Informal Psychology Education and the Fundamental Attribution Error: Testing the

Effectiveness of Accessible Online Passages

Raymond Luong[1] & Ken Butler[2]

[1] Department of Psychology, McGill University, Montreal, QC, Canada

[2] Department of Computer & Mathematical Sciences, University of Toronto Scarborough,

Toronto, ON, Canada

Author Note

Raymond Luong (iD) https://orcid.org/0000-0001-6587-6159

Ken Butler (iD) https://orcid.org/0000-0001-7821-6811

Correspondence concerning this article should be addressed to Raymond Luong, 2001

Avenue McGill College, Montréal, Quebec, Canada, H3A 1G1. raymond.luong@mail.mcgill.ca

Declarations

Abstract

Research suggests that a variety of educational interventions can be effective for reducing cognitive biases such as the fundamental attribution error (FAE). Specifically, comprehensive FAE education, such as social psychology instruction or targeted training interventions, can reduce the FAE. However, most non-experts in social psychology and members of the public are unlikely to receive such comprehensive FAE education. Instead, they would likely learn about the FAE through informal means outside of educational settings, such as through reading on the Internet. In the current study, we tested whether reading a short and accessible educational passage was effective in reducing the FAE in a between-subjects experiment. Two-hundred forty-four adults from the Reddit community r/SampleSize were randomly assigned to read an online educational passage describing the FAE (treatment) or a biology passage (control) before completing a writer attitude attribution task. Preregistered analyses indicated that participants who read the educational passage self-reported greater understanding of the FAE. However, participants committed the FAE, regardless of whether they read the educational passage. Exploratory analyses suggested that reading the educational passage did not increase perceived FAE understanding for participants with pre-existing FAE knowledge. Additionally, when compared to undergraduate students from Stalder (2012), participants who read the educational passage reported lower perceived FAE understanding than undergraduate social psychology students but not general education students. We discuss recommendations for science communicators and future research, including designing enriching FAE materials and assessing FAE reductions in context of real-world behavioral changes.

Keywords: fundamental attribution error, correspondence bias, psychology education, psychological literacy, cognitive bias

Informal Psychology Instruction and the Fundamental Attribution Error: Testing the

Effectiveness of Accessible Online Passages

Can knowing about your own cognitive biases be enough to reduce them? Simply knowing about the effects of your cognitive biases is a challenge: Research suggests that people see themselves as much less influenced by such biases than others, even when this is not the case—a so-called bias blind spot (e.g., Pronin et al., 2002). One cognitive bias of interest is the *fundamental attribution error* (FAE[1]), which is the tendency to overestimate the influence of dispositional factors and underestimate situational factors when making inferences about another person's behavior (Jones & Harris, 1967; Ross, 1977). The classic experimental FAE measure is an attitude attribution task: Participants read an essay that takes a position on a topic that they are told was freely chosen by the writer or forced (situational factor), and they are asked to infer the writer's attitude towards the topic (dispositional factor). The FAE occurs if participants infer that the writer's attitude aligns with the essay's position, even when the writer was forced to write the essay—an overestimation of dispositional over situational factors on behavior (Figure 1). Research suggests that people are aware of the FAE and that it affects how others make inferences about behavior, but they believe that they themselves are less prone to or affected by it (Van Boven et al., 1999).

This FAE blind-spot is important to address because committing the FAE can potentially lead to negative consequences. For example, overemphasizing negative dispositional inferences

---

[1] Note that we are investigating the FAE pertaining to dispositional inferences corresponding to behavior. This has also been referred to interchangeably as the *correspondence bias* (CB) in previous bias intervention studies similar to ours, which also includes those that test the FAE/CB using the same attitude attribution paradigm as ours (Hooper et al., 2015; Hopthrow et al., 2016; Morewedge et al., 2015; Scopelliti et al., 2015; Scopelliti et al., 2017). Studies demonstrating the CB more generally have also used the same attitude attribution paradigm to do so (e.g., Klein et al., 2018; Masuda and Kitayama, 2004). To stay consistent with our research materials, we refer to this bias as the FAE. For a brief history of the FAE and CB nomenclature, see Howell and Shepperd (2011).

about prisoners without considering situational factors may contribute to prisoner abuse (Haney & Zimbardo, 2009). Positive dispositional inferences can also have negative consequences. For example, O'Sullivan (2003) showed that undergraduate students who made positive dispositional inferences about liars (e.g., that they are attractive, trustworthy, likeable, friendly, and interesting) also tended to erroneously judge that they were telling the truth in a given situation, even when they were specifically instructed to avoid this error.

Psychological literacy plays a key role in reducing the FAE as comprehensive FAE education can help to overcome this FAE blind spot. Stalder (2012) found FAE reductions in social psychology students, both compared to general education students and across instruction periods (i.e., before and after completing a social psychology course on biases and the FAE). Enhanced class activities, such as a real-life case study with classroom discussion (Riggio & Garcia, 2009) or an interactive FAE demonstration (Howell & Shepperd, 2011) can reduce the FAE. Outside of social psychology classes, training interventions such as educational video games about cognitive biases and comprehensive 30-minute FAE videos can reduce the FAE (Morewedge et al., 2015).

Although social psychology students can receive comprehensive FAE education, they comprise a small fraction of the general population. Non-experts in social psychology and members of the public—both important targets of psychological literacy and FAE reduction— likely will not receive this level of training. Instead, if they ever learn about the FAE, they will likely do so through informal means outside of formal education systems that lack formal instruction/instructors, such as through reading on the Internet.

Indeed, accessible definitions of the FAE on the Internet are plentiful. For example, the FAE is frequently defined on popular psychology websites (e.g., *Psychology Today*; Sherman,

2014), news outlets (e.g., *Business Insider*; Lebowitz & Baer, 2015), and pedagogical social media posts (e.g., the r/todayilearned community on *Reddit*; [aleguiss], 2018). While these sources are valuable, they are less comprehensive than social psychology courses or FAE-specific interventions because they are often constrained by word limits, are introductory by design, and usually involve no interactive component or assessment. Online FAE passages may also be less effective precisely because they are online passages: People tend to scan and read selectively when reading online text (Liu, 2005), and Internet environments facilitate shallow learning and increased distractibility via multitasking (Loh & Kanai, 2016).

To our knowledge, only Scopelliti et al. (2015) has formally tested whether reading online FAE passages reduces the FAE. In Study 5 of Scopelliti et al. (2015), participants from Amazon Mechanical Turk (MTurk) read a short online passage (125 words) describing the FAE and reported their confidence in making dispositional attributions about behavior. Participants reported reductions in their rated confidence in making dispositional attributions about behaviors ranging from 30% to 43% reductions depending on the statistical model, suggesting that reading the passage reduced the FAE.

We investigated and extended these promising findings from Scopelliti et al. (2015) in several ways. First, the authors acknowledged generalizability issues with the use of MTurk participants. For instance, MTurk participants have reported high education levels (e.g., Martire & Watkins, 2015), which may be of interest here because educational test scores are negatively correlated with propensity for the FAE (Scopelliti et al., 2017), and the FAE passage was written far above U.S. high school readability (e.g., Flesch-Kincaid grade level of 15.12; Kincaid et al., 1975). Education levels could therefore play a role in the efficacy of FAE passage interventions, which necessitates testing more realistic passages in more general populations.

Second, the authors did not measure and account for demand characteristics. Correct hypothesis guessing was likely because participants completed a measure of bias propensity before reading the FAE passage without implementing features to obfuscate connections between the tasks, such as temporal separation of tasks or deception. In addition, MTurk participants, who tend to be non-naïve (for a review, see Meyers et al., 2020) and therefore likely to have experience with research on classic psychology effects like the FAE, would likely correctly infer the passage's purpose. Together, these sources of demand characteristics could make interpretation of results unclear.

In the current study, we investigated whether the FAE is reduced by reading an accessible educational passage in a between-subjects experiment. To expand sample generalizability and ecological validity, we recruited online participants from Reddit, a popular social media and news aggregation website. We tested two research hypotheses:

1) Self-Reported FAE Understanding: Participants who read an educational FAE passage will report greater perceived FAE understanding than participants who do not, controlling for demand characteristics.

