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Abstract

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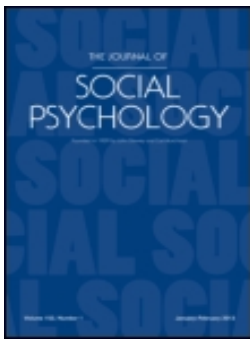
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Act local but don't think too global: The impact of ecological goal level on behavior

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ABSTRACT

Growing awareness of humanity's impact on the environment raises the question of how best to encourage pro-environmental actions. Numerous campaigns have been created to convince people to adopt environmentally friendly everyday behaviors, with varying success. The difficulty may be due, at least in part, to the huge gap between these small individual actions and the high-level goals, such as "saving the planet," often used as incentives. We tested this hypothesis via four experiments. Studies 1 and 2 showed that high-level goals were less effective than low-level goals in promoting paper- and energy-saving behaviors. Study 3 showed that high-level goals engender lower perceived outcome expectancy and higher perception of cumulative effort. Study 4 showed that outcome expectancy mediates the direct effect of goal level on intention.

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Most experts acknowledge the impact of human activities on the environment (e.g., IPCC, 2013). One of the responses favored by international initiatives to mitigate these impacts is action to change people's behaviors (e.g., Agenda 21). As a result, numerous campaigns have been carried out to promote pro-environmental behaviors (Osaldiston & Schott, 2011), most frequently by associating environmentally friendly behaviors with an ecological goal, for example saving the planet or protecting species. For individuals, such ecological goals are both imprecise—at best, only vague referential standards are given—and distal, as the consequences of modifying behaviors will be felt only years, perhaps generations, later. This type of goal is commonly referred to in the literature as a high-level goal (e.g., Abraham & Sheeran, 2003; Bandura & Schunk, 1981). But are high-level goals the best incentives to use when trying to encourage pro-environmental actions? We conjectured that the answer to this question would be no, because high-level goals can give the feeling that associated actions are not impactful (low outcome expectancy) and require the participation of a huge number of people (high cumulative effort). These effects are likely to undermine motivation to act toward achieving a high-level goal. We tested our hypothesis by investigating the relative effects of high-level and low-level ecological goals on the adoption and perception of three pro-environmental behaviors: saving paper, turning off computer screens, and running cars on green fuel.

Ecological goal level and motivation to act pro-environmentally

Since the seminal distinction was made between means and ends (Heider, 1958), the ways in which goals are hierarchized have been conceptualized from several angles (Foss & Lindenberg, 2013). Some analyses differentiate between low, concrete, specific, and proximal goals (e.g., "I am studying to get a good grade on this exam"), and superordinate, high, abstract, and distal goals (e.g., "I am studying in order to ensure a high standard of living for my future family").

For example, according to the action identification theory (Wegner & Vallacher, 1986), a single action can be considered on different levels, from low (e.g., “I press the button to turn off my computer screen”) to high (e.g., “I do my bit for the environment”), with these levels forming a hierarchical *how-why* chain. Similarly, Trope and Liberman’s (2003) construal level theory posits that an object can be considered from different psychological distances, with this distance determining whether the object is considered in concrete terms (low-level construal) or in abstract terms (high-level construal). Furthermore, according to the goal system theory (Kruglanski et al., 2002), goals are embedded in mentally represented hierarchized networks, where means are connected to a sub-goal, which in turn is connected to another sub-goal or a final goal.

Hence, as Abraham and Sheeran (2003, p. 266) noted, “most theorists agree that goals are hierarchically organized with abstract higher-order goals being translated into lower-level goals that ultimately direct muscle movements.” Ecological goals are also embedded in a hierarchical system, which begins with simple low-level tasks, such as switching off the light when leaving a room, and continues through a chain of sub-goals, such as saving electricity *in order to* avoid wasting energy *in order to* avoid building new power plants, etc., and ends with a high-level goal, such as protecting the planet for future generations. A government or organization trying to promote environmental protection might choose one of these different goal levels to motivate people to adopt pro-environmental behaviors. For example, a point-of-decision prompt (i.e., a message asking people to do something, presented at the time the person has to decide whether or not to act) encouraging a company’s staff to cut down on printing may try to motivate compliance by including a “help our company save paper” or a “save the forest” goal. Both goals belong to the same goal system, although the first goal is more specific, more proximal, and at a lower level than the second goal because it comes before the second goal in the causal chain. Does the level of goal used influence people’s motivations to act pro-environmentally? Possible answers to this question are suggested by a number of propositions in the literature, although none of these propositions refers directly to pro-environmental actions. Bandura (1986) postulated that specific and proximal goals should have a greater effect on goal commitment than generalized and distal goals, because specific and proximal goals are more likely to provide information about goal attainment. As a result, they give a sense of efficacy in overcoming a challenge and are therefore more satisfying. This hypothesis is supported by several studies showing that generalized and distally framed goals are less effective than specific and proximally framed goals in initiating a wide variety of behaviors (Cochran & Tesser, 1996; Yukl & Latham, 1978). In the case of environmental behaviors, the higher a goal in the goals hierarchy, the less specific and proximal it is. For example, saving electricity at home is more specific (e.g., people have standards, such as electricity bills, against which goal-attainment can be evaluated) and more proximal (i.e., less far in the future) than the hierarchically highest goal of “saving the planet.” Thus, Bandura and Schunk’s approach results in the assumption that higher-level ecological goals are less motivating than lower-level goals.

Conversely, other researchers have suggested that high-level goals may be more motivating than low-level goals, especially in the case of actions that require little effort. According to the performance optimality hypothesis (Vallacher, Wegner, McMahan, Cotter, & Larsen, 1992), high-level identification is more effective for easy-to-perform behaviors (Mange, Sénémeaud, & Michinov, 2013). In fact, studies show that some easy goals do not give rise to better performance than no goals or vague, do-your-best goals (Cochran & Tesser, 1996). Moreover, Fishbach and Finkelstein (2012) showed that attaining a low-level goal can reinforce sense of fulfillment and lead people to move away from the goal (see also Fishbach, Dhar, & Zhang, 2006). Moreover, failure to achieve a low-level goal may result in a *what-the-hell effect* (Polivy & Herman, 1985). In contrast, because high-level goals are difficult to attain, they may encourage people to continue pursuing an action even after they have achieved or failed to achieve a sub-goal.

Thus, high-level goals, even though they are vague, generalized, and distal, may be the best way to encourage adoption of day-to-day pro-environmental actions (e.g., not wasting water, turning lights

off, reducing printing), as most of these behaviors are easy to perform. However, this has never been tested with respect to campaigns encouraging pro-environmental behaviors, which often use high-level goals whose temporal and spatial extents (e.g., saving the planet, protecting species) greatly exceed those of the high-level identification studied in relation to other behaviors (e.g., “relieving tension,” Vallacher et al., 1992; “improving my career prospects,” Mange et al., 2013). Given the extreme temporal and spatial remoteness of high-level ecological goals, we hypothesized that the assumption that high-level goals are motivating for easy-to-perform behaviors would no longer apply, and that the higher the level of an ecological goal, the lower its ability to motivate pro-environmental actions. Our rationale is based on the literature on goal-setting behavior and its relationship with outcome expectancy. This raises the question of whether outcome expectancy influences the adoption of environmentally friendly behaviors and whether it could result in high-level ecological goals being less motivating than lower-level goals.

