

Misinformation, fake news, and the belief perseverance bias

Teaching material for high schools and universities

Dear high-school teacher, dear university lecturer,

This material has been developed within the research project [PerFake](#) to teach high-school and university students about the belief perseverance bias. Namely, using the provided material, students will learn:

- how fake news and misinformation negatively impact individuals' opinions and decisions,
- about the belief perseverance bias,
- about methods to mitigate the belief perseverance bias.

The teaching unit provides the opportunity for the students to **learn by experience**. Namely, the students can learn and better understand the functioning of the belief perseverance bias in relation to misinformation and fake news by actively participating in an **online experiment**.

Preparation for the lecture

To properly prepare for the lecture, we recommend the teacher/lecturer to watch the [video](#) (11 minutes) or read the general information about the PerFake project at <https://perfake-project.upol.cz/>. Additionally, the teacher/lecturer can also watch the [video for academics](#) (17 minutes) containing a detailed description of the experiments and the research results to gain more sophisticated background information.

Content of the teaching unit

The teaching unit consists of four phases:

1. **Online experiment:** Students complete an online experiment by using the provided link or the QR code.
2. **Input by the teacher/lecturer:** The teacher/lecturer explains the functioning of the belief perseverance bias in relation to misinformation and fake news by using the provided teaching material.
3. **Class discussion:** Students critically reflect on the belief perseverance bias under the guidance of the teacher/lecturer using their experience with the online experiment and the provided material.
4. **Summary and practical guidelines:** The students receive a short manual with a brief summary of the main takeaways and practical guidelines on preventing and correcting the belief perseverance bias and discuss the recommendations in the guidelines.

The time estimation for the teaching block is 45 – 60 minutes.

Phase 1: Online experiment

Duration: about **15 minutes**

Each student can participate in the experiment by using the provided link or the QR code.

Link: <http://bit.ly/30PKH6F>

QR code:



The experiment has a form of an online survey and is conducted using the survey platform Qualtrics. Any device with internet access can be used to access the survey.

The experiment is anonymous and lasts about 12 minutes. No sensitive data about the participants are collected, and the participants are free to end their participation at any time during the experiment. The experiment was approved by the Ethics Committee of the Management Center Innsbruck (Austria).

To ensure that the students can learn by experiencing the belief perseverance bias on their own, the real purpose of the experiment should not be revealed to the students before conducting the experiment. For this reason, the online experiment is present as a “*Survey of opinion on remote work and work in a traditional office among young people soon entering their working life*” at the very beginning of the experiment. In particular, the following informative text is displayed to the students at the beginning of the experiment:



Survey of opinion on remote work and work in a traditional office among young people soon entering their working life

Due to the COVID-19 pandemic, many companies with office jobs have been forced to switch to remote work. After this experience, some companies consider switching to remote work permanently in the future. However, it is not clear whether switching from traditional in-office work to remote work can work well in the long term.

Therefore, the current survey explores the opinions and preferences concerning the work modalities among young people soon entering their working life.

We very much appreciate your participation in this survey. Your opinion is very important for us.

The survey is anonymous and lasts about 12 minutes.

This alleged purpose of the study should also be communicated to the students by the teacher/lecturer at the beginning of the lecture.

The real purpose of the experiment is then explained in detail to the students at the very end of the online experiment. Thus, students are fully aware of the real purpose of the experiment after having completed it, and the teacher/lecturer can, therefore, refer to this real purpose of the experiment from now on. In particular, the following explanation together with encouragement to reflect on and discuss the experiment in the class is displayed to the students at the end of the experiment:

Let us now reveal the **real purpose of the survey**.

The survey did not aim to explore public opinion on the advantages of remote and in-office work for companies as claimed initially. This little deception was necessary to divert your attention from the **real purpose - studying the belief perseverance bias and methods reducing the bias**.

The blog article you read at the beginning of the survey was invented with the intention to examine how misinformation influences peoples' opinion, whether they suffer from the belief perseverance bias after the retraction of misinformation, and subsequently, test methods to reduce the belief perseverance bias.

Now, as you know that the article has been invented, it should have no influence on your opinion on the topic.

This experiment was conducted with 988 participants. The experiment showed that 58% of the participants got influenced by the misinformation, and 42% even suffered from the belief perseverance bias after the retraction of misinformation. It is, therefore, likely that the majority of the students in your class got influenced by misinformation in this experiment, and a large part of you even suffered from the belief perseverance bias after the retraction of misinformation.

