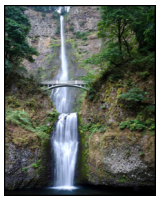
Journal of Environmental Psychology 58 (2018) 86–92

Contents lists available at ScienceDirect

Journal of Environmental Psychology

journal homepage: www.elsevier.com/locate/jep



Increasing collaborative, pro-environmental activism: The roles of Motivational Interviewing, self-determined motivation, and self-efficacy

Sofia Tagkaloglou[a], Tim Kasser[b,*]

[a] Knox College, Box K-1694, 2 East South Street, Galesburg, IL, 61401, USA
[b] Knox College, Box K-83, 2 East South Street, Galesburg, IL, 61401, USA

ARTICLE INFO

Handling Editor: Jeff Joireman

Keywords:
Pro-environmental behaviours
Goals
Motivational Interviewing
Self-determination
Self-efficacy

ABSTRACT

We investigated factors that promote successfully pursuing collaborative activist pro-environmental goals. Undergraduate students were randomly assigned to undergo a single session of Motivational Interviewing or a directive, control intervention; immediately afterwards, they set two collaborative, activist pro-environmental goals and rated how self-determined and self-efficacious they felt about those goals. Approximately 7 weeks later, they reported their progress on the goals and re-rated how self-determined and self-efficacious they had felt about the goals while they were pursuing them. Self-determined motivation both prospectively and concurrently predicted goal progress. Motivational Interviewing helped the goal progress of those participants who, at pre-screening, reported engaging in many individual pro-environmental behaviors, but the more directive approach worked better for those participants who were less ready to change. These results suggest the importance of attending to motivational variables if one hopes to increase people's engagement in collaborative, activist pro-environmental behaviors.

1. Introduction

Large-scale changes in people's behaviors and society's institutions are necessary to address the environmental challenges humanity currently faces (Crompton & Kasser, 2009). Common pro-environmental behaviors (PEBs) like recycling and buying organic food certainly reduce one's personal contributions to ecological degradation (Stern, 2000), but their impact on changing society's institutions is limited. Stern (2000) noted that other PEBs are more activist in nature, as donating to charities and voting for pro-environmental politicians can influence society; nonetheless, such PEBs' societal impact is modest given their individualistic nature. Other activist PEBs are collaborative in nature, as they involve working directly with other people by, for example, participating in environmental organizations and/or protests (Stern, 2000). Such behaviors probably hold the most promise for changing society's unsustainable structures, laws, practices, and policies, as they are both activist and involve joining forces with other individuals.

How might people's engagement in collaborative activist PEBs be enhanced? One answer is to increase the quality and amount of motivation they might have for such behaviors. To this end, the present study examines motivational variables drawn from three distinct theoretical traditions that might help people who rarely engage in collaborative activist PEBs to set and successfully pursue goals relevant to such behaviors. Specifically, we examine the roles of Motivational Interviewing, self-determined motivation, and self-efficacy in promoting progress at goals relevant to collaborative activist PEBs; sections 1.1, 1.2, and 1.3 describe these motivational variables in detail.

1.1. Motivational Interviewing and pro-environmental behavior

Since Miller (1983) developed the techniques of Motivational Interviewing (MI) in his work with people addicted to substances, MI has become a widely-adopted approach for helping people change many types of behavior (Miller & Rollnick, 2013), including pro-environmental behaviors (Klonek, Guntner, Lehmann-Willenbrock, & Kauffeld, 2015). MI's defining element is the person-centered approach it uses to empathically guide clients toward resolving their ambivalence about behavior change (Rosengren, 2009). MI practitioners pay close attention to when their clients' verbalizations demonstrate readiness for change, known as *change talk*, and when clients' speech reflects a perceived inability to change, known as *sustain talk* (Miller & Rollnick, 2013). In response to these different verbal cues, MI practitioners use a variety of client-centered techniques (e.g., actively listening and providing reflective statements, affirming the participant, asking open-ended questions) to help clients resolve their ambivalence about

* Corresponding author.
E-mail addresses: sgtagkaloglou@knox.edu (S. Tagkaloglou), tkasser@knox.edu (T. Kasser).

https://doi.org/10.1016/j.jenvp.2018.06.004
Received 20 November 2017; Received in revised form 20 June 2018; Accepted 20 June 2018
Available online 28 June 2018
0272-4944/

changing their behavior and develop their own solutions for behavior change. Throughout, the MI practitioner also attempts to embody *the spirit of MI* (Rosengren, 2009), i.e., the mindset that clients are their own autonomous selves and the only people capable of changing their behavior. In this way, an MI counseling session is a personalized and dynamic conversation in which clients control the decision-making process and adopt new behaviors at their own pace (Miller & Rollnick, 2013; Rosengren, 2009).

Implicit in MI's approach is the idea that some clients are more ambivalent than are others about changing. Some clients exhibit little ambivalence and feel satisfied with the status quo; MI practitioners would respect this choice. Other clients exhibit more ambivalence, vacillating between desires to maintain the status quo vs. to change their behaviors; such clients are high in *readiness to change* (Rosengren, 2009) and are well-positioned to benefit from MI. In the context of the current study's aim of increasing collaborative activist PEBs, we expected that the people most ready to change are those who already engage in many individual, non-activist PEBs (like recycling) or individual activist PEBs (like signing petitions). People who engage in these types of PEBs may have relatively strong environmental concerns and/or identities, and thus may experience some ambivalence about the fact that they do not engage in collaborative activist PEBs. In contrast, people who rarely engage in individual non-activist or individual activist PEBs likely have little environmental concern, and are therefore unlikely to feel ambivalent about their lack of engagement in collaborative activist PEBs; MI is unlikely to motivate them.