Outcome expectancy and cumulative effort: Two barriers against high-level ecological goal attainment

Outcome expectancy is an individual’s perception of whether or not a given behavior will lead to a specific outcome (Bandura, 1977). Low outcome expectancy is likely to be one of the strongest barriers to adopting pro-environmental behaviors (Gifford, 2011). For example, a person may consider that doing a short journey on foot, rather than by car, has a negligible impact on limiting climate change and therefore not be motivated to do it. The notion of outcome expectancy, albeit under different names, has already been applied to the environmental field. Consumer and environmental psychologists have developed constructs relating to perceptions of whether or not a pro-environmental behavior is likely to achieve an ecological goal. Perceived consumer effectiveness is “the extent to which a respondent believes that an individual consumer can be effective [in solving environmental problems]” (Kinnear, Taylor, & Ahmed, 1974, p.21). Similarly, participative self-efficacy (Azzi, 1998, cited by Van Zomeren, Saguy, & Schellhaas, 2012, p.620) is the belief “that the individual’s participation is seen as having a potential incremental effect on collective action.” Perceived consumer effectiveness correlates with pro-environmental behaviors (Ellen, Wiener, & Cobb-Walgren, 1991), whereas participative self-efficacy is a unique predictor of collective political action (Van Zomeren, Saguy, & Schellhaas).

Will the outcome expectancy of an environmental action be different if the action is associated with a low vs. high-level goal? We postulated that it will. High-level ecological goals, compared with lower-level goals, are likely to result in lower outcome expectancy and thereby reduce commitment to an action. As Bandura and Schunk (1981) surmised, high-level goals are too distant to give precise expectations of an action’s impact. Furthermore, the structural properties of goal systems may make high-level goals harder to reach. In fact, goal system theory (Kruglanski et al., 2002) posits lateral inhibitory links between competing sub-goals or means; hence, high-level goals may raise more potential barriers to achievement than lower-level goals and thereby reinforce low outcome expectancy. Consequently, we hypothesized that the outcome expectancy of a behavior will be lower when that behavior is associated with a high-level goal.

We also surmised the existence of another barrier against ecological goal attainment, in that achieving ecological goals is a collective endeavor that requires the participation of a large number of people (Rees & Bamberg, 2014). Some authors have even viewed environmental actions as a type of social dilemma (e.g., Dawes, 1980; Irwin & Berigan, 2013) because, as in social dilemmas, individuals’ evaluations of whether their participation will have an impact must take into account the likelihood of other people participating. Therefore, when people consider whether or not to act in an environmentally friendly way, they probably estimate, albeit vaguely, the number of people who have to act in a similar way in order to achieve the desired goal, and this estimate might inhibit or facilitate the decision. For example, people who walk short journeys, rather than driving, know their action will have a negligible impact on reducing climate

change unless enough other people adopt a similar behavior. We refer to this perception as perceived cumulative effort.¹ Perceived cumulative effort can vary from low (my action alone is enough to achieve the ecological goal) to high (very many people have to act like me in order to achieve the ecological goal).

Research suggests that high cumulative effort may act as a barrier that results in individuals associating their action with a low outcome expectancy. Hanss and Böhm (2010) showed that the self-efficacy of encouraging others to behave sustainably is a strong predictor of sustainable consumption behavior, thereby suggesting that perceptions of other people's participation are crucial to behavior adoption. Gupta and Ogden (2009) provided more direct evidence of this. They found that green buyers scored higher than non-green buyers on a measure of expectation of others' cooperation. In the same study, expectations of others' cooperation correlated with a measure of outcome expectancy (labeled "personal efficacy" by the authors). This result supports the idea that, when considering a collective goal, people make assumptions about the potential participation—or inaction—of others and act in line with this assumption. Similarly, Kerr (1989) showed that the larger the group facing a social dilemma, the lower each individual's perception that his or her own action is impactful, and this relation holds even when outcome likelihood is unrelated to group size.

Objectives and overview of the studies

We postulated that high-level ecological goals are less effective than low-level ecological goals in promoting pro-environmental behaviors, because high-level goals increase perceived cumulative effort and lower perceived outcome-expectancy. We designed two studies to test the impact of ecological goal level on behaviors. We then tested the postulated mechanisms through two additional studies focusing on possible links between outcome expectancy, cumulative effort, and the effect of different goal levels on behaviors. Studies 1 and 2 examined the relative effectiveness of high-level versus low-level goals in encouraging people to adopt pro-environmental behaviors. Study 3 tested the hypothesis that high-level goals are less effective than low-level goals in terms of outcome-expectancy and cumulative effort. Study 4 investigated the hypothesis that cumulative effort and outcome expectancy mediate the effect of goal level on intentions to adopt a pro-environmental behavior.

Study 1

Study 1 examined the impact of goal level on saving paper. We hypothesized that fewer participants would return sheets of paper when a save-paper message was associated with a high-level goal than when it was associated with a low-level goal.

Method

Sample

Our study sample consisted of 279 first-year psychology students sitting an end-of-year examination. The students were unaware they were participating in an experiment.

Materials² and procedure

In addition to the exam paper, each student was given a list of instructions on an A4 sheet of paper (e.g., "Cell phones must be turned off," "Only one student at a time can go to the bathroom"), which they were asked orally to hand in with their paper at the end of the exam. The upper left-hand corner of the sheet included one of four versions of a sentence asking the student not to write on the sheet so it could be returned and reused. We distributed these sheets in a predefined order (1-2-3-4-1-2-3-4, etc.) before the students arrived for the exam. People sitting next to each other did not have the

same version of the A4 sheet. Because it was an examination, students were not supposed to look at each other's papers. All four versions of the sheet bore the sentence "Do not write on this sheet; it will be reused." Version one included this sentence plus a paper recycling logo and the low-level ecological goal "Help the university save paper"; version two included the sentence plus a paper recycling logo and the high-level ecological goal "Help preserve the planet's resources." We compared these two versions with two control versions. The first control was designed to measure the base-rate of behavior when no prompt is given; therefore, this version included only the sentence "Do not write on this sheet; it will be reused." The second control was designed to measure the base-rate of behavior when only a recycling logo is provided, as simply showing a recycling logo could trigger the desired behavior. This version included the sentence plus a paper recycling logo. Consequently, we were able to resolve the respective impacts of the goals and the logo.

Measures

At the end of the exam, we counted the numbers of sheets returned with nothing written on them. Consequently, our dependent variable was "instruction effectiveness," measured in terms of the numbers of sheets for which the instruction was effective (sheet returned clean).

Results

All the statistical tests reported in this article use an alpha level of .05. A chi-squared test of independence was significant, $\chi^2(3, N = 279) = 8.98, p = .03$. Higher percentages of reusable sheets were returned in the logo only and logo+low-level goal conditions than in the no-logo and logo+high-level goal conditions (Table 1); hence, the logo only and logo+low-level goal versions were more effective in encouraging people to help reuse paper than the no-logo and logo+high-level goal versions. The logo+high-level goal version was significantly less effective than either the logo+low-level goal (Wald = 6.21, $p = .013$, OR = 0.35) or logo-only versions (Wald = 3.97, $p = .046$, OR = 0.45), but not less effective than the no-logo version (Wald = 0.17, $p = .679$, OR = 0.90). The logo+low-level goal version was significantly more effective than the no-logo version (Wald = 4.57, $p = .032$, OR = 2.53), but it was not significantly more effective than the logo-only version (Wald = 0.28, $p = .597$, OR = 1.27). There was no significant difference between the effectiveness of the no-logo version and the logo-only version (Wald = 2.64, $p = .104$, OR = 0.50).

