

THESIS

TESTING ENVIRONMENTAL EDUCATION INTERVENTIONS RELATED TO WOLVERINE
REINTRODUCTION IN COLORADO

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ABSTRACT

TESTING ENVIRONMENTAL EDUCATION INTERVENTIONS RELATED TO WOLVERINE REINTRODUCTION IN COLORADO

Mobilizing collective action is essential for successful wildlife restoration, yet designing effective outreach that meaningfully shifts behavioral intentions remains a key challenge for conservation practitioners. Theory driven educational strategies offer promise for influencing behavioral intentions are underexplored in real-world settings. In summer of 2025, the Center for Human-Carnivore Coexistence at Colorado State University, in partnership with Defenders of Wildlife and CSU Extension, led the implementation of a statewide education campaign focused on wolverine (*Gulo gulo*) reintroduction in Colorado, designed to improve public knowledge, support, and collective action intentions. The education campaign delivered accurate evidence-based scientific information about wolverine ecology and their reintroduction while testing the efficacy of different educational approaches for improving learning outcomes. To do so we implemented a 2X2 factorial experimental design comparing the traditional science communication approach, or rational actor model (“control”), to a theory driven treatment combining the Constructivist Learning Model and emotional appeals using anthropomorphism (“treatment”), delivered in both in-person and virtual formats. Participants completed pre- and post-event surveys to explore changes in their knowledge about wolverines and their reintroduction as well as their support for reintroduction and collective action. Overall, participants in both the control and treatment conditions demonstrated greater knowledge compared to before, though we did not see intervention effects on collective action intentions, likely reflecting ceiling effects among an already supportive audience.

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INTRODUCTION

As the restoration of previously extirpated species becomes an increasingly common tactic to combat biodiversity loss, public support is critical for successful wildlife restorations (Decker et al., 2002; Bonamy et al., 2019). Public support or opposition can influence which species are restored, what management of those species looks like, and whether stakeholders comply with management decisions (Bennett, 2016; Jacobson, 2015; Bonamy et al., 2019). Colorado has recently seen two examples of how the public can influence wildlife management outcomes. In 2020, a ballot initiative on the wolf reintroduction passed by a narrow margin, with 50.9% voting in favor (Ditmer et al., 2022; Niemiec, 2020a). Researchers believe the political polarization of the issue may have increased social conflict and ultimately influenced voting behavior (Ditmer et al., 2022; Gonzalez et al., 2024). More recently, a 2024 public vote to ban trophy hunting on big cats in Colorado failed, driven largely by public skepticism toward wildlife agencies and opposition to using ballot initiatives as a mechanism for wildlife management decisions (Niemiec et al., *In Review*). These cases illustrate that the public has the power to shape wildlife management decisions, making mobilization of that support a central goal of outreach and education efforts.

Public support can manifest in a variety of ways, from individual behaviors such as changing recycling habits (Kollmuss & Agyeman, 2002), to collective action, coordinated behaviors motivated by a shared interest that target behavior change using social networks and cultural norms (Amel, 2017; Niemiec et al., 2020b). While both are forms of public support, collective action may be more effective at achieving conservation outcomes than campaigns targeting individual actions (Niemiec et al., 2020b). By distributing the responsibility across a group rather than on the individual, collective action can lower barriers to participation and lead to more sustained engagement (Amel et al., 2017). For example, Pye (2010) found that collective action efforts successfully connected anti-palm oil advocacy groups,

ultimately resulting in the World Bank removing funding from the palm oil industry. The scale of biodiversity loss requires coordinated societal responses that individual actions cannot achieve alone (Amel et al., 2017; Pye, 2010). Thus, effectively promoting species conservation requires understanding not just how to build public awareness, but how to engage people in sustained collective efforts on behalf of wildlife.

Increasing knowledge about a species or issue is a critical first step to build support around an issue (Bennett, 2016; Bonamy et al., 2019). For this reason, many organizations, such as agencies and NGOs, routinely invest in public outreach and education campaigns. Greater familiarity with a species can foster support by cultivating empathy and reducing fear and uncertainty, both of which are psychological precursors to positive conservation attitudes and behaviors (Ajzen, 1991; Bamberg & Möser, 2007). However, traditional outreach and education approaches often employ the rational actor model, a unidirectional knowledge-transfer approach, in which experts simply deliver information to their audience (Chuang, 2021). These models operate with the assumption that providing information will result in people interpreting it as intended and subsequently changing their corresponding perceptions and behaviors (Cone, 2008; Gould et al., 2023). However, this approach is often insufficient for building knowledge, support, or engagement with complex and contentious environmental issues because it wrongly presumes that inaction *only* stems from a lack of information (Gould et al., 2023; Canfield et al., 2020; Nisbet & Scheufele, 2009). In reality, values, beliefs, attitudes, and contextual factors shape human perceptions and behaviors (Gould et al., 2023; Byerly et al., 2018). Thus, identifying effective approaches, or interventions, that engage these social psychological factors in outreach and education efforts, is critical to enhancing public support for wildlife conservation (Ardoin et al., 2020; Gould et al., 2023).

Research increasingly shows interactive experiential learning programs outperform traditional approaches in enhancing engagement, support, and knowledge (Byerly et al., 2018; Kollmuss & Agyeman, 2002; Arık, S., & Yilmaz, M., 2020). For example, the Constructivist Learning Model (CLM)

has been shown to achieve higher learning outcomes by positioning individuals as active participants in the learning event and encouraging each person to interpret new information through the lens of their prior knowledge, experiences, and worldviews (Arik, S., & Yilmaz, M., 2020; Bhattacharjee, 2015). Constructivist Learning theorists and researchers suggest that learning best occurs through these four core cognitive and social mechanisms (i.e., the learning processes): (1) personal connection to and perceived relevance of the topic, (2) constructing understanding through social interaction, (3) activating prior knowledge and perspectives and, (4) engaging in active meaning-making in the learning event (Zajda, 2021; Toraman & Demir, 2016; Bhattacharjee, 2015; Mishra, 2023).

From a theoretical standpoint, each component of CLM contributes to enhancing knowledge in distinct but complementary ways. Constructivist learning is most effective when learners perceive the content as meaningful to their own lives. By allowing them to integrate new information with existing beliefs and experiences, learning becomes more meaningful, memorable, and retained (McCallie et al., 2009; Mishra, 2023; Battacharjee, 2015). The social learning component of CLM holds that dialogue, collaboration, and exposure to diverse perspectives build knowledge (McCallie et al., 2009). Group discussions and perspective-taking exercises foster social learning by encouraging learners to actively engage with and reflect on others' viewpoints (Cakir 2008; McCallie, E et al.2009). Additionally, CLM posits individuals actively construct knowledge by connecting new ideas to their existing mental frameworks (Bhattacharjee, 2015; Cakir, 2008). CLM has been shown to lead to greater knowledge gains and a variety of other outcomes such as deeper conceptual understanding and improved attitudes toward the subject matter (Ardoin et al., 2020; Battacharjee, 2015).

Beyond CLM, anthropomorphism, the attribution of human-like characteristics and emotions to non-human animals, has been shown to increase public support for wildlife initiatives (Chan, 2012; Manfredo et al., 2020; Russell, 2024). Research suggests that emphasizing perceived similarities between humans and animals fosters empathy, compassion, and moral concern for wildlife (Manfredo et al., 2020; Ballantyne et al., 2007). Perceived similarities also assist in closing the social psychological distance

between humans and animals, making wildlife conservation issues feel more personally relevant to the public (Amel et al., 2017; Shiu, 2024). In a study on how message framing may influence public beliefs on species reintroduction, Niemiec et al. (2020c) found that participants who received the anthropomorphism message reported higher levels of perceived similarities than those that did not receive the anthropomorphized messaging. Additionally, Whitley et al. (2020) found that viewing an anthropomorphic wildlife portrait for 30 seconds increased empathy more than those that viewed a traditional wildlife image or no image for the same amount of time. Anthropomorphism may also evoke emotionally positive reactions, such as curiosity, hope, or excitement, about wildlife, which are often precursors to supportive attitudes (Williams et al., 2021; Manfredi et al., 2020). Research has shown that positive affect enhances receptivity for learning and increases openness to and enthusiasm for conservation actions, fostering more active post-learning engagement (Manfredi et al., 2020; Ballantyne et al., 2007).

In addition to how outreach and education events are designed, the mode of delivery may also shape how effectively knowledge and support are built. Informal education events, particularly by non-profit organizations and community-based institutions, have traditionally relied on in-person attendance. However, when the COVID-19 pandemic rendered in-person events unfeasible, virtual events rapidly expanded in both necessity and adoption. Now, in the post-pandemic era, organizations have the option to continue offering virtual events or return to in-person opportunities. While research suggests that in-person events are more effective at building community and increasing deeper knowledge, virtual events can be easier to organize and more cost-effective, reducing barriers to participation (Baucum, 2022; Gross et al., 2022; Sweet et al., 2023). The efficacy of both in-person and virtual education events is influenced by content design and delivery (Merritt et al., 2022), yet researchers have yet to establish best practices for optimizing either format.

Case Study

In 2024, the Colorado General Assembly passed the *Restoration of Wolverines Act*, granting Colorado Parks and Wildlife (CPW) legislative approval, to legally reintroduce wolverines (*Gulo gulo*) to the state. Hunting, trapping, and poisoning eliminated Colorado's native wolverine population by 1919 as part of widespread predator control efforts across the West. In 1973, Colorado classified wolverines as an endangered species, and in 2023 the US Fish and Wildlife Service listed wolverines as threatened under the Endangered Species Act. Colorado Parks and Wildlife (CPW) plans to begin the reintroduction in late 2027, setting the stage for the first ever wolverine reintroduction.

We applied CLM and anthropomorphism as interventions in an outreach and education campaign, across in person and virtual events, aimed to increase knowledge about and support for the wolverine reintroduction in Colorado, USA. We hypothesized that engaging the four core CLM pathways would increase both support for and knowledge about the wolverine reintroduction. Additionally, we hypothesized two pathways by which anthropomorphism may have increased support for wolverine restoration in Colorado: by increasing empathy towards wolverines and enhancing positive affect (and reducing negative affect) when thinking about wolverines. Specifically, we explored:(1) To what extent does incorporating CLM and anthropomorphism interventions into outreach events increase support for the wolverine reintroduction compared to a traditional knowledge-transfer approach?;(2) To what extent do these interventions increase knowledge about the wolverine reintroduction compared to a traditional knowledge-transfer approach?; and (3) To what extent does delivery mode (in-person versus virtual) influence gains in knowledge and support?