2) Attitude Attribution Task: Participants who read an educational FAE passage will demonstrate reductions of the FAE in the attitude attribution task compared to participants who do not, controlling for demand characteristics and perceived attitudes of the attitude attribution task's subject matter.

Method

Participants

We recruited 263 adults from the Reddit community r/SampleSize ("SampleSize", 2012), which has previously provided data with favorable psychometric and demographic properties

(e.g., Jamnik & Lane, 2017). Participation was voluntary without compensation. We excluded participants who wished to exclude their data ($n = 6$), reported ages under 18 years old ($n = 4$), and demonstrated awareness of hypotheses in qualitative responses ($n = 9$), for an effective total of 244 participants. Power analyses using G*Power 3.1.9.2 (Faul et al., 2009) indicated a sample size of 256 participants. We later deemed this power analysis erroneous, so sensitivity analyses accompany all preregistered analyses alongside adjustments for assumption violations.

Materials

Research materials and analysis scripts are available as Supplementary Materials at https://osf.io/yds6q/?view_only=219760692d224368859c33e10db4e97d.[2] Preregistration details are available at https://osf.io/pkv42/?view_only=3eaff14fa583433e9e43c9595db34b99. We deviated from Preregistered Analysis 2 (attitude attribution task) due to errors. We reported the original analysis and details on these errors in the Appendix; however, our modified analysis did not change any overall conclusions.

Educational FAE Passage

Participants were randomly assigned to read an educational passage describing the FAE (treatment) or a biology passage (control). Both were written by RL, an undergraduate psychology student at the time of writing, and then screened by both JP, a professor of social psychology, and KB, a non-expert in psychology. We measured U.S. grade level readability with the Flesch-Kincaid Grade Level formula (F–K; Kincaid et al., 1975) using the *R* package *quanteda.* Readability of the FAE passage was at or below the eighth-grade level (F–K = 7.71, 190 words), and the biology passage was above high school level (F–K = 20.54, 114 words).

Self-Reported FAE Understanding

---

[2] Raw data is only available upon request from the Corresponding Author as participants did not consent to storage of their raw data on an online repository.

We used Stalder's (2012) self-reported FAE understanding scale, composed of four 7-point agreement items (e.g., "How well do you feel you know the definition of the fundamental attribution error?"). Participants in the control condition instead completed three 7-point filler items about the biology passage.

FAE Attitude Attribution Task

We adapted the attitude attribution paradigm from Jones and Harris (1967). Participants were instructed to read one paragraph of an essay in support of or against assisted suicide, framed as a student's English class assignment, and were asked to infer the writer's attitude on assisted suicide. The instructions stated whether the student freely chose their essay's position or was randomly assigned a position by the teacher. RL created both essays and designed them to look like real English assignments: They were presented as scanned pages with a staple and ostensibly-identifying information obscured with marker. Both essays were written argumentatively in MLA format with similar syntactical structure. The titles and first sentences clearly indicated the essay's position. Both essays were written at or below tenth-grade readability ($F–K_{Pro} = 10.05$, 133 words; $F–K_{Against} = 9.27$, 143 words).

We adapted three items from Masuda and Kitayama (2004), which also used an attitude attribution task with essays. They asked undergraduates to infer the writer's attitude on the essay topic, rate their own view on the essay topic, and rate the view on the essay topic of the average student from their university. In this study, participants were asked to infer the writer's attitude on assisted suicide, rate their own view on assisted suicide, and rate the average university student's view on assisted suicide, on 7-point items (1 = *Against Assisted Suicide*, 7 = *For Assisted Suicide*).

Demand Characteristics

We measured demand characteristics using the Perceived Awareness of the Research Hypothesis Scale (PARH; Rubin, 2016). We also asked participants to qualitatively guess the research hypothesis.

Previous FAE Knowledge

For exploratory analysis, we asked participants to indicate dichotomously (yes/no) whether they had any previous knowledge of the FAE: "Before completing this study, have you ever heard of the fundamental attribution error?".

Procedure

All procedures were approved by the [redacted for blinded review] Ethics Board, and all participants provided consent to participate. To hide the study's purpose and separate connections between tasks, we used a cover story. The study was titled "Perception Study" and was described as such: "[Y]ou are being invited to participate in a research study on reading and perception. We want to learn about what people are thinking when reading different texts." Participants in the treatment condition read the passage describing the FAE and rated their FAE understanding. Afterwards, they read the biology passage before completing the attitude attribution task. Participants in the control condition began with the biology passage, followed by the attitude attribution task and the FAE understanding questions without the FAE passage. All participants then provided demographics information, answered the previous FAE knowledge question, completed the PARH, and qualitatively commented on the research hypotheses before debriefing. The study was posted from March to July 2018, and participation was designed to last between five and ten minutes. On average, participants completed the experiment in 8.06 minutes ($Mdn = 7.68$, $SD = 2.93$).

Results

Preregistered Analysis 1: Self-Reported FAE Understanding

As shown in Figure 2, a one-way ANCOVA indicated that participants who read the FAE passage reported greater understanding of the FAE, $F(1, 241) = 135.69$, $p < .001$, $\omega_p^2 = .36$, 95% CI [.27, .44], $d = 1.52$, 95% CI [1.21, 1.83], %$\Delta_{\text{Passage-Control}} = 45.64\%$, controlling for demand characteristics, $F(1, 241) = 0.0085$, $p = .927$, $\omega_p^2 = .00$, 95% CI [.00, .00]. Normality and heteroskedasticity assumptions were violated, but adjustments using heteroskedasticity-consistent standard errors (HC3) and non-parametric analysis corroborated our results.

Sensitivity Analysis

Using G*Power, we estimated a minimum detectable increase in reported FAE understanding of about $d = 0.36$ at $\alpha = .05$ and $\beta = .20$.

Preregistered Analysis 2: Attitude Attribution Task

A 2 (passage) x 2 (essay position) factorial ANCOVA of the assigned essay condition ($n = 123$) indicated no evidence of a main effect of passage, $F(1, 116) = 2.05$, $p = .154$, $\omega_p^2 = .010$, 95% CI [.00, .075], or an interaction between passage and essay passage, $F(1, 116) = 2.84$, $p = .0948$, $\omega_p^2 = .015$, 95% CI [.00, .085], $d = 0.33$, 95% CI [-0.032, 0.69], but did indicate a significant main effect of essay position, $F(1, 116) = 96.59$, $p < .001$, $\omega_p^2 = .53$, 95% CI [.41, .62]. We controlled for demand characteristics, $F(1, 116) = 5.25$, $p = .0237$, $\omega_p^2 = .040$, 95% CI [.00, .131], personal perceptions of assisted suicide, $F(1, 116) = 0.53$, $p = .469$, $\omega_p^2 = .00$, 95% CI [.00, .00] and perceived student perceptions of assisted suicide, $F(1, 116) = 2.87$, $p = .0927$, $\omega_p^2 = .012$, 95% CI [.00, .078]. As seen in Figure 3, there was no significant effect of passage. However, there were differential attitude attributions between for and against essay positions in

the control group ($d = 2.80$, 95% CI [1.99, 3.60]), indicating that participants committed the

FAE. Normality and heteroskedasticity assumptions were violated, but adjustments using HC3

standard errors did not affect results. Exploratory analyses which included previous awareness of

the FAE and self-reported FAE understanding as covariates also did not affect results (see

Supplementary Materials).

Sensitivity Analysis

Assuming that the population effect size of the FAE is close to its replication in the *Many*

Labs 2 large-scale replication study ($n = 7197$, $d = 1.82$, 95% CI [1.76, 1.87]; Klein et al., 2018),

our statistical simulations estimated minimum detectable FAE attenuation of about $d = 0.52$

(55% reduction of the FAE) at $\alpha = .05$ and $\beta = .20$.

Preregistered Analysis 3: Demographics

Participant demographics are reported in Table 4. Data collection occurred over 3 months

and 22 days with a total of 3210 survey accesses (M daily accesses = 28.16, 7.60% completion

rate).

