The Online Educational Program Perspectives Reduces Affective Polarization and Increases Intellectual Humility

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) and epistemic fragmentation (individuals deriving their knowledge from conflicting sources). In response to these trends, we developed an asynchronous online educational intervention program rooted in psychological principles called Perspectives. In two studies with large samples (total $N = 35,393$), we examined Perspectives users’ scores on key outcomes at pre, post, and one-month follow-up. Study 2 included a quasi-experimental comparison group ($N = 156$). Across both studies, we found that Perspectives users experienced small to medium-sized decreases in affective polarization, small to medium-sized increases in intellectual humility (understanding the limits of one’s knowledge), and increases in sense of belonging. These positive changes were not evidenced in the comparison group and were largely maintained at one-month follow-up. These findings suggest promise for a brief and scalable intervention to reduce affective polarization and increase intellectual humility.
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 Americans increasingly dislike, distrust, and avoid those who hold different political views – a phenomenon labeled “affective polarization” (Iyengar et al., 2012). Currently, American politics is marked by hostility, outrage, contempt, and a lack of willingness to work constructively through disagreements (see Roseman et al., 2021, for a review). A significant portion of both Democrats and Republicans (20% and 15%, respectively) go so far as to agree that the United States (U.S.) 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).

Researchers have identified several large-scale societal trends that may contribute to rising affective polarization (see Iyengar et al., 2019 for a review). There is evidence, for instance, that over the last 50 years, the two major political parties in the U.S. have become more internally homogenous, both in ideology and demographics.
That is, liberals have come to increasingly identify as Democrats and conservatives as Republicans (Levendusky, 2009). White evangelicals are primarily Republican, while Black Americans are predominantly Democrat (Mason, 2015). In addition, the media environment, including social media, has become increasingly partisan and unbalanced (e.g., Lelkes et al., 2017; Rogowski & Sutherland, 2016). Americans have a plethora of choices in the media they consume, and most select the outlets that reinforce their own worldviews (Lelkes et al., 2017). The consequence of these societal trends is that Americans are increasingly likely to interact exclusively with those who share their political party membership, making it easy to stereotype and demonize those who belong to the opposing party. A related consequence of this increased partisan divide is epistemic fragmentation, whereby various individuals and groups in society derive knowledge from distinct, often conflicting, sources (Milano et al., 2021). Recent research, for example, suggests that Americans are vulnerable to believing dubious, conspiratorial, and falsified claims, and cling to them even when confronted with evidence that contradicts their views (Nyhan & Reifler, 2010; Oliver & Wood, 2014; 2016). 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 and epistemic fragmentation with psychological interventions. For instance, studies have shown that partisan animosity decreases when participants are exposed to models of civil and respectful political disagreement (e.g., Huddy & Yair, 2020; Levendusky & Malhotra, 2016). In one example, Ahler and Sood
(2018) observed that Americans 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 American identity among partisans and showed a significant reduction in affective polarization.

With rising epistemic fragmentation, it becomes critical to increase individuals’ intellectual humility, or an awareness of one’s own intellectual limitations (Krumrei-Mancuso & Rouse, 2016). Higher levels of intellectual humility are correlated with greater openness to new ideas, higher empathy, more prosocial values, a greater tolerance for diverse people and perspectives, and greater 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 and lower affective polarization (Krumrei-Mancuso & Newman, 2020; Porter & Schumann, 2018). Intellectual humility appears unrelated to political party identification, suggesting that both conservatives and liberals may equally benefit from interventions fostering intellectual humility (Leary et al., 2017; Porter & Schumann, 2018).

Few psychological interventions to foster intellectual humility have been developed, with most focusing on short term changes in intellectual humility. For example, Fernbach et al. (2013) capitalized on the illusion of explanatory depth (Rozenblit & Keil, 2002) and prompted participants to explain a political policy in detail. Most participants found that their knowledge about such policies was limited and this led them to adopt less extreme political views. In another experiment, Porter and
Schumann (2018) randomly assigned participants to read an essay about growth versus fixed mindset. The key message of the growth mindset essay was that intelligence can be developed, whereas the message in the fixed article was that intelligence is a static trait. Compared to those in the fixed mindset condition, participants who read the growth mindset article reported greater intellectual humility and were more respectful and open during a subsequent disagreement. Finally, Grossman and Kross (2014) found that they could increase “wise reasoning” – a construct related to intellectual humility – by prompting participants to adopt a “self-distancing” perspective by asking them to imagine events as though they were a distant observer.