METHODS

We designed our education campaign with two primary objectives: (1) to deliver accurate, evidence-based scientific information about wolverine ecology and their reintroduction; and (2) to evaluate different educational approaches and assess their effectiveness in improving learning outcomes. To meet objective one, we consulted with leading wolverine and carnivore biologists to identify key topics to communicate to Coloradans and review our education content for accuracy. Our final education content included the following topics: wolverine biology and ecology, how the decision to reintroduce wolverines in Colorado was made, why wolverines are being restored to Colorado, what the restoration means for Coloradans, how CPW plans to restore them, and lastly, how the public can get involved.

To meet objective two, we created control and treatment versions of the education content, comparing a traditional knowledge transfer approach (control) to one that incorporated anthropomorphism and constructivist learning model interventions (treatment). We conducted surveys before and after each education event to measure differences between conditions (Table 1). To ensure consistent implementation of the experimental design, we standardized scripts, slides, and activities. Additionally, the same educator facilitated all events. We manipulated two experimental variables across events: delivery method (treatment vs. control condition) and mode (in-person vs. virtual).

Table 1. Diagram of 2x2 factorial design

		Factor B: Delivery Method	
		In – Person	Virtual
Factor A: Design	Traditional Knowledge Transfer (Control)	<i>Condition 1</i>	<i>Condition 2</i>
	CLM & Anthropomorphism Intervention (Treatment)	<i>Condition 3</i>	<i>Condition 4</i>

Our campaign included 16 individual events across Colorado, including eight in-person events and eight virtual events. We distributed in-person events geographically across the Front Range and Western Slope of Colorado. We chose Fort Collins and Denver because of their large metropolitan population and had accessible venues. We chose Aspen, Gunnison, and Glenwood Springs because of their proximity to reintroduction zones (Figure 1). We employed a quasi-experimental design in which events, rather than individual participants, were assigned to conditions. Prior to recruitment, we systematically assigned each event to one of the four conditions, balancing treatment and control across both delivery mode (in-person vs. virtual) and scheduling slot (weekday evening vs. Saturday morning), to ensure that no single condition was associated with a particular format or time slot.

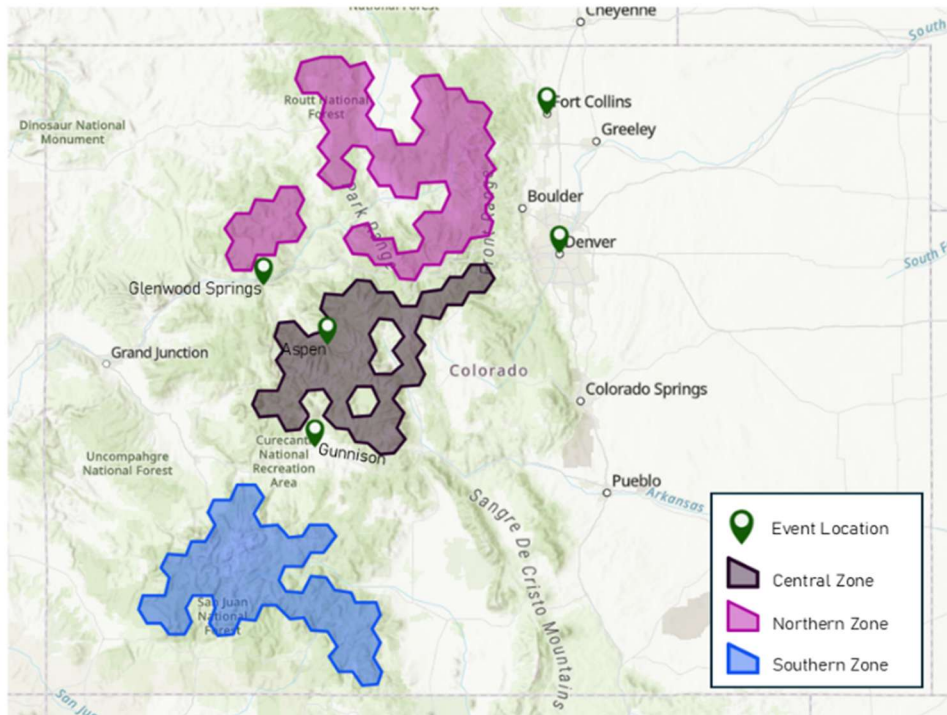


Figure 1. Map of Colorado with the location of in-person events and the three specified wolverine reintroduction zones. Event locations were chosen for their proximity to reintroduction zones.

We did not randomly assign participants; rather, they self-selected into whichever event fit their schedule. Critically, we did not disclose the existence of the study, or the condition participants would receive during advertisement for the events. Promotional materials described only educational events, with no mention of the research study or the existence of multiple program versions. We scheduled events

across weekday evenings (Tuesdays and Thursdays) and Saturday mornings to reduce barriers to participation. We conducted nine Saturday events, five were in-person and four were virtual, with seven assigned to control and three to treatment; of the eight weekday evening events, three were in-person and five were virtual, split evenly between control and treatment. Colorado State University's Institutional Review Board approved all methods (protocol 6751).

Participant Recruitment

We recruited participants in two stages. First, we recruited the Coloradan public to attend one of the education events. To do so, we worked with local community organizations (e.g., public libraries), environmental non-profits (e.g., Rocky Mountain Wild and Defenders of Wildlife), and Colorado State University Extension Offices (see Appendix A for full list). Approximately two weeks before each scheduled event, we sent recruitment materials to these community organizations to help promote the event. The materials included standardized language for a brief social media post or email announcement, PDF versions of the promotional flyer, and image files formatted for social media platforms (Appendix B). All recruitment materials included a link and QR code to an RSVP form. Completing the RSVP form did not constitute enrollment in the study; rather, we used it solely to plan attendance and introduce participants to the opportunity to take part in an optional survey-based study. The RSVP form briefly described the study and informed potential participants that taking part in the study was voluntary and not required to attend the event.

Second, we recruited participants for the study at the beginning of each event from the education event attendees. To do so, the facilitator verbally introduced the study, explaining the research purpose, procedures, participant rights, and voluntary nature of participation, to all attendees over the age of 18. We provided individuals who wished to participate with a link to the online survey or provided a paper copy if requested at an in-person event. The first page of the survey included an informed consent statement, and participants actively selected "I consent" to proceed. All communication emphasized the voluntary nature of the study and participants' right to skip any question or exit the survey at any time.

We incentivized participation by offering the opportunity to enter a drawing as a token of appreciation for their time, contingent on completing both the pre- and post-surveys. Incentives included two \$100 visa gift cards, two gift baskets with local Colorado items, six beanies from Wolverine Farm PubliK House in Fort Collins, and ten “swag bags” with items donated from our nonprofit partners. Once we completed the event content, we invited participants to take the post-survey. We had the facilitator verbally remind participants that completing the post-survey was optional, regardless of their completion of the pre-survey. We opened the floor for attendees to ask questions only after participants had completed the post survey to control for participants at different events receiving different information during the Q & A portion.

Description of Control and Intervention Presentations

We delivered the control presentation in a uni-directional format. Consistent with the traditional knowledge transfer approach, slides were text-heavy with minimal images (Figure 3). The control presentation lasted one hour and included: ten minutes for participants to take the pre-survey; content delivery, which ran for 35 minutes; ten minutes for participants to take the post-survey; and five minutes for questions. Questions were held only after post-survey completion to prevent participants from receiving additional information that could influence their responses.



Figure 3. Examples of control and treatment slides. The left shows four different Control slides with limited images and text heavy. The right shows four different treatment slides with anthropomorphized images, less text, and an example of an activity.

The treatment presentation built directly on the control condition by incorporating CLM and anthropomorphism interventions. While the educational content remained consistent across conditions, the treatment presentations differed in format, using redesigned slide visuals, integrated videos, and interactive activities (Figure 3). The treatment followed the same core structure as the control condition but included approximately 15 additional minutes of content given the dialogue- and activity-based nature of the interventions, for a total duration of about 75 minutes.

To operationalize emotional appeals through anthropomorphism, we developed two recurring narrative characters, a wolverine and a human, whose dialogue guided participants through the educational content using a storytelling approach. For example, the control presentation stated, “*wolverines were eradicated from the state in 1919.*” In the treatment however, the human main character asked, “*what happened to wolverines in Colorado?*” and the wolverine main character replies “*we were eradicated from the state by 1919.*” Additionally, rather than presenting information in a purely descriptive format, we framed biological concepts through relatable human analogies. For example, when discussing wolverine anatomy, we compared features such as paws and claws to human tools (e.g., snowshoes and crampons) to aid comprehension. Similarly, in discussing reproduction, we replaced technical terms such as “males” and “females” with anthropomorphic language (e.g., “father,” “mother”) and described behaviors using phrases such as “raising a family” or “caring for babies.” In contrast to the control condition’s neutral and biology-based terminology (e.g., females have kits).

When integrating our CLM intervention we included content designed to engage each of the four components of CLM: (1) activating prior knowledge; (2) creating personal connection to and perceived relevance of the topic; (3) engaging in active meaning-making; and (4) constructing understanding through social interaction. The presentation began with our facilitator asking participants what they already knew about wolverines, directly activating prior knowledge. This dialogue created an opportunity for participants to connect their existing knowledge with the new information being presented. To create personal relevance, before explaining what wolverine diets would likely consist of in Colorado, we asked

participants to think about which small animals are native to Colorado and share with the group: “What kinds of animals do you think wolverines might hunt in Colorado?” This allowed participants to actively engage in the learning event by relating the information to what they already knew about Colorado. We recorded all participant responses and, when diet was explained in the next slide, called back to the correct answers. This reinforced active participation and sustained engagement in dialogue throughout the session.

To engage participants in active meaning-making, we used dialogue to elicit curiosity and positive emotional engagement. For example, we asked participants, “When wolverine kits are born, do you think they weigh as much as A. a loaf of bread; B. a deck of playing cards; C. a liter of soda; or D. a football?” The question enabled participants to connect the new information about wolverines with information they already knew (i.e., the weight of common items). The activities also fostered understanding through social learning by prompting participants to engage in dialogue with the group.