Discussion

Results support our hypothesis that messages to promote saving paper are less effective when the message is associated with a high-level goal versus a low-level goal. In a natural setting, associating paper conservation with a high-level goal such as preserving the planet led fewer students to adopt paper conservation behaviors. Comparing the productive or counter-productive effects of our message manipulations with the no-logo control condition showed that adding a logo or adding a logo plus a low-level goal was enough to substantially increase the number of reusable sheets returned. The effect of adding a low-level goal to the logo was incremental but non-significant; however, the high percentages of reusable sheets returned in these conditions suggest the presence of a ceiling effect. The lack of a significant difference between these two conditions may also be due to the logo directly inferring a low-level goal, such as saving paper. We explored this assumption in

Table 1. Percentage of sheets returned clean (instruction effective category) in each experimental condition.

No logo ($N = 74$)	Logo only ($N = 67$)	Logo + low-level goal ($N = 69$)	Logo + high-level goal ($N = 69$)
68%	80%	84%	65%

Note. N s vary due to sheets placed on tables which were finally unoccupied due to student's absence at the exam. Only sheets placed on occupied tables were counted.

Study 2. In contrast, the percentage of reusable sheets returned when a high-level goal was added to the logo was comparable to the percentage in the no-logo condition. This suggests a null effect of an incentive based on high-level ecological goals. However, our method prevented us from drawing a definitive conclusion, as associating the logo with the high-level goal may have compensated for a counter-productive effect of the high-level goal. In other words, in a high-level-goal-only condition, we may have obtained a lower percentage of reusable sheets returned than in the no-logo condition. Although this methodological weakness does not call into question the main conclusion of Study 1, we carried out a second study to overcome it by removing the logo and adding a control condition.

Study 2

Study 2 replicated Study 1 for another behavior—saving energy by turning off the screen when a computer is not being used. Casual observations in classrooms equipped with computers indicated that most students leave screens on when they leave the room. As in Study 1, we hypothesized that using a high-level goal rather than a low-level goal would engender less pro-environmental behaviors (turning off the computer screen). In addition, we included a control condition in order to evaluate the main effect of the intervention.

Method

Sample

We carried out the study during computing classes in which students were working on individual computers (36–38 workstations). Our sample consisted of 108 students taking classes on the days the experiment was conducted. They were unaware that they were taking part in an experiment.

Material

We transmitted the environmental message via a point-of-decision prompt, which we taped to the bottom of the computer screens before the students entered the room. Each prompt consisted of a 7.5 cm × 21 cm paper strip bearing the main message, which varied by condition, a picture of a computer screen asleep (with eyes closed), and the reminder sentence “I finish my session = I turn off the screen.” The main message used in the “message-only” condition was “I press the button to turn off my computer screen.” We also created a low-level goal condition by extending the main message so it read “I press the button to turn off my computer screen in order to save energy at the university” and a high-level goal condition by extending the main message so it read “I press the button to turn off my computer screen in order to help phase out nuclear power in Switzerland.”

Procedure

Because the computers were relatively close to each other, we avoided highlighting the different ways in which the messages were termed by distributing the paper strips so adjacent computers bore the same message. Participants could not see the screen in the other rows because these screens were either facing away from them or too far from them for the message to be readable. In addition, all the messages looked the same from a distance or at a glance because they were written using a small font. In order to obtain a base-rate for the number of screens switched off when students were not instructed to do so, we did not attach any message to a quarter of the computers (no message condition). During the experiments, we ensured that all the screens were switched on and had the messages attached before the students entered the room. At the end of each session, when the students had left the room, we noted which screens had been turned off and which had been left on (based on the light on the screen). We then prepared the room for the next session.

Results

As expected, fewer screens were turned off in the high-level goal condition than in the other two conditions (Table 2). The main effect of the experimental condition was significant, $\chi^2(3, N = 108) = 56.73, p < .01$. Every version of the instruction led to a substantial increase in the number of screens switched off compared with the control condition: message only (Wald = 18.28, $p < .001, OR = 140.00$); message and low-level goal condition (Wald = 19.14, $p < .001, OR = 140.00$); message and high-level goal condition (Wald = 10.66, $p < .001, OR = 35.64$). Fewer screens were switched off in the message and high-level goal condition than in the message-only condition (Wald = 4.09, $p = .044, OR = 0.25$), and in the message and low-level goal condition (Wald = 4.65, $p = .031, OR = 0.25$).

Discussion

In line with our hypothesis, participants exposed to the high-level goal were less likely to turn off their computer screen at the end of the session than participants exposed to the low-level goal or the message only. Adding a control condition allowed us to carry out a more detailed analysis of the different experimental conditions than was possible with Study 1. Compared to the control condition, all three message conditions successfully improved target behavior. As in Study 1, there was no significant difference in the effectiveness of the basic instruction (message only) and the low-level goal instruction. Again, it is likely that the message-only condition spontaneously activated a low-level goal such as saving electricity. Because we obtained the same result in two separate studies, we decided to test this hypothesis about the default inference drawn when no goal is given by asking 30 people in the university hall this open-ended question: "If you saw a notice in the computer room or library asking you to turn off your computer screen when leaving the room, which goal would come to mind first?" Twenty-six of the 30 people questioned replied "saving energy" or "reducing electricity consumption at the university," two people answered "I don't know," and two gave another reason. None of these 30 people thought first of a high-level goal such as "saving the planet's natural resources" or "helping Switzerland phase out nuclear power." This complementary result supports the idea that the basic version of the instruction was seen in terms of a low-level goal and explains why the message-only condition and the low-level goal conditions gave similar results.

Study 2 replicated the results of Study 1, in that fewer students performed the target behavior in the message plus high-level goal condition than in the message-only condition. The results also add to the results of Study 1 by showing that using a high-level goal significantly increases target behavior, although to a lesser extent than a low-level goal. Hence, the results of Studies 1 and 2 suggest that high-level goals are less motivating than lower-level goals when promoting unchallenging pro-environmental actions such as switching-off a screen or reusing paper. As discussed in the introduction, we postulated that this effect was due to high-level ecological goals, compared with low-level ecological goals, reducing outcome expectancy and increasing cumulative effort. However, our first two studies did not allow us to test this hypothesis. Furthermore, there is another possible explanation for our results: Our participants may have been less motivated by the high-level goal we used because they considered it less valid. In other words, an individual may endorse a goal such as "saving energy at the university," but consider that phasing out nuclear power in Switzerland is not a good idea and thus be resistant to actions that could contribute to this goal. Although this reasoning is less plausible for the "preserving the planet" goal we used in Study 1, such differences in

Table 2. Percentage of computers turned off (instruction effective category) in each experimental condition and control group (no message).