While the interventions reviewed above are promising, the knowledge base on ways to reduce affective polarization and foster intellectual humility is still only emerging. Currently, research has not progressed beyond one-time experimental manipulations. Although this is relatively common, many interventions use participants recruited through online research registries such as Amazon Mechanical Turk, highlighting the need for greater ecological validity. Also, most of the existing interventions cannot be readily implemented at scale. For instance, while the evidence suggests that more civil media portrayal of politics can help reduce animosity, it is unclear how media outlets can be convinced to shift their approach in the name of fostering a more civil society. Thus, more work is needed to translate these lab-based experiments into interventions that can be feasibly implemented in real-world settings.

A Scalable Intervention to Improve Polarization and Intellectual Humility

In response to rising affective polarization and epistemic fragmentation, we designed an interactive online educational intervention program rooted in psychological
research, called Perspectives. Perspectives is intended to equip people with the social and conversational skills to work 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 engage in constructive dialogue. 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. For Perspectives to be effective, learners should show improvements in affective polarization and intellectual humility, and these improvements should be consistent across learner demographics, including their political views.

Perspectives might also have secondary interpersonal benefits. Partisanship is robustly correlated with a number of social behaviors, including whom we befriend (Pew Research Center, 2017), where we live (Gimpel & Hui, 2015), and even whom we hire (Gift & Gift, 2015). Those who are more strongly polarized are more likely to dehumanize out-partisans (Martherus et al., 2019). On the other hand, intellectual humility is linked with several positive social outcomes. Previous research shows that individuals who practice intellectual humility have more satisfying relationships (Leary et al., 2017; Meagher et al., 2015). Finally, Perspectives seeks to foster more constructive, respectful dialogue in classrooms and workplaces, which might lead to a greater sense of belonging (Baumeister & Leary, 1995). Given these prior findings, it is possible that Perspectives training would, over time, have ancillary benefit on increased sense of belonging in the classroom or workplace.
Overview of the Current Research

We investigated the effectiveness of Perspectives 1.0 and a later iteration, Perspectives 2.0, on key outcomes of affective polarization and intellectual humility. We also examined whether Perspectives was equally effective across the political spectrum. Finally, we explored whether Perspectives had secondary benefits on sense of belonging. Study 1 examined the effectiveness of Perspectives 1.0 by comparing users’ scores on key outcomes at pre-intervention, post-intervention, and one-month follow-up. Study 2 followed the same longitudinal design to examine the effectiveness of an expanded version of Perspectives (2.0), and also added a quasi-experimental comparison group of individuals who completed surveys but did not complete Perspectives, which could provide greater causal evidence on the effectiveness of Perspectives.

Study 1

Study 1 examined the effectiveness of Perspectives version 1.0, which consisted of five 30-minute learning modules focused on exploring the irrational mind, uncovering the roots of ideological differences, cultivating intellectual humility, valuing diverse perspectives, and constructive disagreement. These lessons 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), to name a few. Perspectives 1.0 was available to learners from August 2017 to August 2020.
Methods

Participants
Study 1 consisted of 29,766 participants (56.94% Female, 58.90% White/Caucasian; Mean age = 24.98, SD = 10.90). This sample size provides substantial statistical power to detect even small effect sizes. The majority of participants were using Perspectives as a student in a higher education classroom (81.48%). Most participants were completing Perspectives in the U.S. (88.51%) or Canada (7.20%).

Procedure and Materials
Participants completed a pre-test assessment before engaging in the Perspectives program (pre), a post-test assessment immediately after completing Perspectives (post), and a follow-up survey one month later (follow-up). Because this research is focused on assessing change, participants were only included in the analyses if they provided data at both pre and post.

