisation such as cardiovascular reactivity (Gendolla & Richter, 2010).

In addition, all studies relied on a bogus feedback procedure to manipulate past proenvironmental behaviour. The procedure has the clear advantage of presenting all participants with an explicit piece of information, clearly labelling their past behaviour as sufficiently positive and moral or not. It also allows to draw direct conclusions for real-life applications and the use of such consumer feedback by an increasing number of companies (see below). However, it remains to explore whether other ways to acquire moral credentials, such as the recall of past actions or the possibility to act virtuously on the present moment, similarly interact with regulatory focus.

Beyond the limits of the studies, some questions still remain. First, it is not fully elucidated yet whether people show self-licensing on their more or less frequent behaviour. Habits have an important role in shaping future consistent behaviour (e.g., Dahlstrand & Biel, 1997) and once a behaviour becomes habitual or routinised, it is less subject to external influence. One could then expect that habitual, almost automatic behaviours are less subject to self-licensing. It would be less frequent behaviours (such as a one-time donation or participation in an event, rare purchase, etc.) that are more affected — a possibility that future studies would need to address. However, the frequency of a behaviour does not necessarily align with its impact, since some infrequent behaviours can have a drastic environmental impact (e.g., taking one long-distance flight, or deciding to move into a bigger or smaller house), which speaks to the potential impact of self-licensing dynamics, even on infrequent behaviours.

Second, different levels of motivation could result in different effects depending on what is at stake for individuals. Findings suggest there could be a threshold at higher (or conversely, lower) levels of personal involvement and motivation where the results observed in the present research disappear or even reverse (Lalot et al., 2019; Meijers et al., 2019). Future research is needed to investigate the effect of different levels of motivation on the investigated processes.

Finally, in all studies we manipulated regulatory focus as a short-term induced mindset. However, regulatory focus can also be conceived as a chronic individual difference, with some people showing a stronger promotion or prevention focus. In an applied perspective, it seemed more important to elucidate first the effects of temporally induced regulatory focus, as could be utilised for persuasion messages or campaigns. Yet, further research is needed to examine whether individual differences in the chronic inclination towards a prevention or promotion focus also moderate the effect of feedback on consistency versus self-licensing effects.

14. Conclusion

The present findings are of theoretical and practical relevance. They contribute to the newly growing research on potential moderators of self-licensing effects and suggest that regulatory focus is an important dimension to take into account in order to predict people's reactions to positive information in moral and normative domains. Additionally, they provide useful insights for real-life applications and interventions. Indeed, there is an increasing tendency in Western societies to provide individuals with consumption feedback, notably in terms of sustainable consumption and behaviour. Companies and states adopting this feedback practice clearly hope for positive reactions from consumers and an increased engagement, although literature has shown that positive feedback can produce opposite effects (e.g., Longoni et al., 2014; Schultz et al., 2007). Of course, when it comes to real-life behaviour, other factors that were not investigated in the present studies but hold constant across experimental conditions (e.g., behaviour cost, normative pressure, self-control failure, and a host of situational factors) are expected to additionally influence individuals' behaviour. Therefore, any real-life intervention would need to carefully take them into account.

Our results at least suggest that, in order to counter the rebound effect observed when feedback is positive, feedback information need to be carefully designed and framed in a language that maximises its utility. Specifically, positive feedback informing consumers they are doing well, and better than a certain minimal standard, would be best framed in terms of promotion focus: focusing individuals on positive outcomes, communicating energising emotions, reminding people of the ideal environmental goal, and suggesting further steps to be taken in order to carry on the environmental efforts.

Competing interests

The authors have no competing interests to declare.

15. Data accessibility statement

All data is publicly available on the dedicated OSF webpage: https://osf.io/3jb5q.

CRediT authorship contribution statement

Fanny Lalot: Conceptualization, Data curation, Formal analysis, Investigation, Methodology, Visualization, Writing – original draft, Writing – review & editing. **Juan Manuel Falomir-Pichastor:** Conceptualization, Formal analysis, Investigation, Methodology, Project administration, Supervision, Writing – review & editing. **Alain Quiamzade:** Conceptualization, Investigation, Methodology, Supervision, Writing – review & editing.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.jenvp.2021.101731.

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