No message ($N = 29$)	Message only ($N = 24$)	Message + low-level goal ($N = 30$)	Message + high-level goal ($N = 25$)
3%	83%	83%	56%

Note. N s vary due to messages placed on computers that were finally unoccupied.

perceptions of a goal's validity may account for the differences in behaviors we observed. In addition, the methodology used for the first two studies did not allow us to carry out manipulation checks on goal-level abstraction. Studies 3 and 4 addressed these limitations by adding measures to test these hypotheses and a manipulation check.

Study 3

Studies 1 and 2 showed an influence of goal level on behaviors. In Study 3, we tested our hypothesis that, compared with low-level goals, high-level goals reduce outcome expectancy and increase cumulative effort. A further objective was to rule out an alternative explanation by including an item to check the perceived validity of the goals. As noted in the discussion for Study 2, goal validity may also mediate the effect of goal level on behavior, with high-level goals being perceived as less valid than low-level goals.

Method

Sample

Participants were 118 students and university staff aged between 17 and 42 years ($M = 23.09$, $SD = 4.11$). Most of the participants (75%) were women.

Material

We used the same pro-environmental behaviors as in Studies 1 and 2. Half of the participants were asked about saving paper; the other half were asked about turning off computer screens. We presented each participant with the same behavior (*avoid unnecessary printing at the university/turn off the computer screen when leaving a workstation*) twice, once targeted toward a low-level goal (*save paper at the university/save energy at the university*, respectively), and once targeted toward a high-level goal (*preserve the planet's resources/help phase out nuclear power in Switzerland*, respectively). Counterbalancing the order of goal level between participants led to four different versions of the questionnaire: 2(paper vs. screen) \times 2(low-level goal/high-level goal vs. high-level goal/low-level goal).

In order to check that the goals used actually differed in their level of abstraction, we tested the material on another sample of university students ($N = 26$), who answered an online survey. Instructions for the first task were to "rank the following goals in hierarchical order so goal 1 is the first outcome of the behavior, goal 2 is the outcome of goal 1, etc." We presented four goals, including the two goals used in Studies 1 and 2, for each behavior (*turning off the computer screen when leaving a workstation*, and *avoiding unnecessary printing at the university*). The goals were presented in a mixed order. The measure in which we were interested was the comparative ranking inside the two pairs of goals, so we applied a Wilcoxon signed-rank test. Goals were ranked as we expected. In terms of avoiding unnecessary printing, *save paper at the university* was ranked first by 57.7% of participants and *preserve the planet's resources* was ranked fourth by 57.7% of participants. The difference is significant, $Z = -2.73$, $p = .006$. Similarly, for turning off the computer screen, *save energy at the university* was ranked first by 80.8% of participants and *help phase out nuclear power in Switzerland* was ranked third and fourth by 46% and 42.3% of participants, respectively. The difference is significant, $Z = -3.68$, $p < .001$. Hence, in both cases, participants considered the low-level goal to precede the high-level goal. We also asked our participants to rate the four goals of interest on a 6-point scale, from 1, *very abstract, distant, hypothetical*, to 6, *very concrete, near, certain*. A repeated measures ANOVA showed that the high-level goals were perceived as less concrete than the low-level goals (computer screen: $M_{high-level\ goal} = 3.73$, $M_{low-level\ goal} = 5.04$, $F = 18.06$, $p < .001$, $\eta^2_p = .42$; paper: $M_{high-level\ goal} = 4.42$, $M_{low-level\ goal} = 5.12$, $F = 5.23$, $p = .003$, $\eta^2_p = .17$).

Procedure

We approached people in the university hall and asked them if they would answer a quick survey on a tablet computer (Caretotell LLC, 2013). Most people accepted, suggesting no obvious sampling bias. We described one of the two behaviors (paper or computer screen) with one of the goal levels, and asked each participant five questions about the behavior, repeating the behavior and the goal before each question to ensure participants answered the question with reference to that information. Then, we restated the behavior with the other goal level and asked the same five questions with respect to this second goal. We concluded the survey by asking for demographic information and thanking the participants for taking part. Approximately equal numbers of participants completed each of the two surveys (paper or screen).

Measures

Outcome expectancy

One item measured outcome expectancy: "If I did this action [referring to the behavior presented above the question], my individual action would contribute to achieving the goal." Answers were provided on a 7-point scale ranging from *very weakly* to *very strongly*. Participants could also answer "Don't know."

Cumulative effort

Three items assessed perceptions of cumulative effort. The items were formulated as follows: In your opinion, what percentage of people needs to do this regularly in order to have a SMALL *vs.* MODERATE *vs.* LARGE impact on [the goal, either high-level or low-level]." Each question was followed by a blank space in which participants could write a percentage between 0% and 100%. We determined a cumulative effort score for each goal level by calculating the mean of the three items. The three different levels of impact were used to control for the magnitude of impact that each participant might have had in mind when answering the question, which would have led to inter-individual variability. Cronbach's alphas were .891 for the high-level goal and .822 for the low-level goal.

Validity

In order to control for effects due to possible differences in goal validity, we assessed general goal validity via the question: "Do you feel [the goal, high-level *vs.* low-level] is a valid objective?" Answers were provided on a 7-point scale ranging from *not valid at all* to *totally valid*. Participants could also answer "Don't know."

Results

We excluded from our analyses seven subjects who did not answer the questions seriously (e.g., gave percentages greater than 100 in the cumulative effort items); therefore, our final sample consisted of 111 people.

We performed 2(target behavior: saving paper *vs.* turning off screen) \times 2(order: high-level/low-level *vs.* low-level/high-level) \times 2(goal: high-level *vs.* low-level) ANOVAs on outcome expectancy, cumulative effort, and validity. Target behavior and order were entered as between variables in order to control for their effects. Goal was a within variable. We found significant main effects of target behavior (saving paper *vs.* turning off computer screens) on perceptions of cumulative effort and of outcome expectancy. Perceptions of cumulative effort were lower for saving paper than for turning off computer screens ($M_{\text{paper}} = 52.13$, $M_{\text{screen}} = 59.69$, $F(1,105) = 5.22$, $p = .024$, $\eta^2_p = .05$), whereas perceptions of outcome expectancy were higher for saving paper than for turning off computer screens ($M_{\text{paper}} = 3.91$, $M_{\text{screen}} = 3.40$, $F(1,104) = 4.04$, $p = .047$, $\eta^2_p = .04$). This suggests that saving paper is perceived as a more effective behavior than turning off a computer screen. Goal-level order

had no significant effect on either cumulative effort, $F(1,105) = 1.06, p = .304, \eta^2_p = .01$, or outcome expectancy, $F(1,104) = 1.15, p = .287, \eta^2_p = .01$.

Means of cumulative effort, outcome expectancy, and validity for each goal level are presented in Table 3. Goal level had a significant effect on both cumulative effort ($F(1,105) = 30.34, p < .01, \eta^2_p = .22$) and outcome expectancy ($F(1,104) = 19.55, p < .01, \eta^2_p = .16$). As expected, perceptions of cumulative effort were higher and perceptions of outcome expectancy were lower when the behavior was framed in terms of a high-level goal. Validity scores were almost identical in both conditions.