To minimize participant burden, we used selected items from validated scales, as opposed to full scales. Over the course of data collection, we used five different versions of measures to assess the efficacy of the program. All participants completed measures of demographics, political views, and affective polarization. Measures of intellectual humility were also included in all time points, but the items and subscales administered varied across assessment versions. Secondary outcomes of belonging, self-esteem, and anxiety were only measured for some participants. (See Supplemental Materials, Study 1 Measures, for more details about the measures across the five 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 (which can only be done for self-identified partisans), which is used in much of the literature (Druckman & Levendusky, 2019). However, when we examined political party affiliation as a moderator of intervention effects with moderates, libertarians, and classical liberals included in the analyses, we scored affective polarization as the difference between ratings of conservatives and progressives. This was done to provide estimates of polarization for moderates and those who do not fall on the traditional political ideology continuum, people who receive limited empirical attention in the polarization literature. Intellectual humility was assessed with items from the general intellectual humility scale (Leary et al., 2017). Belonging was measured with 2-3 items (depending on the version) from the Sense of Social Fit Scale (Walton & Cohen, 2007).

**Analytic Strategy**

Data analyses were conducted in Rstudio. Mixed models were conducted with the lme4 package to account for longitudinal data (Bates et al., 2007). The emmeans package was used to compare marginal means and estimate Cohen’s $d$ (Lenth & Lenth, 2018). Estimates of partial $r^2$ ($r_p^2$) were provided by the r2glmm package (Edwards et al., 2008; Jaeger, 2017; Jaeger et al., 2017).
Results

Preliminary Analysis and Recoding

Participant age was highly positively skewed (skewness = 2.51, se = 0.01), so we applied an inverse transformation (Tabachnick et al., 2007).¹ We coded gender as -1 = male, 0 = other/non-binary/prefer not to say, and +1 = female. Of the participants, 67.62% completed the assessment at post, and 6.2% completed the follow-up assessment.²

Baseline Differences by Political Views

We first examined differences in pre-test scores across political views using a series of ANOVAs. 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” (1.58%), “Prefer not to say” (3.38%), or “Don’t know/Not political” (13.11%). However, comprehensive lists of all means comparisons are presented in Supplemental Materials, Tables S1-S5.

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

² The higher attrition at the 1-month follow-up may be because participants were not compensated for completing the follow-up assessment. Missing data at follow-up had significant but small associations with some demographic and pretest variables: Those who did not complete the follow-up were slightly more likely to be non-white (Cramer’s $V = .03$, $p < .001$), male (Cramer’s $V = .02$, $p = .001$), older ($d = 0.16$, $p < .001$), higher in independence of intellect and ego ($d = 0.31$, $p < .001$), lower in openness to revising views ($d = -0.22$, $p < .001$), and higher in belonging ($d = 0.21$, $p < .001$). Follow-up missingness was not significantly associated with political views, affective polarization, or intellectual humility.
**Figure 1.** Baseline Differences by Political Views in Study 1.

Note: Error bars represent 95% confidence intervals around the means. For simplicity, this figure does not include participants who selected “other,” “prefer not to say,” or “don’t know/not political.”
Affective Polarization. Participants’ political views were associated with their reported affective polarization \( (F(10, 28191) = 1465.30, p < .001, \text{see Figure 1}) \). Consistent with previous findings (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 polarized compared to moderates \((d = 1.89, 95\% \text{ CI: } [1.81, 1.97] \text{ and } d = 2.12, 95\% \text{ CI: } [2.07, 2.18], \text{ respectively}) \). In addition, liberals were more polarized than conservatives. This difference was largest when comparing those who were “somewhat conservative” vs. “somewhat liberal” \((d = 0.49, 95\% \text{ CI: } [0.43, 0.54]) \) and smallest when comparing those who were “very conservative” vs. “very liberal” \((d = 0.23, 95\% \text{ CI: } [0.14, 0.32]) \).

Intellectual Humility. Intellectual humility also varied across political groups (main effect: \( F(10, 20269) = 62.29, p < .001; \text{see Figure 1}) \). All liberal groups had significantly higher intellectual humility than conservative groups \((ps \leq .022) \). The least intellectual humble group were those who identified as very conservative \((M = 4.65, 95\% \text{ CI: } [4.54, 4.77]) \), whereas the most intellectually humble group were libertarians/classical liberals \((M = 5.93, 95\% \text{ CI: } [5.84, 6.01]) \).

