The Online Educational Program 'Perspectives' Improves Affective Polarization, Intellectual Humility, and Conflict Management

Solving the most pressing problems of our time requires broad collaboration across political party lines. Yet, the United States is experiencing record levels of affective polarization (distrust of the opposing political party). In response to these trends, we developed and tested an asynchronous online educational program rooted in psychological principles called Perspectives. In Study 1, using a large longitudinal dataset (total *N* = 35,393), we examined Perspectives users' scores on affective polarization and intellectual humility at pre- and post-intervention. Studies 2 and 3 were longitudinal randomized controlled trials with government finance officers (*N* = 341) and college students (*N* = 775), respectively, and examined the effects of Perspectives on affective polarization, intellectual humility, and conflict resolution skills. Across these studies, we found that Perspectives users experienced small to medium-sized decreases in affective polarization and small to medium-sized increases in intellectual humility. In Study 3, we found that Perspectives led to small yet significant improvements in conflict resolution skills. These findings suggest promise for a brief and scalable intervention to improve affective polarization, intellectual humility, and conflict management.

Intellectual humility, political psychology, affective polarization, digital interventions, conflict resolution

Solving the most pressing problems of our time, including climate change, health disparities, and COVID-19, requires broad collaboration across political party lines. At the same time, historical trends indicate that, in the United States (US) and other countries, people increasingly dislike, distrust, and avoid those who hold different political views – a phenomenon labeled "affective polarization" (Iyengar et al., 2012). A significant portion of both Democrats and Republicans (20% and 15%, respectively) go so far as to agree that the US would be better off if large numbers of the opposing party "just died" (Kalmoe & Mason, 2019). This level of affective polarization may have deleterious consequences for the functioning of a democratic society. Out-party animus, for example, has been linked to a tendency to share fake news stories that denigrate the other side (Osmundsen et al., 2021). Additionally, Druckman et al. (2021) showed that affective polarization, measured prior to the onset of the COVID-19 pandemic, was correlated with individuals' appraisals of the seriousness of the pandemic, their willingness to change their behavior to curb the spread of COVID-19, and their support for COVID-19 policies (e.g., stay-at-home orders). To address this growing threat to our democracy, the [organization name withheld for blind review] has created a research-based online educational program to improve mindsets and skill sets associated with better dialogue across differences. The purpose of the present studies is to examine the efficacy of this intervention on affective polarization, intellectual humility, and conflict resolution skills.

Reducing Affective Polarization

Researchers have identified several large-scale societal trends that may contribute to rising affective polarization (see Iyengar et al., 2019 for a review). Over the last 50 years, the two major political parties in the US have become increasingly dissimilar and more internally homogenous, with liberals increasingly identifying as Democrats and conservatives as Republicans (Levendusky, 2009). The media environment has also become more and more partisan and unbalanced (e.g., Lelkes et al., 2017; Rogowski & Sutherland, 2016). These societal trends have led people to interact exclusively with people who have the same political ideology, making it easy to stereotype and demonize those who belong to the opposing party. Confirmation biases appear to be magnified with political issues, whereby individuals are more receptive to information they agree with, yet dismissive of evidence that conflicts with their beliefs (e.g., Taber & Lodge, 2006).

Fortunately, there is a burgeoning literature suggesting that it may be possible to mitigate partisan animosity with psychological intervention. For instance, partisan animosity decreases when participants are exposed to models of respectful political disagreement (e.g., Huddy & Yair, 2021; Levendusky & Malhotra, 2016). Further, Ahler and Sood (2018) observed that people tend to hold stereotypical views of Democrats and Republicans. For instance, people estimate that 32% of Democrats are LGBT (6% in reality). Correcting such misperceptions reduced affective polarization. In another study, Levendusky (2018) primed a shared US identity among partisans and showed a significant reduction in affective polarization.

Increasing Intellectual Humility

In recent years, a body of science has emerged focusing on intellectual humility as a way to promote better dialogue across differences. Intellectual humility is defined as an awareness of one's own intellectual limitations and a recognition of the value of others' intellect (Porter et al., 2021). Intellectual humility is positively associated with openness to new ideas, empathy, prosocial values, tolerance for diverse people and perspectives, and scrutiny of misinformation (Koetke et al., 2021; Krumrei-Mancuso, 2017; Krumrei-Mancuso & Rouse, 2016; McElroy et al., 2014). Importantly, higher intellectual humility is also linked to greater openness to learning about different political views, lower affective polarization, and higher religious tolerance (Hook et al., 2017; Krumrei-Mancuso & Newman, 2020; Porter & Schumann, 2018). Although intellectual humility has been suggested as an antidote for political polarization (Sgambati & Ayduk, 2022), it remains to be seen whether experimentally manipulating intellectual humility can lead to changes in affective polarization or vice versa.

Most intellectual humility intervention work has focused on brief, one-time manipulations to "prime" state (versus trait) intellectual humility and has not examined the consequences of these interventions on affective polarization. One of the most well-studied of these primes uses the "illusion of explanatory depth" (Rozenblit & Keil, 2002). Three separate studies showed that people were less likely to overestimate their own knowledge of a topic after being prompted to write a detailed explanation of how that topic works (Fernbach et al., 2013; Johnson et al., 2016; Meyers et al., 2020). Another effective manipulation prompts participants to step back from their interpersonal conflicts and take a "fly on the wall" (self-distanced) perspective (Kross & Grossman,

2012; Grossman et al., 2019; Grossman & Kross, 2014). Only a few studies have sought to foster intellectual humility using longer interventions over a period of a few weeks or months. For example, Grossman and colleagues (2021) asked participants to journal daily about significant events from a distanced, third-person perspective. Those randomized to this intervention showed higher intellectual humility at the end of the month.

Improving Conflict Resolution Skills

Training in conflict resolution skills may be another viable approach to promoting constructive dialogue across differences. Conflict is inevitable and political conflicts are becoming more prevalent as political party differences are exacerbated and affective polarization increases (Esteban & Ray, 1999; Lee, 2015). When conflict is poorly managed, it can severely undermine group cohesion and productivity (Amason, 1996; Jehn & Mannix, 2001) and make conflicting parties even more steadfast in their positions (Nyhan & Reifler, 2010). Many scholars posit that democracies rely on citizens to have the skills to express their views, listen to others, adjust their opinions based on new information, reach compromise, generate creative solutions, and tolerate differences (Diamond & Morlino, 2004; Schmitter & Karl, 1991).

Meta-analyses suggest that conflict resolution interventions are effective at improving a variety of outcomes, such as reducing violence (Matjasko et al., 2012), improving interactions (Tucker & Finkelhor, 2017), and enhancing teamwork and cooperation (McEwan et al., 2017). Although the majority of conflict resolution training occurs in-person, some recent work has tested such interventions in asynchronous

online settings. For example, Martínez-Moreno and colleagues (2015) had work teams engage in a joint problem-solving task. Teams in the treatment condition were then provided with a guide to debrief their decision-making processes and the quality of the decisions made during the problem-solving task. Compared to the control condition, teams that underwent the 60-minute debrief displayed more functional conflict management strategies (e.g., open communication) and fewer dysfunctional strategies (e.g., avoidance) at post-test. Notably, no research to our knowledge has examined the impact of conflict resolution skills training on outcomes such as affective polarization and intellectual humility.

A Scalable Intervention to Improve Constructive Dialogue

While the interventions reviewed above demonstrate promise, the research on ways to reduce affective polarization, foster intellectual humility, and improve conflict resolution skills have not been well-integrated. That is, existing interventions have focused on shifting one of these outcomes, but none have tried to improve them simultaneously. In addition, the majority of affective polarization and conflict resolution interventions cannot be readily implemented at scale. To address these limitations, we designed an interactive online educational program rooted in psychological research, called Perspectives (see Supplemental Materials for details). Perspectives is intended to equip people with the mindsets and skill sets to engage constructively across differences. Perspectives is a digital program consisting of five to eight 30-minute learning modules that aim to enhance individual readiness to engage across differences and provide concrete behavioral strategies (e.g., active listening) to manage conflict.