Discussion

As discussed in Study 2, it was possible that perceptions of goal validity varied according to goal level. Our results do not support this alternative explanation of the impact of goal level. In fact, we did not find any significant differences in goal validity. In contrast, our results showed, as expected, an impact of goal-level on both outcome expectancy and cumulative effort. When it came to attaining a high-level goal (vs. a low-level goal), individual action was perceived as having a lower impact and a larger percentage of the population was seen as needing to participate. Hence, Study 3 provides insights into the mechanisms underlying the effect of goal level on behavior. However, because Study 3 did not gather behavioral data, we were unable to determine whether cumulative effort and outcome expectancy, after being impacted by goal level, impact behavior. Study 4 addressed this question.

Study 4

Our final study was designed to investigate, in a single experiment, the impacts of goal level on behavior, outcome expectancy and cumulative effort, and to test for mediation effects. Consequently, Study 4 included both a proxy measure for behavior (intention) and measures of outcome expectancy and cumulative effort.

Method

Sample

We recruited 207 participants to complete an online survey via Amazon's Mechanical Turk platform (Buhrmester, Kwang, & Gosling, 2011; Paolacci, Chandler, & Ipeirotis, 2010). Each participant received a payment of \$0.50. Participants were aged between 18 and 70 years old ($M = 32.19; SD = 10.13$); 64% were men; 91% were from the USA, 6% were from India, and 3% were from other countries.

Material and procedure

We asked the participants to evaluate their intention to use a new green fuel and their perceptions of cumulative effort and outcome expectancy associated with this behavior. Each participant performed the task twice. On the first occasion, the behavior was associated with a high-level (low-level) goal; on the second occasion the behavior was associated with a different low-level (high-level) goal. Goal

Table 3. Means and standard deviations of the dependent variables for each goal level.

Goal level	Cumulative effort ($N = 109$)		Outcome expectancy ($N = 108$)		Validity ($N = 109$)	
	Mean	<i>SD</i>	Mean	<i>SD</i>	Mean	<i>SD</i>
Low	52.25	17.01	4.00	1.47	6.05	1.35
High	59.81	21.39	3.34	1.67	6.15	1.09

Note. Means are averaged across the two target behaviors and the two presentation orders. *Ns* vary due to missing data.

order was counterbalanced across participants, with the computer automatically dividing participants into the two different order conditions.

The tasks were presented as follows. A welcome message was followed by a vignette introducing the same situation to the participants in both conditions: “We are Swiss researchers, working for a small town with a population of about 10,000 people. The town’s inhabitants have access to a new fuel derived from renewable sources. It is less polluting than regular fuel (1/3 lower) but costs approximately 20% more. We would like to have your opinion on this product and its potential impacts.³ The goal of using this new fuel is [low-level goal or high-level goal].” The low-level goal was “to reduce the town’s greenhouse gas emissions”; the high-level goal was “to reduce future depletion of the ozone layer.”

The vignette with the first goal was followed by seven questions designed to assess intention to adopt, cumulative effort, and outcome expectancy, presented in that order. When the participant had completed these questions, another screen was displayed bearing the following instruction: “Now consider using the same fuel to reach a different goal: [the other goal]. Please answer the following questions with this new goal in mind.” The participant then answered the same questions as in the first part of the experiment. At the end of the survey, participants were asked to state their country of residence, age, and gender, and thanked for taking part.

Measures

Intention

We measured intention via a single-item: “If you lived in this town, how would you evaluate your intention to use this new fuel in order to [the goal, high-level/low-level version]?” The 7-point scale ranged from *no intention at all* to *strong intention*.

Cumulative effort

The items we used to measure cumulative effort were similar to those used in Study 3: “What percentage of vehicles needs to use this fuel in order to have a SMALL *vs.* MODERATE *vs.* LARGE effect on the goal [high-level *vs.* low-level]?” We obtained cumulative effort scores by calculating the means of the three items for each goal level. Cronbach’s alphas were .875 for the high-level goal and .776 for the low-level goal.

Outcome expectancy

In Study 3 we used a single-item measure of outcome expectancy, which was less than optimal and less reliable than the three-item measure of cumulative effort. In this study, we remedied this by creating a three-item measure of outcome expectancy. The items were formulated as follows: “If this new fuel were adopted by [10% *vs.* 50% *vs.* 90%] of the community, my personal use of it would contribute to achieving the goal [high-level *vs.* low-level].” Scores were given on 7-point scales ranging from *very weakly* to *very strongly*. As well as providing a more reliable measure, using three items allowed us to avoid the possibility that participants would make their own inferences about the number of people who would adopt the behavior, which may have led to unwanted inter-individual variability in the outcome-expectancy score. We expected outcome expectancy to vary with each level of participation, but in the same way in both conditions, with a consistent difference in the general level of outcome expectancy. For each goal level, the mean of the three items was used as an outcome-expectancy score. Cronbach’s alphas were .781 for the high-level goal and .696 for the low-level goal.

Results

We excluded from our analyses participants who completed the questionnaire more quickly than 1 SD below the mean time ($N = 20$) because we suspected that they had not answered the questions

seriously. We also excluded participants who clearly had not understood the questions ($N = 12$) (e.g., those who said more people were needed to have a small impact on the goal than to have a large impact on it). As a result, our final sample consisted of 175⁴ participants.

ANOVAs were performed to test the effect of goal level on the dependent variables (intention, cumulative effort, outcome expectancy). As in Study 3, we entered order of goal presentation as a between-subjects variable, but it had no significant effect. Means are given in Table 4. In line with our hypothesis, intentions to use the fuel were lower in the high-level goal condition than in the low-level goal condition, $F(1,163) = 6.03, p = .02, \eta^2_p = .04$. Outcome expectancy was lower with the high-level goal than with the low-level goal, $F(1,173) = 11.34, p < .01, \eta^2_p = .06$. Also as expected, cumulative effort scores were higher with the high-level goal than with the low-level goal, but the difference was only marginally significant, $F(1,173) = 3.75, p = .06, \eta^2_p = .02$.

We performed additional analyses to test for possible mediating effects of outcome expectancy and cumulative effort on the impact of goal level on intention to adopt a pro-environmental behavior. Judd, Kenny, and McClelland (2001) provide a guideline for estimating mediation in within subjects designs. According to these authors, two conditions must be met in order to conclude a mediation of Y by X when these variables are within subjects. First the overall treatment (in our case the goal-level variable) must have a significant effect on both Y and X. Second, when the Y difference scores (e.g., outcome expectancy for low-level goal minus outcome expectancy for high-level goal) for each subject are regressed on two predictors, the centered sum of each subject's X scores and the difference in that subject's X scores (e.g., intention respective to the low-level goal minus intention respective to the high-level goal), mediation can be concluded to have occurred if the difference in X scores predicts the difference in Y scores. If the intercept is not different from zero, then complete mediation is indicated (Judd et al., 2001, p. 124–125).

The results, which support our assumption that goal level has an effect on both intention and potential mediators (cumulative effort and outcome expectancy), are reported in the previous section. For each mediator, we used the model recommended by Judd et al. (2001) to test our second assumption that outcome expectancy and cumulative effort mediate the effect of goal level on intention. Results indicate that outcome expectancy was a significant mediator ($b_{\text{diff_score}} = .24, p < .01$). The intercept was not significantly different from 0, thereby indicating complete mediation (Intercept = $-.12, p = .10$). Unexpectedly, cumulative effort was not a significant mediator ($b_{\text{diff_score}} = .00, p = .90$).