Interventions often had overlapping CLM components. For example, we facilitated small group discussion in which we gave each group a perspective card for a stakeholder group (e.g., rancher, wildlife advocate, wolverine) and asked to complete the sentence, “to me, successful wolverine restoration looks like...” from the perspective of that group. This actively engaged participants in meaning-making by requiring them to invest cognitive energy in understanding a possibly unfamiliar perspective, in personal connection by prompting reflection on their own values and those of others; and in social learning by encouraging peer dialogue that considered multiple perspectives. Additionally, we implemented anthropomorphism by including wolverines as a stakeholder group. Table 2 provides a complete list of interventions and indicates which aspect of CLM and/or Anthropomorphism is present for each.

Table 2. Description of treatment presentation interventions and their alignment with Constructivist Learning Model (CLM) learning processes and anthropomorphism strategies and “X” indicates the component is present in the intervention.

Intervention	CLM Theme				Anthropomorphism
	Activate prior knowledge	Active meaning-making	Personal Connection & Perceived Relevance	Social Interaction & Learning	
Activity: "What do you already know about wolverines?"	X	X			
Video: Hugh Jackman interview where he talks about not knowing what a wolverine is.			X		
Visual: Images of animals in the weasel family participants may know	X				
Script: Relating wolverine paws to snowshoes and crampons	X				X
Video: Father wolverine feeding mother and wolverine kit. “caring behavior” “Raise a family”		X			X
Script: "You can think of caches like having mini fridges all around your neighborhood with stockpiles of your favorite snacks in them."			X		X
Activity: "What kinds of animals do you think wolverines might hunt in Colorado?"		X		X	
Script: Using "father", "other", and "family" when discussing reproduction					X
Activity: When wolverine kits are born, do you think they weigh as much as A. a loaf of bread; B. a deck of playing cards; C. a liter of soda; or D. a football?		X		X	
Activity: How many wolverines do you think have been confirmed in Colorado since 1919? A. 1; B. 7; C. 19; D. 32		X		X	
Script: Description of testimonial feedback from Wolverine Restoration Act about why some groups are nervous and others are excited about the reintroduction			X	X	
Activity: Small group discussion about different perspectives. Answering, "to me, successful wolverine restoration looks like..." from the perspective of a stakeholder group (i.e. rancher, wildlife advocate, wolverine)		X	X	X	X
Activity: "We started off by talking about what you all already knew about wolverines. Now we want to know something you learned today that surprised you."		X	X	X	

Survey Development

We measured several variables on both the pre-and post-surveys; however, this paper focuses on a subset of these outcomes and covariates. Our three dependent variables, collective action in support, subjective knowledge, and objective knowledge, were measured in both surveys, with post-survey versions serving as dependent variables in our regression models. In the pre-survey, our independent covariates included: (1) empathy; (2) affect; (3) beliefs; (4) attitudes; (5) perceived personal importance; and (6) degree of support. We also collected three demographic variables: (1) county; (2) age; and (3) gender. Of these, empathy, beliefs, and an aggregate of attitudes, perceived personal importance, and degree of support were included as covariates in the regression models. Our primary dependent variable, collective action and support was adapted from Gonzalez et al. (2024) and included six items (e.g., “discuss wolverine management with others”; “write an editorial or other material for media outlets about wolverines”). We asked participants to rate each item on a 5-point scale from not at all likely to extremely likely.

For subjective knowledge we asked participants how knowledgeable they felt about 11 specific topics related to wolverines and their reintroduction to the state, with at least two items relating to each of the five sections of educational content covered in the presentation. Participants answered on a 5-point scale from not at all knowledgeable to extremely knowledgeable. Questions included: “how knowledgeable do you feel about whether wolverines are currently in Colorado” and “how knowledgeable do you feel about how the decision to reintroduce wolverines into Colorado was made.” The objective knowledge battery assessed participants’ actual knowledge through eight true/false items that covered topics such as: “there is currently an established population of wolverines in Colorado”; “the public voted on wolverine reintroduction”; and “wolverines prefer to live in remote, high-elevation habitats.”

To measure the impact of our anthropomorphism intervention on support for the wolverine reintroduction, we included items related to empathy and emotions consistent with prior research

demonstrating that anthropomorphism enhances pro-environmental attitudes toward wildlife by increasing empathy and evoking emotionally positive reactions (Manfredo et al., 2020; Williams et al., 2021). To measure emotions (i.e., affect), we asked participants to indicate the extent to which they felt specific emotions when thinking about wolverine reintroduction in Colorado, using a 5-point scale (1 = not at all, 2 = somewhat, 3 = a moderate amount, 4 = a lot, 5 = a great deal). We included six positive emotions (e.g., proud, happy, hopeful) and six negative emotions (e.g., fearful, anxious, frustrated). We measured empathy using three items rated on a 7-point scale from strongly disagree to strongly agree: “wild animals experience emotions similar to humans,” “wild animals have a mind of their own,” and “wild animals have their own personalities.”

We included 13 items to measure the impact of our educational event on participant beliefs. Beliefs, both positive and negative, shape individuals’ willingness to engage in support behaviors (Byerly et al., 2018; Levine et al., 2015; Wibeck, 2014). Participants rated 10 negative (e.g., “result in ranchers losing money” and “result in wolverines wandering into residential/urban areas”) and 4 positive belief items (e.g., “lead to a recovered, self-sustaining population of wolverines in Colorado” and “benefit Colorado’s ecosystem”) on a 7-point scale from strongly disagree to strongly agree. Finally, we included three demographic questions. Participants self-described the county they lived in (or state if they were out of state), their age (18-24, 35-54, 55+) and their gender (male, female, nonbinary/third gender, prefer not to say, or prefer to self-describe with a text entry box). We asked participants to provide their name solely to match pre- and post- survey responses. We also asked for a mailing address only from those who wished to be entered into the incentive drawing, so that we could distribute winnings. We included all items on both the pre- and post- surveys except for the demographic questions which appeared only on the pre-surveys.

Analysis

Prior to analysis, we screened responses for completeness and data quality. We matched pre- and post- surveys to the correct participant, ensuring each pre-survey had a corresponding post-survey, and

removed surveys without a paired response. We then screened the remaining responses for individual item nonresponse. The final dataset included 99 participants who completed both pre- and post-surveys with an acceptable level of completeness.

We employed principal components analysis (PCA) with Varimax (orthogonal) rotation and Kaiser normalization as a data-reduction technique to reduce dimensionality and avoid overfitting subsequent regression models. We used PCA to create aggregate variables within constructs for the following item batteries: collective action in support of reintroduction, subjective knowledge, affect, empathy, and beliefs. We also applied PCA to aggregate across the individual support, general attitude, and personal relevance construct items to create one variable for the three constructs. We retained items with factor loadings greater than 0.50, given suggestions that loadings above this threshold share a meaningful proportion of variance (Stevens, 2002). Following component extraction, we ran Cronbach's alpha to confirm internal reliability ($\alpha > 0.7$; Taber, 2018) of our scales before we averaged retained items into a single composite variable for each construct. We measured objective knowledge using eight true/false questions, with response options of true, false, and unsure. Each item was coded dichotomously, with correct responses scored as 1 and incorrect or unsure responses scored as 0. An aggregate objective knowledge score was then calculated for each participant by averaging across all eight items, resulting in a continuous score ranging from 0 to 1.

All six collective action items demonstrated high internal consistency and loaded onto one component (factor loadings ≥ 0.7 ; $\alpha = 0.873$), as did the three empathy items (factor loadings ≥ 0.810 ; $\alpha = 0.860$). Eleven of the 13 subjective knowledge items loaded onto one component (factor loadings ≥ 0.516 ; $\alpha = 0.950$) and we dropped the remaining two items that did not load above 0.50 (*“how the public can share questions and concerns related to wolverine reintroduction into Colorado”* and *“how the public can learn about decisions related to wolverine reintroduction”*). PCA on our 12 affect measures resulted in two components, one for positive emotions (e.g., inspired, excited; factor loadings ≥ 0.663 ; $\alpha = 0.935$) and one for negative emotions (e.g., fearful, nervous; factor loadings ≥ 0.573 ; $\alpha = 0.843$). We found the positive and negative versions of both the affect and belief constructs were strongly inversely correlated

(positive affect $\alpha = 0.935$; negative affect $\alpha = 0.843$; negative beliefs $\alpha = 0.902$; positive beliefs $\alpha = 0.714$) and conceptually redundant; therefore, only the positive constructs of affect and beliefs were retained for analysis.

We retained 11 of the 13 belief items across two components: four items that represented positive beliefs (e.g., *“help people appreciate the importance of nature”*; factor loadings ≥ 0.556 ; $\alpha = 0.714$) and seven items that represented negative beliefs (e.g., *“result in attacks on people or pets”*; factor loadings ≥ 0.562 ; $\alpha = 0.902$). We dropped two items (*“reintroduction will result in the removal of wolverines from the Endangered Species Act”* and *“reintroduction will result in people killing wolverines, either legally or illegally”*) that failed to load onto either component at greater than 0.5 (see Appendix D for full PCA results). The three items measuring support for reintroduction, personal relevance of the wolverine reintroduction, and general attitude toward wolverines loaded onto a single PCA component (factor loadings ≥ 0.795) and showed high reliability ($\alpha = 0.825$); these items we therefore averaged those items into a single attitudinal support scale.

To examine the effect of our interventions on our dependent variables, we conducted one primary linear regression model predicting post-survey collective action in support and two exploratory linear regression models predicting post-survey subjective and objective knowledge. In each model, we controlled for baseline levels of each dependent variable by including the corresponding pre-survey measure for that variable (i.e., the corresponding pre-survey version of each dependent variable). We entered the intervention (control, 0 versus. treatment, 1) as the primary independent variable. Second, we entered delivery mode (virtual, 0 versus. in-person, 1), followed by three additional covariates: empathy, positive beliefs, and attitudinal support.

