

THE SELF-CONFIDENCE OF A MODEL – CAN IT MODULATE THE STRENGTH OF LEARNING ABOUT PAIN? A STUDY ON PLACEBO ANALGESIA INDUCED BY OBSERVATIONAL LEARNING

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AIMS OF INVESTIGATION

This study aimed to:

- ✓ Explore the role of the model's self-confidence in the formation of placebo analgesia induced by observational learning
- ✓ Establish the role of self-esteem and self-efficacy of the observer in the formation of placebo analgesia induced by observational learning

METHODS

Participants

- ✓ 60 volunteers (36 women, 24 men; mean age = 23.65 ± 2.54, range = 20-34 years)
- ✓ 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

- ✓ Electrocutaneous 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 and pain expectancy measured on an 11-point numeric rating scales (NRS), ranged from 0 = 'no pain' to 10 = 'the most pain that is tolerable'
- ✓ Rosenberg Self-Esteem Scale (SES, Rosenberg, 1965)
- ✓ The General Self-Efficacy Scale (GSES, Schwarzer & Jerusalem, 1995)

Design and procedures

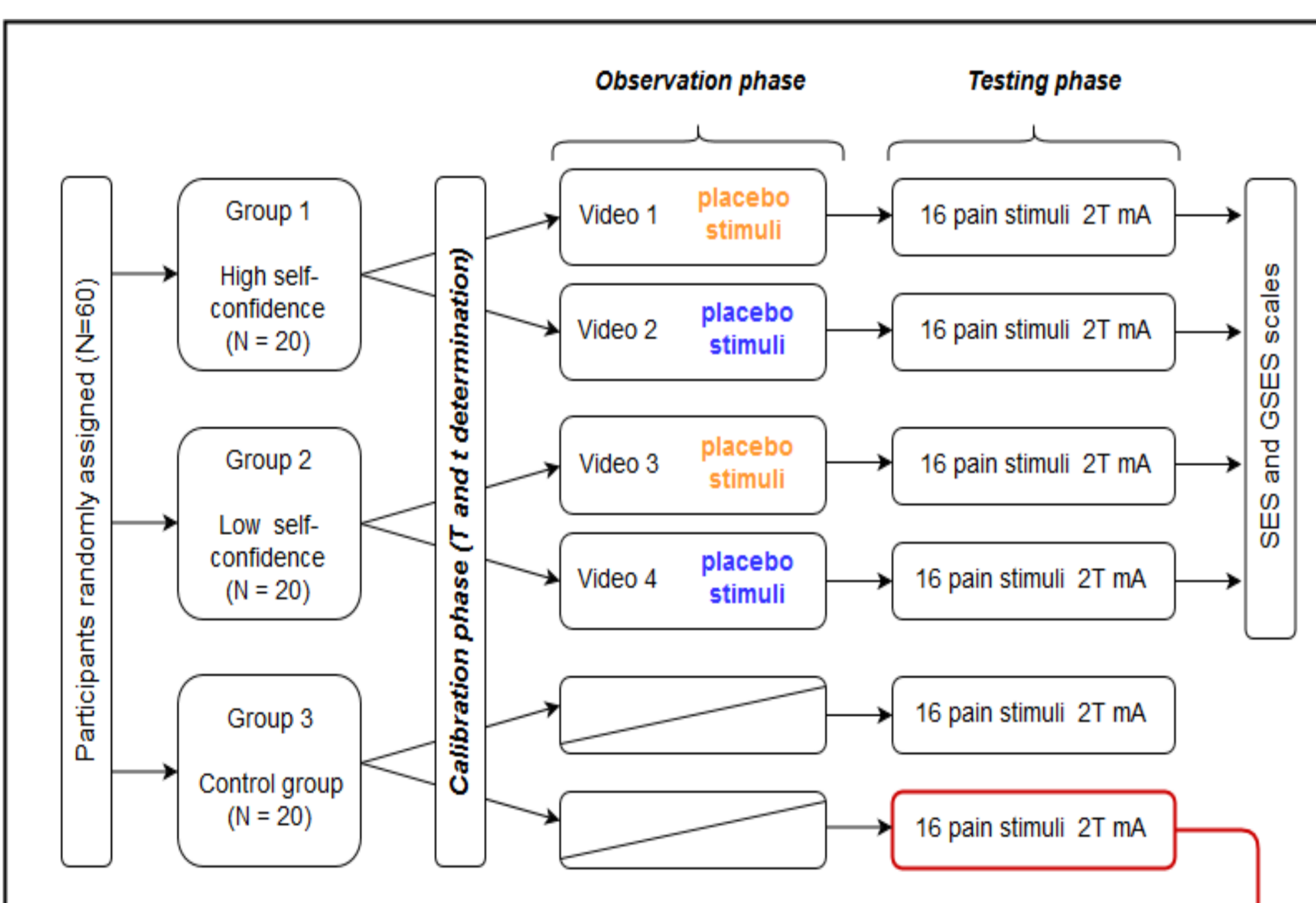


Fig. 1. Study design.

