

It's all in the technique! Meta-analytic evidence for distinct neural correlates of verbally induced only vs. verbally induced and conditioned placebo analgesia

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INTRODUCTION

- Placebo effects in pain can be induced in several ways.¹
- Verbal instruction and conditioning procedures, alone or in combination, are the most commonly used approaches in experimental settings.
- Conditioning procedures consistently enhancing the efficacy of placebo treatments and analgesic effects.²
- However, the underlying neural mechanisms and differences between these two placebo analgesia (PA) techniques are not yet well understood.

RESEARCH AIM

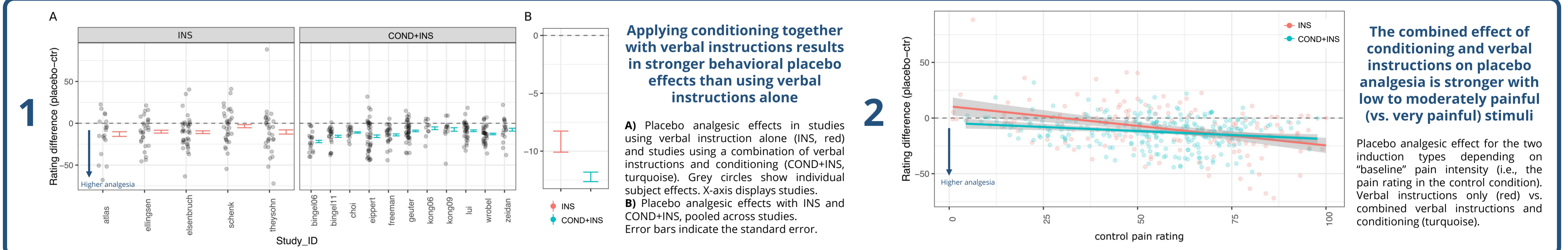
Are there **behavioral and neurophysiological differences** (in PA-associated brain activity) **depending on whether conditioning was used** to induce placebo analgesia or not?



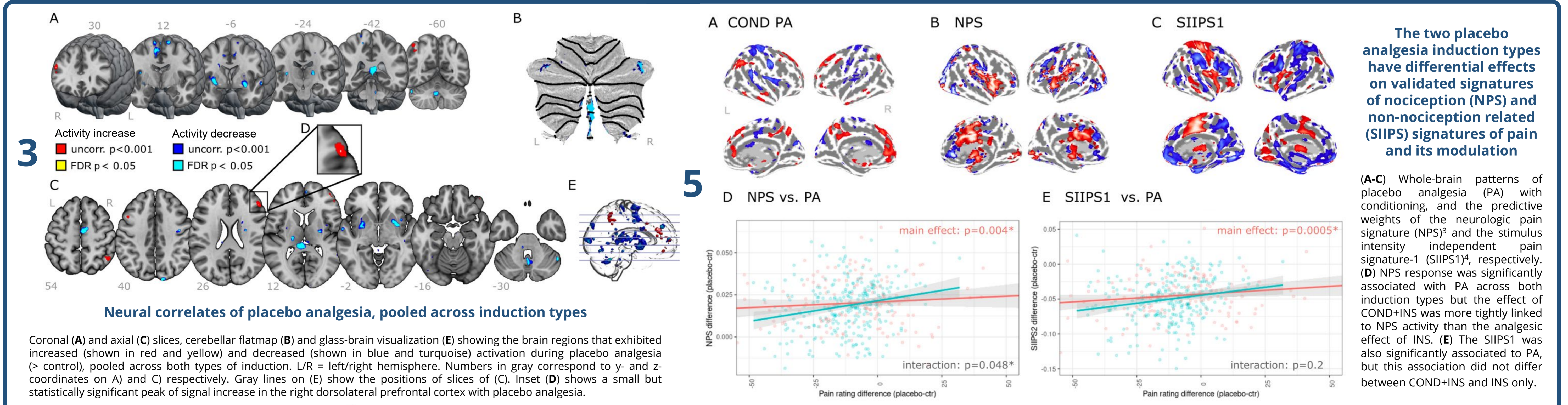
METHODS

- Systematic meta-analysis of individual participant data** from 16 within-subject placebo neuroimaging studies (total $n = 409$)
 - Instructions alone: 5 studies, $n = 147$
 - Instruction combined with conditioning: 11 studies, $n = 268$
- Placebo manipulations:** Topical cream ($k = 7$), intravenous infusion ($k = 5$), sham acupuncture ($k = 2$), sham TENS ($k = 1$), or nasal spray ($k = 1$)
- Noxious stimulation applied:** Thermal ($k = 11$), laser ($k = 2$), distension ($k = 2$), or electrical ($k = 1$) stimulation
- Analysis:** Rank-harmonized individual-level data in a permutation testing framework
- Linear model:** analgesia rating \sim induction type * pain rating + gender + age

BEHAVIORAL RESULTS



BRAIN RESULTS



DISCUSSION

- Replication of previous meta-analytic findings of typical placebo-related activity changes with a different methodology.^{5,6}
- Placebo-induced changes are **not restricted to nociceptive areas** but also engage motor & cognitive-evaluative regions.
- We found **distinct neural correlates** of verbally induced only vs. both verbally induced and conditioned PA.
- Results may **reflect differences in the underlying neural mechanisms** over and above the differences in the magnitude of behavioral analgesia induced by the two different induction types.

REFERENCES

- Enck et al. (2013)
- Vase et al. (2002)
- Wager et al. (2013)
- Woo et al. (2017)
- Zunhammer et al. (2018)
- Zunhammer et al. (2021)

CONTACT

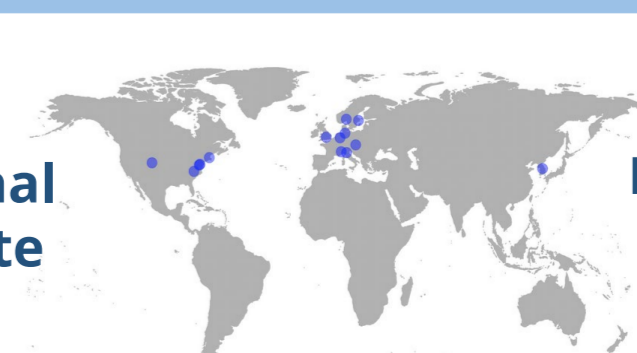


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