**Statistical Analysis**

We grouped repeated survey statements from the pre- and post-training surveys into composite themes: *Spider Interest*, *Spider Phobia*, *Intent to Engage*, *Attainment Value*, *Cost Belief Value*, *Science Communication* *Confidence*, *Communication Confidence*, *Science Identity*, and *Echo Chambers*. We calculated composite scores for each theme by summing the response values per participant, reversing the response option values for statements with opposing tones. We only included participants who responded to all statements within a composite theme.

We first assessed normality using Shapiro-Wilk tests. If the data were normally distributed, we proceeded to use parametric tests. When not normally distributed, we computed parametric and non-parametric tests and reported the parametric results when the conclusions were consistent across approaches.

To identify pre-training perceptions associated with participation in the optional culminating outreach event (*Eight-Legged Encounters*, or ELE), we compared pre-training composite scores for each composite theme between those who did and did not participate in ELE using unpaired t-tests (or Mann-Whitney U-tests). We used Chi-squared tests to additionally assess whether gender or previous science communication experience predicted ELE participation.

To determine whether ELE participation led to different shifts in composite scores (post- minus pre-scores) than participants who only completed the training modules, we used unpaired t-test (or Mann-Whitney U-tests). To assess training impacts on individual statements, we tested pre- and post-training responses using paired t-tests (or Wilcoxon Signed-Rank tests), applying Bonferroni corrections within each theme.

To assess the roles of gender and previous experience (with arachnids or science communication), we tested whether pre-training scores or their pre-to-post changes varied by gender or prior science communication experience (for non-spider-related themes; including informal science learning and after-school STEM education), and repeated analyses of spider-related themes excluding participants with previous arachnid experience (e.g., coursework or research).

All analyses were completed in R [ADD VERSIONS, PACKAGES, CITATIONS].

**RESULTS**

Across three training sessions (Spring 2022, Fall 2022, Spring 2023), 110 participants completed at least one survey – pre-training survey, four post-module surveys, and/or post-training survey (Figure S1). Of these, 93 participants completed at least one of the four post-module surveys (Figure S2A), with most agreeing that the modules effectively met the objectives (Figure S2B).

To evaluate the outcomes of the training, we focused on the 68 participants who submitted both the pre- and post-training surveys (see Figure S3 for demographics). Excluding the 9 participants with previous arachnid experience did not change the model outcomes for spider-related themes, so we included these participants in all analyses. Previous science communication experience (reported by 37 out of 68 participants) did not affect pre-training scores or shifts in scores for any theme (Table 1).

**Pre-Training Perceptions Predict ELE Participation**

Participants were more likely to participate in *Eight-Legged-Encounters* (ELE) if they: had a greater interest in spiders, had a greater intention to engage in science communication, had a higher science identity, and placed greater value and lower costs on science communication (Figure 1; Table 1). Gender (*C12* = 0.000, *P* = 1.000), previous science communication experience (*C12* = 0.747, *P* = 0.387), and the other themes (Table 1) did not predict ELE participation. *Spider Phobia* was the only theme where pre-training composite scores varied by gender – females reported higher baseline phobia scores (+1 composite score difference) than males (Table 1).

**Training Induced Shifts in Spider and Science Communication Perceptions**

When asked directly, 70% of participants reported improved attitudes toward spiders, and 89% reported increased interest in science communication after the training (Figure 2A, C). ELE participation was associated with significantly improved attitudes toward spiders (Figure 2B; *t* = 3.103, *df* = 42.353, *P* = 0.003), but not with changes in science communication interest (Figure 2D, *t* = 0.647, *df* = 35.837, *P* = 0.522) than those who only participated in the modules. These outcomes did not differ by gender (spider attitude: *t* = -1.647, *df* = 31.593, *P* = 0.109; sci-comm interest: *t* = -1.264, *df* = 33.428, *P* = 0.215) or previous science communication (sci-comm interest: *t* = -0.047, *df* = 57.923, *P* = 0.962).

Hands-on experience with public outreach (ELE participation) was associated with improved confidence in science communication abilities (Figure 3, Table 1). Participants responded more positively post-training to three of the four statements within this theme (Figure 3):

* “How good are you at science communication?” (*t67* = -5.929, *P* < 0.001)
* “How well does the public understand your science when you communicate it to them?” (*t67* = -7.818, *P* < 0.001)
* “Think about the classes and professional development training you have had in the past. How good of a job did they prepare you to engage in science communication?” (*t67* = 3.027, *P* = 0.014)
* “If you were to list all the students/staff in your department from the worst to the best in science communication, where would you place yourself?” (*t67* = 1.807, *P* = 0.301)

Only shifts in *Intent to Engage* were significantly affected by gender, with males exhibiting decreased intention to engage in science communication (Table 1; males: -1.000 ± 0.511, females: 0.196 ± 0.225). This decline in male intent was not explained by ELE participation (*t* = 0.549, *df* = 4.934, *P* = 0.607) or previous science communication experience (*t* = -0.863, *df* = 14.107, *P* = 0.403).

No other individual statement across themes showed significant shifts from pre- to post-training (Figures S4-6). However, in open-response descriptions of science communication, participants shifted from using terms like ‘science’, ‘public’, ‘research’, and ‘outreach’ to words like ‘audience’, ‘fun’, ‘engagement’, and ‘social media’, but consistently used words like ‘education’ and ‘science’ (Figure S7).