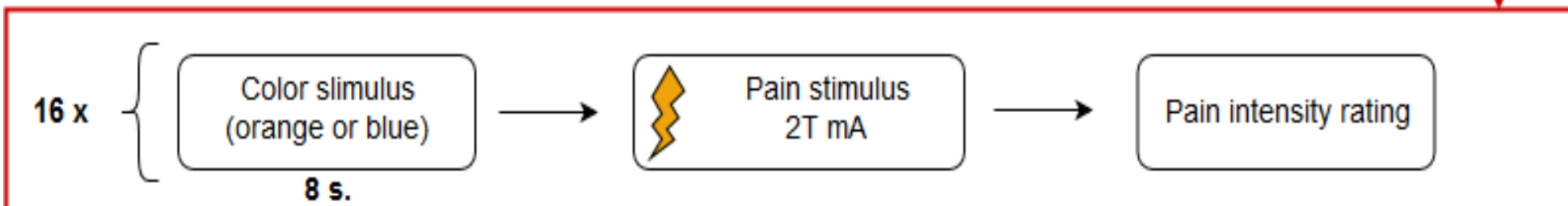


Fig. 2. Single trial design.

Calibration phase

- ✓ Determination of the individual pain threshold (T)

Observation phase

- ✓ In groups 1 and 2 participants watched a video with a male model undergoing the same (planned also for participants) experimental procedure. In each group, half of participants watched the video where the model rated blue stimuli lower (2-4 on NRS scale) and orange stimuli higher (7-9 on NRS scale), while the other half of participants watched the video where this rating trend was reversed. Color stimuli rated as less painful on the NRS scale functioned as placebo stimuli, respectively color stimuli rated as more painful functioned as control stimuli.

- ✓ The level of self-confidence was manifested in the body posture and facial expressions of the model, as well as in the specific behavior accompanying the assessment of pain. Video 1 and 2 - model with high self-confidence (upright body posture, quick pain ratings without postponement and hesitation, loud voice)
- Video 3 and 4 - model with low self-confidence (closed body posture, hesitation before making pain assessment, asking type of voice intonation)

- ✓ In the control group no video was displayed

Testing phase

- ✓ 16 electrocutaneous pain stimuli of the same intensity (2T), preceded randomly by the blue or orange color, were applied to all groups
- ✓ The NRS for pain intensity ratings appeared immediately after the electrocutaneous stimulus was applied, with the color stimulus as a background