Broadly, the Perspectives modules teach learners techniques based on established psychological research, including Moral Foundations Theory (Graham et al., 2013), dual process models of cognition (e.g., Kahneman, 2011), and moral outrage (e.g., Crockett, 2017). The modules are interactive, weaving scientific findings with thought experiments and opportunities for practice, and are designed to apply to learners within and outside of the US. The content incorporates a number of short research-based interventions, such as the illusion of explanatory depth (Rozenblit & Keil, 2002) and correcting misperceptions about out-partisans (Ahler & Sood, 2018). As an optional element, learners can pair up with another Perspectives user for four "peer-to-peer" discussions where they can put into practice the skills covered in the online modules.

Overview of the Current Research

We investigated the effectiveness of the Perspectives online program on key outcomes of affective polarization, intellectual humility, and conflict resolution skills. We also explored whether Perspectives was equally effective across the political spectrum. Study 1 utilized a pre-post quasi-experimental design with a large sample of learners. Studies 2 and 3 used randomized controlled designs with employees of local government and college students, respectively. We hypothesized that individuals who engage in Perspectives would show lower affective polarization, increased intellectual humility, and report better conflict resolution skills.

Study 1

Study 1 used data from the Perspective program's embedded assessment, which learners complete immediately before the first module and immediately after the last module. Two versions of Perspectives were included in this study. Perspectives 1.0, available from August 2017 to August 2020, consisted of five 30-minute learning modules. Perspectives 2.0 was available after August 2020 and consisted of eight 30-minute modules, as well as four optional 45-minute peer-to-peer conversations where participants partnered with another Perspectives learner to practice concepts covered in the modules. A detailed description of the content of Perspectives is available in the Supplemental Materials. In addition to examining changes from pre- to post-intervention, Study 1 also examined whether program efficacy differed across the two versions of Perspectives.

Methods

Participants

Study 1 consisted of 29,706 Perspectives 1.0 users and 5,503 Perspectives 2.0 users (N = 35,209). The sample was 57.65% female, 41.70% male, 0.65% other/non-binary. Mean age was 24.98 years (SD = 10.87). The sample was relatively racially diverse (58.96% White/Caucasian). Most participants were completing Perspectives in the US (86.10%) or Canada (8.19%). The majority of participants were using

Perspectives as a student in a higher education classroom (84.64%); others were completing Perspectives with a community organization (e.g., church, professional association; 10.12%), their workplace (1.83%), a highschool class (2.28%), or a student group or organization (1.13%). Gender was coded using two dummy variables representing men (men vs. otherwise) and women (women vs. otherwise), which allowed us to statistically account for those who identify as non-binary or other.

Procedure and Materials

All participants were enrolled in Perspectives by their class instructors or organizational leaders as part of a course, a workplace training, or an organizational initiative. In classrooms, Perspectives was written into course syllabi, and students received course credit or extra credit for completing the program. In organizations, Perspectives was used as a part of mandatory or optional employee training. Once enrolled, participants were emailed a link to access the Perspectives program.

Participants completed a pre-test assessment before engaging in the Perspectives program and a post-test assessment immediately after completing Perspectives. Most (80.05%, N = 28,186) of the participants provided data that were usable for this study at pretest and 54.13% (N = 19,058) provided usable data at post. Although the statistical power varied by the outcome and model used, these sample sizes provided substantial power (>99.99%) to estimate small effect sizes (d = 0.20) between paired means (e.g., pre vs. post). For analyses involving changes from pre to post, we only included participants in the analyses if they provided data at both time

points. We present the total sample sizes for each longitudinal model in the Results section.

Because participants were completing this as part of a class or employee training, and not a research study, and were not receiving monetary incentives for survey completion, it was important to keep the surveys as short as possible. To this end, we used selected items from validated scales, as opposed to full scales. Over the course of Study 1, we changed the assessment six times, since we had a large sample and were interested in exploring a range of outcomes while keeping the assessment short. All participants completed measures of demographics, political views, and affective polarization. Measures of intellectual humility were also included in all time points, but we experimented with differing items and subscales across assessment versions. Although many of these outcomes were assessed with a single item from their respective scale or not measured as across all assessment versions, they do shed light on what potential constructs Perspectives might shift (See Supplemental Materials for more details about the measures across the six assessment versions).

We measured affective polarization with the temperature rating scale (Lelkes & Westwood, 2017). Participants were asked how they felt about individuals who identify as progressive and individuals who identify as conservative, on a scale of 0 (*cold*) to 100 (*warm*). We scored affective polarization as the difference in ratings for political ingroup vs. outgroup (Druckman & Levendusky, 2019), which resulted in scores for self-identified liberals and conservatives.

Intellectual humility was assessed across two constructs throughout Study 1: General intellectual humility and independence of intellect and ego. There were 1-2

items used for each construct. 30.52% of participants completed two items from the general intellectual humility scale (Leary et al., 2017): “I accept that my beliefs may be wrong” and “I question my own opinions, positions, and viewpoints because they could be wrong” (Cronbach’s α = .60 at pre, .67 at post). Another 43.20% of participants received only the latter item. We also measured intellectual humility with the Independence of Intellect and Ego, a subscale of the Comprehensive Intellectual Humility Scale (Krumrei-Mancuso & Rouse, 2016), using two items: “When someone disagrees with ideas that are important to me, it feels as though I’m being attacked” and “When others disagree with my ideas, I feel like I'm being attacked” (Cronbach’s α = .76 at pre, .83 at post). 30.53% of participants received assessments with these items. Both items were reverse scored and averaged, such that higher scores represented greater intellectual humility.

Analytic Strategy

Data analyses were conducted in R. Mixed models were conducted with the lme4 package to account for longitudinal data (Bates & Sarkar, 2007). The emmeans package was used to compare marginal means and estimate Cohen’s *d* (Lenth & Lenth, 2018), whereas the reghelper package was used to interpret simple slopes with continuous moderators (e.g., political views; Hughes, 2022). Estimates of partial r^2 (r_p^2) were provided by the r2glmm package (Edwards et al., 2008; Jaeger, 2017; Jaeger et al., 2017). Participant age was highly positively skewed (skewness = 2.51, *se* = 0.01, Anderson-Darling A = 4237.50, $p < .001$), so we applied an inverse transformation

(Tabachnick et al., 2007).[1] For analyses involving change over time, participants that did not provide responses at both pre and post were removed using list-wise deletion.

Results and Discussion

Preliminary Analysis

Affective polarization had small negative correlations with general intellectual humility (r = -.09, p < .001) and independence of intellect and ego (r = -.11, p < .001). General intellectual humility and independence of intellect and ego were positively correlated, but the correlation was modest (r = .07, p < .001). Bivariate correlations, descriptive statistics, and attrition analyses are detailed in Tables S2 and S3.[2]

We first examined differences in pre-test scores across political views using a series of ANCOVAs, controlling for age, gender, and race (White vs. non-White). Group differences in affective polarization and intellectual humility are presented in Figure 1. For brevity, we do not include in this main analysis those participants who self-identified as “Other” (1.65%), “Don’t know/Not political” (12.73%), or those that did not provide information about their political views (4.88%).

Participants' political views were associated with their reported affective polarization (F(5, 19687) = 1310.61, p < .001).[3] Consistent with previous findings

[1] This transformation resulted in the interpretation of age being reversed in models since higher ages are assigned lower values.

[2] The magnitude of these correlations were similar across liberals and conservatives. However, general intellectual humility and affective polarization were negatively correlated in conservatives (r = -0.08, p < 0.001), but positively correlated in liberals (r = 0.04, p < 0.001). In addition, independence of intellect and ego and affective polarization were negatively correlated in liberals (r = - 0.13, p < .001), but not correlated among conservatives (r = -0.02, p = 0.492).