Non-Preregistered Analyses

Self-Reported FAE Understanding and Previous FAE Knowledge

Following Preregistered Analysis 1, we explored whether having previous FAE

awareness (dichotomous: yes/no) moderates the positive effect of reading the FAE passage on

self-reported FAE understanding. 50% of participants reported existing FAE awareness. A 2

(passage) x 2 (previous FAE awareness) factorial ANCOVA indicated a significant main effect

of educational passage, $F(1, 239) = 10.43$, $p = .00141$, $\omega_p^2 = .49$, 95% CI [.27, .44], a significant

main effect of existing FAE awareness, $F(1, 239) = 167.46$, $p < .001$, $\omega_p^2 = .27$, 95% CI [.18,

.35], and a significant interaction between passage and previous FAE awareness, $F(1, 239) = $

77.87, $p < .001$, $\omega_p^2 = .25$, 95% CI [.15, .33], controlling for demand characteristics, $F(1, 239) =$

0.53, $p = .417$, $\omega_p^2 = .00$, 95% CI [.00, .00]. Among participants who did not read the FAE

passage, those with previous FAE knowledge ($M = 5.06$, 95% CI [4.82, 5.30]) reported greater

FAE understanding than participants without previous FAE knowledge ($M = 3.03$, 95% CI [2.83,

3.23]). Among participants who did read the FAE passage, those with previous FAE knowledge

($M = 5.59$, 95% CI [5.38, 5.81]) did not significantly differ in FAE understanding from those

without FAE knowledge ($M = 5.63$, 95% CI [5.36, 5.89]). Our statistical simulations estimated a

minimum detectable decrease of the positive FAE passage effect on FAE understanding of about

$d = 0.36$ (i.e., 23% decrease of the observed FAE passage increase) at α = .05 and β = .20.

Comparing Self-Reported FAE Understanding with Undergraduate Students

We compared the self-reported FAE understanding of the FAE passage condition

participants ($M = 5.61$, $SD = 0.76$, $n = 110$) to undergraduate students from Stalder (2012) who

completed the same scale. In Study 1, Stalder (2012) recruited social psychology (FAE discussed

in-depth in five textbook chapters with an assignment, $n = 61$) and general education students

(FAE discussed in two textbook chapters in social sciences courses, $n = 72$). Welch's *t*-tests

indicated that our participants reported significantly lower FAE understanding compared to the

social psychology students, $t(145.89) = -4.25$, $p < .001$, $d = -0.58$, 95% CI [-0.90, -0.26], but did

not report a statistically significant difference in understanding compared to the general

education students, $t(153.38) = 1.69$, $p = .0923$, $d = 0.23$, 95% CI [-0.066, 0.53]. Using

G*Power, we estimated that a minimum detectable FAE understanding difference of about $d =$

0.45 at α = .05 and β = .20.

Passage Reading Time

After removing participants with timing errors (reading time greater than median study

completion time, $n = 4$), we compared the reading time (in minutes) of the 110 FAE passage

participants ($M = 1.39$, $SD = 0.76$) to 134 control passage participants ($M = 1.32$, $SD = 0.76$).

The expected reading time for each passage and completion of its questions was about 1.5

minutes, and we found no evidence that participants spent different amounts of time reading the

passages and answering the questions, $t(226.84) = 0.74$, $p = .459$, $d = 0.10$, 95% CI [-0.15, 0.36].

Self-Reported FAE Understanding Scale Structural Validity

Following Stalder's (2012) procedure, a principal components analysis supported a one

component solution that explained 71% of the total variance. Component loadings similar in

magnitude and identical in direction (Table 1) with high inter-item and item-total correlations

(Table 2). However, factor models are appropriate for latent constructs like FAE understanding,

and using principal components analysis instead can lead to erroneous conclusions (Park et al.,

2002). Therefore, we also conducted a one-factor confirmatory factor analysis using robust

maximum likelihood estimation (MLM; Satorra & Bentler, 2010). Considering the poor

performance of RMSEA for low-*df* models with small sample sizes (Kenny et al., 2014), the one-

factor model demonstrated adequate fit, $\chi^2_{S-B}(2) = 12.96$, $p = .002$, CFI$_{Robust}$ = .98, SRMR =

.031, RMSEA$_{Robust}$ = .15, 90% CI [.079, 0.23]. Factor loadings were statistically significant and

identical in direction (Table 1).

Both analyses corroborated a one-factor solution, so we averaged the four items to create

an FAE understanding score ($\omega = 0.85$, 95% CI [0.81, 0.88]). Average scores can produce

different results from factor scores in congeneric factor models (McNeish & Wolf, 2020), so we

also estimated factor scores from this factor model and compared them to the average scores.

The factor scores were highly correlated with the average scores, $r(242) = .99$, $p < .001$, 95% CI

[.98, .99], and our results did not meaningfully differ using the factor scores. Therefore, we

report our results with the average scores for interpretability (see Supplementary Materials for

details).

PARH Scale Structural Validity

We conducted confirmatory factor analyses using robust maximum likelihood estimation

(MLM; Satorra & Bentler, 2010) to validate the one-factor structure of the PARH. Considering

the poor performance of RMSEA for low-*df* factor models with small sample sizes (Kenny et al.,

2014), the one-factor model demonstrated adequate fit, $\chi^2_{S-B}(2) = 9.08$, $p = .011$, CFI$_{Robust}$ = .96,

SRMR = .041, RMSEA$_{Robust}$ = .219, 90% CI [.090, .37]. Given known fit issues with negatively-

keyed items (Brown, 2003), modification indices appropriately suggested including a correlated

residual variance between the two reverse-scored items (MI = 27.19). This modified one-factor

model also demonstrated adequate fit, $\chi^2_{S-B}(1) = 2.756$, $p = .097$, CFI$_{Robust}$ = .994, SRMR = .014,

RMSEA$_{Robust}$ = .110, 90% CI [0.00, 0.273] and fit better than the original model, $\chi^2_{\Delta Robust}(1) =$

5.14, $p = .02335$, ΔCFI$_{Robust}$ = .039, ΔSRMR = .027, ΔRMSEA$_{Robust}$ = .109. Factor loadings were

statistically significant and identical in direction (Table 1) with high inter-item and item-total

correlations (Table 3).

Both models corroborated a one-factor solution, so we averaged the four items to create a

PARH score ($\omega = 0.91$, 95% CI [0.87, 0.97]). Again, we also estimated factor scores from the

modified one-factor model and compared them to the average scores. The factor scores were

highly correlated with the average scores, $r(242) = .98$, $p < .001$, 95% CI [.97, .98], and our

results did not meaningfully differ using the factor scores. Therefore, we report our results with

the average scores for interpretability (see Supplementary Materials for details).

Discussion

The current study explored the efficacy of reducing the FAE by reading an accessible

educational passage. Although participants reported improved FAE understanding (large effect), that improvement was not reflected in the attitude attribution task. If educational passages are effective for reducing the FAE, we found no evidence that they would result in FAE reductions of about 55% or greater (medium effect or greater) when measured online with an attitude attribution task. These findings apply to our sample of Reddit users, reflecting a subset of general Internet users who might realistically read a short online post or article about the FAE.

This difference between perceived FAE understanding and actual FAE behavior appears characteristic of known tendencies to overestimate the efficacy of simply reading material as a learning strategy (Karpicke et al., 2009) and ability relative to one's actual performance (e.g., Kruger & Dunning, 1999). This overconfidence occurs with beginners exposed to little learning and contributes to poorer judgments (Sanchez & Dunning, 2018). Overestimation of ability also tends to occur with tasks with low perceived difficulty (Burson et al., 2006). Indeed, the FAE may have been perceived as easy to understand here because it is not a particularly technical concept and because it was described in a brief, introductory, and accessible way.

One important consequence of this overconfidence could include disregarding actual FAE susceptibility by believing that reading a passage is enough learning to avoid it. When studying definitions of psychology terms, overconfident students stop studying prematurely and retain less information long term (Dunlosky & Rawson, 2012). Moreover, people (including students) specifically using the Internet to problem-solve and answer knowledge questions overestimate their own problem-solving ability and knowledge, resulting in poorer objective performance (Pieschl, 2021). Members of the public who learn about the FAE by reading an online FAE passage—particularly non-students who lack opportunities for objective assessments of their FAE understanding—have no way to gauge or correct their overconfidence, so they may

prematurely end their learning and/or not pursue further learning before any actual FAE reductions occur. We note, however, that the increase in FAE comprehension was not a ceiling effect, suggesting that pursuing further FAE learning is still possible because participants still see room to improve their FAE understanding.