Efficacy of Perspectives 1.0

To test the efficacy of Perspectives 1.0, we conducted two mixed models for each outcome. The first model regressed the outcome (e.g., affective polarization, intellectual humility) on time, thus comparing scores at pre-test, post-test, and one-month follow-up. The second model added statistical covariates, including age, political ideology, squared political ideology (to account for nonlinear effects), gender, and race. Unless the second model revealed a change in the pattern or significance of the results, we report only the
results from the first model below. To ensure we were testing changes from pre to post, data were excluded from this analysis if missing cases were present at pretest and post-test. The effects of Perspectives 1.0 on all outcomes are summarized in Figure 2, and more detailed results are in the Supplemental Materials, Tables S6-11.

**Affective Polarization.** There was a significant improvement in polarization from pre to post-test, which was small to medium in size ($d = -0.36$, $p < .001$). There was also no loss in intervention gains, as evidenced by a non-significant change from post to follow up ($d = -0.01$, $p = .769$).

**Intellectual Humility.** Intellectual humility improved significantly from pre to post ($d = 0.20$, $p < .001$), and gains were maintained from post to follow-up ($d = -0.03$, $p = .292$). The overall change from pre to follow up was significant ($d = 0.17$, $p < .001$).

**Belonging.** Belonging improved from pre to post ($d = 0.08$, $p = .003$) but did not significantly increase from post to follow-up ($d = .08$, $p = .107$). At follow-up, belonging scores were significantly higher from scores at pre-test ($d = 0.16$, $p = .001$).
Figure 2. Effects of Perspectives 1.0.

Note: As expected, affective polarization significantly decreased, whereas intellectual humility increased after completing Perspectives 1.0. Points represent estimated marginal means derived from multilevel models. Error bars represent 95% confidence intervals. Effect sizes (Cohen’s $d$) appear in blue text. ***$p < .001$, **$p < .01$, *$p < .05$
Effects of Perspectives 1.0 Across Political Views

Were Perspectives’s effects stronger for progressives, moderates, or conservatives? We investigated whether political ideology moderated the effects of Perspectives by conducting mixed models predicting affective polarization and intellectual humility from a pre vs. post dummy variable, a post vs. follow-up dummy variable, political ideology, and the relevant interaction terms. We also controlled for age, gender, and race\(^3\) in secondary models. Similar to the previous analyses, we only present the secondary models if the conclusions from these models differ from the primary models. We examined conditional effects of Perspectives with political ideology as a categorical variable (progressives, moderates, and conservatives). This was accomplished by collapsing all three progressive political categories and all three conservative categories into one left/progressive category and one conservative/right category. The results are presented in Figure 3 and tables of all models are presented in the Supplemental Materials, Tables S12-S16. Because some might consider those who identified as “slightly” conservative or progressive as moderate, we conducted supplemental analyses of these results with participants who have these views classified as “moderate.” The pattern of the results were consistent with those reported here (See Supplemental Materials, Tables S17-S21).

Affective Polarization. The effects of Perspectives on affective polarization differed across political ideologies, as indicated by a significant time x political category

\(^3\) Race/ethnicity was measured by asking participants to select all racial/ethnic categories that apply rather than a single choice measure as is used by the Census bureau (U.S. Census Bureau, 2021). We used race as a covariate with a dummy code representing those who identified as exclusively Caucasian vs. those who did not.
interaction ($F(4, 17329) = 99.48, p < .001$). From pre to post, the greatest improvement was seen among progressives ($d = -0.46, p < .001$), followed by conservatives ($d = -0.27, p < .001$), and then moderates ($d = -0.14, p < .001$). In addition, no groups showed a significant change from post to follow up ($ps \geq .068, |d|s \leq 0.07$), suggesting that the effects of Perspectives were stable across time in all groups.

**Intellectual Humility.** Progressives, moderates, and conservatives differed in how they changed in intellectual humility across time, as shown by a significant time x political category interaction ($F(4, 12629) = 4.14, p = .002$). From pre to post, conservatives ($d = 0.25, p < .001$) and progressives ($d = 0.24, p < .001$) showed similar levels of improvement in intellectual humility; this change was significantly lower among moderates ($d = 0.15, p < .001$). No groups significantly differed in post to follow-up changes (simple interaction $ps \geq .216$).