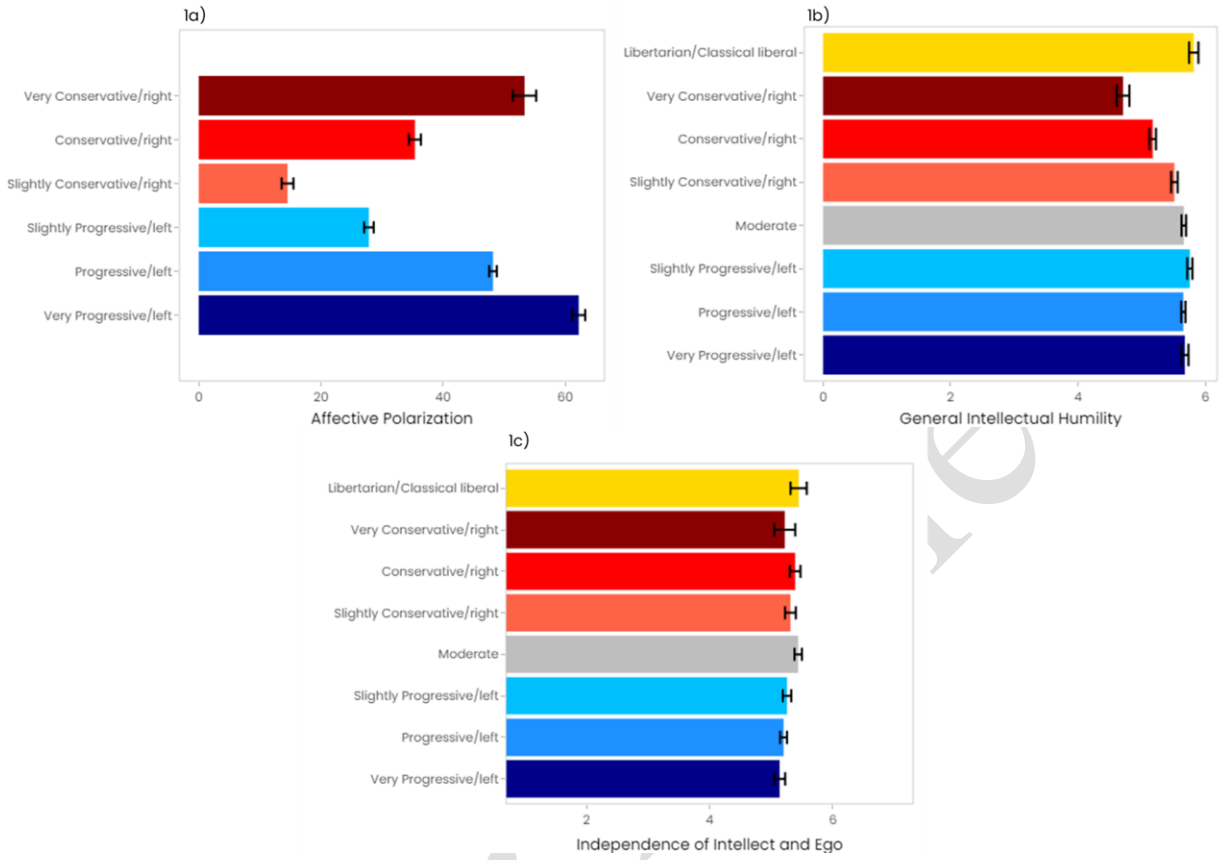
[3] Political views were compared across the following categories: Very progressive/left, Progressive/left, Slightly progressive/left, Moderate, Slightly conservative/right, Conservative/right, Very conservative/right.

(Lelkes, 2021; Rogowski & Sutherland, 2016), as participant views moved further from center, polarization increased. Those who were very conservative and very liberal were considerably more affectively polarized compared to those who identified as “slightly” liberal or conservative (*d*s ≥ 0.99, *p*s < .001). In addition, all liberal categories were more affectively polarized than their respective conservative categories (e.g., very conservative vs. very liberal) (*d*s ≥ 0.34, *p*s < .001).

Intellectual humility also varied across political groups (main effect: $F(7, 20772) = 99.81$, $p < .001$; see Figure 1). All liberal groups had significantly higher general intellectual humility than conservative groups (*d*s = 0.12 to 0.88, *p*s ≤ .001). Those who identified as very conservative reported the lowest general intellectual humility ($M = 4.71$, 95% CI: [4.61, 4.81]), whereas libertarians/classical liberals had the highest scores ($M = 5.82$, 95% CI: [5.74, 5.89]). Independence of intellect and ego also varied across political views ($F(7, 8573) = 13.20$, $p < .001$), although differences were less pronounced (all |*d*|s < 0.24). Libertarians/classical liberals ($M = 5.44$, 95% CI: [5.31, 5.58]) and moderates ($M = 5.44$, 95% CI: [5.38, 5.50]) had the highest levels, whereas the lowest levels were found among those who were very progressive/left ($M = 5.14$, 95% CI: [5.04, 5.23]). See the Supplemental Materials for more details.

Because affective polarization was scored in partisans, moderates and views other than liberal or conservative were not included in analyses involving affective polarization.

Figure 1. Baseline differences by political views in Study 1.



Note: Error bars represent 95% confidence intervals around the means.

Efficacy of Perspectives

We conducted random intercept moderated 2-level models to test whether Perspectives improved affective polarization and intellectual humility, controlling for demographic covariates. Full model statistics are summarized in the Supplemental Materials. As shown in Figure 2, participants demonstrated improvements in both affective polarization and intellectual humility from pre- to post-intervention. Both models control for age, gender, race, and political views on a liberal to conservative spectrum (-3 = *very liberal*, 0 = *moderate*, 3 = *very conservative)*. For models with affective polarization, we also included a quadratic term for political views, since previous

analyses suggested a potential curvilinear relationship between political views and affective polarization.

For affective polarization, learners showed a significant decrease after completing Perspectives (d = -0.47, p < .001), indicated by a significant main effect of time (F(1, 13204) = 1529.87, p < .001). There was also a significant time x version interaction (F(1, 13204) = 23.45, p < .001). Although the participants completing Perspectives 1.0 showed a significant reduction in affective polarization from pre to post (d = -0.41, p < .001), the improvements in Perspectives 2.0 learners were significantly stronger (d = -0.53, p < .001).

For general intellectual humility, learners showed a significant increase from pre to post (d = 0.26), which was reflected in a significant main effect for time (F(1, 12677) = 479.89, p < .001). There was also time x version interaction (F(1, 12677) = 3.85, p = .0498). Here, participants completing Perspectives 1.0 showed a significant increase in general intellectual humility from pre to post (d = 0.24, p < .001), but the improvements in Perspectives 2.0 learners were slightly stronger (d = 0.28, p < .001).

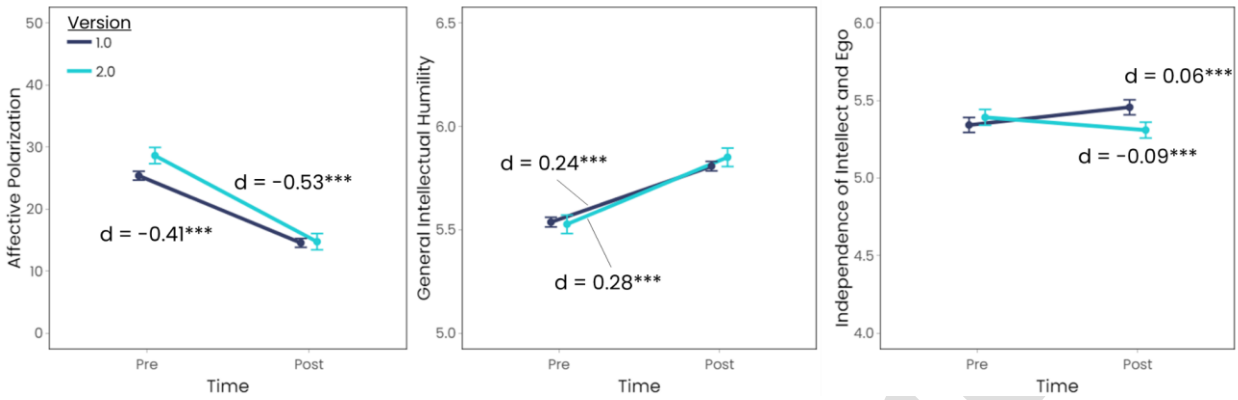
Finally, there was no overall improvement in independence of intellect and ego across time (d = 0.01, Main effect of time: F(1, 5483) = 1.01, p = .315). However, there was a significant time x version interaction (F(1, 5483) = 37.25, p < .001). Those using version 1.0 showed a small increase in independence of intellect and ego (d = 0.06, p < .001), whereas those using version 2.0 showed a small decrease (d = -0.09, p < .001).