Exploratory Analyses

Our exploratory analyses suggested that previous FAE knowledge eliminates the increase in perceived understanding from reading the passage. This is unsurprising as our passage was brief, introductory, and accessible by design. Participants with prior FAE knowledge likely possessed the same or greater knowledge, so reading the passage would not affect perceived understanding or would act as a reminder at best. Although this might imply that participants with prior FAE knowledge would also not be affected by a passage as a reminder, that would mean if knowledge was effective within the sensitivity of our analyses, then those participants should demonstrate lower FAE overall. However, controlling for prior FAE knowledge had no detectable impact on the attitude attribution task.

Surprisingly, participants who read the FAE passage perceived similar FAE understanding to students who learned the FAE in two textbook chapters as part of a graded course. This coincides with our concerns regarding overconfidence in FAE comprehension. However, there are multiple explanations that should be explored in future research. First, temporality might play a role as students in Stalder (2012) responded at the end of the semester, whereas our participants responded immediately after reading the passage; responding right after reading about the FAE could make the concept of the FAE more salient, thus increasing perceived understanding. Second, this may be an artifact of inconsistent measurement properties across the studies (i.e., measurement non-equivalence) as the scale has only been structurally

validated with university students in Stalder (2012) and Reddit users here but not across these populations.

Third, our FAE passage participants and/or participants' prior FAE knowledge may have been pedagogically equivalent to the FAE coverage in those general education courses. This may even be true more generally for introductory psychology courses because social psychology comprises a fraction of content in introductory psychology textbooks (Griggs, 2014), and introductory psychology instructors generally "teach the textbook." That is, they generally do not assign readings outside of the textbook, and the amount of time spent on chapter topics in class tends to be proportional to the amount of space that the chapter takes in the textbook (Griggs, 2014; Griggs & Bates, 2014; Miller & Gentile, 1998). Hence, the FAE is likely to be covered only in a brief and introductory capacity much like our passage. Non-psychology students who take introductory psychology as their only psychology course (e.g., as an elective) or even adjacent courses with introductory psychology content coverage, such as general education courses, could be susceptible to this overconfidence in FAE understanding. This possible explanation should be explored in future research that also assesses objective FAE understanding (e.g., quiz questions) in addition to perceived FAE understanding and the occurrence of the FAE.

FAE Reduction Effect Sizes and Real-World Behavior

An important interpretational limitation of our attitude attribution task is that its corresponding effect sizes appear inflated, so we strongly caution interpreting their diagnostic value beyond the limits of our sensitivity analyses. In that respect, our findings did not conflict with Scopelliti et al. (2015), who did observe FAE reductions smaller, percentage-wise, than what we could detect. Demand characteristics also influenced the results of the attitude attribution task but not perceived FAE understanding, even after removal of aware participants

via qualitative comments, suggesting that their FAE reductions were inflated.

More generally, it is unclear how effective an FAE reduction strategy should be to be useful for real-world behaviors. We have found that studies which investigate FAE interventions rarely discuss effect sizes relative to their impact on real-world behavior. It is not clear how much reduction is useful because we have not investigated how prevalent the FAE is and how it influences downstream real-world behavior—a known concern (Gilbert & Malone, 1995) that has remained unaddressed.

Although we did not measure the prevalence of the FAE, our results can inform on the impact of the FAE passage on behavior. To make a non-trivial impact on behavior, we suggest that individual FAE reduction strategies must be highly effective on their own or multiple strategies must be highly effective in total because the FAE itself does not have a large effect on behavior. Consider Figure 4, a hypothetical path diagram in which the FAE theoretically affects behavior as an indirect effect through attitudes (possible target of dispositional inferences). The FAE increases negative attitudes about a target based on overreliance on dispositional inferences and increasing negative attitudes in turn increase negative behaviors towards the target. For illustration, we simplified the model such that path coefficients are equivalent to correlations.

Meta-analyses on the general correspondence between attitudes—an example target of dispositional inferences—and behaviors indicate a correlation of about $r = 0.51$ (e.g., Glasman & Albarracin, 2006). Our study was sensitive enough to detect an FAE reduction equivalent to $r = -0.25$. If these assumptions hold and the FAE has a strong, enduring effect on attitudes—suppose $r = 0.50$, which is large by traditional conventions for social psychological research (Cohen, 1988)—we can calculate the total (indirect) effect of the FAE passage by multiplying the path coefficients. In turn, we find that the hypothetical indirect effect of FAE education on negative

behaviors through attitudes is very small, equivalent to $\beta = -0.0625$.

Of course, this model is an extreme oversimplification with optimistic assumptions, and we are not suggesting to only pursue highly effective interventions alone. Many psychological effects are small given the complexity of human behavior (Ahadi & Diener, 1989; De Boeck & Jeon, 2018), so individual strategies are probably not effective enough alone. Rather, we suggest exploring combination approaches contextualized by the drawbacks of specific strategies. If we consider other strategies such as educational games (Morewedge et al., 2015) and interactive activities (Howell & Shepperd, 2011; Riggio & Garcia, 2009) in addition to FAE awareness, their effects could sum to a larger impact on behavior. However, the total effectiveness of multiple strategies likely does not follow our oversimplified model and should be tested in future research.

Implications for FAE Communication

Our results suggest that, at a minimum, surface-level coverage of the FAE through definitional passages alone should be avoided if the goal is to meaningfully reduce the FAE. We recommend that science communicators enrich FAE teaching materials to provide a gateway for more comprehensive educational interventions. Communications on social media that are constrained by space, accessibility, and attention limitations could adapt explanations towards salient real-world case examples—perhaps examples like the Jonestown Massacre and other newsworthy cult groups (Riggio & Garcia, 2009)—and should embed links to additional information to facilitate further learning and assessment for interested readers. To combat overconfidence in FAE understanding, some platforms may also allow embedding interactive FAE activities within the posts to facilitate objective FAE assessment; for example, built-in polls on Reddit and Twitter posts could be used to quiz the reader's understanding of the FAE.

Although our study did not test FAE communications in a formal instructional setting, we believe that introductory psychology and general education instructors can avoid surface-level coverage of the FAE while not unreasonably increasing preparation time, as evidenced by previous FAE instruction research. Instead of definitions and generic examples communicated via lecture or textbook, instructors can implement fast enrichment activities such as the 5-minute in-class FAE demonstration tested by Howell and Sheppard (2011) or teach the FAE through case studies with pre-existing materials as per Riggio and Garcia (2009). Instructors of focused social psychology classes should capitalize on their additional class time by combining in-class demonstrations/videos with an educational FAE game (Morewedge et al., 2015).

Limitations and Future Research

External and Ecological Validity

We identified three limitations that constrain the external and ecological validity of our findings. First, we emphasize the exploratory nature of many analyses presented here, which should primarily inform new directions for future investigations. Second, we acknowledge that our attitude attribution experiment, which had participants respond right after reading the FAE passage, is not entirely realistic. For example, people who read an online FAE passage in real settings may read the passage more than once, consult other FAE resources, and/or discuss with others on social media to supplement their understanding. Third, we recruited Reddit participants who presented better demographic diversity and correspondence to realistic Internet readers, but they should not be generalized broadly (i.e., to the public, to all Internet users). One important extension for future replications includes sampling across multiple platforms to recruit a wider range of people likely to encounter online FAE information. Additional replication is also important to capture other cultural groups that were not captured in our sample as cultural

differences can moderate the FAE (e.g., Masuda & Kitayama, 2004).