**Belonging.** Progressives, moderates, and conservatives did not differ in how they changed in belonging across time, as indicated by the absence of any significant interactions between political categories and time during the model ($ps \geq .258$).
Figure 3. Perspectives’s Effectiveness by Participant’s Political Leaning.

Note: Error bars represent 95% confidence intervals, whereas points represent estimated marginal means at pre, post, and follow-up.
Discussion

The results of Study 1 showed that Perspectives 1.0 users reported significant reductions in affective polarization and increased intellectual humility from pre to post, and that these changes are largely maintained at one-month follow-up. The effects tended to be stronger for progressives and conservatives, as compared to those in the political middle (who were much less polarized to begin with). Perspectives users also experienced significant improvements in belonging. All changes were small to medium in magnitude.

These results suggest that Perspectives 1.0 is a promising tool for improving affective polarization, intellectual humility, and belonging. The Perspectives program continued to be refined based on user feedback, and Perspectives 2.0 was launched in August 2020. The effects of version 2.0 were examined in Study 2. An improvement was also made to the study design with the addition of a quasi-experimental comparison group.

Study 2

Study 2 examined the effects of Perspectives 2.0, an expanded version that consisted of eight 30-minute learning 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.
Methods

Participants

Study 2 participants consisted of Perspectives 2.0 users \((N = 5,471)\) and a smaller comparison group that completed the pre and post assessments without completing the Perspectives program \((N = 156)\). This sample size provided adequate power for many statistical tests with small effect sizes. Perspectives users were somewhat diverse (59.29% women, 56.60% White/Caucasian, 6.00% Black/African American; 7.19% Hispanic/Latino; 11.86% Asian; Mean age = 24.98, \(SD = 10.62\)), primarily from the U.S. (80.17%) or Canada (10.06%), and most completed the program as a higher education student (81.85%).

Comparison group participants were college students\(^4\) recruited from 7 four-year colleges and universities in the U.S. and Canada (60.90% Women; 42.95% White; 13.46% Black/African American; 12.82% Hispanic/Latino; 16.03% Asian; Mean age = 22.10, \(SD = 6.55\)). Participants took the assessments for partial course credit in courses on Communications, Psychology, Religious Studies, Philosophy, Physics, and Engineering. Comparison group participants received $15 for completing the measures.

Procedure and Materials

Similar to Study 1, Perspectives participants completed measures immediately before (pre) and immediately after engaging in the program (post), along with a one-month follow-up assessment (follow-up). The comparison group completed pre and

\(^4\) Unlike the comparison group, not all participants in the Perspectives group were college students. Because of this, we repeated all Study 2 analyses involving comparisons to the control group with only student Perspectives participants (See Supplemental Materials, Tables S22-S25). The pattern of findings were consistent across the sets of analyses. For completeness and generalizability, we report analyses with all Perspectives users.
post measures on the same timeline as the intervention group, approximately one month apart. Participants completed the same measures of demographics, political views, and affective polarization used in Study 1. They also completed 2 items from the general intellectual humility scale (Cronbach’s $\alpha = .61$; Leary et al., 2017). Belonging was measured using the two items predominantly used in Study 1, adapted from the Sense of Social Fit Scale (Walton & Cohen, 2007; Cronbach’s $\alpha = .78$).

Results

Preliminary Analyses

As in Study 1, age was highly skewed (Skewness = 2.60, $se = .03$) and transformed with an inverse transformation. We coded gender as $-1 =$ male, $0 =$ other/non-binary/prefer not to say, $1 =$ female. Attrition rates were similar to Study 1, with 60.23% of participants completing the assessment at post and 10.29% completing the 1-month follow up assessment.

Baseline Differences by Political Views

We examined differences in pre-test outcomes across political ideologies using one-way ANOVA in the entire sample, comprising Perspectives and comparison participants. The results of these analyses are presented in Figure 4. Broadly, the pattern of results was consistent with those of Study 1. A comprehensive list of all mean comparisons are presented in the Supplemental Materials, Tables S26-S28.
Figure 4. Baseline Differences by Political Views in Study 2.