As a robustness check, we also examined maintenance of effects one month post-intervention. These analyses used data from a non-random sample of 4.95% of participants who completed the follow-up assessment. Given the potential limitations

associated with attrition (e.g., selection bias) and more limited statistical power, we report these results in the Supplemental Materials. Overall, these results suggested changes after completing Perspectives remained stable from post to follow-up. However, it was worth noting there was weak evidence that political views may moderate the stability of effects of Perspectives on affective polarization at one month compared to just after completing Perspectives (interaction: p = .049, see supplemental tables S33-S36). However, simple slopes analysis suggested the changes from post to follow-up were small and non-significant, with a small increase in those who were very liberal (d = 0.08, p = 0.085) and a small decrease in those who were very conservative (d = -0.07, p = 0.095).

We also recruited a comparison group that completed the pre and post assessments without completing the Perspectives program (*N* = 156). Comparison group participants were college students recruited from 7 four-year colleges and universities in the US and Canada (60.90% Women; 42.95% White; 13.46% Black/African American; 12.82% Hispanic/Latino; 16.03% Asian; Mean age = 22.10, *SD* = 6.55). Because this sample is small and consists solely of college students, we report these analyses in the Supplemental Materials. In brief, the results showed that the changes observed among Perspectives learners were not seen in the comparison group.

Figure 2. Differences in effectiveness of Perspectives between version 1.0 and version 2.0.



Note: Points represent estimated marginal means from multilevel models, whereas error bars represent 95% confidence intervals.

Moderation by Political Views

Did the effects of Perspectives vary depending on learners' political views? We examined this question with a two level model testing a time x political views interaction in each model, along with demographic covariates. In these models, political views were analyzed as a continuous variable. Libertarians were not included within this coding scheme since they do not easily fall on the liberal to conservative spectrum (Iyer et al., 2012). Full model statistics are in the Supplemental Materials.

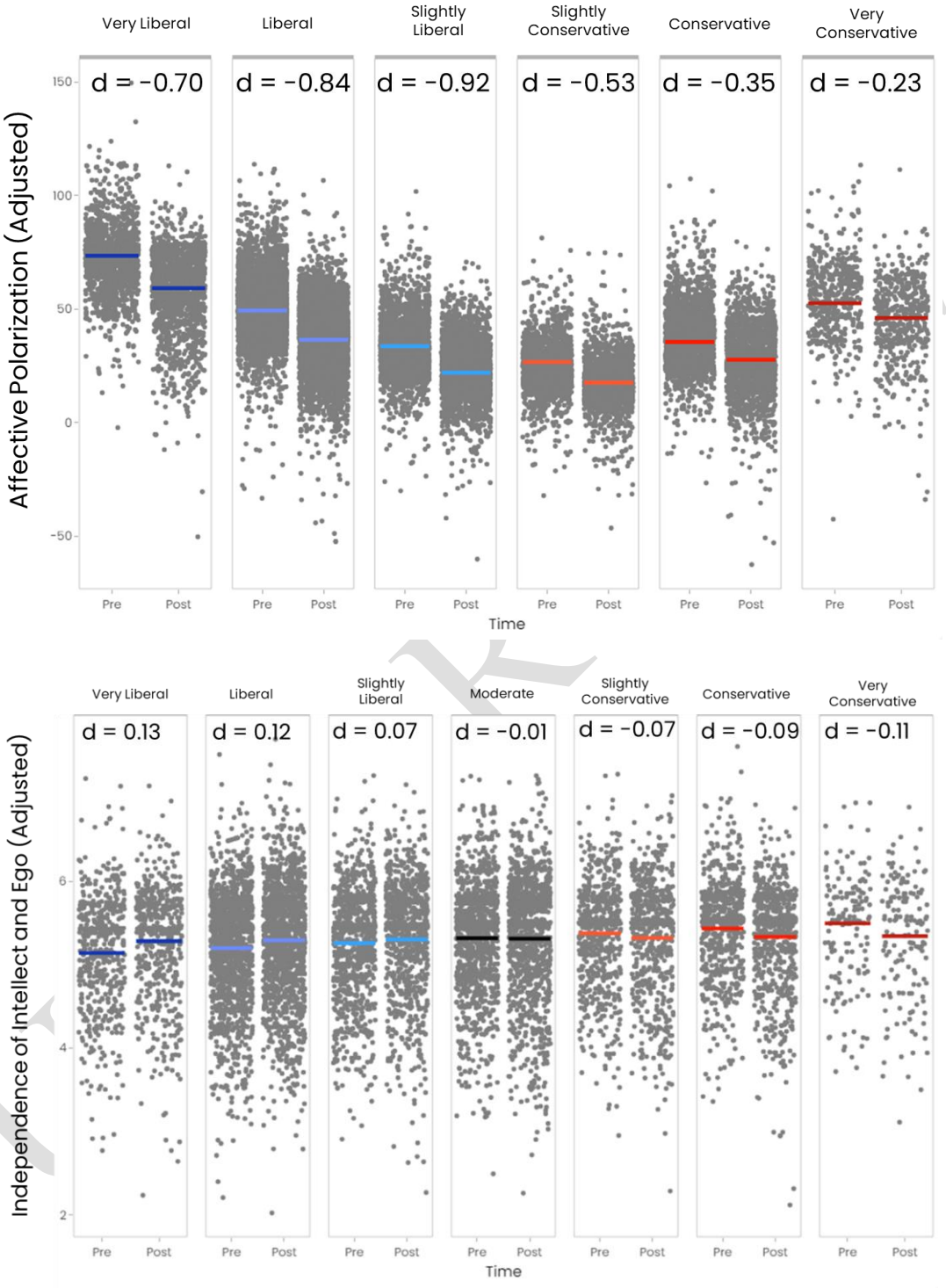
For affective polarization, there was a significant three way interaction (b = 1.30, $t(13204) = 10.75$, $p < .001$). We decomposed this interaction with simple slopes analysis at the different levels of political views and converted the effects to Cohen's d using the established formula $d = 2 * t\sqrt{dferror}$. These effect sizes are presented in Figure 3, upper panel. Although Perspectives was effective at reducing affective polarization

across the entire political spectrum (*p*s < .001), the effects were stronger for liberal/progressives (*d*s from -0.70 to -0.92) compared to conservatives (*d*s from -0.23 to -0.53).

For general intellectual humility, the effectiveness of Perspectives did not significantly vary across groups, as indicated by non-significant time x political views interactions (*B* = 0.00, *t*(12677) = 0.17, *p* = .866). Perspectives was effective at all values of political views (*t*s ≥ 10.82, *p*s < .001).

Political views significantly moderated changes in independence of intellect and ego (*B* = -0.05, *t*(5483) = -4.97, *p* < .001), although the variation was small (see Figure 3, lower panel). Simple slopes analysis revealed that those with more liberal/progressive views slightly increased in independence of intellect and ego after completing Perspectives (*d*s from 0.07 to 0.13, *p*s ≤ .008), whereas those with more conservative views slightly decreased (*d*s from -0.11 to -0.07, *p*s ≤ 0.015).

Figure 3. Changes in affective polarization and independence of intellect and ego across political views.



Note: Lines represent predicted values from multilevel simple slopes analysis. Points represent partial residuals from the multilevel models, not raw values.