Study Implementation

We identified three limitations in the implementation of our study. First, we only measured the FAE under the standard single-item attitude attribution paradigm, which has been critiqued (e.g., Schwarz, 1994), only captures one attitudinal manifestation of dispositional inference, and provides limited information about the FAE for real-world behaviors. Future research could improve FAE measurement by using the Neglect of External Demands scale, a recent but well-validated measure of the FAE that encompasses multiple targets of dispositional inferences (Scopelliti et al., 2017). Second, we did not randomize question orders within any of the questionnaires, so our results may be susceptible to order effects. We do not suspect that possible order effects, if any, would change our primary conclusions because both treatment and control groups would both be affected. However, order effects potentially impacted our exploratory comparison of FAE understanding with findings from Stalder (2012), but they provided no information on question randomization. Third, we did not implement any attention or validity checks within the questionnaires, though we do not suspect fatigue or inattention to threaten data quality due to the short lengths of the passages and questionnaires.

Conclusions

Beyond improving academic achievement, an important goal of improving psychology literacy in cognitive biases like the FAE is to reduce their influence on behaviors. Here, we found no evidence that passages about the FAE that are accessible for non-experts (Reddit users) accomplish that goal. If they do work, we posit that such passages cannot make an impact large enough to use as effective interventions alone, particularly because they facilitate a potentially harmful asymmetry between perceived FAE comprehension and actual FAE susceptibility.

Overall, we hope that our findings can aid science communicators and psychology instructors to design educational materials about the FAE that are simultaneously accessible to the public, academically enriching, and effective as debiasing interventions.

References

[aleguiss]. (2018, October 18). *TIL about the Fundamental Attribution Error, a concept that describes how we blame others when bad things happen to them, but blame the external situations when bad things happen to us.* Reddit. https://www.reddit.com/r/todayilearned/comments/9p51j3/til_about_the_fundamental_attribution_error_a/

Ahadi, S., & Diener, E. (1989). Multiple determinants and effect size. *Journal of Personality and Social Psychology*, *56*(3), 398–406. https://doi.org/10.1037/0022-3514.56.3.398

Burson, K. A., Larrick, R. P., & Klayman, J. (2006). Skilled or unskilled, but still unaware of it: How perceptions of difficulty drive miscalibration in relative comparisons. *Journal of Personality and Social Psychology*, *90*(1), 60–77. https://doi.org/10.1037/0022-3514.90.1.60

Brown, T. A. (2003). Confirmatory factor analysis of the Penn State Worry Questionnaire: Multiple factors or method effects? *Behaviour Research and Therapy*, *41*(12), 1411–1426. https://doi.org/10.1016/S0005-7967(03)00059-7

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences (2nd ed.)*. Hillsdale, NJ: Erlbaum.

De Boeck, P., & Jeon, M. (2018). Perceived crisis and reforms: Issues, explanations, and remedies. *Psychological Bulletin*, *144*(7), 757–777. https://doi.org/10.1037/bul0000154

Dunlosky, J., & Rawson, K. A. (2012). Overconfidence produces underachievement: Inaccurate self evaluations undermine students' learning and retention. *Learning and Instruction*, *22*(4), 271–280. https://doi.org/10.1016/j.learninstruc.2011.08.003

Faul, F., Erdfelder, E., Lang, A. G., & Buchner, A. (2007). G*Power 3: A flexible statistical

power analysis program for the social, behavioral, and biomedical sciences. *Behavior Research Methods*, *39*, 175-191. https://doi.org/10.3758/BF03193146

Gilbert, D. T., & Malone, P. S. (1995). The correspondence bias. *Psychological Bulletin*, *117*(1), 21. https://doi.org/10.1037/0033-2909.117.1.21

Glasman, L. R., & Albarracín, D. (2006). Forming attitudes that predict future behavior: A meta-analysis of the attitude–behavior relation. *Psychological Bulletin*, *132*(5), 778–822. https://doi.org/10.1037/0033-2909.132.5.778

Griggs, R. (2014). Topical coverage in introductory textbooks from the 1980s through the 2000s. *Teaching of Psychology*, *41*, 5–10. https://doi.org/10.1177/0098628313514171

Griggs, R., & Bates, S. (2014). Topical coverage in introductory psychology: Textbooks versus lectures. *Teaching of Psychology*, *41*, 144–147. https://doi.org/10.1177/0098628314530347

Haney, C., & Zimbardo, P. G. (2009). Persistent dispositionalism in interactionist clothing: Fundamental attribution error in explaining prison abuse. *Personality and Social Psychology Bulletin*, *35*(6), 807–814. https://doi.org/10.1177/0146167208322864

Hooper, N., Erdogan, A., Keen, G., Lawton, K., & McHugh, L. (2015). Perspective taking reduces the fundamental attribution error. *Journal of Contextual Behavioral Science*, *4*(2), 69–72. https://doi.org/10.1016/j.jcbs.2015.02.002

Hopthrow, T., Hooper, N., Mahmood, L., Meier, B. P., & Weger, U. (2017). Mindfulness reduces the correspondence bias. *Quarterly Journal of Experimental Psychology (2006)*, *70*(3), 351–360. https://doi.org/10.1080/17470218.2016.1149498

Howell, J. L., & Shepperd, J. A. (2011). Demonstrating the correspondence bias. *Teaching of Psychology*, *38*(4), 243–246. https://doi.org/10.1177/0098628311421320

Jamnik, M. R., & Lane, D. J. (2017). The use of Reddit as an inexpensive source for high-quality data. *Practical Assessment, Research & Evaluation*, *22*(5), 1-10. https://doi.org/10.7275/swgt-rj52

Jones, E. E., & Harris, V. A. (1967). The attribution of attitudes. *Journal of Experimental Social Psychology, 3*(1), 1-24. https://doi.org/10.1016/0022-1031(67)90034-0

Karpicke, J. D., Butler, A. C., & Roediger, H. L. (2009). Metacognitive strategies in student learning: Do students practise retrieval when they study on their own? *Memory (Hove, England)*, *17*(4), 471–479. https://doi.org/10.1080/09658210802647009

Kenny, D. A., Kaniskan, B., & McCoach, D. B. (2015). The Performance of RMSEA in models with small degrees of freedom. *Sociological Methods & Research*, *44*(3), 486–507. https://doi.org/10.1177/0049124114543236

Klein, R. A., Vianello, M., Hasselman, F., Adams, B. G., Adams, R. B., Alper, S. ,…Nosek, B. A. (2018). Many Labs 2: Investigating variation in replicability across samples and settings. *Advances in Methods and Practices in Psychological Science*, *1*(4), 443–490. https://doi.org/10.1177/2515245918810225

Kruger, J., & Dunning, D. (1999). Unskilled and unaware of it: How difficulties in recognizing one's own incompetence lead to inflated self-assessments. *Journal of Personality and Social Psychology*, *77*(6), 1121–1134. https://doi.org/10.1037//0022-3514.77.6.1121

Lebowitz, S., & Baer, D. (2015, August 12). *15 cognitive biases that screw up your relationships*. Business Insider. https://www.businessinsider.com/cognitive-biases-affect-relationships-2015-8

Liu, Z. (2005). Reading behavior in the digital environment: Changes in reading behavior over the past ten years. *Journal of Documentation*, *61*(6), 700–712.

https://doi.org/10.1108/00220410510632040

Loh, K. K., & Kanai, R. (2016). How has the Internet reshaped human cognition? *The Neuroscientist*, *22*(5), 506–520. https://doi.org/10.1177/1073858415595005

Martire, K. A., & Watkins, I. (2015). Perception problems of the verbal scale: A reanalysis and application of a membership function approach. *Science & Justice: Journal of the Forensic Science Society*, *55*(4), 264–273. https://doi.org/10.1016/j.scijus.2015.01.002

Masuda, T., & Kitayama, S. (2004). Perceiver-induced constraint and attitude attribution in Japan and the US: A case for the cultural dependence of the correspondence bias. *Journal of Experimental Social Psychology*, *40*, 409-416. https://doi.org/10.1016/j.jesp.2003.08.004

McNeish, D., & Wolf, M. G. (2020). Thinking twice about sum scores. *Behavior Research Methods*, *52*(6), 2287–2305. https://doi.org/10.3758/s13428-020-01398-0