Note: Error bars represent 95% confidence intervals around the means.
**Affective Polarization.** The overall pattern of group differences in affective polarization were similar to those of Study 1 (main effect: $F(10,5600) = 379.89$, $p < .001$). Participants with very progressive or very conservative views were much more polarized than those who were politically moderate ($d = 2.46$, 95% CI: [2.34, 2.58] and $d = 1.67$, 95% CI: [1.47, 1.87], respectively). In addition, progressives were more polarized than conservatives, with medium to large effect sizes ($ds = 0.58$ to $0.79$, no CI included 0)

**Intellectual Humility.** Political groups significantly differed in intellectual humility (main effect: $F(10, 5601) = 13.69$, $p < .001$). In general, progressive participants scored significantly higher on intellectual humility than conservative participants ($ps < .001$), with the exception of the comparison between progressives/liberals and those who were slightly conservative/right ($p = .077$) as well as those who were very progressive/liberal and slightly conservative/right ($p = .263$). In contrast to Study 1, libertarians/classical liberals did not have the highest intellectual humility.

**Testing the Efficacy of Perspectives 2.0**

To test the effects of Perspectives 2.0 relative to a comparison group, we conducted a series of mixed models testing the effects of time, group membership, and interactions between time and group on affective polarization, intellectual humility, and belonging. Because the comparison group did not complete a follow-up assessment, analyses were restricted to pre and post scores. Participants that did not provide responses at both pre and post were removed using list-wise deletion. Effects on affective polarization, intellectual humility, and belonging are presented in Figure 5.
Controlling for demographic covariates did not change the significance or pattern of these findings. See Supplemental Materials, Tables S29-S32.
**Figure 5.** Affective Polarization, Intellectual Humility, and Belonging in Perspectives 2.0 Users and Comparison Participants (Study 2).

Note: Points represent estimated marginal means from multilevel models. Error bars represent 95% confidence intervals. *** $p < .001$
Changes in affective polarization varied significantly between the Perspectives and comparison groups (time x group interaction: $b = 15.18$, $t(1885) = 4.71$, $p < .001$, $r^2_p = .002$). Decomposing this interaction revealed that polarization improved in the Perspectives group from pre to post ($d = -0.49$, $p < .001$). However, the comparison group did not significantly change in the corresponding time frame ($d = 0.05$, $p = .645$).

Intellectual Humility. For intellectual humility, there was a significant time x group interaction ($b = -0.28$, $t(3386) = 3.92$, $p < .001$, $r^2_p = .001$). The Perspectives group significantly increased in intellectual humility from pre to post ($d = 0.31$, $p < .001$), but the comparison group did not ($d = -0.08$, $p = .425$).

Belonging. The two conditions did not significantly differ in changes in belonging (group x time interaction: $b = -0.15$, $t(2123) = -1.74$, $p = .081$, $r^2_p = .00$). However, Perspectives participants showed a significant increase in belonging from pre to post ($d = 0.17$, $p < .001$), whereas comparison participants did not ($d = -0.02$, $p = .831$).

Moderating Effects of Political Views

In the next series of analyses, we examined whether political views moderated the effects of Perspectives 2.0 across time. In other words, we were interested in whether Perspectives was more effective for progressives, conservatives, or moderates. These analyses consisted of four primary models where affective polarization and intellectual humility were regressed on two dummy codes for political views (progressives vs. conservatives, moderates vs. conservatives), time (pre vs. post), group (Perspectives vs. comparison), and all possible interaction terms. The results and effects sizes are presented in Figure 7 and explained in depth in the Supplemental.
Materials (Tables S29a-S30c). Similar to Study 1, the effectiveness of Perspectives was similar across progressives, moderates, and conservatives.

**Extended Effects in Follow-up Data**

We collected one-month follow-up data for participants in the Perspectives 2.0 group to assess the maintenance of effects. We examined these changes across time using multilevel models (See Figure 6 and see Supplemental Materials, Tables S39a-S42a for the full models). The results from Study 2 replicated most findings from Study 1. On average, participants experienced significant improvements in affective polarization (all participants and within partisans), intellectual humility, and belonging from the pre-assessment to follow-up in the small to medium effect size range. No groups showed significant changes from post to follow-up, except that sense of belonging continued to increase after the post assessments.