We identified covariates using correlation matrices (Appendix E), to examine the relationships between post-survey independent and dependent variables. We retained variables that were significantly correlated with our dependent variables and not at risk for multicollinearity (threshold of $r \geq .69$, as $r \geq 0.70$ is high risk). Given the sample size ($n = 99$), we limited each linear regression model to six independent variables to maintain a ratio of at least 15 observations per variable (16.5 observations per

covariate in our linear regression models), consistent with recommendations for reliable linear regression equations (Stevens, 2002; Babyak, 2004). Within the correlation matrices, we found that positive affect was highly correlated with positive beliefs ($r = 0.631, p = 0.01$) and that positive affect and empathy were moderately correlated ($r = 0.350, p < 0.01$). We retained positive beliefs, as the more proximal predictor of collective action (Ajzen, 1991), along with empathy. We excluded positive affect to minimize multicollinearity and maintain model parsimony. Attitudinal support was highly correlated with all three independent variables ($p \leq 0.001$). Each final model therefore included the pre-survey measure of our dependent variables, delivery method, delivery mode, positive beliefs, empathy, and attitudinal support.

Prior to regression analyses, we also examined dependent variable distributions and determined that several deviated from normality; we therefore conducted Mann-Whitney U tests, a nonparametric alternative to independent samples t-tests that does not assume normally distributed data (Babyak, 2004), to examine unadjusted differences between treatment and control groups. These tests provided bivariate comparisons, whereas subsequent linear regression models estimated adjusted effects controlling for baseline measures and additional covariates. We performed all analyses using IBM SPSS statistical software for Windows, Version 31.0 (IBM Corp., 2025).

RESULTS

Of the 135 event attendees, 99 sufficiently completed both the pre and post surveys. Respondents were from 19 Colorado counties with 51.5% in the Front Range and 35.5% in the Western Slope. Though events were marketed towards Coloradans, 9.1% of participants were from a state other than Colorado (North Carolina, New York, & California), and 4% did not specify. Across participants, 67% identified as female and 34% identified as male. In terms of age, 26% were 18 to 34 years old, 29% were 35 to 54, and 46% were 55 or older.

Collective Action

The Mann-Whitney U test for collective action in support (Table 4) indicated no significant difference between the treatment and control groups ($U = 1176.50$, $Z = -0.15$, $p = 0.884$).

In the linear regression predicting post-event collective action in support, pre-event collective action in support emerged as the only significant predictor ($\beta = 0.817$, $p < 0.001$; Table 6). No other variables were significant, indicating that the interventions did not meaningfully influence willingness to engage in collective action. Average intention to engage in collective action behaviors in support of restoration across participants from all event conditions increased from a pre-survey average of 2.84 moderately to extremely likely (on a 5-point scale) to an average of 3.33 moderately to extremely likely on the post-survey, an increase of 0.49 (Table 7).

Table 4. Results from Mann-Whitney U nonparametric tests for each dependent variable

Dependent Variable	U	Z	p
Collective Action	1176.50	-0.15	0.884
Subjective Knowledge	1351.5	1.09	0.27
Objective Knowledge	1403.5	1.449	0.06

Table 6. presents standardized β coefficients, standard errors, and p-values for all independent variables across three models predicting Collective Action, Subjective Knowledge, and Objective Knowledge. Overall model fit was strongest for the Collective Action model (Adjusted $R^2 = .657$), followed by Objective Knowledge (Adjusted $R^2 = .177$) and Subjective Knowledge (Adjusted $R^2 = .158$).

Dependent Variables	Independent Variables	β	SE	p-value
Collective Action				
	Pre-Collective Action	0.817	0.067	< 0.001*
	Method: Treatment or Control	0.006	0.114	0.919
	Mode: In Person or Virtual	-0.077	0.117	0.231
	Pre-Survey Empathy	0.006	0.047	0.921
	Pre-Survey Positive Beliefs	0.065	0.085	0.393
	Pre - Attitudinal support	-0.061	0.072	0.444
Subjective Knowledge				
	Pre-Survey Subjective Knowledge	0.312	0.065	0.012*
	Method: Treatment or Control	0.083	0.102	0.39
	Mode: In Person or Virtual	-0.009	0.105	0.927
	Pre-Survey Empathy	0.066	0.042	0.511
	Pre-Survey Positive Beliefs	0.183	0.076	0.128
	Pre - Attitudinal support	0.028	0.071	0.843
Objective Knowledge				
	Pre-Survey Objective Knowledge	0.474	0.032	< 0.001*
	Method: Treatment "1" or Control "0"	0.203	0.015	0.035*
	Mode: In Person "1" or Virtual "0"	0.17	0.016	0.089
	Pre-Survey Empathy	-0.091	0.006	0.346
	Pre-Survey Positive Beliefs	0.035	0.012	0.764
	Pre - Attitudinal support	-0.263	0.01	0.047*

* Significance based on $\alpha = 0.05$

Table 7. Pre- and post-survey averages for the six collective action items rated on a 5-point likelihood scale, along with the change from pre-to-post. Across all items, participants showed increased likelihood of engaging in collective action following the intervention, with the largest gains in discussing wolverine management with others ($\Delta = 0.68$) and contacting a political or agency representative ($\Delta = 0.58$).

Collective Action Questions	Pre Average	Post Average	Change
Join a local group to influence wolverine management in the state	2.53 [somewhat to moderately likely]	2.96 [somewhat to moderately likely]	0.43
Call or send a letter or email to my political or agency representative about wolverine management	2.81 [somewhat to moderately likely]	3.38 [moderately to very likely]	0.58

Discuss wolverine management with others	3.38 [moderately to very likely]	4.06 [very likely]	0.68
Attend a meeting about wolverine management hosted by the agency tasked with restoring wolverines	3.67 [moderately to very likely]	4.17 [very to extremely likely]	0.51
Share a social media post about wolverines	2.63 [somewhat to moderately likely]	3.05 [moderately likely]	0.42
Write an editorial or other material for media outlets about wolverines	2.05 [somewhat likely]	2.36 [somewhat to moderately likely]	0.31
AVERAGE	2.84	3.33	0.49

Subjective Knowledge

For our subjective knowledge outcome, we observed a small, but not significant, positive difference between treatment and control groups in the Mann-Whitney U test ($U = 1351.5$, $Z = 1.09$, $p = 0.27$; Table 4). In the exploratory regression predicting post-event subjective knowledge, only pre-event subjective knowledge significantly predicted post-subjective knowledge ($\beta = 0.166$, $p < 0.012$; Table 6), with no evidence of intervention effects. On average, participants across all conditions joined events reporting feeling slightly to moderately knowledgeable (score of 2.20 on 5-point scale; Table 8) and left events feeling very to extremely knowledgeable across all survey items (score of 4.22; increase of 2.02 points).

Table 8. Pre- and post-survey averages for eleven subjective knowledge items rated on a 5-point scale. Participants reported substantial gains in perceived knowledge across all items following the intervention, with an overall average increase of 2.02 points.

Subjective Knowledge Questions	Pre Average	Post Average	Change
Generally, about wolverines?	2.34 [slightly to moderately]	3.63 [moderately to very]	1.29
Whether wolverines are currently present in Colorado?	2.32 [slightly to moderately]	4.43 [very to extremely]	2.11
Whether wolverines may come into conflict with livestock?	2.29 [slightly to moderately]	4.34 [very to extremely]	2.05
The type of habitat wolverines live in?	2.49 [slightly to moderately]	4.40 [very to extremely]	1.91
What wolverines eat?	2.27 [slightly to moderately]	4.30 [very to extremely]	2.03
Why wolverines are going to be reintroduced to Colorado?	2.13 [slightly to moderately]	4.24 [very to extremely]	2.11
How the decision to reintroduce wolverines into Colorado was made?	1.82 [not at all to moderately]	4.22 [very to extremely]	2.4
Whether wolverines are a threat to pets?	2.21 [slightly to moderately]	4.34 [very to extremely]	2.13
How the public can share questions and concerns related to wolverine reintroduction into Colorado?	1.72 [not at all to moderately]	4.02 [very]	2.3
How the public can learn about decisions related to wolverine reintroduction?	1.84 [not at all to moderately]	4.01 [very]	2.17
Whether wolverines typically pose a threat to people?	2.79 [slightly to moderately]	4.49 [very]	1.7
AVERAGE	2.20 [slightly to moderately]	4.22 [very to extremely]	2.02

Objective Knowledge

For objective knowledge, the Mann-Whitney U test there was a moderate but not significant difference between treatment and control groups ($U = 1403.5$, $z = 1.449$, $p = 0.06$), indicating a trend toward increased objective knowledge among participants who received the treatment presentation. The exploratory regression predicting post-event objective knowledge identified two significant independent variables. While pre-event baseline objective knowledge was the strongest predictor of post-event objective knowledge ($\beta = 0.141$, $p < 0.001$), both delivery method (Virtual, 0 vs. In-person, 1; $\beta = 0.033$, $p = 0.035$) and pre-event attitudes ($\beta = -0.021$, $p = 0.047$) also emerged as significant. Participants in the treatment condition scored slightly higher on objective knowledge than those in the control group, (Control, 0 vs. Treatment, 1; $\beta = 0.203$, $p = 0.035$) whereas higher baseline attitudinal support was associated with marginally lower post-event knowledge ($\beta = -0.263$, $p = 0.047$). In-person delivery mode showed a positive but non-significant association with objective knowledge ($\beta = 0.170$, $p < 0.089$). Pre-event true/false accuracy (i.e., objective knowledge) averaged 0.58 correct responses across all items and conditions (Table 9). After the event, accuracy increased to an average of 0.96 across all items and conditions.

Table 9. Pre- and post-survey scores for eight objective knowledge items, where a score of 1 indicates a correct response. Participants demonstrated improvement on all items with the largest improvements for no established wolverine population in Colorado ($\Delta = 0.57$) and that CPW biologists do not need legislative approval to reintroduce a federally protected species ($\Delta = 0.53$).