Meyers, E. A., Walker, A. C., Fugelsang, J. A., & Koehler, D. J. (2020). Reducing the number of non-naïve participants in Mechanical Turk samples. *Methods in Psychology*, *3*, 100032. https://doi.org/10.1016/j.metip.2020.100032

Miller, B., & Gentile, B. F. (1998). Introductory course content and goals. *Teaching of Psychology*, *25*(2), 89–96. https://doi.org/10.1207/s15328023top2502_2

Morewedge, C. K., Yoon, H., Scopelliti, I., Symborski, C. W., Korris, J. H., & Kassam, K. S. (2015). Debiasing decisions: Improved decision making with a single training intervention. *Policy Insights from the Behavioral and Brain Sciences*, *2*(1), 129–140. https://doi.org/10.1177/2372732215600886

O'Sullivan, M. (2003). The fundamental attribution error in detecting deception: The boy-who-cried-wolf effect. *Personality and Social Psychology Bulletin*, *29*(10), 1316–1327.

https://doi.org/10.1177/0146167203254610

Park, H. S., Dailey, R., & Lemus, D. (2002). The use of exploratory factor analysis and

principal components analysis in communication research. *Human Communication

Research*, *28*(4), 562–577. https://doi.org/10.1111/j.1468-2958.2002.tb00824.x

Pieschl, S. (2021). Will using the Internet to answer knowledge questions increase users'

overestimation of their own ability or performance? *Media Psychology*, *24*(1), 109–135.

https://doi.org/10.1080/15213269.2019.1668810

Pronin, E., Lin, D. Y., & Ross, L. (2002). The Bias Blind Spot: Perceptions of bias in self

versus others. *Personality and Social Psychology Bulletin*, *28*(3), 369–381.

https://doi.org/10.1177/0146167202286008

Riggio, H. R., & Garcia, A. L. (2009). The power of situations: Jonestown and the fundamental

attribution error. *Teaching of Psychology*, *36*(2), 108–112.

https://doi.org/10.1080/00986280902739636

Ross, L. (1977). *The intuitive psychologist and his shortcomings: Distortions in the attribution

process*. In L. Berkowitz (Ed.), *Advances in experimental social psychology* (Vol. 10, pp.

173-219). New York: Academic Press.

Rubin, M. (2016). The Perceived Awareness of the Research Hypothesis Scale: Assessing the

influence of demand characteristics. *Figshare*.

https://doi.org/10.6084/m9.figshare.4315778.v2

"SampleSize". (2012). Retrieved from https://www.reddit.com/r/SampleSize/

Sanchez, C., & Dunning, D. (2018). Overconfidence among beginners: Is a little learning a

dangerous thing? *Journal of Personality and Social Psychology, 114*(1), 10–28.

https://doi.org/10.1037/pspa0000102

Satorra, A., & Bentler, P. M. (2010). Ensuring positiveness of the scaled difference chi-square

 test statistic. *Psychometrika*, *75*(2), 243–248.

 https://doi.org/10.1007/s11336-009-9135-y

Schwarz, N. (1994). Judgment in a social context: Biases, shortcomings, and the logic of

 conversation. In M. P. Zanna (Ed.), *Advances in Experimental Social Psychology* (Vol.

 26, pp. 123–162). Academic Press. https://doi.org/10.1016/S0065-2601(08)60153-7

Scopelliti, I., Min, H. L., McCormick, E., Kassam, K. S., & Morewedge, C. K. (2017).

 Individual differences in correspondence bias: Measurement, consequences, and

 correction of biased interpersonal attributions. *Management Science*, *64*(4), 1879–1910.

 https://doi.org/10.1287/mnsc.2016.2668

Scopelliti, I., Morewedge, C. K., McCormick, E., Min, H. L., Lebrecht, S., & Kassam, K. S.

 (2015). Bias Blind Spot: Structure, measurement, and consequences. *Management

 Science*, *61*(10), 2468–2486. https://doi.org/10.1287/mnsc.2014.2096

Sherman, M. (2014, June 20). *Why We Don't Give Each Other a Break*. Psychology Today.

 http://www.psychologytoday.com/blog/real-men-dont-write-blogs/201406/why-we-dont-

 give-each-other-break

Stalder, D. R. (2012). A role for social psychology instruction in reducing bias and conflict.

 Psychology Learning and Teaching, 11, 245-255.

 https://doi.org/10.2304/plat.2012.11.2.245

Van Boven, L., Kamada, A., & Gilovich, T. (1999). The perceiver as perceived: Everyday

 intuitions about the correspondence bias. *Journal of Personality and Social Psychology*,

 *77*(6), 1188–1199. https://doi.org/10.1037/0022-3514.77.6.1188

Figure 1

Hypothetical FAE and FAE Reduction Intervention Demonstrated by Attitude Attribution Task
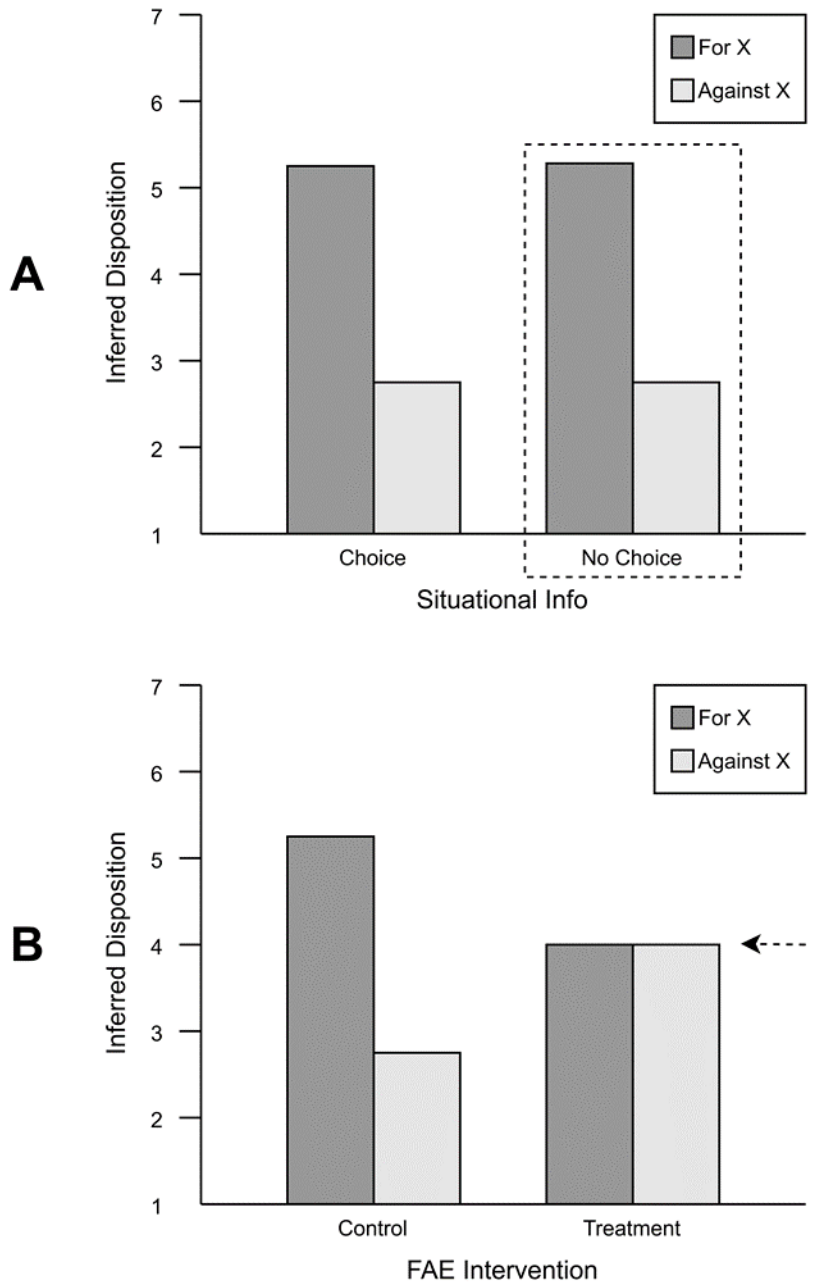
Note. 1A shows the FAE: Inferred dispositions correspond to the position despite the writer having no choice. 1B shows an intervention eliminating the FAE where inferred dispositions are equal in the Treatment group (e.g., scale midpoint, perception of average disposition for X).