Limitations and Future Directions

Despite the large sample size, this study had a number of limitations. First, the study was not experimental in design, making it difficult to rule out alternative explanations such as maturation (participants naturally improving regardless of the intervention) or history (specific events occurring between measurements, e.g., presidential elections) (Campbell, 1957). We also did not directly recruit participants, so selection bias could have contributed to the observed changes from pre to post. In addition, our measure of intellectual humility relied on a small number of items chosen from larger measures, and the measurement of intellectual humility changed over the course of data collection. There are also multiple ways to measure affective polarization beyond thermometer ratings (Iyengar et al., 2012). Study 2 aimed to address these limitations.

Study 2

Study 1 used a quasi-experimental design and showed that Perspectives learners reported improvements in affective polarization and general intellectual humility from pre to post-intervention, and that the effects were slightly stronger for Perspectives 2.0 than 1.0. While these findings are promising, quasi-experimental studies cannot rule out competing explanations (e.g., history, maturation; See Campbell, 1957). In addition,

Study 1 relied on a population largely composed of college students, which may limit generalizability. To address these limitations, Study 2 evaluated the effectiveness of Perspectives 2.0 using a randomized waitlist controlled design in a novel population of government finance officers.

Methods

Participants

Participants were 341 members of the Government Finance Officers Association (GFOA). They were mostly middle-aged (*M* = 50.46 years, *SD* = 9.80), female (72.26% women, 28.16% men, 0.57% prefer not to say), and White/Caucasian (84.59%). The sample size for a given measure varied depending on missing data and the multilevel model structure used. However, the power to detect independent sample mean differences at alpha = .05 using a two-tail test for a medium effect (*d* = 0.50) was >99%, 78%, and 88% power at pre, post, and follow-up, respectively. Statistical power was reduced for testing small effect sizes (*d* = 0.20), with 45%, 20%, and 24% power at pre, post, and follow-up.

Procedure

An invitation email explaining the research study and sign-up form was sent to all members of GFOA by GFOA leadership. After enrolling, participants were randomly assigned to the treatment (*n* = 177) or the waitlist control group (*n* = 164). The groups

did not differ on the dependent variables at pre-test (*p*s ≥ 0.271). The treatment group completed the pre-intervention assessment, then the Perspectives modules over the course of eight weeks, followed by the post-intervention assessment. They completed the follow-up assessment eight weeks after post. The waitlist control group completed assessments at the same times as the treatment group, but completed the Perspectives lessons between the post- and follow-up assessments. There was some attrition, with 153 (43 Control, 110 Treatment) and 159 (82 Control, 77 Treatment) providing data at post and follow-up, respectively. For their participation, individuals received continuing education credits, a $20 Amazon gift card, and entry into a raffle to win an iPad.

Materials

Participant demographics were measured at Time 1, whereas affective polarization and intellectual humility were measured at all three timepoints. Conflict resolution skills were assessed at Time 1 and Time 2. Descriptive statistics for all measures are included in Table S47.

Demographics. Participants provided their gender, age, race/ethnicity, and political views.[4] A Shapiro-wilk test revealed that age was significantly negatively skewed (skewness = -0.35, W = .99, p = .003). Thus, age was transformed using a reflect and square root transformation in all analyses (Tabachnick & Fidell, 2007).

[4] Study 2 used the same demographic measures as Study 1, although now participants were able to choose “non-binary” as a response for their gender. However, since no participants identified as non-binary or “other,” we did not include a gender code for non-binary in the analysis.

Affective Polarization (Trait Rating). Affective polarization was measured with the trait-rating scale used by Iyengar and colleagues (2012).[5] Participants rated Democrats and Republicans on nine positive (e.g., patriotic, intelligent) and negative (e.g., selfish, mean) traits using a 5-point Likert scale (1 = *not at all well*, 5 = *extremely well*). Polarization was calculated by taking the difference of the average positive and negative trait ratings for Democrats and Republicans, and then subtracting the outgroup party difference score from the ingroup party difference score. Thus, this measure was only available for liberals and conservatives. All trait rating scales had good reliability at all time points (αs ranging from .83 to .91).

Intellectual Humility. Participants provided self-report ratings of their intellectual humility using the General Intellectual Humility Scale (Leary et al., 2017). The scale used six items with a 1 (*strongly disagree*) to 5 (*strongly agree*) rating scale, and showed good internal consistency across all waves (αs from .82 to .88).

Conflict Resolution Skills. Broadly, conflict resolution skills were measured using the Negotiation Evaluation Survey (NES; Coleman & Lim, 2001). Participants were asked to list 3 people with whom they experienced conflict, from 3 categories: friends/family, coworker/supervisor, and coworker/supervisee. Then, they were asked to rate how frequently they engage in specific behaviors when in conflict with these individuals, across four subscales: Negative Attacking (e.g., “Speak in a disrespectful manner”), Negative Evading (“Remain silent or change the subject because I am uncomfortable with open conflict”), Positive Opening (e.g., “Ask respectful questions to learn about what is important to the other person”), and Positive Uniting (e.g., “Seek and

[5] We initially also included the thermometer measure of affective polarization used in Study 1 (Iyengar et al., 2012). However, a programming error resulted in data loss.

build on areas of agreement between myself and the other"). The scale uses a 1 (*never*) to 7 (*always*) rating scale. Across all waves and targets, the internal consistency was generally acceptable for these subscales (mean αs from .75 to .93). Scores were averaged across the three targets for each subscale.

Data Analysis

Changes over time were compared between the Treatment and Control groups using moderated 2-level models. We tested for a 2-way interaction between time and group using F-tests and then explored interactions by comparing the estimated marginal means. Linear mixed model results are presented in the Supplemental Materials. Since assessments were planned to occur two months apart, visual inspection of completion times also led us to exclude outliers of participants who completed the study with too little time (<25 days) or too much time (>100 days) between the pre and post assessments. For analyses involving pre to post changes, we excluded any participants with missing pre or post data using listwise deletion.

Results and Discussion

Preliminary Analysis

Similar to Study 1, affective polarization and general intellectual humility had a small, negative correlation at pre-test (r = -.17, p = .033). General intellectual humility was negatively correlated with negative attacking (r = -.19, p = .007) and evading behaviors (r = -.15, p = .031), but positively correlated with positive opening (r = .34, p < .001) and uniting behaviors (r = .40, p < .001). Importantly, missing data at post-test was not associated with affective polarization, but those with complete post data had slightly lower general intellectual humility (d = -0.09) than those with missing data. See Tables S45-47 for complete descriptive statistics and correlations, as well as attrition analysis.