Question	Pre	Post	Change
There is currently an established population of wolverines in Colorado.	0.4	0.97	0.57
Wolverines are related to wolves.	0.82	0.99	0.17
Wolverines mainly hunt deer and elk.	0.6	0.97	0.37
Colorado Parks and Wildlife (CPW) will be reintroducing wolverines.	0.61	0.99	0.38
The public voted on wolverine reintroduction.	0.37	0.79	0.42
CPW biologists must get legislative approval to reintroduce a federally protected species.	0.44	0.97	0.53
Wolverines prefer to live in remote, high-elevation habitats.	0.71	1	0.29
Wolverines rarely come into contact or conflict with people and domestic animals.	0.72	0.97	0.25
AVERAGE	0.58	0.96	0.37

DISCUSSION

As wildlife restoration efforts expand in response to biodiversity loss, the ability to cultivate genuine public support and collective action is crucial for their success (Ditmer et al., 2022; Gonzalez et al., 2024). The dominant approach for addressing public support is still through the information deficit approach even though evidence continues to suggest that the model rarely produces durable change in public knowledge, beliefs, or behavior (Gould et al., 2023; Canfield et al., 2020). Researchers and practitioners are calling for more strategic, theory driven outreach approaches that remain underutilized. CLM and Anthropomorphism represent two theoretically promising interventions for deepening engagement with wildlife conservation issues. In this study, we implemented a statewide public education campaign about wolverine restoration in Colorado and experimentally tested educational interventions designed to enhance public support and knowledge about reintroduction. By integrating an experimental design within a real-world outreach effort, we aimed to provide insight into how specific educational strategies influenced learning and behavioral intentions in a conservation context.

Across outcomes, baseline perceptions and perceived understanding strongly predicted post-event responses, indicating that participants entered the events with relatively stable orientations toward wolverine restoration. While the interventions did not significantly shift collective action intentions or perceived (subjective) knowledge, participants who received the treatment demonstrated modestly higher objective knowledge than those in the control condition. Notably, attendees entered the events already highly supportive of restoration, reported feeling knowledgeable about the topic, and expressed relatively strong intentions to engage in supportive behaviors, which likely created a ceiling effect and constrained the observable impact of the interventions.

We incorporated anthropomorphism as an emotional appeal expected to increase support by fostering relational connection with wolverines and boost collective action (Urquiza-Haas & Kotrschal,

2015). However, empathy, our mechanism for measuring anthropomorphism (Williams et al., 2021; Manfredo et al., 2020), did not predict collective action in our models. Prior studies have shown that anthropomorphic framing can increase prosocial responses toward wildlife and animals in certain contexts (Whitley et al., 2020; Butterfield, Hill, & Lord, 2012). In our intervention, anthropomorphic elements (e.g., likening food caches to “mini-fridges”) may have functioned more as cognitive scaffolds that linked new information to familiar human schemas rather than as the intended emotional triggers designed to shift behavioral intention (Urquiza-Haas & Kotrschal, 2015; van Nooijen, 2024). The absence of an effect is consistent with prior work suggesting that emotional appeals through anthropomorphic framing do not always translate into measurable actions. For instance, while participants who received anthropomorphic messaging reported stronger emotional responses, it did not significantly influence their support for the wolf reintroduction via vote (Niemic et al., 2020c) These findings suggest that anthropomorphic framing may successfully engage emotional processing without translating that affect into behavioral intentions, particularly among already motivated audiences.

More broadly, educational interventions that rely primarily on information distribution are unlikely to shift behavioral intentions when engagement with social norms, perceived behavioral control, or opportunities for behavioral rehearsal are absent (Ajzen, 1991; Webb & Sheeran, 2006; Cinner, 2018). Future conservation outreach efforts aiming to increase collective action may benefit from incorporating normative cues, peer-to-peer engagement, or small, immediate participatory actions, which prior research has shown to catalyze subsequent pro-environmental behaviors in other domains (Danielsen et al., 2005; Toomey, 2023).

Subjective knowledge increased from pre- to post-event across all conditions, but there were no significant differences between treatment and control groups. In contrast, objective knowledge improved modestly under the constructivist treatment condition, even after accounting for baseline knowledge, which remained a significant predictor of post-event accuracy. This divergence suggests that while perceived understanding rose broadly among participants, factual retention was more sensitive to

instructional design. We suggest that subjective knowledge may function more as a measure of confidence than informational accuracy. Our findings align with prior research that self-reported knowledge often exceeds demonstrable knowledge gains (Liaw et al., 2012; Vicente-Molina et al., 2013). We noted that perceived knowledge can shape decision-making processes because individuals who feel informed are more likely to express certainty, engage in discussion, and rely on those beliefs when forming judgments or intentions (Toomey, 2023; Vicente-Molina et al., 2013), even when factual mastery is limited.

We identify several factors likely contributed to the limited intervention effects observed for collective action and subjective knowledge. First, we delivered the intervention in a single 60-minute session. Although prior research has shown that brief, one-time interventions can shift attitudes and behaviors in some contexts, such as when they leverage social norms or targeted behavioral cues (Stewart et al., 2021; Brent et al., 2015). Researchers and practitioners typically implement CLM over extended instructional periods spanning weeks or months (Arik & Yilmaz, 2020; Mishra, 2023; Kim, Fisher, & Fraser, 1999; Nkire, 2014). To our knowledge, this was the first experimental test of CLM interventions in a one-hour session. While our findings indicate that CLM can modestly enhance factual retention even within a short session, meaningful engagement with CLM's core components (personal relevance, activation of prior knowledge, social interaction, and active meaning-making) may require more time than a single-session outreach format allows.

Second, participants constituted an already motivated and supportive audience. Attendance was voluntary, baseline collective action intentions were high, and participants had already engaged in a support behavior by choosing to attend our public event about wolverine restoration. We suggest that in such contexts, informational interventions may reinforce established dispositions rather than produce detectable shifts in behavioral intention. Finally, although prior research has shown that brief anthropomorphic framings can increase empathy and prosocial responses in controlled settings (Whitley et al., 2020; Butterfield, Hill, & Lord, 2012), the integration of anthropomorphism within an educational

presentation may not generate sufficient emotional activation to alter intentions in an already highly supportive sample. Together, these patterns suggest that while CLM is a promising framework for enhancing learning in short-term conservation outreach, repeated engagement or complementary norm-based strategies may be necessary to influence value-based or behavioral outcomes. This raises the possibility that, for participants who already strongly support wolverine restoration, the primary barrier to collective action may not be attitudinal. Rather, factors such as social stigma or low perceived efficacy may better explain the gap between strong support but limited behavioral engagement (Ajzen, 1991; Amel, 2017).

Most participants in our study were already highly supportive of wolverine reintroduction prior to the intervention, which likely contributed to ceiling effects that constrained our ability to detect intervention impacts. This pattern reflects a common challenge in conservation outreach known as “preaching to the choir,” where educational programs disproportionately attract audiences who are already engaged and supportive (Jones & Niemiec, 2022; Niemiec et al., 2020b). Rather than viewing this as a limitation alone, it presents an opportunity for practitioners to leverage this highly supportive audience to expand wolverine restoration outreach. Rather than focusing future efforts on further increasing knowledge or support among an already engaged audience, practitioners should design outreach programs to motivate these audiences to become active partners in the conservation effort through relational organizing, defined as intentional efforts made by engaged individuals to share information about and encourage others they know to engage in specific behaviors (Jones & Niemiec, 2022). Relational organizing has been successful at disseminating information through peer learning, where in one study with forest landowners, 98% of participants reported they had or planned to share what they learned with others (Ma et al., 2012). Researchers have also seen success with integrating a specific behavior change, for example landowners in New South Wales, Australia used relational organizing to successfully engage new community members to manage invasive species (McKiernan,

2018). The strategy integrated social capital and reinforced social norms which are one of the most useful drivers for changing behavior (Jones & Niemiec, 2022; Kollmuss & Agyeman, 2002).

Future outreach efforts should leverage this already-supportive audience by incorporating interventions that equip participants with tools to discuss wolverine restoration with their peers and community. Researchers should investigate whether and how conservation practitioners can motivate supportive individuals to engage in relational organizing behaviors to extend the reach of conservation efforts. For our primary outcome of interest, collective action in support of wolverine restoration, pre-event intention was the only predictor of post-event intention. No intervention effects emerged, and there were no meaningful differences across treatment conditions or delivery modes. Participants entered the events with relatively high levels of support and reported willingness to engage in supportive behaviors, and these pre-existing intentions remained stable following the intervention. This pattern aligns with established behavioral science research demonstrating that behavioral intentions are often highly stable during short-term interventions and are the strongest predictors of subsequent action (Ajzen, 1991; Webb & Sheeran, 2006). Rather than indicating that the intervention was ineffective, this result suggests that pre-existing motivation dominated informational effects within this already supportive and self-selected audience.

We found that delivery mode was not a statistically significant predictor of post-event objective knowledge in the adjusted analyses; however, in the unadjusted analyses, objective knowledge scores were slightly higher among participants who attended in-person sessions. This directional pattern is consistent with prior research indicating stronger knowledge outcomes in in-person compared to virtual learning environments (Alpert et al., 2016), suggesting that in-person settings may modestly support factual retention. One plausible explanation is that in-person sessions more effectively support discussion, social interaction, and facilitator engagement, central components of constructivist learning. Facilitators observed higher participation and sustained engagement during small-group activities in in-person settings, whereas maintaining involvement during virtual breakout discussions proved more challenging.

At the same time, virtual events broadened geographic participation, enabling attendance from more rural or distant communities and reducing logistical and financial barriers (Baucum, 2022; Odegaard, 2024). For practitioners such as NGOs or state agencies, who often operate with limited time, staffing, and financial resources, statewide outreach efforts require careful balancing of depth and reach. Thus, hybrid outreach models may offer the most balanced and feasible approach for large-scale conservation education initiatives.

Limitations

There are several limitations that should be considered when interpreting these findings. Because participants self-selected into a public event about wolverine restoration, our sample did not represent the broader Colorado public. Participants entered the study with relatively high levels of support, empathy, and positive beliefs, raising the possibility of ceiling effects and limiting generalizability beyond already supportive audiences. Baseline collective action intentions were high, and attendance itself reflected the kind of action our survey measured. The sample size was modest ($n = 99$); although the observation-to-predictor ratio was within recommended guidelines, dividing participants across four conditions in a factorial design likely underpowered the study, reducing our ability to detect statistically significant effects. Including multiple predictors further increased our risk of overfitting the model (Stevens, 2002; Babyak, 2004). We also did not measure key behavioral constructs such as subjective norms or perceived behavioral control, central components of the Theory of Planned Behavior (Ajzen, 1991; Bamberg & Möser, 2007), which may have limited our ability to fully explain collective action intentions. Finally, we assessed objective knowledge using eight true/false items, which constrained the depth of measurement relative to multi-item or repeated assessments commonly used in longer-term constructivist learning research.