We have three sets of reasons for believing that MI might be well-suited for helping highly ready individuals successfully pursue goals relevant to collaborative activist PEBs. First, when a practitioner follows MI's four main principles (i.e., supporting clients' autonomy, rolling with their resistance, developing discrepancies between their values and behavior, and building their self-efficacy; Miller & Rollnick, 2013), participants are likely to begin articulating their pro-environmental values. Pro-environmental values are associated with pro-environmental attitudes and behaviors (de Groot & Steg, 2010), and environmental self-identity is strengthened when participants' environmental identities and their pro-environmental goals are linked to their previous PEBs (van der Werff, Steg, & Keizer, 2014). This strengthening of environmental identity, in turn, can further increase people's pro-environmental attitudes and behaviors (e.g., Lacasse, 2016; Whitmarsh & O'Neill, 2010). Second, MI may prime environmental commitment and help people ready for engaging in collaborative activist PEBs to self-identify with biocentric values and take personal responsibility regarding environmental impacts, each of which is associated with higher pro-environmental intentions and behaviors (Arnocky, Stroink, & De Cicco, 2007; Hinds & Sparks, 2008). Third, by acknowledging and affirming the PEBs participants already engage in, MI may reduce participants' feelings of environmental guilt, which can help to increase their motivation for other PEBs (Bissing-Olson, Fielding, & Iyer, 2016). In sum, the techniques used in MI might build upon participants' existing pro-environmental values and the individualized PEBs they already engage in, thereby helping motivate them to successfully pursue goals relevant to collaborative activist PEBs.

1.2. Self-determined motivation

Motivational Interviewing shares much in common with the second theory that informed this research: Self-determination theory (SDT). SDT is a well-researched, general theory of human motivation that has been widely applied to a variety of aspects of human behavior (Ryan & Deci, 2017), including goals (Sheldon & Kasser, 1998) and PEBs (Osbaldiston & Sheldon, 2003; de Groot & Steg, 2010). SDT argues that optimal motivation, functioning, and well-being occur when people experience the satisfaction of needs for autonomy, competence, and relatedness; the present project focuses on autonomy.

People have many reasons for engaging in behaviors, and SDT organizes these reasons along a continuum ranging from highly self-determined reasons (which satisfy the need for autonomy) to more controlled reasons (which interfere with satisfaction of autonomy). Self-determined reasons for pursuing a behavior include *intrinsic* reasons (i.e., for the fun and challenge inherent in the behavior) and *identified* reasons (i.e., because the behavior is personally valued and important to one's identity). Controlled reasons for pursuing a behavior include *introjected* reasons (i.e., because one would feel anxious or guilty if one did not do the behavior) and *external* reasons (i.e., one engages in the behavior to obtain a reward or to avoid a punishment). Substantial research demonstrates the validity of this continuum and its relevance to many outcomes, including behavioral persistence and performance (see Ryan & Deci, 2017, Chapter 8).

In addition to testing whether self-determined motivation for collaborative activist PEB goals positively correlates with progress at those types of goals, we explored whether self-determined motivation mediates any beneficial effects that MI (vs. control) has on goal progress. Although MI and SDT developed independently of each other, the two approaches share a similar philosophy that focuses on empowering individuals (Vansteenkiste & Sheldon, 2006). Given MI's focus on helping individuals make their own decisions for pursuing new behaviors, MI (vs. a more directive approach) could facilitate a more self-determined (vs. controlled) set of reasons for pursuing collaborative activist PEB goals which could, in turn, lead to greater goal progress.[1]

1.3. Self-efficacy

The third motivational construct we tested was derived from Bandura's (1977, 1994) theory of self-efficacy beliefs. Self-efficacy is one's belief that one can accomplish a designated course of action. Efficacy beliefs are of two main types: *outcome expectations*, the belief that a given behavior will yield a certain result, and *personal efficacy expectations*, the belief that one will be able to carry out the behavior successfully. Bandura's theory suggests that self-efficacy for goals is built through finding success in goal-related experiences, seeing others' success in goal-related experiences, and reducing perceived goal-related risks and anxieties. Hundreds of studies show the importance of self-efficacy for health and academic behaviors (e.g., Pajares, 1996; Strecher, DeVellis, Becker, & Rosenstock, 1986); other work shows that self-efficacy promotes PEBs (Lauren, Fielding, Smith, & Louis, 2016).

As with self-determined motivation, we both tested if self-efficacy positively correlates with progress at collaborative activist pro-environmental goals and explored whether it mediates any beneficial effects MI has on goal progress. Because the techniques used by MI practitioners, such as open-ended questions and affirmations, guide participants towards applying their previous experiences to decisions about behavior change (Miller & Rollnick, 2013), MI's techniques align with modes of building self-efficacy proposed by Bandura (1977, 1994). We therefore explored whether engaging in a session of MI (vs. a directive session) builds self-efficacy in participants, which, in turn, helps people make progress at their goals.

1.4. The present study

Informed by MI, SDT, and self-efficacy theory, we tested three main hypotheses about motivational variables that could facilitate progress at goals for collaborative activist PEBs. First, we predicted that participation in a single MI session (vs. a more directive, control session) will help people who are highly ready to change successfully pursue goals

[1] While there is overlap between SDT's construct of autonomy-support and MI's principles, MI is not synonymous with autonomy-support, as it includes principles and techniques (e.g., developing discrepancies and promoting change talk) that are distinct from autonomy-support.

relevant to collaborative activist PEBs. Second, we predicted that progress at collaborative activist PEB goals will be positively correlated with self-determined motivation for those goals. Third, we predicted that progress at collaborative activist PEB goals will be positively correlated with self-efficacy for those goals. In addition, we explored whether the effectiveness of MI (vs. control) on goal progress is mediated by goal self-determination and self-efficacy, such that MI (vs. control) promotes more self-determined and self-efficacious goals, which in turn promote progress at those goals.