**Figure 6.** Changes across time in Perspectives users within Study 2.

![Figure 6](image)

*Note.* Points represent estimated marginal means from multilevel models. Effect sizes are presented in the metric of Cohen’s *d*. Error bars represent 95% confidence intervals. *** *p* < .001, ** *p* < .01, * *p* < .05
Figure 7. Changes in Perspectives and comparison participants by political group.

Note: Points represent estimated marginal means from multilevel models, whereas effect sizes are Cohen’s ds and error bars represent 95% confidence intervals. *** $p < .001$, ** $p < .01$, * $p < .05$
Comparison between Perspectives 1.0 and 2.0

Did the effectiveness of Perspectives improve from Perspectives 1.0 (Study 1) to Perspectives 2.0 (Study 2)? We conducted three mixed models examining affective polarization, intellectual humility, and belonging as a function of time and version of Perspectives. The results are presented in Figure 8. All three models indicated significant time (pre vs. post) x version interactions ($ps \leq .001$) and greater improvement from using Perspectives 2.0 compared to Perspectives 1.0. For affective polarization, learners in 2.0 experienced greater drops in polarization from pre to post ($d = -0.50$, $p < .001$) compared to 1.0 learners ($d = -0.36$, $p < .001$). For intellectual humility, 2.0 learners also saw a significantly greater improvement from pre-post ($d = 0.26$, $p < .001$) compared to 1.0 learners ($d = 0.20$, $p < .001$). Finally, for belonging, 2.0 learners ($d = 0.18$, $p < .001$) saw greater improvements from pre to post compared to 1.0 learners ($d = 0.08$, $p = .006$).

Comparing post to follow-up changes suggested that maintenance of intervention gains were improved with belonging in Perspectives 2.0, but not affective polarization. Although 1.0 learners maintained changes in affective polarization, 2.0 learners showed a slight increase at the one-month follow-up ($d = 0.10$, $p = .012$). No significant changes from post to follow-up were seen for either version 1.0 or 2.0 on intellectual humility, see Supplemental Materials, Tables S43a-S45c for model statistics). However, although 2.0 and 1.0 learners continued to increase in belonging from post to follow-up, 2.0 learners showed stronger increases ($d = 0.22$, $p < .001$) than 1.0 learners ($d = 0.08$, $p < .001$).
Figure 8. Differences in Effectiveness of Perspectives between Version 1.0 (Study 1) and Version 2.0 (Study 2).

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

Discussion

Study 2 investigated the effects of an expanded version of Perspectives and included a non-randomized comparison group. Results showed that Perspectives learners showed small to medium-sized improvements in affective polarization, intellectual humility, and belonging, which was not evidenced in the comparison group. Comparison of effect sizes showed that Perspectives 2.0 had enhanced effectiveness, compared to Perspectives 1.0. Across both studies, Perspectives led to the greatest benefit for progressives and conservatives in terms of affective polarization, as compared to moderates.
General Discussion

Taken together, the results from Studies 1 and 2 suggest that Perspectives is a promising intervention for reducing affective polarization and fostering intellectual humility. Perspectives may also have secondary benefits to sense of belonging. A comparison of the effect sizes from Study 1 to Study 2 showed that the expanded 2.0 version of Perspectives led to somewhat stronger effects on outcomes. Moreover, in both Studies, the improvements seen post-Perspectives were largely stable one month later.

As far as we know, Perspectives is the only intervention that has been shown to produce a stable reduction in affective polarization outside of a brief intervention. Prior studies have exclusively used one-time experimental manipulations to reduce affective polarization among research participants recruited from registries and have examined only immediate changes in affective polarization. The findings from the current study also showed that these changes in attitudes can be sustained at least one month post-intervention. 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., 2019) and polarized behavioral responses to COVID-19 (Druckman et al., 2021).

This study adds to the nascent literature on intellectual humility interventions. Perspectives users showed small to medium changes in intellectual humility from pre to post. 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 natural human tendency to be more receptive to evidence that confirms our existing beliefs and the resulting epistemic fragmentation at a societal level.