Discussion

Study 4 tested the impact of goal level on intention, outcome expectancy, and cumulative effort within a single sample. In line with our hypothesis, the high-level goal engendered fewer intentions to adopt a pro-environmental behavior. This replicates the findings from our first two studies. In addition, Study 4 showed that the high-level goal was associated with lower outcome expectancy and higher cumulative effort, thereby replicating the results of Study 3. Study 4's additional contribution was to allow us to test for mediation. We showed that the effect of goal level on intention was mediated by outcome expectancy but not by cumulative effort. This might suggest that only outcome expectancy discourages people from engaging in pro-environmental behaviors. The absence of mediation of goal level by cumulative effort was unexpected. It may indicate that, even if cumulative

Table 4. Means and standard deviations of the three dependent variables according to goal level.

Goal level	Cumulative effort ($N = 175$)		Outcome expectancy ($N = 175$)		Intention ($N = 165$)	
	Mean	SD	Mean	SD	Mean	SD
Low	49.53	11.26	4.65	1.45	5.35	1.5
High	51.37	14.03	4.41	1.59	5.15	1.7

Note. N s vary due to missing data.

effort is influenced by goal level, it has no impact on motivation to adopt a behavior. However, this is not in line with other results in the literature (Gupta & Ogden, 2009; Kerr, 1989), which suggest that individuals' decisions to adopt pro-environmental behaviors are influenced by the perception of cooperation by others. Further research is needed to more fully investigate this aspect of our results. Most notably, cumulative effort may influence behavior via outcome expectancy, as a strong impression of cumulative effort generated by a high-level goal could accentuate the feeling that the behavior will have little impact and thereby directly influence the decision. Our experimental design did not allow us to test this type of causal path.

General discussion

Do messages based on high-level ecological goals effectively promote easy-to-perform pro-environmental behaviors such as recycling paper or turning off computer screens? Some experimental findings and theoretical suppositions in the literature, including the performance optimality hypothesis (Vallacher et al., 1992), suggest that this should be the case. Nevertheless, we hypothesized that high-level goals are likely to limit a message's effect on motivation and behavior. All four of our studies supported this hypothesis, as they showed that associating an environmental message with a high-level goal has counterproductive effects on adoption of pro-environmental behaviors (Studies 1 and 2), on perceptions of outcome expectancy and cumulative effort (Studies 3 and 4), and on intention to adopt a pro-environmental behavior (Study 4). Effect sizes for goal level varied across the four studies, and η^2_p values were generally small (between .02 and .17). However, the differences in behavior adoption of more than 20% found in Studies 1 and 2 suggest that the goal level associated with messages promoting pro-environmental behaviors has a substantial effect on behavior adoption rates.

Low-level goals may also have the additional, indirect advantage of reducing reactance. Although none of the participants in our Study 2 removed the strip of paper from the computer screen, this did occur in a pilot study we carried out and in a study by Sussman and Gifford (2012) involving visual prompts in washrooms asking people to turn off the lights when leaving. After replacing the signs several times, a note was added asking the person concerned to write their objection to them. The answer was that the message was "blatant eco-guilt propaganda [...]" (p. 601). Sussman and Gifford believe this sort of reaction could have been avoided by omitting the reference to global warming. Although this might be a complementary explanation for the counterproductive effect of high-level goals, our results for outcome expectancy suggest that the effect also occurs through motivational paths.

Our results are consistent with Bandura and Schunk's (1981) postulate that specific and proximal goals are more motivating than generalized and distal goals, and we build on their work by showing that the degree of abstraction can also affect motivation. They also extend Bandura and Schunk's work beyond the individual task-mastery goals they studied to collective goals, such as ecological goals, which require the involvement of numerous people.

In the introduction, we described three main theories about goal levels. In line with the goal-system theory (Kruglanski et al., 2002), our results suggest that people see more potential barriers to achieving high-level goals than low-level goals. However, it is less easy to interpret our results with respect to construal level theory. Saving the planet can be considered both an abstract goal and a value (Eyal & Liberman, 2012). If it is seen primarily as an abstract concept, and therefore a potential generator of procrastination (McCrea, Liberman, Trope, & Sherman, 2008), it would be less likely to prompt pro-environmental behaviors. This interpretation is in line with our results. However, if it is seen primarily as a value, it would be expected to lead people who hold pro-environmental values to behave more pro-environmentally. This is not what we observed. However, we may have found more pro-environmental behaviors if we had measured future behaviors, rather than current behaviors or intentions, as future behaviors have been found to be more strongly related to values (Eyal, Sagristano, Trope, Liberman, & Chaiken, 2009). In addition, this hypothesis suggests that the

effect of goal level should be moderated by values, which we did not measure in our studies. Further research is needed to test this appealing hypothesis. Action identification theory also supports the idea that high-level identification may lead individuals to act in accordance with their values, rather than with respect to situational constraints (Vallacher & Wegner, 1987). Consequently, our results showing the greater effectiveness of low-level goals in prompting immediate behaviors in certain situations should not be seen as a call to remove high-level goals from all messages designed to generate pro-environmental behaviors. In fact, messages relating to people's values are useful, for example, to prevent the "what-the-hell" effect (Polivy & Herman, 1985) mentioned in the introduction.

Our results show the value of studying ecological goals because, contrary to most of the goals people set themselves, ecological goals involve behaviors whose impact will be negligible unless they are adopted by thousands of people. Our theorization of perceptions of pro-environmental behavior was based on the notions of outcome expectancy and cumulative effort, which, despite being rooted in the general notion of self-efficacy (Hanss & Böhm, 2013), provide a more precise description of people's conceptions of how their pro-environmental behaviors may or may not achieve desired ecological goals (Kerr, 1989). Further studies are now required to more thoroughly investigate why goal-level impacts outcome expectancy and cumulative effort. It may be because high-level goals prompt people to examine messages more analytically and lead them to conclude that their individual behavior will have little impact and/or to acknowledge that thousands of people need to adopt the behavior in order to achieve the goal. Because low-level goals are more familiar or more similar to common goals, such as saving money, they may trigger more heuristic processes and therefore elicit automatic responses.

The results of Study 3 suggest that pro-environmental messages should take into account outcome expectancy and, to a lesser extent, cumulative effort. Hanss and Böhm (2013) designed an intervention study in which they targeted (amongst others) the collective nature of sustainable consumption. The intervention was successful, but the effect was not mediated by self-efficacy. However, this intervention would probably have had an impact on cumulative effort beliefs such as "I think a lot of people will purchase sustainable products." Because the authors did not include such measures, we can only speculate on this point. Social norm-based interventions have also proved to be effective in promoting pro-environmental behaviors. Again, their effectiveness may reside in the impact of the information the social norm provides about cumulative effort. For example, Goldstein, Cialdini, and Griskevicius (2008) showed that towel reuse rates among hotel guests can be dramatically increased by combining an ecological goal with the additional information that 75% of guests use their towels more than once. One possible explanation of this effect is that people feel that reusing towels has no environmental impact unless a lot of people do it. Telling them that a lot of people do reuse towels might remove this barrier. However, this role of cumulative effort should be considered with caution because Study 4 does not show a mediating effect of cumulative effort on the effect of goal-level on intention. Further research is needed to investigate how interventions, as well as cumulative effort, impact behavior.