Conclusion

We experimentally evaluated CLM and anthropomorphic framing within a real-world public outreach campaign on wolverine restoration. We found baseline behavioral intentions strongly predicted

post-event collective action, underscoring the stability of motivation within an already supportive audience. Second, subjective knowledge increased broadly across all conditions, while objective knowledge improved modestly under the constructivist treatment, suggesting that perceived understanding and factual retention respond differently to educational design.

For practitioners, our results suggest that short-term educational events may be most effective for reinforcing engagement and improving factual understanding among already interested constituencies rather than shifting behavioral intentions in highly motivated audiences. Constructivist elements, such as facilitating discussion, activating prior knowledge, and encouraging personal relevance, can enhance learning even within time-constrained outreach settings. However, practitioners seeking to increase collective action may need to incorporate complementary strategies that include social norms, participatory commitments, or repeated engagement over time. For researchers, future work should examine how CLM operates across varying durations and audience types, particularly among less supportive or more ambivalent publics. Researchers should further explore the conditions under which anthropomorphic framing meaningfully influences support for conservation initiatives. Longitudinal designs and more comprehensive behavioral measures would further clarify how educational interventions translate into sustained engagement. Finally, when outreach efforts reach already-supportive audiences, practitioners should consider how to engage existing motivations beyond further education by harnessing audiences for relational organizing roles that can extend conservation efforts.

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APPENDIX

Appendix A | Full list of organizations contacted and the outcome of the interaction. There was no way to confirm if those who agreed to help advertise did so as mailing lists are private.

Organization	Outcome
Town of Northglenn	Agreed to post
Colorado Association of Conservation Districts	Agreed to post
Rocky Mountain Wild	Agreed to post
The Wildlife Society	Agreed to post
Defenders of Wildlife	Agreed to post
Archuleta Extension	Agreed to post
Broomfield Extension	Agreed to post
Denver Zoo	Agreed to post
Denver Extension	Agreed to post
Eagle Summit Wilderness Alliance	Agreed to post
El Paso Extension	Agreed to post
Garfield Extension	Agreed to post
Gilpin Extension	Agreed to post
Endangered Species Coalition	Agreed to post
Gunnison Fairgrounds/Library	Agreed to post
Gunnison Extension	Agreed to post
Jackson Extension	Agreed to post
La Plata Extension	Agreed to post
CSU Nordic Ski	Agreed to post
CSU Warner Colorado	Agreed to post
Logan Extension	Agreed to post
Colorado Mesa University	Agreed to post

Moffat Extension	Agreed to post
Montezuma Extension	Agreed to post
Pitkin Extension	Agreed to post
Independence Pass Foundation	Agreed to post
Pueblo Extension	Agreed to post
Rio Blanco Extension	Agreed to post
Routt Extension	Agreed to post
Keep Routt Wild	Agreed to post
San Juan Citizen's Alliance	Agreed to post
San Miguel Extension	Agreed to post
Teller Extension	Agreed to post
Protect Our Winters	DNR
Teddy Roosevelt Conservation Partnership	DNR
Extension Office	DNR
Colorado Wildlife Federation	DNR
Baca Extension	DNR
Bent Extension	DNR
Boulder Extension	DNR
Chaffee Extension	DNR
Cheyenne Extension	DNR
Conejos Extension	DNR
Costilla Extension	DNR
Delta Extension	DNR
Colorado Mountain Club	DNR
Conservation Colorado	DNR
Dolores Extension	DNR
Eagle Extension	DNR
Elbert Extension	DNR
Colorado Mountain College	DNR

Grand Extension	DNR
Western Colorado University	DNR
High Country Citizens Alliance	DNR
Kiowa Extension	DNR
Kit Carson Extension	DNR
Las Animas Extension	DNR
Mesa Extension	DNR
Mineral Extension	DNR
Montrose and Ouray Extension	DNR
Morgan Extension	DNR
Park Extension	DNR
Phillips Extension	DNR
Prowers Extension	DNR
Rio Grande-Saguache Extension	DNR
Sedgwick Extension	DNR
Summit Extension	DNR
Washington Extension	DNR
Weld Extension	DNR
Yuma Extension	DNR
Aspen Global Change Institute	DNR
Aspen Valley Land Trust	DNR
Roaring Fork Conservancy	DNR
UNCOVER COLORADO	DNR
Arvada Comms and engagement Department	DNR
Westminster Library	DNR
Adams Extension	DNR
Arapahoe Extension	DNR
Fox31	DNR
Denver Library	DNR

Douglas Extension	DNR
Eagle County Conservation District	DNR
Basalt Chamber of Commerce	DNR
Vail Gov	DNR
Vail Daily Events Calendar	DNR
Aspen Town Calendar	DNR
Jefferson Extension	DNR
City of Sterling	DNR
Sterling Public Library	DNR
Moffat Library	DNR
Pitkin Library (Event hosts)	DNR
Rangely Library	DNR
Meeker Library	DNR
Steam Boat Library	DNR
Hayden Library	DNR
South Routt Public Library	DNR
City Event Calendar	DNR
National Wildlife Federation	Maybe
Larimer Extension	Maybe
Aspen Center for Environmental Studies	DNR
Mount Sopris Conservation District	Will not post

Appendix B | Example of promotional materials sent to organizations who agreed to assist in advertising events.

Wolverine Event Communications Kit

Sample Newsletter Promotion

Join Us for an Informational Event about Restoring Wolverines in Colorado!

Wolverines are making a comeback to Colorado, and we want you to be part of the conversation! Colorado State University Extension, the Center for Human Carnivore Coexistence, and Defenders of Wildlife are hosting a series of events to explore wolverine ecology, how and why they're being restored to Colorado, and what it means for our state.


Click here to RSVP

Sample Social Media Caption

Did you know wolverines are coming back to Colorado? 🐾
Attend our free community events on [date] and [date] to learn why, how, and what it means for you.

- ✔ Free to attend
- 🎁 20 chances to win a prize
- 💬 Community Q&A
- 📅 RSVP today at [link]

[Event location and time]




JOIN US TO LEARN ABOUT
Restoring Wolverines to Colorado




Join Colorado State University Extension and partners for a free community event to explore wolverine ecology, how and why they're being restored to Colorado, and what it means for our state.

free event | snacks and drinks provided | 20 chances to win a prize!

Thursday, July 17, 2025 | 6:00 PM - 7:30 PM
Saturday, July 19, 2025 | 10:30 AM - 12:00 PM
 at the Denver Zoo
 2300 Steele St, Denver, CO 80205

Scan to RSVP



Supported by:  **COLORADO STATE UNIVERSITY EXTENSION**  




JOIN US TO LEARN ABOUT
Restoring Wolverines to Colorado

July 17, 2025 | 6:00 PM - 7:30 PM
at the Denver Zoo in Denver

July 19, 2025 | 10:30 AM - 12:00 PM
at the Denver Zoo in Denver

Free community event | Snacks and drinks provided
+ 20 chances to win a prize!

RSVP Today



Restoring Wolverines to Colorado

RSVP for this **free** community event to explore wolverine biology, why they are being restored to our state and what this means for Coloradans.

Thursday, July 17, 2025
6:00 PM - 7:30 PM at the Denver Zoo in Denver

Saturday, July 19, 2025
10:30 AM - 12:00 PM at the Denver Zoo in Denver

Wolverine Event Pre-Survey

You are invited to take part in a research study about wolverine education. The goal of this study is to learn how different ways of sharing information affect what people know and think about wolverine reintroduction in Colorado.

If you agree to take part, you will be asked to complete a short survey before and after the education event. Each survey should take around 10 minutes to complete and they will ask about your knowledge and opinions related to wolverine reintroduction in Colorado. If you complete both surveys, you will be entered into a chance to win one of 20 prizes!

Taking part is completely voluntary and you can choose to stop at any time. Your answers will be kept private and only used for research purposes. There are no known risks to participating and we have taken every reasonable precaution to minimize known and potential (but unknown) risks. Some questions may ask about your opinions, but you can always skip any question you don't want to answer. We will report results of the study via scientific publications, reports, and public talks. When we report and share the results of the surveys with others outside the research team, we will combine the data from all participants so that your individual responses will not be identifiable. If you provide your name and address to be entered into the raffle, we will keep your contact information confidential; your data will be kept in a password-protected folder accessible only to the research team.

If you have any questions about the research, please contact Dr. Mireille Gonzalez; Co-Director, The Center for Human-Carnivore Coexistence at mireille@colostate.edu. If you have any questions about your rights as a volunteer in this research, contact the CSU IRB at: RICRO_IRB@mail.colostate.edu; 970-491-1553. The protocol number is #6751 and the name is "Testing Environmental Education Approaches: The Case of Wolverine Reintroduction in Colorado."