Figure 2

Effect of FAE Passage on Self-Reported FAE Understanding
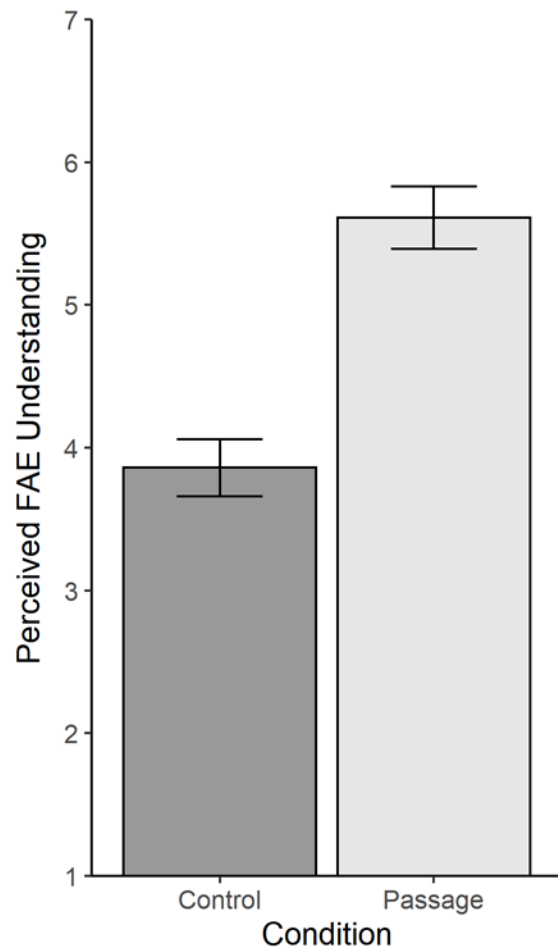
Note. Error bars represent 95% CIs. Estimated marginal means are adjusted for demand

characteristics.

Figure 3

Effect of FAE Passage on the Attitude Attribution Task
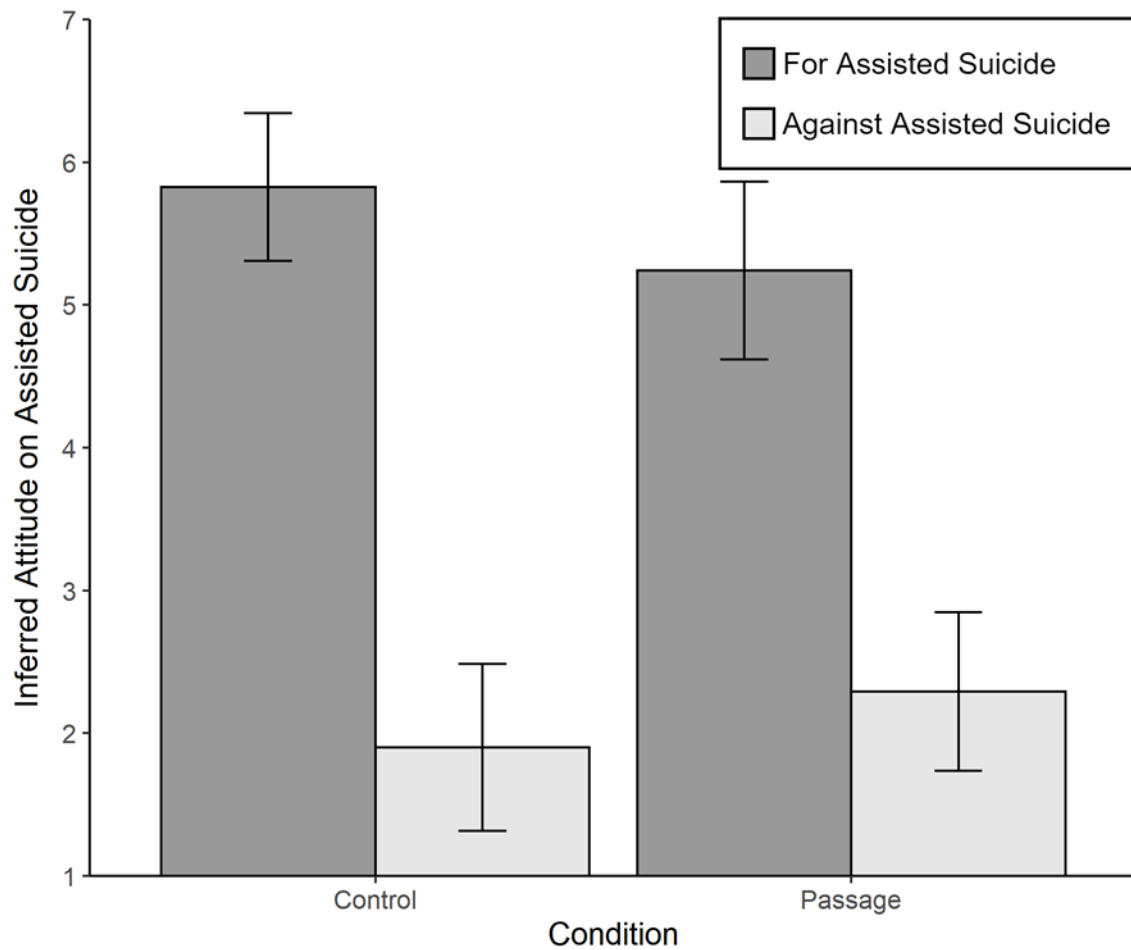
Note. Error bars represent 95% CIs. Estimated marginal means are adjusted for perceptions of assisted suicide, perceptions of the average university student's perceptions of assisted suicide, and demand characteristics.

Figure 4

Hypothetical Path Diagram for the Effect of FAE Passages on Behavior
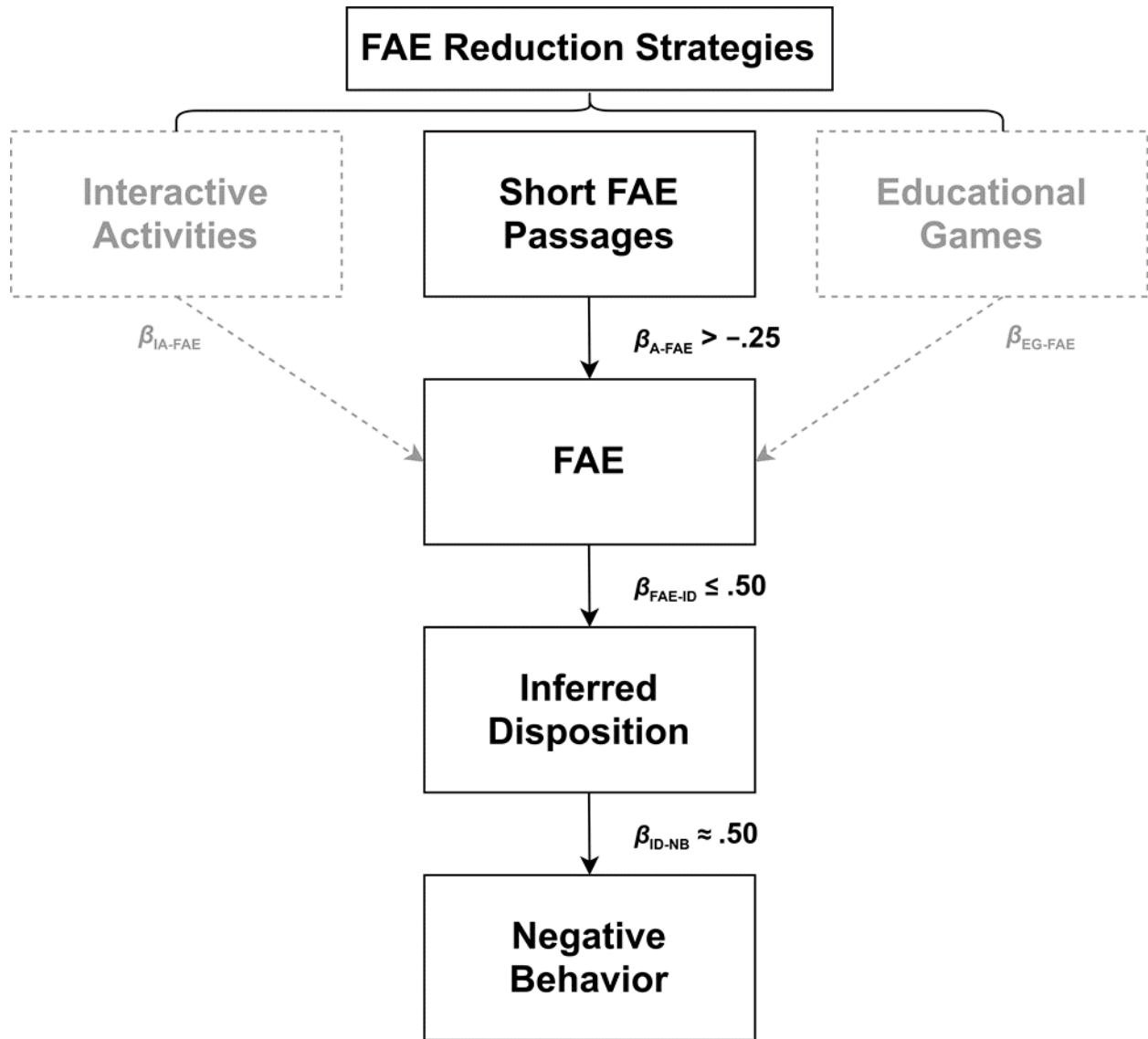
Note. The total (indirect) effect of FAE awareness on behavior is the product of its paths represented as beta coefficients, and the total (indirect) effect of the example FAE mitigation strategies is the sum of all three products.