We identified some limitations of the current research. First, our studies used two goal levels, defining one as low and the other as high. However, a goal's level might be relative. For example, our low-level goal of saving energy at the university may be considered a high-level goal compared with saving energy in a specific office. Consequently, future studies should include more than two goal levels in order to test a wider range of goal levels.

Second, the goal we used for the high-level condition in Studies 2 and 3—"to help phase out nuclear power in Switzerland"—is potentially controversial and may have evoked opinions for or against nuclear power in some participants, thereby contributing to the deleterious effect of the high-level goal. However, this effect also occurred in Studies 1 and 4, where we used other goals for the high-level condition. This widens the external validity of our results. In addition, this argument would not explain the impact of the high-level goal on outcome-expectancy. Consequently, we

believe that using this goal did not impact our results. Nevertheless, future studies should test different goals.

Third, we identified outcome-expectancy and cumulative effort as mediators that drive the effect of goal-level. Although the conceptualizations of goals described in the literature assume the existence of a hierarchy between goals, theories differ as to the criteria on which these hierarchies are built. We tested the level of abstraction of the goals used in our material and found that it varied as assumed. However, this does not rule out possible variations in other dimensions of these goals. A test of one of these dimensions (validity of the goal, Study 3) showed that it does not explain our results. Hence, even though our research shows that low-level and high-level ecological goals have different effects, more fundamental research is needed to determine more precisely the dimensions underlying low-level and high-level goals that could specifically influence motivation and behaviors.

A final limit involves mediation, which, for practical reasons related to data collection and matching, we tested on measures of intention, rather than on measures of behavior. Although intention has been used as a proxy for behavior since Fishbein and Ajzen (1975), concerns have been raised about the intention-behavior gap (Sheeran, 2002). Consequently, future studies should take up the challenge of measuring both beliefs and behavior in order to test mediation on behavioral outcomes.

Conclusion

Our results call into question the use of high-level goals in pro-environmental messages. Although such goals are widely used by environmental campaigns, the results of our first two studies suggest that low-level goals are much more effective in promoting pro-environmental behaviors. Two practical conclusions can be drawn from this finding. First, campaigns should focus more on low-level goals. The low-level goals used in Studies 1 and 2 created the idea of proximity by referring to actions that would be beneficial to the university. This “proximity effect” is likely to occur in all situations where individual actions have a relatively large impact, such as “your apartment building” or “your neighborhood.” In order to counterbalance the effect of the perception of high cumulative effort, messages should also highlight the idea that many people are already doing the behavior or are willing to do it. Second, our results suggest that high-level goals should be used with care, as they can generate the idea of “having a mountain to climb,” which is likely to discourage many people. However, high-level goals can also have positive effects, such as creating values or uniting people around high moral values. Further research is needed to examine how individual behaviors can be linked to these high-level goals. In a world where it is becoming essential to change people’s habits, campaigns encouraging environmentally friendly behaviors need to be as effective as possible. This article suggests that calls to save the planet, a common message nowadays, are not the most effective way.



Notes

1. Cumulative effort differs from the notion of collective efficacy (Bandura, 1997), which is defined as a group’s belief in its capacity to reach a goal—for example, a football team who believes it can win, or a community’s belief it can adapt to cope with the scarcity of drinking water (Rees & Bamberg, 2014; Thaker, 2013).
2. The complete materials and data for the four studies are available online and can be accessed from this permanent link (osf.io/vj9ts/; Moussaoui & Desrichard, 2015).

3. We introduced this situation because our participants came from a wide variety of backgrounds. We could not use “the university” as a low-level goal, as in the first three studies, because we were not addressing only students. We stated the number of inhabitants to ensure “*reduce the town’s greenhouse gas emissions*” was seen as a low-level goal. Indeed, the term “your town” might have had different meanings depending on the size of the participant’s place of residence. For example, people living in a megalopolis could have considered a town-level goal to be high-level.
4. Due to missing values, degrees of freedom are sometimes different in the following analysis.

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References

- Abraham, C., & Sheeran, P. (2003). Implications of goal theories for the theories of reasoned action and planned behaviour. *Current Psychology: Developmental, Learning, Personality, Social*, 22, 264–280. doi:10.1007/s12144-003-1021-7
- Azzi, A. E. (1998). From competitive interests, perceived injustice, and identity needs to collective action: Psychology mechanisms in ethnic nationalism. In C. Dandeker (Ed.), *Nationalism and violence* (pp. 73–138). New Brunswick, NJ: Transaction.
- Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavioral change. *Psychological Review*, 84, 191–215. doi:10.1037/0033-295X.84.2.191
- Bandura, A. (1986). *Social foundations of thought and action: A social cognitive theory*. Englewood Cliffs, NJ: Prentice-Hall, Inc.
- Bandura, A. (1997). *Self-efficacy: The exercise of control*. New York, NY: W. H. Freeman.
- Bandura, A., & Schunk, D. H. (1981). Cultivating competence, self-efficacy, and intrinsic interest through proximal self-motivation. *Journal of Personality and Social Psychology*, 41, 586–598. doi:10.1037/0022-3514.41.3.586
- Buhrmester, M., Kwang, T., & Gosling, S. D. (2011). Amazon’s mechanical Turk: A new source of inexpensive, yet high-quality, data? *Perspectives on Psychological Science*, 6, 3–5. doi:10.1177/1745691610393980
- Caretotell_LLC. (2013). *Caretotell (Version 1.7)*. [iPad application]. Retrieved from <http://itunes.apple.com>
- Cochran, W., & Tesser, A. (1996). The “what the hell” effect: Some effects of goal proximity and goal framing on performance. In L. L. Martin & A. Tesser (Eds.), *Striving and feeling: Interactions among goals, affect, and self-regulation* (pp. 99–120). Mahwah, NJ: Erlbaum.
- Dawes, R. M. (1980). Social dilemmas. *Annual Review of Psychology*, 31(1), 169–193. doi:10.1146/annurev.ps.31.020180.001125
- Ellen, P. S., Wiener, J. L., & Cobb-Walgreen, C. (1991). The role of perceived consumer effectiveness in motivating environmentally conscious behaviors. *Journal of Public Policy & Marketing*, 10, 102–117. Retrieved from <http://www.jstor.org/stable/30000238>
- Eyal, T., & Liberman, N. (2012). Morality and psychological distance: A construal level theory perspective. In M. Mikulincer & P. R. Shaver (Eds.), *The social psychology of morality: Exploring the causes of good and evil. Herzliya series on personality and social psychology* (pp. 185–202). Washington, DC: American Psychological Association.
- Eyal, T., Sagristano, M. D., Trope, Y., Liberman, N., & Chaiken, S. (2009). When values matter: Expressing values in behavioral intentions for the near vs. distant future. *Journal of Experimental Social Psychology*, 45, 35–43. doi:10.1016/j.jesp.2008.07.023
- Fishbach, A., Dhar, R., & Zhang, Y. (2006). Subgoals as substitutes or complements: The role of goal accessibility. *Journal of Personality and Social Psychology*, 91, 232–242. doi:10.1037/0022-3514.91.2.232
- Fishbach, A., & Finkelstein, S. R. (2012). How feedback influences persistence, disengagement, and change in goal pursuit. In H. Aarts & A. Elliot (Eds.), *Frontiers of social psychology: Goal-directed behavior* (pp. 203–230). New York, NY: Psychology Press.
- Fishbein, M., & Ajzen, I. (1975). *Belief, attitude, intention and behavior: An introduction to theory and research*. Reading, MA: Addison-Wesley.
- Foss, N. J., & Lindenberg, S. (2013). Microfoundations for strategy: A goal-framing perspective on the drivers of value creation. *The Academy of Management Perspectives*, 27(2), 85–102. doi:10.5465/amp.2012.0103
- Gifford, R. (2011). The dragons of inaction: Psychological barriers that limit climate change mitigation and adaptation. *American Psychologist*, 66, 290–302. doi:10.1037/a0023566

