

# Open Science Badges foster lay people's trust in scientists

## (Re)Building trust?

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## Introduction

Trust in science and scientists is generally high, but drops when learning about challenges in replication (Hendriks et al., 2020). Approaches to outline 'open reforms' in science on a general level do not seem to rebuild trust in science (Anvari & Lakens, 2019; Wingen et al., 2019). We thus shift the focus to concrete applications of open science practices (OSP) in journal articles such as open practice badges. As their effect may interact with epistemic beliefs (Hofer & Pintrich, 1997), we further will investigate their role in this context.

## Research Questions

- Does the **visibility of OSP** influence perceived **trustworthiness** in scientists?
- Is there a relationship between **multiplistic epistemic beliefs** and the perceived **trustworthiness** in scientists?
- Do **multiplistic epistemic beliefs** moderate the effect of [1.]?
- Does the **visibility of OSP** influence **multiplistic epistemic beliefs**?

Preregistration: [osf.io/ybs7f](https://osf.io/ybs7f)

## Methods

**Sample:** 270 student teachers

**Design:**

- Stimuli: title pages of artificial journal article research reports
- Conditions:
  - visOSP: author *engaged* in OSP, visible through badges
  - nonOSP: author *did not engage* in OSP, visible through badges
  - nonvis: no information about engagement in OSP, no badges
- randomized assignment to two of the conditions