The debiasing method you were confronted with in the last part of the experiment is one of two debiasing methods that proved to be effective in reducing the belief perseverance bias.

Use the experience gained in the experiment to **reflect on and discuss** in the class the reasons why many of you got influenced by the article and why some of you suffered from the belief perseverance bias after the retraction of misinformation.

Steps of the experiment:

1. **Introduction:** Information about the alleged purpose of the study (see above).
2. **Demographical questions:** Age, gender, country of residence
3. **Initial opinion:** Students express their initial opinion on remote and in-office work by answering a set of three questions.
4. **Misinformation:** Students read an invented article arguing why remote work is better for companies than working in an office.
5. **Opinion after reading the article:** Students again express their opinion on remote and in-office work by answering another set of three questions.
6. **Retraction of misinformation:** Students are informed that the article they read in Step 2 was retracted. The alleged reasons for the retraction are provided as well.
7. **Opinion after the retraction of misinformation:** Students again express their opinion on remote and in-office work by answering another set of three questions.
8. **Debiasing:** Each student is randomly assigned one of two debiasing methods – awareness training or counter-speech.
9. **Opinion after debiasing:** Students again express their opinion on remote and in-office work by answering another set of three questions.
10. **Debriefing:** Students are informed about the real purpose of the experiment and encouraged to reflect on and discuss the experiment in the class (see above).

Phase 2: Input by the teacher/lecturer

Duration: about **15 minutes**

After the students complete the online experiment, the teacher/lecturer uses the provided teaching material (presentation in PDF format can be downloaded [here](#)) to:

- Define misinformation and fake news
- Emphasize the possible negative consequences of misinformation and fake news for individuals and society
- Define the belief perseverance bias and explain its functioning on particular examples
- Show that belief perseverance exists and can be demonstrated in an experimental setting by referring to the results of the experiment the students participated in
- Describe methods able to reduce the belief perseverance bias after the retraction of misinformation or fake news and refer to the results of the experiment to show the effectiveness of the methods
- Formulate recommendation how the belief perseverance bias can be mitigated in practice

Phase 3: Class discussion

Duration: **10 to 25 minutes** (Depends on how active the students are. The duration can be adapted depending on the remaining time available.)

Class discussion can follow or be combined with Phase 2. In this phase, the students should get the possibility to actively reflect on what happened during the experiment, whether and how their opinion changed during the experiment, whether they might have suffered from the belief perseverance in the past, and how they could actively reduce the belief perseverance bias in the future.

The teacher/lecturer can use the following **questions to stimulate students' reflection**:

- Do you think your opinion concerning remote and in-office work changed during the experiment?
- What was your opinion at the beginning of the experiment?
 - a) Office work is better than remote work.
 - b) Remote work is better than office work.
 - c) Neither remote nor office work is better than the other.
- Did you find the article convincing? Why? Why not?
- Did you change your opinion after reading the article? Why? Why not?

(Note: Over 58% of 988 participants in the experiment changed their opinion after reading the article. Therefore, it is quite likely that about the same percentage of the students in this class changed their opinion as well after reading the article.)
- Do you think you suffered from the belief perseverance bias after you have been informed that the article was retracted?

(Note: Over 42% of 988 participants in the experiment suffered from the belief perseverance. Therefore, it is quite likely that about the same percentage of the students in this class suffered from the belief perseverance as well.)
- Why do you think you suffered from the belief perseverance?
- Do you think that the belief perseverance occurs in real life?
- Do you think you have suffered from belief perseverance bias in the past?
- How could you prevent the belief perseverance bias in the future?
- What will you pay attention to when encountering fake news and misinformation in the future?

The printout (document in DOCX format) with the above-listed questions to stimulate students' reflection and discussion can be downloaded [here](#).



<https://perfake-project.upol.cz/>

Phase 4: Summary and practical guidelines

Duration: **5 minutes**

After the reflection phase, the teacher/lecturer can distribute to the students a short 2-page **Manual on mitigating the belief perseverance bias** (manual in PDF format can be downloaded [here](#)). The manual summarizes the most important takeaways from the lecture and provides practical guidelines on how to prevent or correct the belief perseverance bias in relation to misinformation and fake news in the future. The teacher/lecturer should review with the students the guidelines on preventing and correcting the belief perseverance bias (p. 2 of the manual) and ideally refer to students' reflections in the Class discussion phase on how they could prevent the belief perseverance bias in the future.

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For more information about the PerFake project, visit <https://perfake-project.upol.cz/>.