2. Methods

2.1. Subjects

Students at a small mid-western U.S. liberal arts college were recruited outside the cafeteria and in Environmental Studies classes by offering them a piece of candy in return for completing an 18-item survey; 345 students completed the survey. These pre-screening items asked the students to think about the last three months and report their engagement in six individual non-activist PEBs (e.g., "used a reusable water bottle"; rated on a 5-point scale (1 = *never or almost never* and 5 = *always or almost always*)), six individual activist PEBs (e.g., "donated money to an environmental cause"; rated on a 0 = *no* or 1 = *yes* scale), and six collaborative activist PEBs (e.g., "volunteered for an environmental organization"; also rated on a 0 = *no* or 1 = *yes* scale). The 6 items per category were averaged to create scores for each type of PEB.

Given that we wanted to study individuals who were not currently engaged in collaborative activist PEBs but might be highly ready to do so, we initially invited only those students who had not engaged in any collaborative activist PEBs at pre-screening (i.e., had a score of 0 on that variable) but who were highly engaged in either individual non-activist or individual activist PEBs (i.e., scored 1 SD above the sample mean on either of those variables at pre-screening). These students were told that, in exchange for a $20 honorarium, they would engage in a 20–30 minute conversational session, complete some survey instruments, pursue environmentally-relevant goals over the course of several weeks, and, at the end of the study, report on their success at those goals. Unfortunately, response rates to our invitations were lower than we hoped, so we loosened our criteria and included participants who were perhaps less ready to change than we initially hoped. Ultimately we invited 162 students who had rarely or never engaged in collaborative activist PEBs (i.e., had a score of 0 or 1 on that variable) but were somewhat engaged in either individual non-activist or individual activist PEBs (i.e., scored above the sample mean on either of those variables).

Because we loosened our recruiting criteria, we created a variable indexing each participant's *Pre-screening Readiness*. That is, because we designed our study and MI intervention for people already highly engaged in individual PEBs (i.e., those other than collaborative activist PEBs), we wanted to be able to assess the intervention's effectiveness for such highly-ready individuals in comparison to those who were less ready. We therefore standardized participants' pre-screening scores on their individual non-activist and individual activist PEBs, averaged those standardized scores together, and then standardized this average to create a *Pre-screening Readiness* variable ($M = 0.00$, $SD = 1.00$).

Ultimately, 39 students agreed to participate in the main study, 36 (92%) of whom completed all phases of the study and therefore constituted the sample on which analyses were conducted.[2] Of these 36 students, 28 participants were female, 7 were male, and 1 did not respond concerning sex; 23 participants identified as White, 4 as mixed ethnicity, and 3 each as Black, Asian, and Hispanic. Age ranged from 18 to 22 ($M = 20.25$, $SD = 1.34$).

2.2. Procedures and measures

Participants were emailed a 2083-word essay about industrialization, consumerism, and ecological destruction that concluded by suggesting that individual behaviors were insufficient to meet current ecological challenges and that collaborative activist PEBs were necessary. Participants then took a short quiz assessing their understanding of the essay; on average, participants answered 7.37 of the 8 questions correctly. Next, participants scheduled a time to meet individually for 20–30 minutes with the researcher to discuss the reading and their environmental behavior. At this point, participants were randomized to either the experimental or control group via an online random number generator.

2.2.1. Motivational Interviewing vs. control session

All meetings began with the researcher (the first author, a female undergraduate at the college) asking for the participants' thoughts about the essay. From that point, the researcher's behavior diverged.

In the control group ($n = 18$), the researcher reiterated the urgency of acting against ecological destruction and tried to convince participants to adopt collaborative activist PEBs. Throughout, the researcher added information to the conversation and reinforced the essay's emphasis on collaborative action. She praised the PEBs the participants mentioned they already engaged in, but focused on convincing them to adopt collaborative activist PEB goals. Ultimately, the researcher's aims in the control group were to educate the participants and to convince the participants to set collaborative activist goals.

In the experimental group ($n = 18$), the researcher and the participants engaged in a Motivational Interview (MI).[3] The researcher applied MI's four core skills to the conversation: open-ended questions, affirmations, reflective listening, and summaries. These core skills were complemented by the spirit of MI, including genuine respect for the participant's autonomy, active efforts to collaborate rather than dictate, empowering the participant by building his or her self-efficacy, and evoking the ideas of the participant that suggest willingness to change. The researcher's aim in the MI group was to guide the participants towards their own decisions about which collaborative activist goals best align with their values.

2.2.2. Intervention measures

At the end of the conversation, the researcher provided participants with example collaborative activist pro-environmental goals and asked them to set two such goals to work on over the next several weeks. Some goals set by participants include "Participate in Beekeeping Club," "Teach a class on sustainable menstrual products," and "Participate in the organization of a protest." The researcher then asked the participant to write down each of his/her goals and rate each goal on six items.