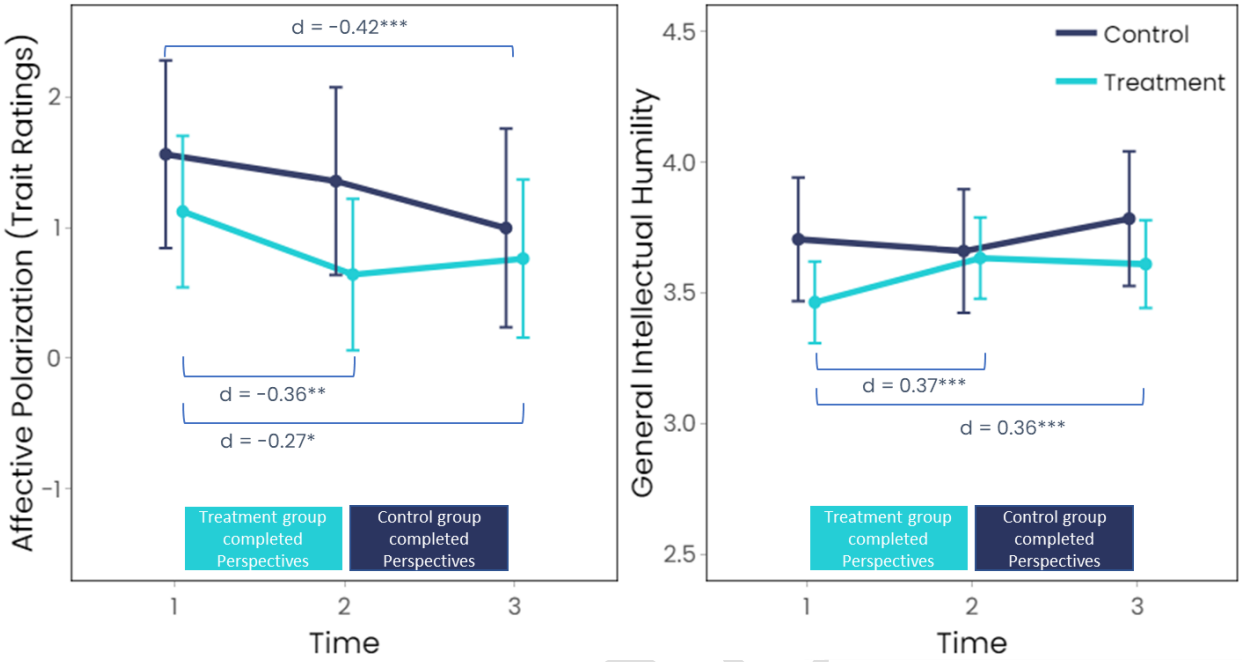
We examined differences in our outcomes across political views at pre-test. Conservatives and liberals did not differ in affective polarization (d = 0.18, p = .270). However, general intellectual humility differed across liberals, moderates, and conservatives (F(2, 238) = 7.61, p < .001). Conservatives had significantly lower general intellectual humility compared to moderates (d = -0.36, p = .034) and liberals (d = -0.62, p < .001), but moderates and liberals did not differ significantly (d = 0.26, p = .092). There were no differences across groups for any conflict resolution subscales (ps ≥ .221). Because these patterns showcased potential nonlinear relationships between political views and outcomes, we include a quadratic effect of political views as a covariate in our below analyses.

Testing the Efficacy of Perspectives

For affective polarization, multilevel models revealed that there was no interaction between time and group ($F(2, 137.25) = 1.29$, $p = .278$, $n = 84$, See Figure 4A). However, the general pattern of results was consistent with expectations. Affective polarization significantly declined from Time 1 to Time 2 in the treatment group ($d = -0.36$, $p = .001$), and remained significantly lower at Time 3 compared to Time 1 ($d = -0.27$, $p = .037$). The control group did not show the same magnitude of change from Time 2 to Time 3 ($p = .360$, before and after they completed Perspectives). However, their Time 3 scores were significantly lower than their Time 1 scores ($d = -0.42$, $p = .030$), possibly reflecting some change due to the intervention.

For general intellectual humility (Figure 4B), a significant time x group interaction emerged ($F(2, 194.58) = 4.71$, $p = .010$, $n = 120$). From Time 1 to Time 2, the treatment group increased ($d = 0.37$, $p < .001$), remaining significantly higher at Time 3, compared to baseline ($d = 0.36$, $p < .001$). However, the control group showed no changes between any time points ($ps \geq .297$).

Figure 4. Changes in affective polarization and general intellectual humility in the treatment and control groups.



Note: Points represent estimated marginal means from multilevel models, whereas effect sizes are Cohen's ds and error bars represent 95% confidence intervals. ***p < .001, **p < .01, *p < .05

The treatment group and control group did not significantly differ across time for negative attacking (group x time interaction: $F(1, 92) = 0.09$, $p = .770$), negative evasion ($F(1, 92) = 1.01$, $p = .319$), positive opening ($F(1, 92) = 0.90$, $p = .346$), or positive uniting behaviors ($F(1, 92) = 0.00$, $p = .973$) across all three targets ($n = 94$ for these models). This did not provide evidence that Perspectives improved conflict resolution skills, but the sample size may be underpowered.

Moderation by Political Views

We examined whether political views moderated the effects of Perspectives by testing a 3-way interaction (group x time x political view). Political view was treated as a continuous variable (-3 = *very liberal*, 0 = *moderate*, 3 = *very conservative*). Political

views did not moderate the time x group interactions in models predicting affective polarization, general intellectual humility, negative attacking, negative evading, positive opening, or positive uniting (*p*s ≥ .065).[6] These findings contradict those of Study 1, where political groups moderated changes in affective polarization and intellectual humility. However, Study 1 had much higher statistical power to detect such moderation effects.

Limitations and Future Directions

Study 2 had several limitations. First, statistical power was limited, and attrition was particularly pronounced for the control group, which may have introduced bias. In addition, missing demographic data did not allow us to confirm whether the models were robust after controlling for demographic factors. Although Study 2 did not find evidence that Perspectives improved affective polarization, we used a different measure than Study 1. Since there might be method variance causing these differences in findings, it is important to conduct a study including both measures of affective polarization.

[6] Because some readers might speculate about the pattern of findings in the interaction (*p* = .065) for negative attacking. When we decomposed this interaction, we found a trend for very liberal participants to show a decrease in the control group from pre to post (*d* = -0.35, *p* = .099), but very conservative participants have a trend of increasing in the control group (*d* = 0.36, *p* = .089). All other interactions with political views were nonsignificant (*p*s ≥ .113).

Study 3

Study 2 used a randomized controlled waitlist design to evaluate the efficacy of Perspectives 2.0 among a sample of local government employees. Results showed that Perspectives 2.0 improved general intellectual humility. There was also some evidence that Perspectives 2.0 led to reductions in affective polarization, as measured by trait ratings, but no evidence that the program improved conflict resolution skills. However, Study 2 was underpowered. Study 3 improved on the limitations of Study 2 in several ways. Like Study 2, Study 3 also used a randomized waitlist control design, but with a larger sample. In addition, to address inconsistent findings related to affective polarization between Studies 1 and 2, affective polarization was measured with both thermometer and trait ratings in Study 3.

Methods

Participants

Participants were 775 college students recruited from ten participating classes across three institutions. Participants' average age was 21.27 years (*SD* = 3.75). The sample was predominantly White/Caucasian (46.01%) and mostly female (65.47% female, 30.40% male, 3.60% Non-binary, and .54% Other). There was some attrition at the second wave, with 450 participants beginning the post-test (205 Treatment, 245

Control). Although the sample size for a given analysis varied by measure, we provide power estimates using general intellectual humility data, which had the greatest number of responses from participants. To detect independent sample mean differences at alpha = .05 using a two-tail test and a medium effect size (d = 0.50), we had >99% power at each wave. However, our sample was underpowered for analyses with a small effect size (d = 0.20), with 75% power and 55% for the pre- and post-assessment, respectively.

Procedure and Materials

The research team partnered with three professors who agreed to distribute research recruitment emails to their students. Students were provided with course credits for completing Perspectives, but participation in research (i.e., completing the surveys) was optional. Fall 2021 students were compensated with a $10 Amazon gift card for each completed survey, whereas Spring 2022 students were compensated with a $15 Amazon gift card per survey (incentive was increased in order to boost response rates). Within professors, classes were randomly assigned to the treatment group or the waitlist control group. The treatment and control groups did not significantly differ on key dependent variables at pre, suggesting that randomization was successful ($|t|$s ≤ 1.49, ps ≥ .137). The treatment group completed the pre-assessment and then completed the Perspectives lessons over a four-week period, after which they completed the post-assessment. The control groups completed assessments within the same four-week period, but completed the Perspectives lessons after completing the post-assessment.

Demographics, Affective Polarization, Intellectual Humility. Participants completed the same demographic, affective polarization trait ratings, and intellectual humility measures used in Study 2, as well as the affective polarization thermometer rating from Study 1. The affective polarization trait measure showed acceptable reliability for all pre and post scales (Cronbach's αs ≥ .78), as did general intellectual humility (both Cronbach's αs =.86).

Age was highly positively skewed (Skewness = 3.97, Shapiro-Wilk W = .65, p < .001) and was transformed using an inverse transformation (Tabachnick & Fidell, 2007). Similar to Study 1, gender was coded using two dummy variables representing men (men vs. otherwise) and women (women vs. otherwise).

