

Supplementary information S1 (table)						
Modality	Suggestions about...	Subjective experience	Autonomic	Endocrine	Immune	Explanation of effects
<i>Verbal suggestions alone</i>						
Inflammatory skin reactions ¹	skin reactions		Yes (HR)		No (skin wheal size)	Reduced HR with placebo
Gastric motility ²	gastric activity		Mixed(effects on EGG; No effect on HRV, SCR)			Placebo effects on gastric slow-wave activity in direction of suggestions
Blood pressure (BP) ³	blood pressure	Yes	Mixed (effects on SCR; no effect on BP or HRV)			SCR increase and subjective drug effect with suggested effective drug
Buprenorphine analgesia ⁴	pain		Yes (Resp)			Reduced respiration with suggested effective drug
Electrical pain in clinic; Ischemic arm pain in lab ⁵	pain	Yes	Yes (HR)			Reduced pain and reduced HR with placebo
Airway resistance ⁶	airway constriction	No	Yes (Resp)			Increased airway resistance with suggested bronchoconstrictor
Tourniquet pain ⁷	pain	Yes		Cortisol, ACTH		Nocebo increases endocrine responses
Ischemic pain ⁸	pain	Mixed (placebo effect only; no nocebo effect)		Mixed (Cortisol: Nocebo effect, no placebo effect; No effects on beta-endorphins)		Nocebo increases endocrine responses; Placebo reduces pain reports
Thermal pain ⁹	pain	Mixed	Mixed (effects on LF/HF HRV ratio; no effects on HR or total HRV)			Placebo reduces low/high frequency HRV ratio, not total HRV; Placebo effects on pain intensity and stress; No placebo effect on pain unpleasantness, mood, or arousal
Conditioned pain modulation ¹⁰	pain	Yes (females only)	No (HR)			Gender-specific effects on pain, no physio effects

SUPPLEMENTARY INFORMATION

Modality	Suggestions about...	Subjective experience	Autonomic	Endocrine	Immune	Explanation of effects
<i>Suggestion including possible effects of learned associations</i>						
Caffeine ¹¹	arousal	No	Mixed (effects on SCR, startle eye blink; no effects on BP, HR)			Decaf coffee increases SCR and startle eye blink
Hormone responses to milkshakes ¹²	calorie content	No		Ghrelin		Ghrelin increases with "sensible" vs. "indulgent" milkshake
Caffeine ¹³	arousal	Mixed				Decaf coffee increases HR, subjective arousal; no effect on stress, calmness, SCL, systolic BP
Muscle relaxant ¹⁴	arousal	Yes	Yes (blink)			Low-arousal suggestions reduce blink reflexes
Responses to propranolol (β -blocker) and atropine (Ach-m agonist) ⁵	drug effects (Open vs hidden drug)		Yes (HR)			Open admin of propranolol reduces HR, open atropine increases HR
Advertising effects on allergen challenge ¹⁵	allergic responses (via advertisements)	Yes			Yes (skin wheal size)	Advertisement effects on skin wheals and beliefs in non-allergic subjects only
Hormonal responses ¹⁶	hormone changes			No (Growth hormone, cortisol)		Growth hormone, cortisol changes with pharmacological conditioning but no effects of suggestion
Electrical pain ¹⁷	pain*	Yes	No (SCR)			Effects on pain only when suggestion is combined with response conditioning; no effects on SCR

SUPPLEMENTARY INFORMATION

Electrical pain ¹⁸	pain*	Yes	Yes (pupil, SCR)	Dose-dependent placebo effects on pain, SCR and pupil size
Thermal pain ¹⁹	pain*	Yes	Yes (SCR)	"Strong" placebo reduces pain and SCR
Thermal pain ²⁰	pain*	Yes	Yes (SCR)	Placebo reductions in pain and SCR, blocked by naloxone
Secondary hyperalgesia ²¹	pain*	Yes	No (HR, BP)	Effects on pain and secondary hyperalgesia but not physio

Note. Autonomic and neuroendocrine effects of verbal suggestions about treatment effects. "Yes" indicates significant effects, "No" indicates null findings. Empty cells indicate a lack of available information. Studies manipulating verbal suggestions about pain or other stimulus/response features have shown effects on autonomic responses and hormone levels, though they do not always mirror the suggestions themselves. Other studies have combined suggestions with previously learned cues, or independently manipulated (crossed) learned cues with suggestion. Combined suggestion and learning has produced strong autonomic effects in some, but not all, studies. In some cases, effects were driven by learning. The effects of suggestion on autonomic and endocrine responses may depend on interactions with learning processes or their ability to engage strong affective responses. Abbreviations: ACTH: adrenocorticotrophic hormone; Blink: Startle blink reflex magnitude; BP, blood pressure; EGG: electrogastrogram; HR, heart rate; HRV, heart-rate variability; SCL, skin conductance level; SCR, skin conductance response. *: includes response conditioning.

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