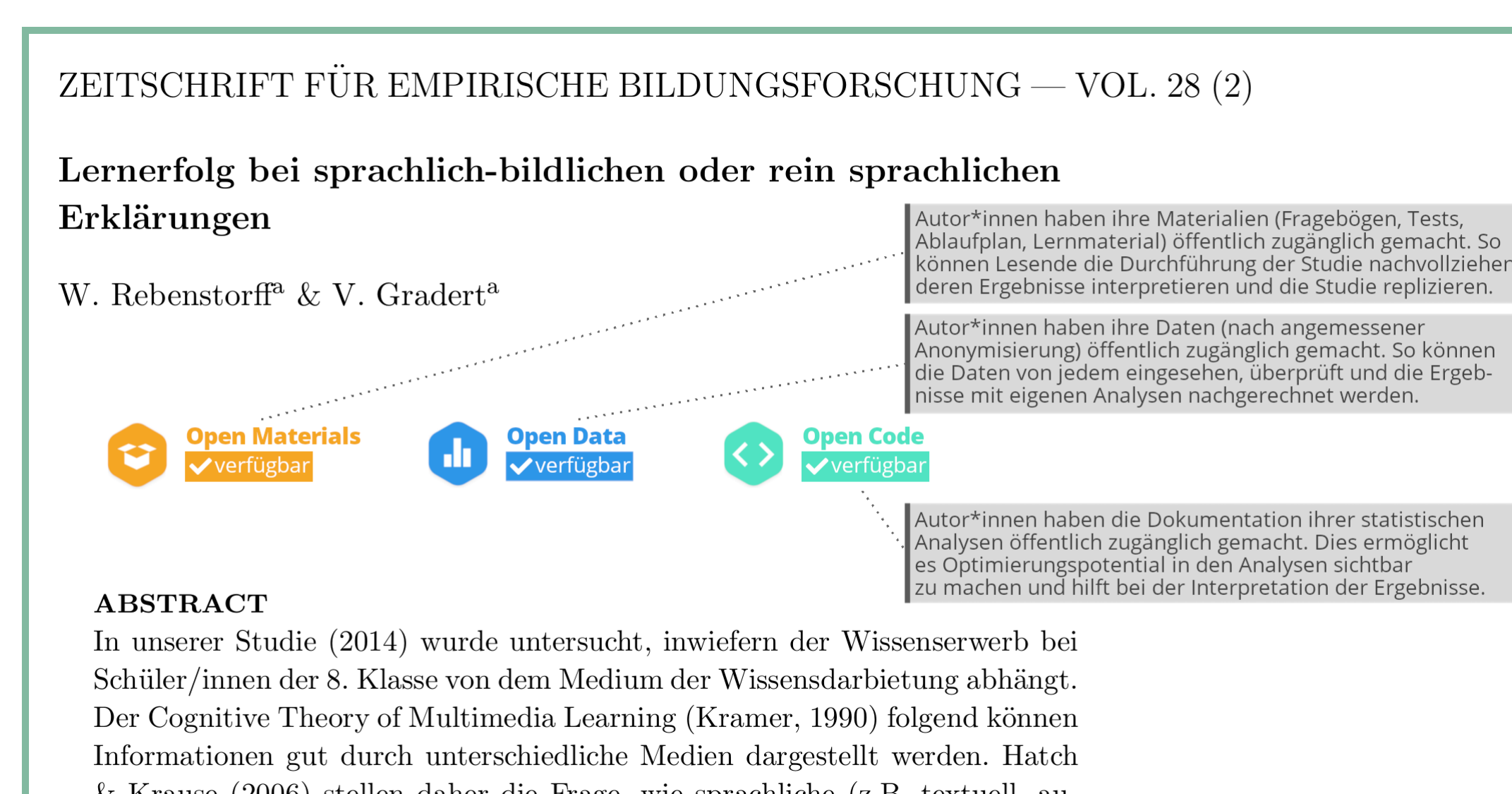


Figure 1: Stimuli of condition visOSP

**Measures:**

- Laypeople's Trust in Experts (Hendriks et al., 2015)
- Topic specific multiplistic epistemic beliefs (Merk et al., 2017)
- Topic specific treatment check

Questionnaire: [rbt-demo.formr.org](https://rbt-demo.formr.org)

## Results

**Research Question 1**

$$\begin{aligned} H1: \mu_{nonOSP} &= \mu_{nonvis} = \mu_{visOSP} \\ H2: \mu_{nonOSP} &< \mu_{nonvis} < \mu_{visOSP} \\ H3: \mu_{nonOSP} &< \mu_{nonvis} = \mu_{visOSP} \end{aligned}$$

- ✓ Highest posterior probability for H2.
- ✓  $BF_{21} = 5.24 \cdot 10^7$ ;  $BF_{23} = 5.60 \cdot 10^1$