Conflict Resolution Skills. Like Study 2, participants also completed the negative attacking, negative evasion, positive opening, and positive uniting subscales of the NES (Coleman & Lim, 2001). To reduce participant burden and improve survey completion, however, we only asked participants to report on how they handle conflict with friends/family, and removed the set of items about how they handle conflict with their coworker/supervisor and coworker/supervisee (see Supplemental Materials for more details). Items were averaged within subscales for analysis.

Data Analysis

Participants were excluded from analyses if they missed an attention check item or they completed the Perspectives lessons in a previous course. Visual inspection of completion times and consideration of the study timeline led us to exclude outliers of participants with <15 days or >74 days between the pre and post assessments. This

resulted in a final sample size of 311 with 169 controls and 142 treatment participants. Similar to Study 2, we also excluded participants from pre vs. post comparisons that had missing data at either time point for each respective model. We note the available sample sizes for each model below.

Results and Discussion

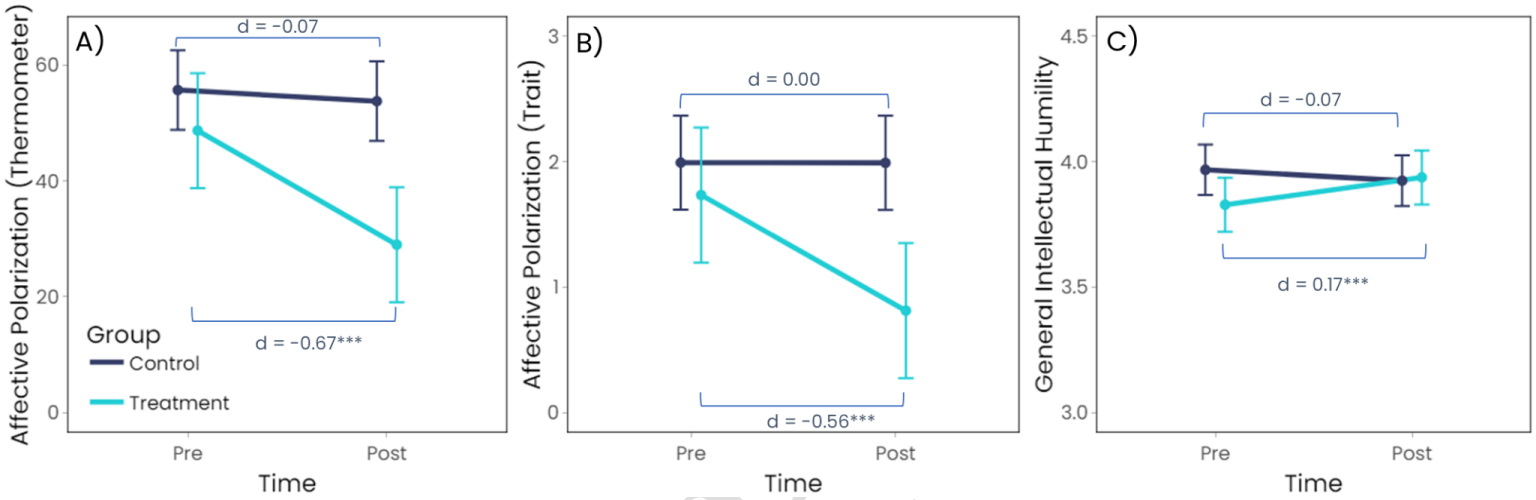
Preliminary Analyses

Correlations between the key outcomes were mostly small at pre-test Affective polarization (thermometer) was positively correlated with negative attack behaviors (r = .19, p = .038). General intellectual humility was negatively correlated with negative attack behaviors (r = -.13, p = .044) but positively correlated with negative evasion behaviors (r = .15, p = .022), positive opening behaviors (r = .34, p < .001), and positive uniting behaviors (r = .26, p < .001). General intellectual humility and affective polarization measures (both thermometer and trait ratings) were not correlated (ps ≥ .559). Descriptives, attrition analysis, and bivariate correlations are detailed in Tables S69-70.

Liberals reported significantly higher affective polarization than conservatives using the thermometer measure (d = 1.47, p < .001). However, there were no significant differences between liberals and conservatives on the affective polarization trait ratings (d = 0.39, p = .131), and no differences across political views for intellectual humility,

negative attacking, negative evasion, positive opening, and positive uniting (*p*s ≥ .115). See Tables S48-49 for more details.

Figure 5. Changes in control and treatment groups for intellectual humility and affective polarization (Study 3).



Note: Points represent estimated marginal means from multilevel models, whereas effect sizes are Cohen's ds and error bars represent 95% confidence intervals. *** $p < .001$, ** $p < .01$, * $p < .05$

Testing the Efficacy of Perspectives

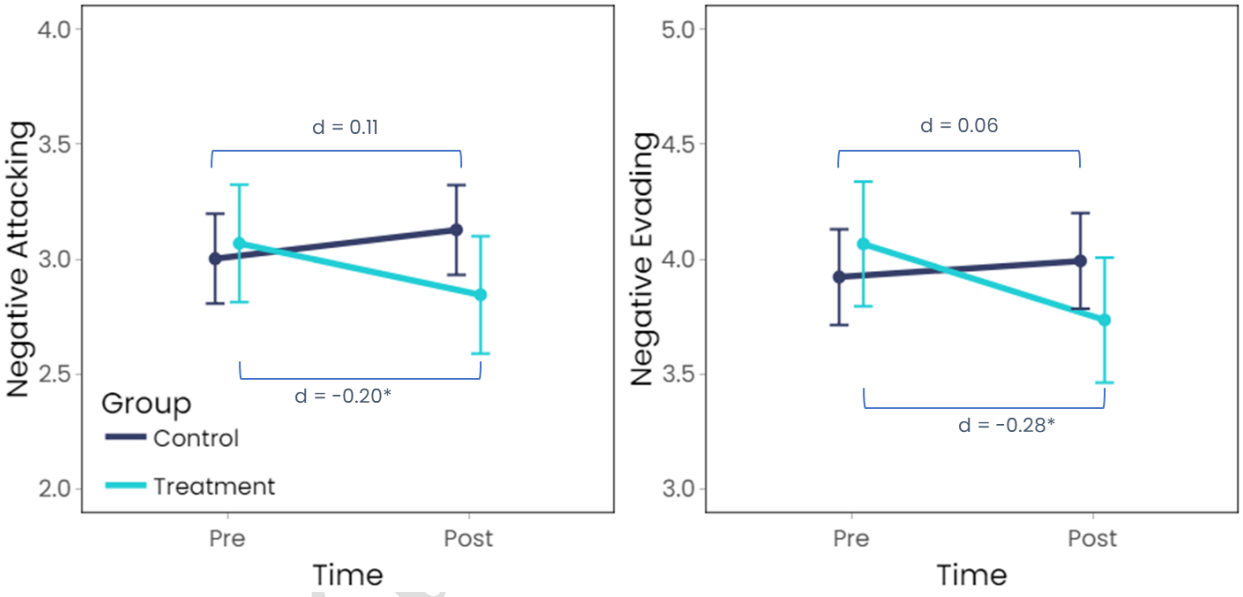
Results suggested that Perspectives improved affective polarization. For the thermometer measure, there was a significant time x group interaction ($F(1, 103) = -13.67$, $p < .001$, n = 105). Those in the treatment group significantly decreased in affective polarization ($d = -0.67$, $p < .001$), but those in the control group did not ($d = -0.07$, $p = .482$, see Figure 5A). For the trait rating affective polarization measure, there was also a significant group x time interaction ($F(1, 108) = 11.22$, $p = .001$, n = 110). In the treatment group, affective polarization significantly decreased ($d = -0.56$, $p < .001$), but remained stable in the control group ($d = 0.00$, $p = .994$, see Figure 5B).

For intellectual humility, there was a significant group x time interaction ($F(1, 275) = 5.35$, $p = .021$, n = 277). Intellectual humility scores significantly increased in the treatment group ($d = 0.17$, $p = .024$), but not in the control group ($d = -0.07$, $p = .336$, see Figure 5C).