1. By continuing, you are saying you understand this information and agree to take part in the study.

- Yes, I consent
- No, I do not consent

2. Would you say your general attitude toward wolverines is positive, negative, or neutral?

Extremely negative	Moderately negative	Slightly negative	Neutral	Slightly positive	Moderately positive	Extremely positive
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

3. To what extent do you approve or disapprove of reintroducing wolverines to Colorado?

Strongly disapprove	Moderately disapprove	Slightly disapprove	Neutral	Slightly approve	Moderately approve	Extremely approve
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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4. How knowledgeable do you feel about the following:

	Not at all knowledgeable	Slightly knowledgeable	Moderately knowledgeable	Very knowledgeable	Extremely knowledgeable
Generally, about wolverines?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Whether wolverines are currently in Colorado ?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Whether wolverines may come into conflict with livestock?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The type of habitat wolverines live in?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
What wolverines eat?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Why wolverines are going to be reintroduced to Colorado?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
How the decision to reintroduce wolverines into Colorado was made?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Whether wolverines are a threat to pets?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
How the public can share questions and concerns related to wolverine reintroduction in Colorado?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
How the public can learn about decisions related to	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

wolverine reintroduction?					
Whether wolverines typically pose a threat to people?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

5. Please answer the following questions about wolverines:

	True	False	Unsure
There is currently an established population of wolverines in Colorado	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Wolverines are related to wolves	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Wolverines mainly hunt deer and elk	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Colorado Parks and Wildlife (CPW) will be reintroducing wolverines	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The public voted on wolverine reintroduction	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
CPW biologists must obtain legislative approval to reintroduce a federally protected species	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Wolverines prefer to live in remote, high-elevation habitats	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Wolverines rarely come into contact or conflict with people and domestic animals	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

6. How often do you recreate in backcountry areas?

Never	Rarely	Occasionally	Frequently	Very Frequently
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

7. In the last year, have you participated in any of the following activities:

	Yes	No
Downhill Skiing	<input type="checkbox"/>	<input type="checkbox"/>
Cross country skiing	<input type="checkbox"/>	<input type="checkbox"/>

Hiking	<input type="checkbox"/>	<input type="checkbox"/>
Camping	<input type="checkbox"/>	<input type="checkbox"/>
Recreational (non-commercial) hunting	<input type="checkbox"/>	<input type="checkbox"/>
Recreational (non-commercial) fishing	<input type="checkbox"/>	<input type="checkbox"/>
Trail running	<input type="checkbox"/>	<input type="checkbox"/>
Wildlife watching and photography	<input type="checkbox"/>	<input type="checkbox"/>
Snowmobiling	<input type="checkbox"/>	<input type="checkbox"/>
Snowshoeing	<input type="checkbox"/>	<input type="checkbox"/>
Outdoor Rock Climbing	<input type="checkbox"/>	<input type="checkbox"/>

8. Would the presence of wolverines in Colorado increase, decrease, or not change your participation in outdoor recreation activities?

- Increase participation No change Decrease participation

9. How likely are you to engage in any of the following actions **in support of** wolverine restoration in Colorado?

	Not at all likely	Somewhat likely	Moderately likely	Very likely	Extremely likely
Join a local group to influence wolverine management in the state	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Call or send a letter or email to my political or agency representative about wolverine management	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Discuss wolverine management with others	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Attend a meeting about wolverine management hosted by the agency tasked with restoring wolverines	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Share a social media post about wolverines	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Write an editorial or other material for media outlets about wolverines	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

10. Below, please indicate the extent that you agree, disagree, or neither with the following statements:

	Strongly disagree	Moderately disagree	Slightly disagree	Neither	Slightly agree	Moderately agree	Strongly agree
Wild animals experience emotions similar to humans.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Wild animals have a mind of their own.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Wild animals have their own personalities.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

11. Please indicate the extent that you feel the following emotions when thinking about wolverines being reintroduced into Colorado.

	Not at all	Somewhat	A moderate amount	A lot	A great deal
Curious	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Nervous	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Excited	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Angry	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Happy	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Confused	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Hopeful	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Fearful	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Anxious	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Frustrated	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Proud	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Inspired	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

12. How often have you attended education events about wildlife or the environment?

Very frequently	Frequently	Occasionally	Rarely	Very rarely	Never
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

13. How important is the issue of wolverine restoration and management in Colorado to you personally?

Not at all important	Slightly important	Moderately important	Very important	Extremely important
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

14. How important is the conservation of threatened and endangered wildlife to you personally?

Not at all important	Slightly important	Moderately important	Very important	Extremely important
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

15. Overall, how positive or negative of an impact do you think reintroducing wolverines will have on Colorado?

A strong negative impact	A moderate negative impact	A slight negative impact	No impact	A slight positive impact	A moderate positive impact	A strong positive impact
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

16. To what extent do you feel that wolverines will have a direct impact on your livelihood or quality of life?

A strong negative impact	A moderate negative impact	A slight negative impact	No impact	A slight positive impact	A moderate positive impact	A strong positive impact
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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17. Below, rate the extent to which you agree or disagree with the following potential outcomes of wolverine restoration in Colorado.

Reintroducing wolverines into Colorado will...

	Strongly disagree	Moderately disagree	Slightly disagree	Neither	Slightly agree	Moderately agree	Strongly agree
result in large numbers of attacks on livestock.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
result in ranchers losing money.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
increase tourism in Colorado.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
help people appreciate the importance of nature.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
lead to negative consequences for the ski industry.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
result in the removal of wolverines from the Endangered Species Act.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
lead to a recovered, self-sustaining population of wolverines in Colorado.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
negatively impact recreation opportunities (camping, skiing, backcountry hiking).	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
result in attacks on people or pets.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
benefit Colorado's ecosystem.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
result in people killing wolverines, either legally or illegally.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
result in wolverines wandering into residential/urban areas.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

lead to large losses in deer and elk populations.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
---	--------------------------	--------------------------	--------------------------	--------------------------	--------------------------	--------------------------	--------------------------

18. Below, please enter your first and last name. We will use your name to match your pre- and post-surveys and will not share your identifiable information with anyone outside of the research team.

First name: _____ Last name: _____

19. What county in Colorado do you live in (if you are from a different state, enter your state).

20. Age (choose one) - What age group are you in?

- 18-34
- 35-54
- 55+

21. Gender (choose one) - which of the following best describes you:

- Male
- Female
- Non-binary/third gender
- Prefer not to say
- Prefer to self describe

Survey is complete. Thank you for your participation!

Wolverine Event Post-Survey

Thank you for joining our education event about wolverine restoration in Colorado! Please only take this post-event survey if you took the pre-event survey. This second survey should take approximately 10 minutes to complete. If you complete both surveys, you will be entered into a chance to win one of 20 prizes!

Taking part is completely voluntary and you can stop at any time. Your answers will be kept private and only used for research purposes. There are no known risks to participating and we have taken every reasonable precaution to minimize known and potential (but unknown) risks. Some questions may ask about your opinions, but you can always skip any question you don't want to answer. We will report results of the study via scientific publications, reports, and public talks. When we report and share the results of the surveys with others outside the research team, we will combine the data from all participants so that your individual responses will not be identifiable. If you provide your name and address to be

entered into the raffle, we will keep your contact information confidential; your data will be kept in a password-protected folder accessible only to the research team.

If you have any questions about the research, please contact Dr. Mireille Gonzalez; Co-Director, The Center for Human-Carnivore Coexistence at mireille@colostate.edu. If you have any questions about your rights as a volunteer in this research, contact the CSU IRB at: RICRO_IRB@mail.colostate.edu; 970-491-1553. The protocol number is #6751 and the name is "Testing Environmental Education Approaches: The Case of Wolverine Reintroduction in Colorado."

1. By continuing, you are saying you understand this information and agree to take part in the study.

- Yes, I consent
- No, I do not consent

2. Below, please add your first and last name. We will only use your name to match your pre- and post-surveys and to enter you in a chance to win one of our prizes!

First name: _____ Last name: _____

3. Would you like your name entered into a chance to win one of our prizes?

- Yes
- No

If you would like to be entered in a chance to win one of the prizes, enter your address below.

Email Address: _____

Street Address: _____

City: _____ State: _____ Zip code: _____

4. Would you say your general attitude toward wolverines is positive, negative, or neutral?

Extremely negative	Moderately negative	Slightly negative	Neutral	Slightly positive	Moderately positive	Extremely positive
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

5. To what extent do you approve or disapprove of reintroducing wolverines to Colorado?

Strongly disapprove	Moderately disapprove	Slightly disapprove	Neutral	Slightly approve	Moderately approve	Extremely approve
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Continued on next page

6. How knowledgeable do you feel about the following:

	Not at all knowledgeable	Slightly knowledgeable	Moderately knowledgeable	Very knowledgeable	Extremely knowledgeable
Generally, about wolverines?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Whether wolverines are currently in Colorado ?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Whether wolverines may come into conflict with livestock?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The type of habitat wolverines live in?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
What wolverines eat?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Why wolverines are going to be reintroduced to Colorado?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
How the decision to reintroduce wolverines into Colorado was made?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Whether wolverines are a threat to pets?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
How the public can share questions and concerns related to wolverine	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

reintroduction in Colorado?					
How the public can learn about decisions related to wolverine reintroduction?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Whether wolverines typically pose a threat to people?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Continued on next page

7. Please answer the following questions about wolverines:

	True	False	Unsure
There is currently an established population of wolverines in Colorado	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Wolverines are related to wolves	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Wolverines mainly hunt deer and elk	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Colorado Parks and Wildlife (CPW) will be reintroducing wolverines	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The public voted on wolverine reintroduction	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
CPW biologists must obtain legislative approval to reintroduce a federally protected species	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Wolverines prefer to live in remote, high-elevation habitats	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Wolverines rarely come into contact or conflict with people and domestic animals	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

8. Would the presence of wolverines in Colorado increase, decrease, or not change your participation in outdoor recreation activities?

- Increase participation No change Decrease participation

9. If the presence of wolverines would either increase or decrease your participation in outdoor recreation activities, can you please describe why below.

10. How likely are you to engage in any of the following actions *in support* of wolverine restoration in Colorado?

	Not at all likely	Somewhat likely	Moderately likely	Very likely	Extremely likely
Join a local group to influence wolverine management in the state	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Call or send a letter or email to my political or agency representative about wolverine management	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Discuss wolverine management with others	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Attend a meeting about wolverine management hosted by the agency tasked with restoring wolverines	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Share a social media post about wolverines	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Write an editorial or other material for media outlets about wolverines	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

11. Below, please indicate the extent that you agree, disagree, or neither with the following statements:

	Strongly disagree	Moderately disagree	Slightly disagree	Neither	Slightly agree	Moderately agree	Strongly agree

Wild animals experience emotions similar to humans.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Wild animals have a mind of their own.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Wild animals have their own personalities.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

12. Please indicate the extent that you feel the following emotions when thinking about wolverines being reintroduced into Colorado.

	Not at all	Somewhat	A moderate amount	A lot	A great deal
Curious	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Nervous	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Excited	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Angry	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Happy	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Confused	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Hopeful	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Fearful	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Anxious	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Frustrated	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Proud	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Inspired	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

13. How important is the issue of wolverine restoration and management in Colorado to you personally?

Not at all important	Slightly important	Moderately important	Very important	Extremely important
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

14. How important is the conservation of threatened and endangered wildlife to you personally?

Not at all important	Slightly important	Moderately important	Very important	Extremely important
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

15. Below, we would like to learn about your experience during our education event. Please rate the degree to which you agree, disagree, or neither with the following statements.