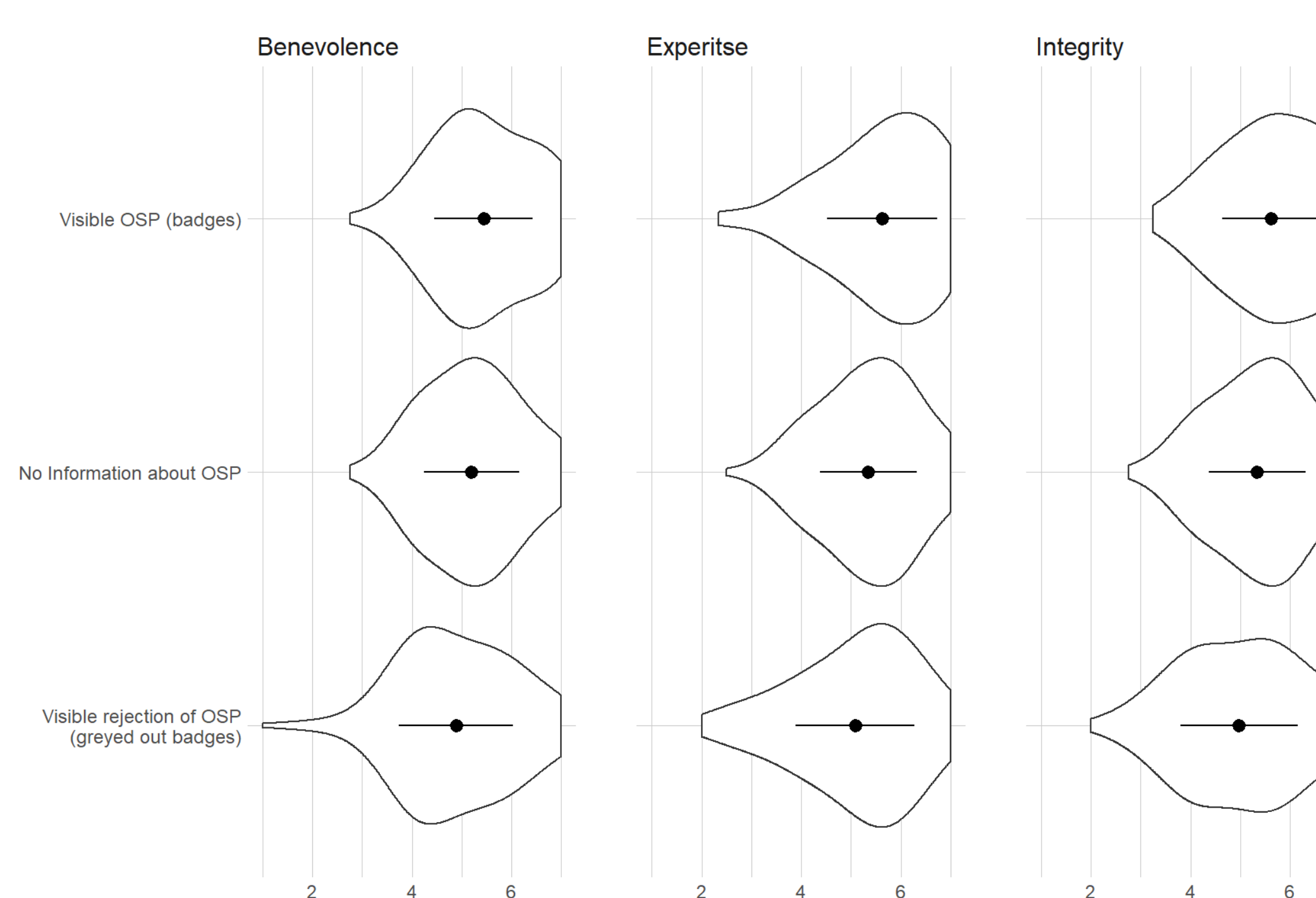


Figure 2: Trustworthiness subscales by treatment. Violinplots and means  $\pm 1*SD$

**Research Question 2**

$$\begin{aligned} H1: r_{mult-trust} &< 0 \\ H2: r_{mult-trust} &= 0 \end{aligned}$$

- ✓ Highest posterior probability for H1.
- ✓  $BF_{12} = 1.17 \cdot 10^{21}$

**Research Question 3**

$$\begin{aligned} H1: r_{(mult-trust)}^{nonOSP} &< r_{(mult-trust)}^{nonvis} < r_{(mult-trust)}^{visOSP} \\ H2: (r_{(mult-trust)}^{nonOSP}, r_{(mult-trust)}^{nonvis}) &< r_{(mult-trust)}^{visOSP} \\ H3: r_{(mult-trust)}^{nonOSP} &= r_{(mult-trust)}^{nonvis} = r_{(mult-trust)}^{visOSP} \end{aligned}$$

- × Highest posterior probability for H3.
- ×  $BF_{31} = 13.76$ ;  $BF_{32} = 17.38$



Figure 3: Multiplistic epistemic beliefs with integrity per treatment.