The first four items were used to compute a measure of how self-determined the individual felt about his/her goals (Sheldon & Kasser, 1998). Using a 9-point scale (1 = *Not at all because of this reason* and 9 = *Completely because of this reason*), participants rated four reasons they might be pursuing the goal, corresponding to external ("somebody else wants me to pursue this goal"), introjected ("I would feel guilty if I didn't pursue this goal"), identified ("it is an important goal to pursue"),

[2] Because only 3 participants dropped out of the study, we did not conduct attrition analyses. We have no information regarding their age, sex, or ethnicity (since those data were collected at Follow-up), but can report that 2 were in the MI group and 1 was in the control group.

[3] Before the study commenced, the first author participated in two Motivational Interviewing trainings conducted by a member of the Motivational Interviewing Network of Trainers. The first author also practiced MI with several pilot subjects before commencing work with the actual participants.

and intrinsic motivation ("it would be fun for me to pursue this goal"). Following established scoring procedures, a summary score for each goal was computed by weighting the external rating by −2, the introjected rating by −1, the identified rating by +1, and the intrinsic rating by +2; we then averaged these scores across the two goals.[4] Higher scores indicate more *self-determined motivation* for the collaborative activist PEB goals set by the participant ($M = 9.10$, $SD = 7.90$).

Participants then rated each goal on two items concerning self-efficacy using a 9-point scale (1 = *Not at All* and 9 = *Very Much*). The *personal self-efficacy* (PSE) item ($M = 7.22$, $SD = 1.31$) asked participants "the extent to which you feel you have the skills and resources necessary to accomplish this goal"; the *outcome self-efficacy* (OSE) item ($M = 6.39$, $SD = 1.47$) asked participants "the extent to which you feel your goal will eventually yield environmental benefits." Scores were averaged across the two goals.

Finally, to check the integrity of the MI vs. control manipulation, the intervention questionnaire asked participants to rate six aspects of the researcher's behavior during the meeting on a 5-point scale (1 = *Strongly Disagree* and 5 = *Strongly Agree*). Four items assessed the researcher's adherence to MI principles (e.g., "I feel like the experimenter and I were working together to develop my goals", "I feel like the experimenter supported my choices") and two items assessed how much the researcher was attempting to direct the participant's decision (e.g., "I feel like the experimenter was trying to convince me to adopt certain goals" and "I feel like the experimenter was trying hard to educate me about my behavior"). After reversing these latter two items, the six items were averaged to create a *Researcher MI-adherence* score ($M = 3.69$, $SD = 0.84$; Cronbach's alpha = .79).

2.2.3. Follow-up measures

Two, four, and six weeks after the interview, participants were emailed reminders about their two goals as a way to keep these goals in participants' focal awareness amidst their many other competing priorities. After about seven weeks, participants scheduled a session where they completed follow-up measures and were given their $20 honorarium.

At follow-up, participants were presented with their two goals and made three sets of ratings regarding their progress on each goal. The first item, concerning *goal standing* (Koestner, Powers, Milyavskaya, Carbonneau, & Hope, 2015), asked participants to answer "Where do you currently stand on this goal?" by circling one of the following options: (a) "I achieved this goal"; (b) "I made some progress but did not fully achieve this goal"; (c) "I abandoned this goal"; or (d) "I failed at this goal." Following Koestner et al. (2015), an index of goal success was calculated as follows: (2 × the number of successful goals) + (the number of continuing goals) − (the number of abandoned goals) − (2 × the number of failed goals); $M = -1.06$, $SD = 2.41$. The second item, concerning *goal success*, asked participants to "rate how successful you were in accomplishing your goal" on a 9-point scale (1 = *Not at all* and 9 = *Very*) scale; scores were averaged across the two goals ($M = 2.82$, $SD = 2.06$). Third, participants rated "the extent to which you feel each of the following emotions regarding your current standing on your goal" using a 9-point scale (1 = *Not at all* and 9 = *Very much*) scale; the emotions included three positive emotions (e.g., "proud") and five negative emotions (e.g., "stressed"). After reverse-scoring the negative emotions and averaging across the two goals, we followed Koestner et al. (2015) in calculating an average *goal satisfaction* score ($M = 4.73$, $SD = 1.63$). Notably, all three means on the goal measures were rather low, suggesting that participants did not feel that they made much progress at their goals. A factor analysis of the scores on goal standing, success, and satisfaction yielded a single factor that accounted for 90.48% of the variance and on which each variable loaded > 0.93. We therefore z-scored all variables and averaged them to create a *goal progress* variable used in the following analyses ($M = 0.00$, $SD = 0.95$).

Participants also completed follow-up measures of self-determined motivation ($M = 3.58$, $SD = 9.62$), PSE ($M = 6.85$, $SD = 1.81$), and OSE ($M = 5.81$, $SD = 1.79$) for each of their goals, following the same procedures as at intervention but rating how they felt during the weeks they had been pursuing each goal.

3. Results

3.1. Preliminary analyses

We tested whether random assignment to MI vs. control was successful by conducting independent samples t-tests on the three Pre-screening PEBs. As reported in Table 1, each difference was non-significant. These results suggest that when the study began, participants in the MI group had engaged in the same amount of PEBs over the previous 3 months as did participants in the control group.

As a manipulation check, we tested the participants' perceptions of how the researcher had behaved during the MI and control sessions. An independent-samples *t*-test revealed a significant difference between the MI group ($M = 4.22$, $SD = 0.43$) and the control group ($M = 3.15$, $SD = 0.82$) on the Researcher MI-adherence score ($t_{(34)} = 4.93$, $p < .001$, $d = 1.63$). Thus, MI participants perceived the researcher to be significantly more supportive of their choices than did control group participants, who perceived the researcher as more directive.