	Strongly disagree	Moderately disagree	Slightly disagree	Neither	Slightly agree	Moderately agree	Strongly agree
This presentation made me think differently about something I thought I already understood.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I considered different viewpoints about wolverine reintroduction during this session.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I felt mentally engaged throughout the presentation.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I felt bored during the session today.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I was motivated to engage with the material.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The information I learned today feels relevant to my life or community.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I can see how this topic connects to issues I care about.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I was encouraged to explore and develop my own ideas today.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I was interested in what I learned today.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

I was mentally engaged rather than passive during this session.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I participated actively in today's session.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
This session sparked my curiosity.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

16. Overall, how positive or negative of an impact do you think reintroducing wolverines will have on Colorado?

A strong negative impact	A moderate negative impact	A slight negative impact	No impact	A slight positive impact	A moderate positive impact	A strong positive impact
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

17. To what extent do you feel that wolverines will have a direct impact on your livelihood or quality of life?

A strong negative impact	A moderate negative impact	A slight negative impact	No impact	A slight positive impact	A moderate positive impact	A strong positive impact
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Survey continued on next pager

18. Below, rate the extent to which you agree or disagree with the following potential outcomes of wolverine restoration in Colorado.

Reintroducing wolverines into Colorado will...

	Strongly disagree	Moderately disagree	Slightly disagree	Neither	Slightly agree	Moderately agree	Strongly agree
result in large numbers of attacks on livestock.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
result in ranchers losing money.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
increase tourism in Colorado.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
help people appreciate the importance of nature.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
lead to negative consequences for the ski industry.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
result in the removal of wolverines from the Endangered Species Act.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
lead to a recovered, self-sustaining population of wolverines in Colorado.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
negatively impact recreation opportunities (camping, skiing, backcountry hiking).	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
result in attacks on people or pets.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
benefit Colorado's ecosystem.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
result in people killing wolverines, either legally or illegally.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
result in wolverines wandering into residential/urban areas.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
lead to large losses in deer and elk populations.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

19. How would you like to stay informed about wolverine restoration and management

20. Is there anything else about wolverine restoration and management that you would like to know that we did not cover in this education event?

Survey is complete. Thank you for your participation!

Appendix D | PCA Factor Loading Scores
Empathy

Empathy Questions	Component Matrix Loading Score
Wild animals have their own personalities.	.935
Wild animals have a mind of their own.	.916
Wild animals experience emotions similar to humans	.810

Affect

Affect Questions	Rotated Component Loading Scores	
	1	2
Inspired	.920	
Happy	.919	
Proud	.918	
Hopeful	.892	
Excited	.872	
Curious	.663	
Fearful		.876
Nervous		.863
Angry		.808
Anxious		.758
Confused		.725
Frustrated		.573

*Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.

Attitude, Support, and Personal Relevance

Questions	Component Matrix Loading Score
General attitude toward wolverines is positive, negative, or neutral?	.887
approve or disapprove of reintroducing wolverines to Colorado?	.896
How important is the issue of wolverine restoration and management in Colorado to you personally?	.795

*Extraction Method: Principal Component Analysis.

Collective Action

Collective Action Questions	Component Matrix Loading Scores
Write an editorial or other material for media outlets about wolverines.	0.829
Discuss wolverine management with others	0.824
Call or send a letter or email to my political or agency representative about wolverine management	0.813
Join a local group to influence wolverine management in the state.	0.811
Share a social media post about wolverines.	0.725
Attend a meeting about wolverine management hosted by the agency tasked with restoring wolverines.	0.707

*Extraction Method: Principal Component Analysis.

Subjective Knowledge

Pre Subjective Knowledge Questions*	Components	
	1	2
Generally, about wolverines?	0.884	
The type of habitat wolverines live in?	0.857	
What wolverines eat?	0.848	
Whether wolverines typically pose a threat to people?	0.806	
Whether wolverines are a threat to pets?	0.783	
Whether wolverines are currently in Colorado?	0.758	
Whether wolverines may come into conflict with livestock?	0.745	0.417
**How the public can share questions and concerns related to wolverine reintroduction into Colorado?		.906
**How the public can learn about decisions related to wolverine reintroduction?		.862
Why wolverines are going to be reintroduced to Colorado?	0.624	0.649
How the decision to reintroduce wolverines into Colorado was made?	0.515	0.635

*Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.

**Did not load onto component one and were dropped from the final aggregated variable.

Appendix E | Correlation Matrices

Collective Action

Table E.1. Correlation matrix for Collective Action outcome variable. Uses Pearson correlation and significance for a two-tailed test.

	OUTCOME: Collective Action	Method: Treatment or Control	Mode: In Person or Virtual	Pre-Survey Empathy	Pre-Survey Positive Affect	Pre-Survey Positive Beliefs	Pre-Survey Subjective Knowledge	Pre-Survey Collective Action	Pre-Survey Objective Knowledge	Pre-Survey Support, Attitude, and Personal Relevance
OUTCOME: Collective Action	--									
N	99									
Method: Treatment or Control	-0.009	--								
N	99	99								
Mode: In Person or Virtual	-0.123	-.209*	--							
N	99	99	99							
Pre-Survey Empathy	.290**	0.04	-0.185	--						
N	99	99	99	99						
Pre-Survey Positive Affect	.575***	-0.024	-0.036	.350***	--					
N	99	99	99	99	99					
Pre-Survey Positive Beliefs	.352***	0.023	0.146	0.177	.631***	--				
N	98	98	98	98	98	98				
Pre-Survey Subjective Knowledge	.426***	0.091	-0.151	.303**	.466***	.222*	--			
N	99	99	99	99	99	98	99			
Pre-Survey Collective Action	.819***	-0.03	-0.076	.337***	.697***	.407***	.604***	--		
N	99	99	99	99	99	98	99	99		
Pre-Survey Objective Knowledge	.254*	0.077	-0.138	0.161	.280**	0.166	.647***	.367***	--	
N	99	99	99	99	99	98	99	99	99	
Pre-Survey Support, Attitude, and Personal Relevance	.416***	0.008	-0.04	.211*	.755***	.576***	.573***	.533***	.495***	--
N	99	99	99	99	99	98	99	99	99	99

** Correlation is significant at the 0.01 level (2-tailed).

*** Correlation at 0.001(2-tailed)

* Correlation is significant at the 0.05 level (2-tailed).

Subjective Knowledge

Table E.2. Correlation matrix for Subjective Knowledge outcome variable. Uses Pearson correlation and significance for a two-tailed test.

	Outcome: Subjective Knowledge	Method: Treatmen t or Control	Mode: In Person or Virtual	Pre- Survey Empath y	Pre- Survey Positive Affect	Pre- Survey Positive Beliefs	Pre- Survey Subjective Knowledg e	Pre- Survey Collective Action	Pre- Survey Objective Knowledg e	Pre-Survey Support, Attitude, and Personal Relevance
Outcome: Subjective Knowledge	--									
N	99									
Method: Treatment or Control	0.13	--								
N	99	99								
Mode: In Person or Virtual	-0.068	-.209*	--							
N	99	99	99							
Pre-Survey Empathy	.209*	0.04	-0.185	--						
N	99	99	99	99						
Pre-Survey Positive Affect	.337***	-0.024	-0.036	.350***	--					
N	99	99	99	99	99					
Pre-Survey Positive Beliefs	.280**	0.023	0.146	0.177	.631***	--				
N	98	98	98	98	98	98				
Pre-Survey Subjective Knowledge	.389***	0.091	-0.151	.303**	.466***	.222*	--			
N	99	99	99	99	99	98	99			
Pre-Survey Collective Action	.379***	-0.03	-0.076	.337***	.697***	.407***	.604***	--		
N	99	99	99	99	99	98	99	99		
Pre-Survey Objective Knowledge	.264**	0.077	-0.138	0.161	.280**	0.166	.647***	.367***	--	
N	99	99	99	99	99	98	99	99	99	
Pre-Survey Support, Attitude, and Personal Relevance	.327***	0.008	-0.04	.211*	.755***	.576***	.573***	.533***	.495***	--
N	99	99	99	99	99	98	99	99	99	99

* Correlation is significant at the 0.05 level (2-tailed).

*** Correlation at 0.001(2-tailed)

** Correlation is significant at the 0.01 level (2-tailed).

Objective Knowledge

Table E.3. Correlation matrix for Objective Knowledge outcome variable. Uses Pearson correlation and significance for a two-tailed test.

	Outcome: Objective Knowledge	Method: Treatment or Control	Mode: In Person or Virtual	Pre-Survey Empathy	Pre-Survey Positive Affect	Pre-Survey Positive Beliefs	Pre-Survey Subjective Knowledge	Pre-Survey Collective Action	Pre-Survey Objective Knowledge	Pre-Survey Support, Attitude, and Personal Relevance
Outcome: Objective Knowledge	--									
	N 99									
Method: Treatment or Control	.198*	--								
	N 99	99								
Mode: In Person or Virtual	0.096	-.209*	--							
	N 99	99	99							
Pre-Survey Empathy	-0.088	0.04	-0.185	--						
	N 99	99	99	99						
Pre-Survey Positive Affect	-0.07	-0.024	-0.036	.350***	--					
	N 99	99	99	99	99					
Pre-Survey Positive Beliefs	-0.024	0.023	0.146	0.177	.631***	--				
	N 98	98	98	98	98	98				
Pre-Survey Subjective Knowledge	0.117	0.091	-0.151	.303**	.466***	.222*	--			
	N 99	99	99	99	99	98	99			
Pre-Survey Collective Action	0.038	-0.03	-0.076	.337***	.697***	.407***	.604***	--		
	N 99	99	99	99	99	98	99	99		
Pre-Survey Objective Knowledge	.331***	0.077	-0.138	0.161	.280**	0.166	.647***	.367***	--	
	N 99	99	99	99	99	98	99	99	99	
Pre-Survey Support, Attitude, and Personal Relevance	-0.03	0.008	-0.04	.211*	.755***	.576***	.573***	.533***	.495***	--
	N 99	99	99	99	99	98	99	99	99	99

* Correlation is significant at the 0.05 level (2-tailed).

*** Correlation at 0.001(2-tailed)

** Correlation is significant at the 0.01 level (2-tailed).