Finally, we found evidence that Perspectives may lead to an increased sense of belonging, improved self-esteem, and reduced anxiety. These findings are broadly consistent with previous correlational and experimental research, which suggests that these indices of well-being are correlated with each other and also linked to lower affective polarization and higher intellectual humility (Leary et al., 2017; Martherus et al., 2019). Because these hypotheses were exploratory, however, we did not design our studies to explicitly examine mediation. Future research should examine the mechanisms by which Perspectives may improve belonging and other indices of well-being.

While not the primary focus of the current study, the demographic differences in key outcome variables deserve some discussion. We replicated past research showing that participants’ ideology is correlated with affective polarization, with more extreme progressives and conservatives reporting the greatest out-party animus (Webster & Abramowitz, 2017). In both studies, we found that liberal participants had greater affective polarization and reported higher intellectual humility, and also showed greater reductions in affective polarization. We are not aware of other studies finding differences in affective polarization between liberals and conservatives, but our findings stand at
odds with previous research which found no group differences on intellectual humility by party membership (Leary et al., 2017). Differences in sample characteristics or in measurement may account for these discrepant findings, but more research is needed to explain and reconcile the mixed findings.

The key findings were mostly replicated across both studies. However, one inconsistency between the two studies was that libertarians showed the highest levels of intellectual humility in Study 1, but libertarians' intellectual humility was decreased in Study 2. The reason for this difference is unclear. Little is known about the psychological functioning of Libertarians (but see Iyer et al., 2012). Some literature suggests the COVID-19 pandemic and government responses to the pandemic have divided libertarians, who value individual liberty and minimal government involvement (e.g., Hamdan & Shabeeb, 2021), yet either reluctantly accept government mandates impacting the pandemic or oppose them (Block, 2020; Hamdan & Shabeeb, 2021).

Study 2’s data collection also occurred during a particularly polarizing U.S. presidential election (e.g., Jacobson, 2021). It is possible, although speculative, that the context of the pandemic and the 2020 U.S. election may have slightly shifted libertarian’s self-reports of intellectual humility.

Future Directions and Limitations

Some limitations of the current research should be noted. First, although Study 2 included a comparison group, future research should use a randomized controlled design, with participants randomly assigned to condition. A randomized controlled design provides the most rigorous test of causal effects. Moreover, our comparison sample was relatively small and composed only of college students. In addition, attrition
was high at follow-up. It is possible that these findings are a result of systematic differences in those who responded to the follow-up survey. Finally, our measurement was limited. To reduce participant burden, we used only selected items from validated scales, not the full scale. This could have increased measurement error and reduced our ability to detect true effects (Hedge et al., 2018). In addition, our assessment of outcomes relied on participant self-report of their attitudes. Future research is needed to examine whether these self-reported attitudinal shifts are observable by others and accompanied by changes in behavior, such as improved conflict resolution skills.

**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 Americans to arrive at mutually beneficial policy compromises and could ultimately undermine the nation’s foundational democratic norms (Druckman & Levy, 2021). The current study suggests that affective polarization can be reduced with an educational intervention and that these changes are maintained in the short term. The next step is to conduct a rigorous randomized controlled trial with longer-term follow-up to establish the effects of Perspectives on behavioral outcomes.
References


Fernbach, P. M., Rogers, T., Fox, C. R., & Sloman, S. A. (2013). Political extremism is supported by an illusion of understanding. *Psychological science, 24*(6), 939-946. 

[https://doi.org/10.1177%2F0956797612464058](https://doi.org/10.1177%2F0956797612464058)

Fernbach, P. M., Rogers, T., Fox, C. R., & Sloman, S. A. (2013). Political extremism is supported by an illusion of understanding. *Psychological science, 24*(6), 939-946. 

[https://doi.org/10.1177%2F0956797612464058](https://doi.org/10.1177%2F0956797612464058)

Fernbach, P. M., Rogers, T., Fox, C. R., & Sloman, S. A. (2013). Political extremism is supported by an illusion of understanding. *Psychological science, 24*(6), 939-946. 

[https://doi.org/10.1177%2F0956797612464058](https://doi.org/10.1177%2F0956797612464058)


Krumrei-Mancuso, E. J. (2017). Intellectual humility and prosocial values: Direct and


Oliver, J. E., & Wood, T. J. (2014). Conspiracy theories and the paranoid style(s) of