Both negative attacking and negative evasion behaviors were improved as a result of completing Perspectives (See Figure 6). There was a significant time x group interaction for negative attacking behaviors ($F(1, 198) = 7.08$, $p = .008$, n = 200). Those in the treatment group decreased in negative attack behaviors ($d = -0.20$, $p = .033$), whereas those in the control group did not ($d = 0.11$, $p = .118$). This pattern was similar for negative evasion behaviors (time x group interaction, $F(1, 198) = 5.41$, $p = .021$, n = 200). Those in the treatment group decreased ($d = -0.28$, $p = .017$), but the control group did not ($d = 0.06$, $p = .505$).

The pattern of data was as expected for positive opening and uniting behaviors, but the time x group interactions were not significant ($F(1, 198) = 1.129$, $p = .289$, n = 200 and $F(1, 198) = .98$, $p = .323$, n = 200 respectively). However, both positive opening behaviors ($d = 0.25$, $p = .015$) and uniting behaviors ($d = 0.27$, $p = .017$) significantly improved in the treatment group, but not in the control group ($ps \geq .129$).

Figure 6. Changes in control and treatment groups for negative conflict resolution tactics (Study 3).



Note: Points represent estimated marginal means from multilevel models, whereas effect sizes are Cohen's ds and error bars represent 95% confidence intervals. *** $p < .001$, ** $p < .01$, * $p < .05$

Moderation by Political Views

We examined whether political views moderated the effect of Perspectives by testing a 3-way group x time x political view interaction. Like in Study 2, political views

were modeled as a continuous variable. None of these models contained a significant 3-way interaction (*p*s ≥ .115).[7] See Tables S87-S93 for more details.

General Discussion

Taken together, this research suggests that Perspectives is a promising intervention for reducing affective polarization, fostering intellectual humility, and improving conflict resolution tactics.

Many intervention studies have primarily relied on one-time experimental manipulations to reduce affective polarization among research participants recruited from online registries (e.g., Mechanical Turk) and have focused on immediate changes in affective polarization, although there are several larger scale studies examining longer term effects from more representative samples (e.g., Brookman et al., in press; Kalla & Broockman, 2021, Santoro & Broockman, 2022). This study adds to the emerging literature examining longer-term intervention effects. The findings from Studies 1 and 2 suggest that these changes in attitudes may be sustained at least one to two months post-intervention, although further research is needed to address

[7] Since we elected to only measure conflict resolution skills toward friends and family members in Study 3, we also examined whether the control and treatment groups differed across time in the four conflict resolution skills with friends and family members in Study 2. The pattern of findings suggested Perspectives may improve negative attacking and positive opening behaviors toward friends and family. Although the interaction term was not significant for negative attacking behaviors ($F(1, 91) = 3.43$, $p = .067$), the pattern of change across groups was consistent with hypotheses. Specifically, those in the treatment condition declined in negative attacking behaviors ($d = -0.30$, $p < .001$), whereas those in the control condition did not ($d = 0.08$, $p = .860$). There was no significant time x group interaction for negative evasion ($F(1, 91) = 0.37$, $p = .543$) or positive opening ($F(1, 91) = 0.03$, $p = .871$). For positive opening behaviors, there was a significant time x group interaction ($F(1, 91) = 4.46$, $p = .038$), where those in the treatment group increased in positive opening behaviors ($d = 0.40$, $p < .001$), but the control group did not ($d = 0.07$, $p = .947$).

limitations of attrition and statistical power. These findings are notable given that affective polarization has been correlated with deleterious social and political consequences, including dehumanization of out-partisans (Martherus et al., 2021) and polarized behavioral responses to COVID-19 (Druckman et al., 2021).

Perspectives also led to an increase in intellectual humility, as measured by the General Intellectual Humility Scale (Leary et al., 2017). This finding is notable because intellectual humility has been correlated with several intrapersonal and interpersonal benefits, including better judgment of arguments, more accurate memory recall, and improved interpersonal relationships (Leary et al., 2017; Meagher et al., 2015). Intellectual humility has also been linked to more openness to diverse perspectives and a willingness to work constructively across differences (Porter & Schumann, 2018). It remains to be seen whether Perspectives, by cultivating intellectual humility, can help to curb the tendency to be more receptive to evidence that confirms our existing beliefs. Of note, we did not find the expected differences when intellectual humility was measured with items from the CIHS in Study 1 (Krumrei-Mancuso & Rouse, 2016). There are many caveats to this finding, including that only a select number of items from the CIHS were administered in Study 1. Nevertheless, these findings are consistent with literature suggesting that the existing measures of intellectual humility may tap into distinct dimensions (Porter et al., 2021). The findings may suggest that Perspectives may shift self-focused cognitions about one's intellectual limitations, but not how intellectual humility is expressed externally to others (Porter et al., 2021). Given the nascent literature of intellectual humility, future research using multiple measures will be helpful in delineating the nomological network of this construct.

We found that Perspectives led to reductions in negative conflict tactics (negative evading and attacking) in Study 3 but not Study 2. This is possibly due to greater statistical power in Study 3. However, we did not find conclusive evidence that Perspectives led to improvements in the use of positive conflict tactics such as positive evading and positive uniting in either study. In Study 3, there was some evidence that the use of positive behaviors during conflict improved from pre- to post- in the treatment group, although the group x time interaction was not significant. These findings may indicate that these components of Perspectives need to be strengthened.

Finally, this is one of the few studies to simultaneously examine the impact of an intervention on the outcomes of affective polarization, intellectual humility, and conflict resolution skills. This study contributes to the emerging work demonstrating that these three constructs are related and contributes to the functioning of a thriving pluralistic democracy. Recent work by Lubis & Sinaipar (2021) found that intellectual humility was a critical factor for improving religious tolerance among aggressive people. Similarly, Bowes and colleagues (Bowes et al., 2020) found that intellectual humility is inversely related to affective polarization and can buffer people against the negative consequences of affective polarization. Additionally, affective polarization has been linked to more aggressive and dehumanizing online interactions (Harel et al., 2020). Theoretically, conflict resolution skills often involve perspective taking and building areas of agreement, which may temper affective polarization. Nevertheless, more work is needed to understand how these constructs are related.

Future Directions and Limitations

Some limitations of the current research should be noted. First, attrition was generally high at post-assessment. It is thus possible that these findings are a result of systematic differences in those who responded to the post-Perspectives survey. In addition, our assessment of outcomes relied primarily on participant self-report of their attitudes and experiences rather than observed behaviors. Future studies examining conflict resolution skills would be strengthened by informant reports or behavioral observations.

In addition, we used multiple measures of affective polarization. Although the pattern of results was consistent across studies and measures, the thermometer and trait ratings were only modestly correlated. This lack of convergent validity among different measures of affective polarization have been noted by others (Druckman et al., 2019). Future research examining interventions to reduce affective polarization would benefit from the inclusion of multiple measures with a latent variable to assess affective polarization or greater attention to how these measurements of affective polarization may be distinct. Finally, the current research yields evidence that the Perspectives program is effective, but more work is needed to understand the mechanisms underlying the effects. For one, it is unclear which interventions in the multi-module program are producing the effects on affective polarization, intellectual humility, and conflict resolution skills. More work is also needed, at both the theoretical and empirical levels, to understand how the outcomes measured in this study are interrelated. It is possible, for example, that interventions designed to increase intellectual humility also indirectly reduce affective polarization.

Conclusion

Affective polarization has been consistently on the rise for a number of decades, and scholars have worried that this trend may make it difficult for individuals to arrive at mutually beneficial policy compromises and could ultimately undermine the nation's foundational democratic norms (Druckman & Levy, 2022). The current study suggests that affective polarization can be reduced with an educational intervention and that these changes may be maintained in the short term. However, more work is needed to link the individual-level outcomes documented in this study to societal and cultural changes, such as greater policy collaboration and adherence to democratic principles.

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