3.2. Primary analyses

3.2.1. Correlations

Table 2 presents correlations between all primary study variables, focusing on the relationships between Follow-up Goal Progress and the goal variables assessed at intervention and at follow-up. Follow-up Goal Progress was significantly positively correlated with both Intervention and Follow-up Self-determined Motivation. Thus, people made more progress at their goals when they felt self-determined about their goals. Follow-up Goal Progress was also marginally positively correlated with Follow-up PSE.

3.2.2. Group differences

Table 3 presents the results of independent samples t-tests examining whether the intervention affected any of the goal variables. No significant effects were found for Follow-up Goal Progress, any of the Intervention goal variables, or the Follow-up PSE or OSE variables. The only significant effect was that participants in the MI condition reported higher levels of self-determined motivation at Follow-up than did those in the control condition.

3.2.3. Regressions

Recall that we had initially intended to test the effectiveness of MI (vs. control) sessions on individuals who were potentially highly ready

Table 1
Comparisons of Motivational Interviewing vs. Control on Pre-screening Pro-environmental Behaviors.

Variable	Motivational Interviewing	Control	*t*-test	Cohen's d
Individual non-activist PEBs	23.83 (2.60)	24.50 (3.09)	−0.70	−0.23
Individual activist PEBs	3.56 (1.25)	2.94 (1.39)	1.39	0.47
Collaborative activist PEBs	0.07 (0.09)	0.06 (0.08)	0.33	0.12

Note: None of the t-tests are significant; $n = 36$.

[4] A clerical error occurred in transcribing one goal of one participant, and so analyses for this person were based on the single correct goal, rather than the average scores relevant to two goals.

Table 2
Pearson correlations of primary study variables.

	Follow-up Goal Progress	Intervention Self-determined Motivation	Intervention Personal Self-efficacy	Intervention Outcome Self-efficacy	Follow-up Self-determined Motivation	Follow-up Personal Self-efficacy
Intervention Self-determined Motivation	0.48**					
Intervention Personal Self-efficacy	0.15	0.33+				
Intervention Outcome Self-efficacy	0.24	0.63**	0.39*			
Follow-up Self-determined Motivation	0.44**	0.72**	0.23	0.60**		
Follow-up Personal Self-efficacy	0.30+	0.25	0.34*	0.35*	0.34*	
Follow-up Outcome Self-efficacy	0.26	0.52**	0.34*	0.70**	0.60**	0.54**

Note: + = $p < .10$; * = $p < .05$; ** = $p < .01$. $n = 36$.

Table 3
Comparisons of Motivational Interviewing vs. Control on Intervention and Follow-up Goal Self-determined Motivation and Self-efficacy and on Follow-up Goal Progress.

Variable	Motivational Interviewing	Control	*t*-test	Cohen's d
Intervention Self-determined Motivation	9.14 (7.46)	9.06 (8.52)	0.03	0.01
Intervention Personal Self-efficacy	7.50 (1.51)	6.94 (1.03)	1.29	0.43
Intervention Outcome Self-efficacy	6.72 (1.68)	6.06 (1.17)	1.38	0.46
Follow-up Self-determined Motivation	7.31 (8.19)	−0.14 (9.71)	2.49*	0.83
Follow-up Personal Self-efficacy	7.28 (1.53)	6.42 (2.01)	1.45	0.48
Follow-up Outcome Self-efficacy	6.28 (1.58)	5.33 (1.90)	1.62	0.54
Follow-up Goal Progress	0.01 (0.84)	−0.01 (1.08)	0.09	0.02

Note: * = $p < .05$. $n = 36$.

to adopt new behaviors relevant to collaborative activist PEBs. Because we were unsuccessful in meeting our initial recruitment criteria (see Section 2.1), the final sample included some participants who were perhaps less ready to take on this new behavior. As such, an adequate test of our hypothesis required testing whether participants' goal progress was an interactive function of the type of intervention that participants received and of participants' Pre-screening Readiness (i.e., how much they had been engaging in individual non-activist and individual activist PEBs before the study began).

We tested this interaction hypothesis via six regression analyses predicting Follow-up Goal progress. In Models 1a, 2a, and 3a, we entered a contrast-coded variable representing Intervention Group (control = −1, MI = +1), centered Pre-screening Readiness, and a term coding the interaction between Intervention Group and Pre-screening Readiness; this allowed us to examine whether the type of intervention to which participants were exposed interacted with Pre-screening Readiness to predict Follow-up Goal Progress. In Models 1b, 2b, and 3b, instead of using the contrast coded variable representing Intervention Group, we entered the Researcher MI-adherence score and used it in the calculation of the interaction term; this allowed us to examine whether participants' perception that the researcher embodied the spirit of MI (vs. being more directive) interacted with Pre-screening Readiness to predict Follow-up Goal Progress. In Models 1a and 1b, we tested the effects of these variables after controlling for scores on the Pre-screening Collaborative Activist PEB measure (as some subjects had done zero and others had done one such PEB in the three months before Pre-screening assessment occurred). In Models 2a and 2b, we added the Intervention PSE, OSE, and Self-determined Motivation variables, whereas in Models 3a and 3b we added the parallel variables from the Follow-up data collection.

As shown in Table 4, the interaction between Intervention Group and Pre-screening Readiness was marginally significant in Model 1a ($p = .073$) and Model 2a ($p = .051$) and was significant in Model 3a ($p = .025$). The parallel interaction between Researcher MI-adherence and Pre-screening Readiness was marginally significant in all three models ($ps = .071$, .070, and .055 respectively). All six interactions were of the same basic form: At high levels of Pre-screening Readiness, participants who received MI, or who perceived the researcher as embodying the spirit of MI, reported more Follow-up Goal Progress than participants who received the directive intervention, or who perceived the researcher as more directive; in contrast, at lower levels of Pre-screening Readiness, participants who received the directive intervention, or who perceived the researcher as more directive, made more Goal Progress than participants who received the MI intervention, or who perceived the researcher as embodying the spirit of MI. Fig. 1 shows this interaction for the regression reported in Model 1a.