- Goldstein, N. J., Cialdini, R. B., & Griskevicius, V. (2008). A room with a viewpoint: Using social norms to motivate environmental conservation in hotels. *Journal of Consumer Research*, 35, 472–482. doi:10.1086/586910
- Gupta, S., & Ogden, D. T. (2009). To buy or not to buy? A social dilemma perspective on green buying. *Journal of Consumer Marketing*, 26, 376–391. doi:10.1108/07363760910988201
- Hanss, D., & Böhm, G. (2010). Can i make a difference? The role of general and domain-specific self-efficacy in sustainable consumption decisions. *Umweltpsychologie*, 14(2), 46–74. Retrieved from https://bora.uib.no/bitstream/handle/1956/6238/Hanss%20%26%20Bohm_Umweltpsychologie.pdf?sequence=1
- Hanss, D., & Böhm, G. (2013). Promoting purchases of sustainable groceries: An intervention study. *Journal of Environmental Psychology*, 33, 53–67. doi:10.1016/j.jenvp.2012.10.002
- Heider, F. (1958). *The psychology of interpersonal relations*. New York, NY: Wiley.
- IPCC. (2013). *Climate Change 2013: The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change*. T. F. Stocker, D. Qin, G. K. Plattner, M. Tignor, S. K. Allen, J. Boschung, A. Nauels, Y. Xia, V. Bex, and P. M. Midgley (Eds.) (p. 1535). Cambridge, United Kingdom: Cambridge University Press.
- Irwin, K., & Berigan, N. (2013). Trust, culture, and cooperation: A social dilemma analysis of pro-environmental behaviors. *The Sociological Quarterly*, 54, 424–449. doi:10.1111/tsq.12029
- Judd, C. M., Kenny, D. A., & McClelland, G. H. (2001). Estimating and testing mediation and moderation in within-subject designs. *Psychological Methods*, 6, 115–134. doi:10.1037/1082-989X.6.2.115
- Kerr, L. N. (1989). Illusions of efficacy: The effects of group size on perceived efficacy in social dilemmas. *Journal of Experimental Social Psychology*, 25, 287–313. doi:10.1016/0022-1031(89)90024-3
- Kinnear, T. C., Taylor, J. R., & Ahmed, S. A. (1974). Ecologically Concerned Consumers: Who Are They? *Journal of Marketing*, 38(2), 20–24. doi:10.2307/1250192
- Kruglanski, A. W., Shah, J. Y., Fischbach, A., Friedman, R., Chun, W. Y., & Sleeth-Keppler, D. (2002). A theory of goal systems. In M. P. Zanna (Ed.), *Advances in experimental social psychology* (Vol. 34, pp. 331–378). San Diego, CA: Academic Press.
- Mange, J., Sénémeaud, C., & Michinov, N. (2013). Jotting down notes or preparing for the future? Action identification and academic performance. *Social Psychology of Education*, 16, 151–164. doi:10.1007/s11218-012-9205-3
- McCrea, S. M., Liberman, N., Trope, Y., & Sherman, S. J. (2008). Construal level and procrastination. *Psychological Science*, 19(12), 1308–1314. doi:10.1111/j.1467-9280.2008.02240.x
- Moussaoui, L. S., & Desrichard, O. (2015, December 10). *Act local but don't think too global: The impact of ecological goal level on behavior (JSP)*. Retrieved from osf.io/vj9ts
- Osbaldiston, R., & Schott, J. P. (2011). Environmental sustainability and behavioral science: Meta-analysis of pro-environmental behavior experiments. *Environment and Behavior*, 44, 257–299. doi:10.1177/0013916511402673
- Paolacci, G., Chandler, J., & Ipeirotis, P. G. (2010). Running experiments on Amazon Mechanical Turk. *Judgement and Decision Making*, 5, 411–419. Retrieved from <http://sjdm.org/~baron/journal/10/10630a/jdm10630a.pdf>
- Polivy, J., & Herman, C. P. (1985). Dieting and bingeing: A causal analysis. *American Psychologist*, 40, 193–201. doi:10.1037/0003-066X.40.2.193
- Rees, J. H., & Bamberg, S. (2014). Climate protection needs societal change: Determinants of intention to participate in collective climate action. *European Journal of Social Psychology*, 44, 466–473. doi:10.1002/ejsp.2032
- Sheeran, P. (2002). Intention-behavior relations: A conceptual and empirical review. *European Review of Social Psychology*, 12(1), 1–36. doi:10.1080/14792772143000003
- Sussman, R., & Gifford, R. (2012). Please turn off the lights: The effectiveness of visual prompts. *Applied Ergonomics*, 43, 596–603. doi:10.1016/j.apergo.2011.09.008
- Thaker, J. (2013). *Climate change in the Indian mind: Role of collective efficacy in climate change adaptation*. Doctoral dissertation, George Mason University. Retrieved from http://digilib.gmu.edu/jspui/bitstream/handle/1920/7882/Thaker_dissertation_2012.pdf?sequence=1&isAllowed=y
- Trope, Y., & Liberman, N. (2003). Temporal construal. *Psychological Review*, 110, 403–421. doi:10.1037/0033-295X.110.3.403
- Vallacher, R. R., & Wegner, D. M. (1987). What do people think they're doing? Action identification and human behavior. *Psychological Review*, 94(1), 3–15. doi:10.1037/0033-295X.94.1.3
- Vallacher, R. R., Wegner, D. M., McMahan, S. C., Cotter, J., & Larsen, K. A. (1992). On winning friends and influencing people: Action identification and self-presentation success. *Social Cognition*, 10, 335–355. doi:10.1521/soco.1992.10.3.335
- Van Zomeren, M., Saguy, T., & Schellhaas, F. M. H. (2012). Believing in “making a difference” to collective efforts: Outcome expectancy beliefs as a unique predictor of collective action. *Group Processes & Intergroup Relations*, 16, 618–634. doi:10.1177/1368430212467476
- Wegner, D. M., & Vallacher, R. R. (1986). Action identification. In R. M. Sorrentino & E. T. Higgins (Eds.), *Handbook of motivation and cognition: Foundations of social behavior* (pp. 550–582). New York, NY: Guilford Press.
- Yukl, G. A., & Latham, G. P. (1978). Interrelationships among employee participation, individual differences, goal difficulty, goal acceptance, goal instrumentality, and performance. *Personnel Psychology*, 31, 305–323. doi:10.1111/j.1744-6570.1978.tb00449.x