**Research Question 4**

$$\begin{aligned} H1: \mu_{nonOSP} &= \mu_{nonvis} = \mu_{visOSP} \\ H2: \mu_{nonOSP} &> \mu_{nonvis} > \mu_{visOSP} \\ H3: (\mu_{nonOSP}, \mu_{nonvis}) &> \mu_{visOSP} \end{aligned}$$

- ✓ Highest posterior probability for H2.
- ✓  $BF_{21} = 7.32$ ;  $BF_{23} = 1.85$

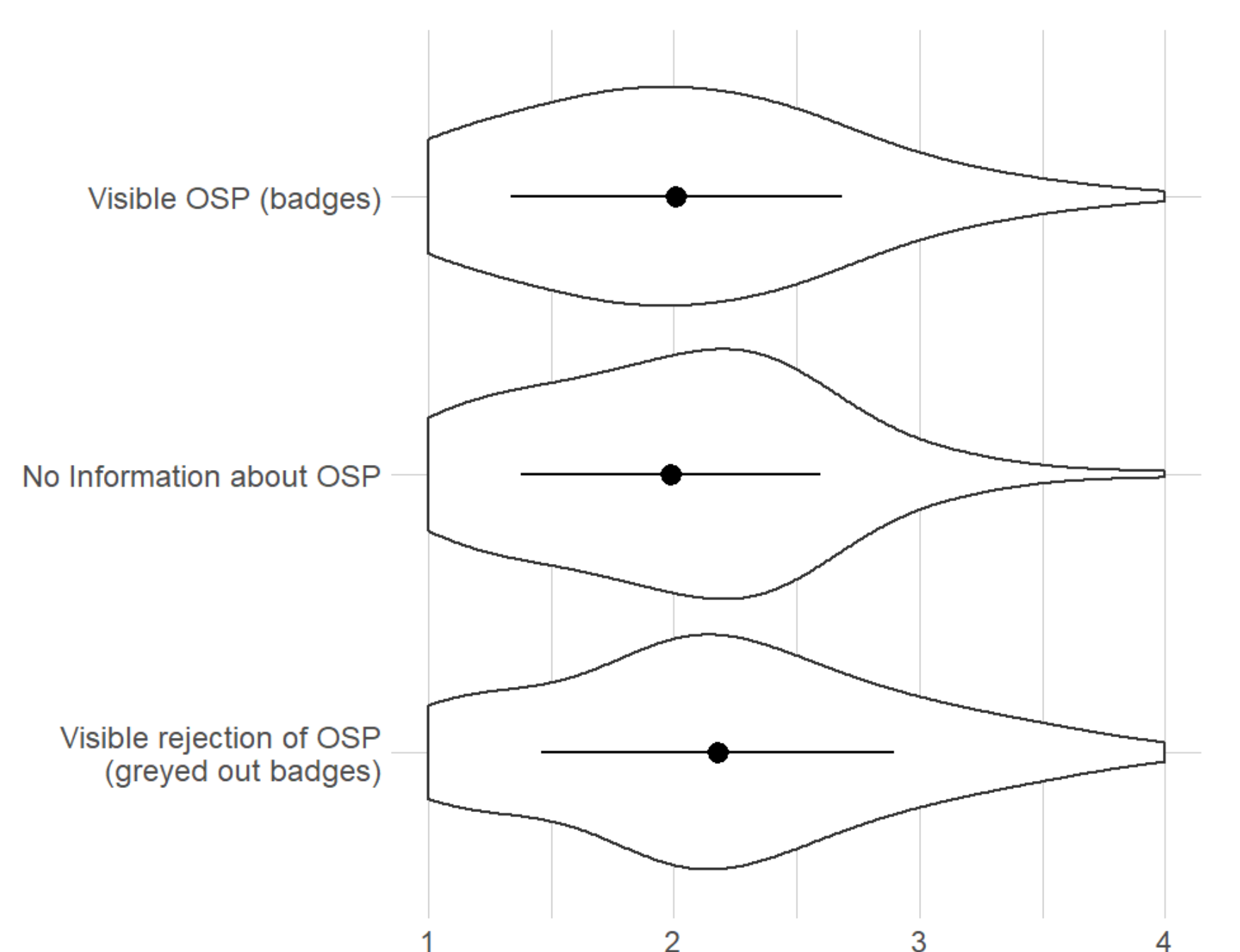


Figure 4: Treatment on multiplistic epistemic beliefs. Violinplots and means  $\pm 1*SD$

## References

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