RESULTS

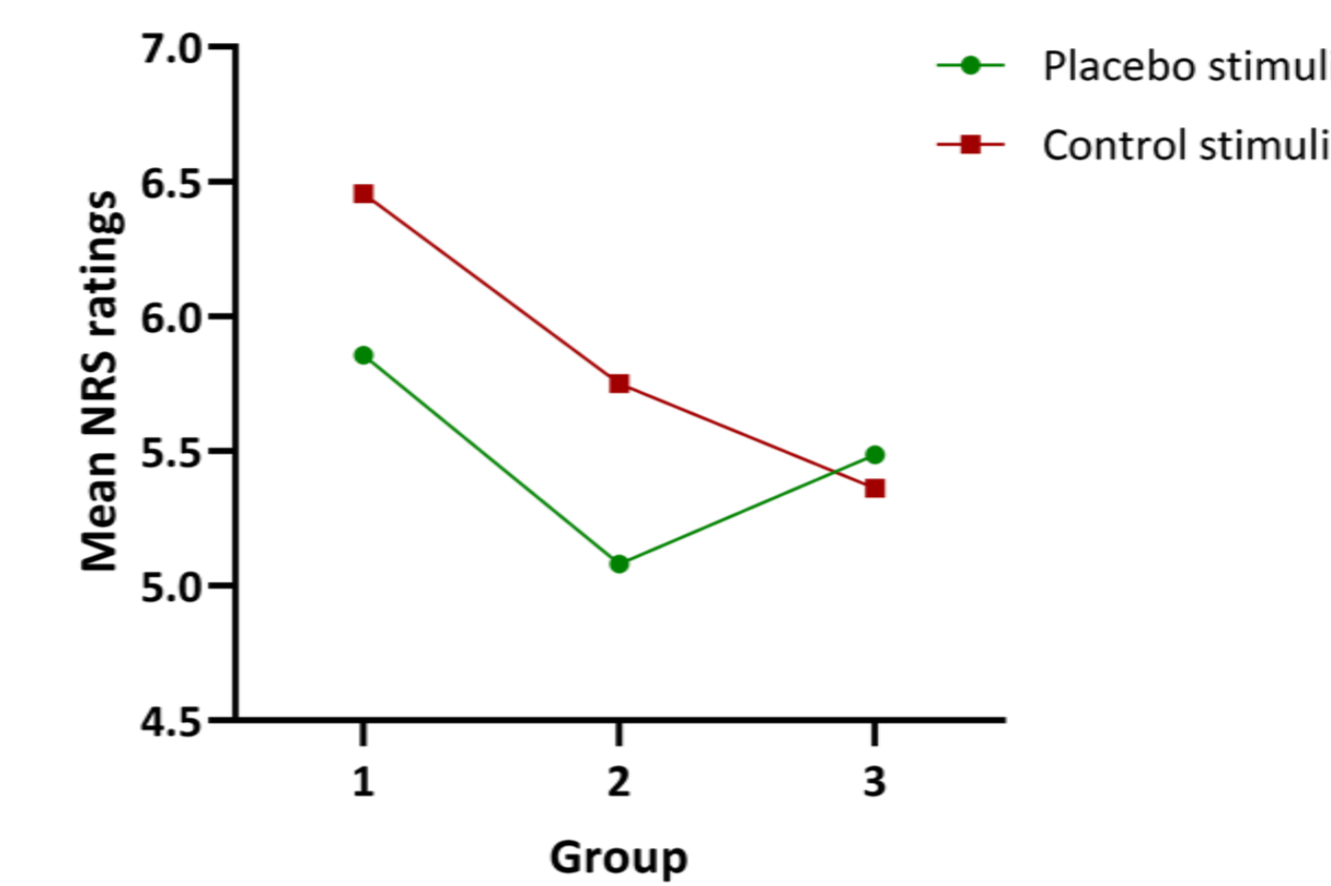


Fig. 3. Between-group comparisons of mean pain intensity.

- ✓ Placebo analgesia was found both in the high self-confidence group (1) and low self-confidence group (2). Experimental groups did not differ significantly in the magnitude of the placebo effect

- ✓ Multiple regression analysis showed that perceived self-confidence of the model was a significant predictor of the magnitude of the placebo effect in both experimental groups ($F(1, 38) = 5.44, p = 0.03, R^2_{adj} = 0.13, \beta = 0.354$)

- ✓ Induced placebo effect diminished over time in the high self-confidence group, but not in the low self-confidence group (Fig. 4)

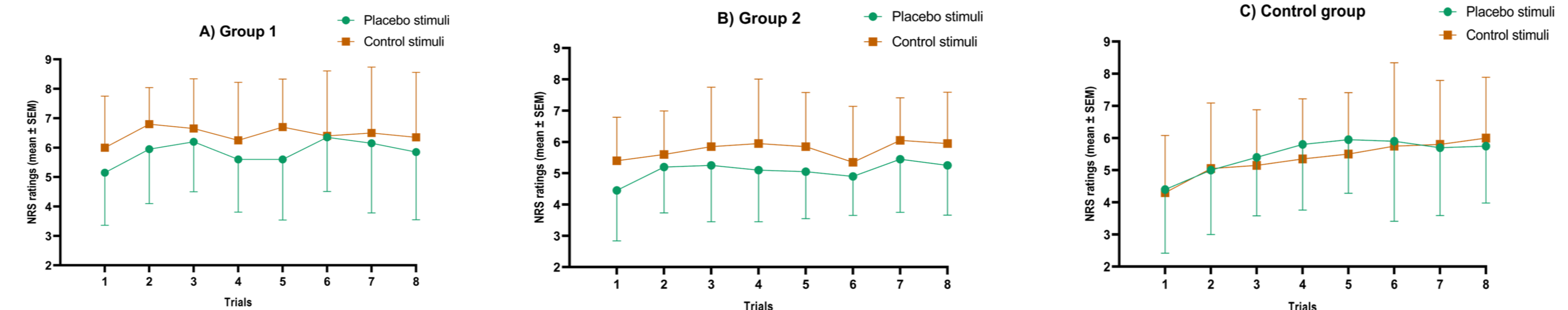


Fig. 4. Trial by trial pain ratings during the testing phase in the high self-confidence group (A), low self-confidence group (B), and the control group (C) (data from the control group were randomly divided in half and assigned to the category 'placebo stimuli' or 'control stimuli').

- ✓ The magnitude of placebo analgesia in both experimental groups was not predicted by participant's self-esteem.
- ✓ The magnitude of placebo analgesia was predicted by participant's self-efficacy, but only in the low self-confidence group ($F(1,18) = 5.66, p = 0.03, R^2 = 0.24, \beta = -0.49$)

CONCLUSIONS

- ✓ Placebo analgesia was successfully induced by video-based observational learning. The magnitude of the placebo effect was similar in both experimental groups
- ✓ Perceived self-confidence of the model may predict the magnitude of placebo analgesia
- ✓ The self-esteem of the observer did not predict the magnitude of placebo analgesia
- ✓ The self-efficacy of the observer may predict the magnitude of placebo analgesia under some conditions

ADDITIONAL INFORMATION

- ✓ The authors are supported by the National Science Centre in Poland within grant no. 2014/14/E/HS6/00415
- ✓ The study protocol was approved by the Research Ethics Committee at the Institute of Psychology of Jagiellonian University, Kraków, Poland.
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