We probed the form of this interaction more fully by conducting floodlight analyses (Spiller, Fitzsimons, Lynch, & McClelland, 2013) for each of the six models. The general pattern of these results again suggested that at high levels of Pre-screening Readiness there were positive effects of MI vs. control and of Researcher MI-adherence on Follow-up Goal Progress, whereas at lower levels of Pre-screening Readiness there were negative effects of MI vs. control and of Researcher MI-adherence on Follow-up Goal Progress. That said, as shown in the last two rows of Table 4, the floodlight analyses suggested substantial inconsistency regarding the levels of Pre-screening Readiness at which the effects of Intervention Group or of Researcher MI-adherence were significantly related to Follow-up Goal Progress. Instead, the results suggest that the interaction is in the form of a relatively weak, albeit consistently present, cross-over interaction of the form presented in Fig. 1.

3.3. Exploratory analyses

We had planned to explore the possibility that goal self-determination and/or goal self-efficacy mediated the effects of MI (vs. control) on progress at collaborative activist PEB goals. This, however, was not possible because there were no effects of MI vs. control on Follow-up Goal Progress (see Table 3), and, as such, no relationship between these

Table 4
Regression Analyses predicting Follow-up Goal Progress with Floodlight Johnson-Neyman Regions.

Predictor Variable	Regressions without Self-determination or Efficacy variables		Regressions with Intervention Self-determination and Efficacy variables		Regressions with Follow-up Self-determination and Efficacy variables	
	Model 1a	Model 1b	Model 2a	Model 2b	Model 3a	Model 3b
Pre-screening Collaborative Activist PEBs	.19	.15	.20	.17	.19	.16
Pre-screening Readiness	.17	.18	−.01	.03	.14	.16
MI vs. Control	−.01	–	.06	–	−.23	–
Interaction of Pre-screening Readiness and MI vs. Control	.32+	–	.35+	–	.36*	–
Researcher MI-adherence	–	.29+	–	.15	–	.04
Interaction of Pre-screening Readiness and Researcher MI-adherence	–	.32+	–	.34+	–	.33+
Self-determined Motivation	–	–	.62**	.55*	.48*	.40+
Personal Self-efficacy	–	–	−.05	−.01	.33+	.27
Outcome Self-efficacy	–	–	−.21	−.23	−.18	−.17
Johnson-Neyman Lower Level	None	None	−1.79+	None	−0.32*	None
Johnson-Neyman Upper Level	None	0.24*	1.30+	1.50+	None	None

Note: + = $p < .10$; * = $p < .05$; ** = $p < .01$. $n = 36$. Models 1a, 2a, and 3a use the Contrast Coded MI (+1) vs. Control (−1) variable and the interaction between MI vs. Control and Pre-screening Readiness in the equations; Models 1b, 2b, and 3b use Researcher MI-adherence and the interaction between Researcher MI-adherence and Pre-screening Readiness in the equations. Models 2a and 2b use Intervention Self-determined motivation, Personal self-efficacy, and Outcome self-efficacy; Models 3a and 3b use Follow-up Self-determined motivation, Personal self-efficacy, and Outcome Self-efficacy. Betas are reported for all regressions. The Johnson-Neyman Levels represent the values of Pre-screening Readiness below which (for the lower level) and above which (for the upper level) there is a significant (or marginally significant) effect of MI vs. Control (in Models 1a, 2a, and 3a) or of Researcher MI-adherence (in Models 1b, 2b, and 3b) on Follow-up Goal Progress.

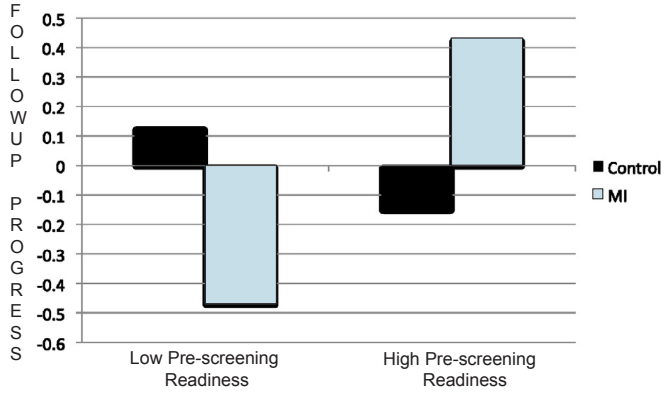


Fig. 1. Interaction of Pre-screening Readiness and MI vs. Control group on Follow-up Goal Progress.
Note: The figure is based on Model 1a (see Table 4) and presents predicted values of Follow-up Goal Progress for participants in the Control or the Motivational Interviewing Group who were 1 Standard Deviation above or below the mean on Pre-Screening Readiness; the sample mean of Pre-screening Collaborative Activist PEBs was used for all participants in these calculations.

variables to be mediated. Given, however, that Pre-screening Readiness and type of counseling session interacted to predict Follow-up Goal Progress (see Table 4), we explored whether this interaction might be related to the proposed mediators. However, no significant interaction effects were revealed for any of the Self-determined Motivation or Personal Self-efficacy variables; the only potential mediator that this interaction term was even marginally significantly related to was Intervention OSE, but (as shown in Table 2) this variable was unrelated to Follow-up Goal Progress. These results suggest that whatever the process is through which Intervention Group interacts with Pre-screening Readiness to affect progress at collaborative activist PEB goals, it is likely not goal self-determination or goal self-efficacy.

