

DO WE LEARN PAIN BETTER FROM PEOPLE LIKE US? OBSERVATIONAL LEARNING IN INDUCING PLACEBO ANALGESIA

Authors: Elżbieta A. Bajcar¹, Dominika Farley¹, Karolina Wiercioch-Kuzianik¹, Jakub Nastaj¹, Ewa Buglewicz¹, Wacław M. Adamczyk^{1,2}, Przemysław Bąbel¹

¹ Jagiellonian University, Institute of Psychology, Pain Research Group, Kraków, Poland

² The Jerzy Kukuczka Academy of Physical Education, Laboratory of Pain Research, Katowice, Poland

AIMS OF INVESTIGATION

Despite the strong evidence that observational learning can induce the placebo effect, factors influencing the magnitude of analgesia induced in this way have not yet been fully elucidated. This study aimed to:

- ✓ compare the placebo effects induced by observing a model introduced as another participant of the study or as a coworker of the experimenter
- ✓ investigate the contribution of the observer's individual characteristics such as empathy, conformity, fear of pain to the placebo analgesia induced by observational learning

METHODS

Participants

- ✓ 96 healthy volunteers (62% females), age = 22 ± 2.67
- ✓ Exclusion criteria: (1) age below 18 and over 35, (2) previous participation in a pain study, (3) pain complaints, (4) taking painkillers, (5) using drugs (6) overusing of alcohol, (7) presence or history of any neurological, respiratory, circulatory, musculoskeletal and/or psychiatric disorders

Stimuli

- ✓ Electrical stimuli: square pulses with a duration of 200 μs, delivered to the volar surface of the nondominant forearm. Apparatus: Constant Current High Voltage Stimulator (Digitimer, Welwyn Garden City, England, model DS7AH)
- ✓ Color stimuli: blue and orange colors presented in full-screen mode on a computer screen (17", resolution 1280 x 1024) facing the participant at a distance of approximately 50 cm

Measures

- ✓ Pain intensity measured on an 11-point numeric rating scale (NRS), ranged from 0 = 'no pain' to 10 = 'the most pain that is tolerable'
- ✓ Fear of pain measured by *Fear of Pain Questionnaire* (FPQ-III, McNeil & Rainwater 1998)
- ✓ Empathy measured by *Interpersonal Reactivity Index* (IRI, Davis, 1980)
- ✓ Conformity and the tendency to yield to social influence measured by (1) *The Gudjonsson Compliance Scale* (GCS, Gudjonsson, 1989), (2) *Measure of Susceptibility to Social Influence* (MSSI, Bobier, 2003)