Table 1

Factor Loadings and Components for the Self-Reported FAE Understanding and PARH Scales

		One-Factor Model (CFA)			Principal Components			
	Item	λ	SE_λ	p	PC1	PC2	PC3	PC4
	Q1	1.72	0.080	< .001	0.50	0.40	0.73	0.26
Self-Reported	Q2	0.96	0.078	< .001	0.48	0.57	-0.66	
FAE	Q3	1.41	0.096	< .001	0.53	-0.29		-0.80
Understanding	Q4	1.27	0.104	< .001	0.49	-0.66	-0.17	0.54
	Q1	1.43	0.081	< .001				
PARH Scale	Q2	1.17	0.086	< .001				
	Q3	1.10	0.095	< .001				
	Q4	1.12	0.092	< .001				

Note. Factor loadings are unstandardized and were estimated without a marker item

(identification by variance standardization). The factor loadings for the PARH are from the

modified model. The principal components analysis used the correlation matrix for calculations.

Table 2

Inter-Item and Item-Total Correlations for the Perceived FAE Understanding Scale

Item	*M*	*SD*	1	2	3	4
1. SR1	4.21	2.29				
2. SR2	5.32	1.34	.62 [.54, .69]			
3. SR3	4.62	1.60	.66 [.58, .72]	.61 [.53, .69]		
4. SR4	4.45	1.63	.55 [.46, .63]	.54 [.44, .62]	.72 [.65, .77]	
5. Total	4.65	1.45	.87 [.84, .90]	.80 [.74, .84]	.88 [.84, .90]	.82 [.78, .86]

Note. Correlations are Pearson correlation coefficients, *n* = 244, *p*s < .001. Values in square

brackets are 95% confidence intervals.

Table 3

Inter-Item and Item-Total Correlations for the PARH Scale

Item	*M*	*SD*	1	2	3	4
1. PARH 1	3.18	1.61				
2. PARH 2	3.18	1.57	.68 [.60, .74]			
3. PARH 3	2.83	1.43	.68 [.61, .75]	.55 [.46, .63]		
4. PARH 4	3.10	1.58	.62 [.53, .69]	.73 [.67, .79]	.58 [.48, .65]	
5. Total	3.07	1.32	.87 [.84, .90]	.87 [.84, .90]	.81 [.77, .85]	.86 [.82, .89]

Note. Correlations are Pearson correlation coefficients, $n = 244$, ps $< .001$. Values in square brackets are 95% confidence intervals.

Table 4

Participant Demographics

	%	*M*	*SD*
Age		24.89	6.56
Gender			
Male	44		
Female	53		
Non-Binary	3		
Highest Level of Education			
Less than High School	2		
High School (or equivalent)	20		
Some Post-Secondary	30		
Associate Degree	5		
Bachelor's Degree	23		
Some Post-Graduate	4		
Master's Degree	10		
Professional Degree	1		
Doctoral Degree	3		
Country of Responding			
United States	51		
Canada	9		
United Kingdom	9		
Germany	4		

Australia	3
Other	24

Appendix

Original Preregistered Analysis 2: Testing FAE Hypotheses from Jones and Harris (1967)

The original plan for the FAE reduction analysis (Preregistered Analysis 2) used a 2 (passage) x 2 (essay position) x 2 (essay assignment) ANCOVA, controlling for demand characteristics, personal perceptions of assisted suicide, and perceived student perceptions of assisted suicide. If the three-way interaction was not significant, then we would follow up by testing the 2 (essay position x 2 (essay assignment) ANCOVA to verify that the FAE was replicated as per Jones and Harris (1967). Testing whether the passage reduced the FAE and whether the FAE replicated only required examining the forced essay assignment condition and not the freely chosen condition (i.e., a 2 [passage] x 2[essay position] interaction under the assigned essay condition). However, the original strategy tested whether *both* hypotheses from Experiment 2 of Jones & Harris (1967) were affected by reading the FAE passage—namely the disparity between in inferred attitudes appearing in *both* essay position conditions—which was a more ambitious goal that required a larger sample size than planned. The original planned analysis was thus much less efficient for detecting an FAE reduction.

We report the original three-way interaction analysis for transparency here; the results from the original analysis support the conclusions in the main text. A 2 (passage) x 2 (essay position) x 2 (essay assignment) factorial ANCOVA indicated no significant main effect of passage, $F(1, 233) = 0.11$, $p = .745$, $\omega_p^2 = .001$, 95% CI [.00, .024], but did indicate a significant main effect of essay assignment, $F(1, 233) = 14.96$, $p < .001$, $\omega_p^2 = .019$, 95% CI [.00, .068], and essay position, $F(1, 233) = 405.58$, $p < .001$, $\omega_p^2 = .79$, 95% CI [.75, .83]. Furthermore, there was no evidence of a two-way interaction between passage and essay assignment, $F(1, 233) = 1.30$, p

= .255, ω_p^2 = -.004, 95% CI [.00, .00] or passage and essay position, $F(1, 233) = 0.057$, $p = .811$,

ω_p^2 = .015, 95% CI [.00, .059], but there was a significant two-way interaction between essay

assignment and essay position, $F(1, 233) = 20.90$, $p < .001$, ω_p^2 = .18, 95% CI [.10, .27]. Finally,

there was no evidence of a three-way interaction between passage, essay position, and essay

assignment, $F(1, 233) = 2.11$, $p = .147$, ω_p^2 = .005, 95% CI [.00, .037], indicating no difference

in FAE form across passage conditions. We controlled for demand characteristics, $F(1, 233) =$

8.65, $p = .00360$, ω_p^2 = .048, 95% CI [.009, .11], personal perceptions of assisted suicide, $F(1,$

$233) = 0.94$, $p = .333$, ω_p^2 = .-.004, 95% CI [.00, .00], and perceived student perceptions of

assisted suicide, $F(1, 233) = 2.61$, $p = .107$, ω_p^2 = .017, 95% CI [.00, .063].

Sensitivity Analysis

Assuming that the population effect size of the FAE is close to its replication in the Many

Labs 2 large-scale replication study ($n = 7197$, $d = 1.82$, 95% CI [1.76, 1.87]; Klein et al., 2018),

our statistical simulations estimated a minimum FAE form change, assumed to be FAE

reduction, of about $d = 0.73$ (77.5% reduction of the FAE) at $\alpha = .05$ and $\beta = .20$.