4. Discussion

Past studies have investigated ways to motivate people to engage in PEBs such as recycling, donating money to environmental causes, etc. The present study examined ways to motivate people to engage in another important PEB: joining with other individuals to engage in activism concerning ecologically-supportive outcomes. We examined how progress at goals relevant to such collaborative activist PEBs was predicted by three distinct motivational variables: experiencing a single session of Motivational Interviewing (vs. a directive, control session; Miller & Rollnick, 2013), self-determined motivation for one's goals (Ryan & Deci, 2017), and self-efficacy for one's goals (Bandura, 1977, 1994).

Results suggested a complex relationship between MI and goal progress that was dependent on participants' readiness to change. Specifically, participants who had previously engaged in many individual PEBs (e.g., recycled paper, donated to an environmental organization) made more progress at their collaborative, activist pro-environmental goals if they received a single session of MI than if they received a more directive, control session, but participants who had previously engaged in relatively few individual PEBs made more goal progress if they received a more directive, control session than a session of MI. A similar cross-over interaction occurred when we analyzed the results using a measure of the participants' perception that the researcher embodied the spirit of MI vs. acted in a more directive fashion. While this cross-over interaction was consistently present across analyses, it was frequently marginally significant, and floodlight analyses suggested that there was no consistent level of participant readiness at which the effects on goal progress of MI vs. control or of perception of the researcher were significantly different.

On the one hand, the beneficial effects of MI (vs. control) on goal progress are consistent with studies that have shown the usefulness of MI for promoting PEBs (Klonek et al., 2015). On the other hand, the fact that participants who had previously engaged in relatively few individual pro-environmental behaviors benefited more from a directive approach than from MI is consistent with other studies showing that the effectiveness of goal-based interventions sometimes depends on participant characteristics (e.g., Ferguson & Sheldon, 2010; Sheldon, Kasser, Smith, & Share, 2002). Given the current findings and these other studies, as well as research showing that people prefer different forms of social support (Cutrona, 1990), we recommend that researchers attempt to replicate the current interaction so that the literature might become clearer about how best to motivate people who vary in their readiness to adopt collaborative activist PEBs. Such research would do well to use a substantially larger sample than ours, as well as to give participants more than one session of MI and the opportunity to interact with a counselor more highly-trained in MI than was the researcher here.

People's progress at their goals was consistently positively associated with how much they endorsed self-determined reasons (i.e., because such a goal was fun and/or valuable to them) and denied controlled reasons (i.e., because of guilt or external inducements) for their goals. Importantly, these findings were significant when self-determined motivation was assessed both seven weeks before and concurrently with measures of goal progress, as well as when other motivational variables were controlled (see Table 4). Such findings add to the literature showing the importance of self-determined motivation for pro-environmental behaviors (Osbaldiston & Sheldon, 2003; de Groot & Steg, 2010).

Surprisingly, participants' ratings of goal self-efficacy bore little relationship with goal progress. Outcome beliefs were never related to goal progress, and personal efficacy beliefs were only marginally associated with goal progress when these two variables were assessed concurrently. Such findings suggest that individuals' beliefs about the ultimate impact their goals will have on the world are relatively unimportant in determining their progress at collaborative, activist PEB goals. Further, the findings suggest that individuals may be relatively poor at predicting whether they have the skills to succeed at collaborative, activist PEB goals. Another possibility is that the single-item measures we used to assess self-efficacy lacked validity. Given past research showing the importance of self-efficacy for success at PEBs (Lauren et al., 2016), we suggest that more research is needed to explore this construct's role in success at collaborative activist pro-environmental goals.

A secondary intention of this project was to explore whether self-determined motivation and self-efficacy mediated any effects of MI on goal progress. We found no evidence supporting this idea. Importantly, however, MI was effective in helping participants achieve sustained self-determined motivation for their goals over the course of approximately seven weeks (see Table 3). Such findings support suggestions that MI and SDT may benefit from integration (Teixeira, Palmeira, & Vansteenkiste, 2012; Vansteenkiste & Sheldon, 2006).

The current project had numerous limitations. First, the sample was composed of U.S. college students and was predominantly female and White; research should test whether our results replicate in more heterogeneous samples. Second, the sample size was quite small, limiting statistical power and increasing the likelihood of Type II errors; although other MI intervention studies occasionally use small samples, future researchers should obtain much larger samples. Third, all measures were assessed via self-report; research could correct for reporting biases or use more objective ways to assess goal progress. Fourth, participants reported low goal progress, suggesting that neither MI nor the directive intervention were especially effective at promoting progress at collaborative activist PEB goals. Fifth, given the relatively weak results that occurred for self-efficacy, researchers could examine SDT's concept of competence. Finally, the present study ignored the role of relatedness needs; research could combine MI sessions with support groups to help participants feel more connected to others as they pursue their goals.

Despite these weaknesses, the current study's results suggest that environmental educators and activists who hope to encourage individuals to become more involved in collaborative, activist pro-environmental behaviors would do well to attend to motivational variables such as individuals' feelings of self-determination for their goals. Further, our results suggest that motivational interventions may need to be matched to individuals' potential readiness to take on new and difficult PEBs.

Declarations of interest

None.