Design and procedures

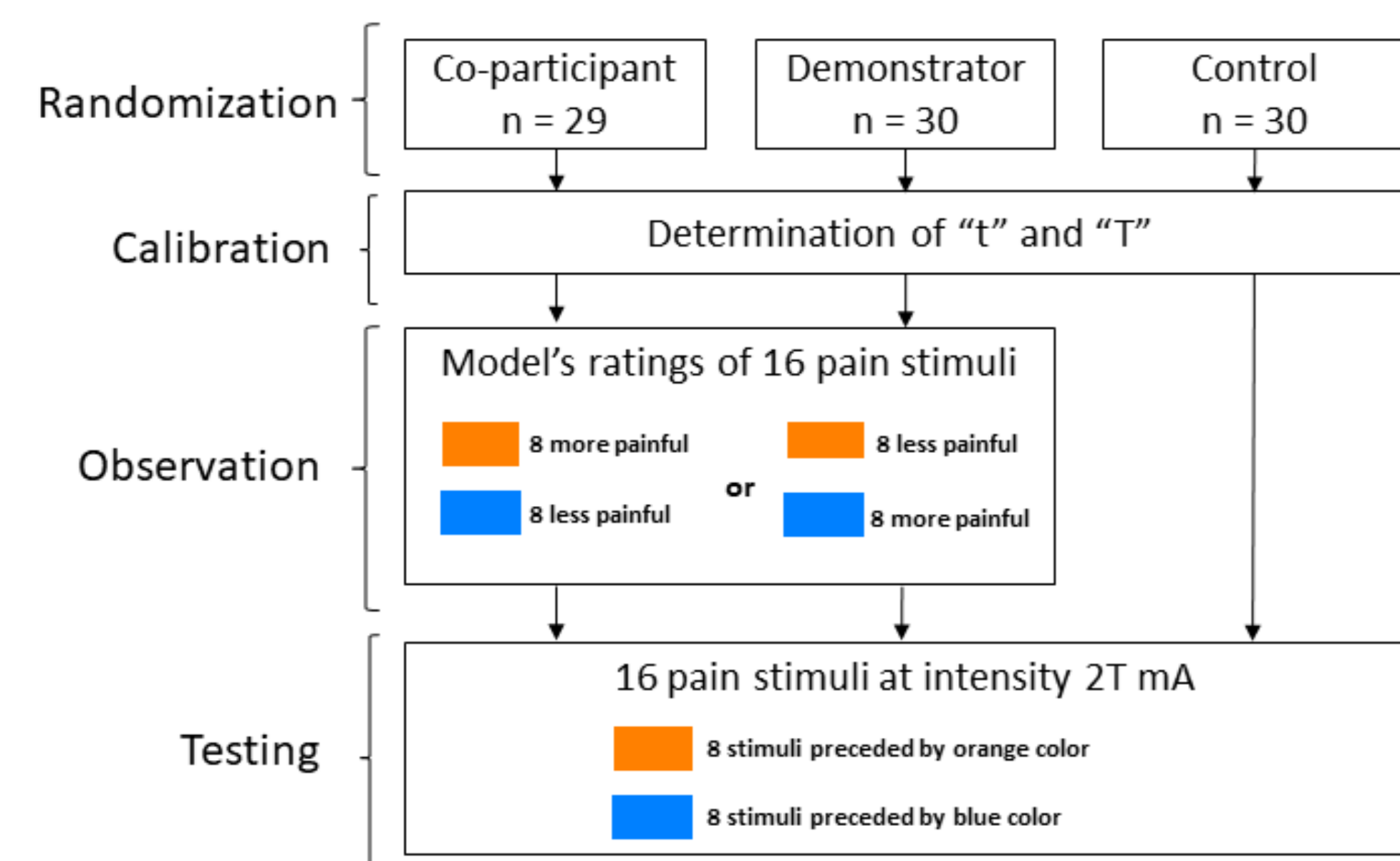


Fig. 1. Study design.

Randomization. Participants were randomly assigned to one of the three groups: co-participant, demonstrator or control group.

Calibration. Two ascending series of stimuli were delivered in steps of 0.5 mA, starting from 0 mA to determine tactile sensation threshold (t) and pain threshold (T). The intensity of pain stimulus used in the study was set at 2T mA.

Observation. Participants in the co-participant and demonstrator groups observed the model rating pain stimuli preceded by one of the two colors as more painful and preceded by the other color as less painful. **In the co-participant group**, the participants were informed that the model was another participant taking part in the same study. **In the demonstrator group**, the participants were informed that the model was a coworker of the experimenter and that the model would present how to use the pain intensity scale. Participants from the control group did not observe the model.

Testing. Participants received 16 pain stimuli at intensity 2T mA preceded by blue or orange colors and rated the intensity of pain.

RESULTS

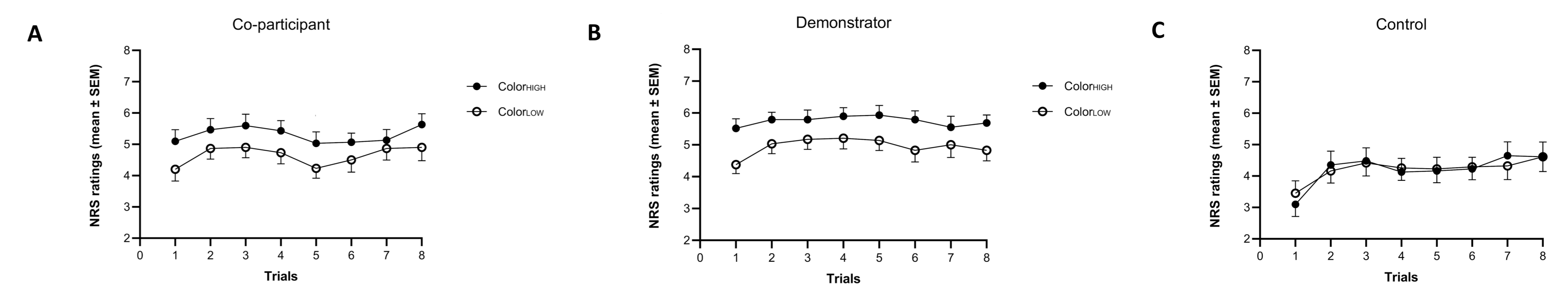


Fig. 2. Pain ratings during the testing phase in co-participant group (A), demonstrator group (B) and control group (C). Mean pain intensity ratings for stimuli preceded by color_{LOW} (i.e. color preceding pain stimuli rated by the model as less painful) and color_{HIGH} (i.e. color preceding pain stimuli rated by the model as more painful) in two experimental groups and preceded by color₁ (i.e. blue or orange) and color₂ (i.e. orange or blue) in the control group. NRS – Numeric Rating Scale; SEM – Standard Error of the Mean.