Acknowledgements

We appreciate the advice provided by Dr. Florian Klonek and the informative trainings, resources, and support provided by Dr. Richard Rutschman. This work was supported by the Paul K. and Evalyn Elizabeth Richter Memorial Fund and by Knox College's Office of Sustainability.

References

Arnocky, S., Stroink, M., & De Cicco, T. (2007). Self-construal predicts environmental concern, cooperation, and conservation. *Journal of Environmental Psychology, 27*, 255–264.
Bandura, A. (1977). Self-efficacy: Towards a unifying theory of behavioral change. *Psychological Review, 84*, 191–215.
Bandura, A. (1994). Self-efficacy. *Encyclopedia of Human Behavior, 4*, 71–81.
Bissing-Olson, M. J., Fielding, K. S., & Iyer, A. (2016). Experiences of pride, not guilt, predict pro-environmental behavior when pro-environmental descriptive norms are more positive. *Journal of Environmental Psychology, 45*, 145–153.
Crompton, T., & Kasser, T. (2009). *Meeting environmental challenges: The role of human identity.* Godalming, UK: WWF-UK.
Cutrona, C. E. (1990). Stress and social support: In search of optimal matching. *Journal of Social and Clinical Psychology, 9*, 3–14.
Ferguson, Y. L., & Sheldon, K. M. (2010). Should goal-strivers think about 'why' or 'how' to strive? It depends on their skill level. *Motivation and Emotion, 34*, 253–265.
de Groot, J. I. M., & Steg, L. (2010). Relationships between value orientations, self-determined motivational types and pro-environmental behavioural intentions. *Journal of Environmental Psychology, 30*, 368–378.
Hinds, J., & Sparks, P. (2008). Engaging with the natural environment: The role of affective connection and identity. *Journal of Environmental Psychology, 28*, 109–120.
Klonek, F., Guntner, A., Lehmann-Willenbrock, N., & Kauffeld, S. (2015). Using Motivational Interviewing to reduce threats in conversations about environmental behavior. *Frontiers in Psychology, 6*, 1015. https://doi.org/10.3389/fpsyg.2015.01015.
Koestner, R., Powers, T., Milyavskaya, M., Carbonneau, N., & Hope, N. (2015). Goal internalization and persistence as a function of autonomous and directive forms of goal support. *Journal of Personality, 83*, 179–190. https://doi.org/10.1111/jopy.12093.
Lacasse, K. (2016). Don't be satisfied, identify! Strengthening positive spillover by connecting pro-environmental behaviors to an 'environmentalist' label. *Journal of Environmental Psychology, 48*, 149–158.
Lauren, N., Fielding, K. S., Smith, L., & Louis, W. R. (2016). You did, so you can and you will: Self-efficacy as a mediator of spillover from easy to more difficult pro- environmental behaviour. *Journal of Environmental Psychology, 48*, 191–199.
Miller, W. (1983). Motivational Interviewing with problem drinkers. *Behavioural Psychotherapy, 11*, 147–172.
Miller, W., & Rollnick, S. (2013). *Motivational Interviewing: Helping people change.* New York, NY: Guilford Press.
Osbaldiston, R., & Sheldon, K. M. (2003). Promoting internalized motivation for environmentally responsible behavior: A prospective study of environmental goals. *Journal of Environmental Psychology, 23*, 349–357.
Pajares, F. (1996). Self-efficacy beliefs in academic settings. *Review of Educational Research, 66*, 543–578.
Rosengren, D. (2009). *Building Motivational Interviewing skills: A practice workbook.* New York, NY: Guilford Press.
Ryan, R. M., & Deci, E. L. (2017). *Self-determination theory: Basic psychological needs in motivation, development, and wellness.* New York: Guilford Press.
Sheldon, K. M., & Kasser, T. (1998). Pursuing personal goals: Skills enable progress, but not all progress is beneficial. *Personality and Social Psychology Bulletin, 24*, 1319–1331.
Sheldon, K. M., Kasser, T., Smith, K., & Share, T. (2002). Personal goals and psychological growth: Testing an intervention to enhance goal attainment and personality integration. *Journal of Personality, 70*, 5–31.
Spiller, S. A., Fitzsimons, G. J., Lynch, J. G., & McClelland, G. H. (2013). Spotlights, floodlights, and the magic number zero: Simple effects tests in moderated regression. *Journal of Marketing Research, 50*, 277–288.
Stern, P. (2000). Toward a coherent theory of environmentally significant behavior. *Journal of Social Issues, 56*, 407–424. https://doi.org/10.1111/0022-4537.00175.
Strecher, V. J., DeVellis, B. M., Becker, M. H., & Rosenstock, I. M. (1986). The role of self-efficacy in achieving health behavior change. *Health Education & Behavior, 13*, 73–92.
Teixeira, P. J., Palmeira, A. L., & Vansteenkiste, M. (2012). The role of Self-determination Theory and Motivational Interviewing in behavioral nutrition, physical activity, and health: An introduction to the IJBNPA special series. *International Journal of Behavioral Nutrition and Physical Activity, 9*, 17.
Vansteenkiste, M., & Sheldon, K. M. (2006). There's nothing more practical than a good theory: Integrating Motivational Interviewing and Self-determination Theory. *British Journal of Clinical Psychology, 45*, 63–82.
van der Werff, E., Steg, L., & Keizer, K. (2014). Follow the signal: When past pro-environmental actions signal who you are. *Journal of Environmental Psychology, 40*, 273–282.
Whitmarsh, L., & O'Neill, S. (2010). Green identity, green living? The role of pro-environmental self-identity in determining consistency across diverse pro-environmental behaviours. *Journal of Environmental Psychology, 30*, 305–314.