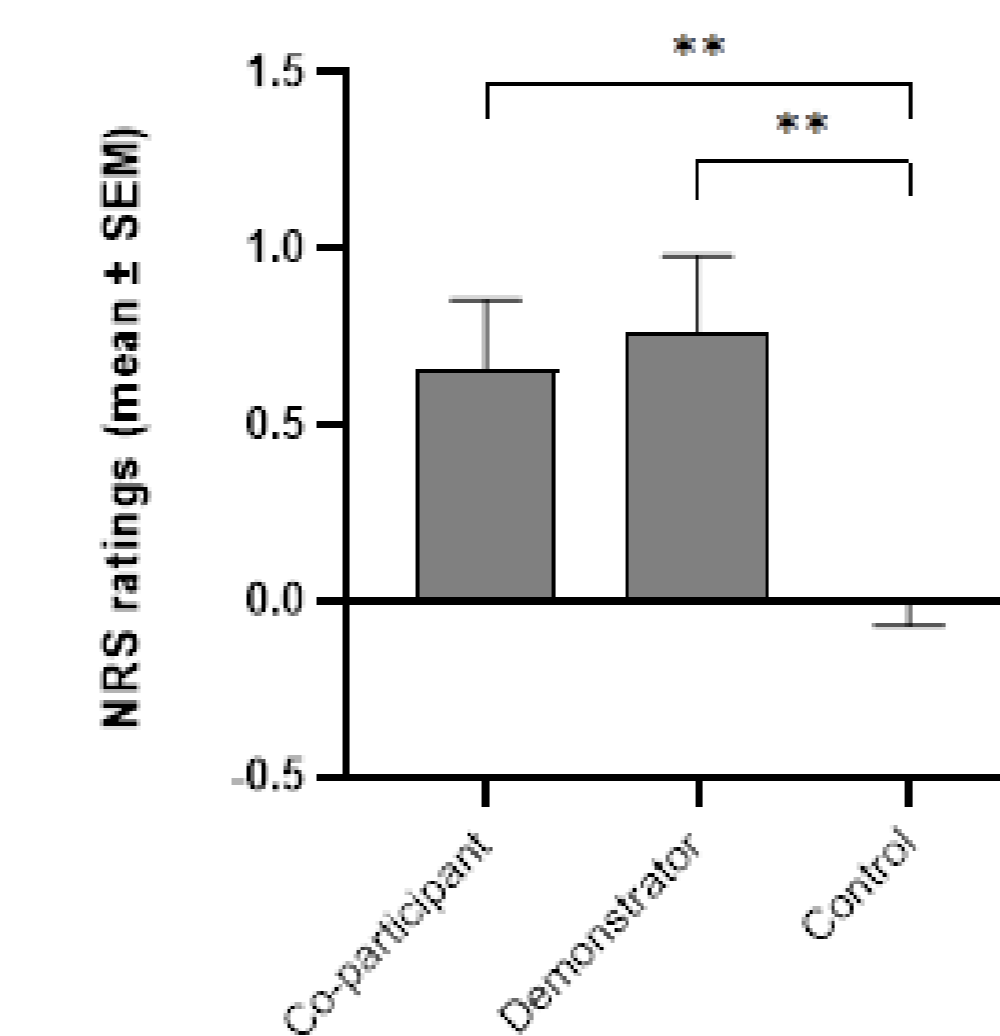


Fig. 3. Between-group comparisons of mean pain intensity. Nocebo hyperalgesia was induced both in the co-participant and demonstrator group. The demonstrator and co-participant groups did not differ significantly in the magnitude of the nocebo effect. NRS – Numeric Rating Scale; SEM – Standard Error of the Mean, **p < 0.05

The magnitude of placebo analgesia in both experimental groups was not correlated with IRI empathic concern ($r = 0.02, p = 0.866$), **IRI personal distress** ($r = -0.08, p = 0.582$), **IRI perspective taking** ($r = -0.15, p = 0.269$), **MSSI principled autonomy** ($r = 0.08, p = 0.581$), **MSSI social adaptability** ($r = -0.13, p = 0.358$), **MSSI social friction** ($r = 0.25, p = 0.068$), **tendency to conform measured by GCS scale** ($r = -0.17, p = 0.203$), and **fear of pain measured by FPQ** ($r = 0.17, p = 0.217$).

CONCLUSIONS

- ✓ Placebo analgesia of similar magnitude was found in both experimental groups, regardless of whether the model was introduced as another participant or as a coworker of the experimenter
- ✓ The dispositional characteristics of the observer did not correlate with the magnitude of placebo analgesia
- ✓ We conclude that in situations associated with high probability of aversive events, people attempt to utilize all available cues that allow them to predict noxious stimulation regardless of the source they come from

ADDITIONAL INFORMATION

- ✓ The study was funded by the National Science Centre in Poland (grant no. 2016/23/B/HS6/03890).
- ✓ The study protocol was approved by the Research Ethics Committee at the Institute of Psychology, Jagiellonian University, Kraków, Poland.
- ✓ Contact information: Elżbieta A. Bajcar, Jagiellonian University, Institute of Psychology, Pain Research Group, ul. Ingardena 6, 30-060 Kraków, Poland. E-mail: elzbieta.bajcar@uj.edu.pl

YOU CAN SEE POSTER ONLINE!

