

INTRODUCTION

Perceived self-efficacy is defined by Bandura et al (1987) as people's "judgments of their capabilities to execute given levels of performance and to exercise control over events." Studies have shown that perceived self-efficacy is associated with better evaluative pain outcomes; however, it is unknown whether it has consistent effects across different experimental pain modalities. Further, it is unknown whether self-efficacy engages descending mechanisms that alter afferent nociception at spinal levels. The current study combined data from four experimental pain studies that administered a brief, 5-item, self-report measure of self-efficacy for pain reduction (SE-PR). If self-efficacy is correlated with spinal nociceptive reflexes, this would suggest it engages descending modulation that alters spinal nociception.

OBJECTIVES

- To determine if self-efficacy is correlated with spinal reflexes (Nociceptive Flexion Reflex threshold and finger withdrawal to fast-ramped radiant heat) as well as evaluative measures of pain (pain tolerance latencies, pain ratings)
- To examine the influence of self-efficacy on three experimental pain modalities (radiant heat, cold pressor, noxious electrical stimulation)

SELF EFFICACY FOR PAIN REDUCTION QUESTIONNAIRE (SE-PR)

Instructions: Please circle the number that indicates your answer to the following questions. These questions refer to your ability to make reductions in pain *without* taking drugs or medication.

uncertain 0 1 2 3 4 5 6 7 8 9 10 certain

1. To what degree do you believe that you can make a reduction in *mild pain*?
2. To what degree do you believe that you can make a reduction in *discomforting pain*?
3. To what degree do you believe that you can make a reduction in *distressing pain*?
4. To what degree do you believe that you can make a reduction in *horrible pain*?
5. To what degree do you believe that you can make a reduction in *excruciating pain*?

GENERAL OVERVIEW OF STUDIES

- Data were gathered from 4 experimental pain studies (N=188) that administered the SE-PR questionnaire
- Study 1 used a cold pressor
- Study 2 used a radiant heat device
- Studies 3 and 4 used electric stimulation to elicit the Nociceptive Flexion Reflex threshold (NFR threshold)

STUDY 1: COLD PAIN

- Study examined pain responses on 3 separate occasions at least 24 hours apart using a cold pressor
- Participant characteristics
 - 38 male veterans with and without substance dependence
 - 54% were white, 43% were African American
 - Excluded for less than two weeks of sobriety, PTSD, recent use of analgesia, neurological problems, severe cognitive impairment, and psychoticism

STUDY 1: COLD PAIN

- Subjects emerged forearm in .4° C water
- Pain intensity was rated on the M-VAS on a scale ranging from "not at all unpleasant" to "most unpleasant pain imaginable"



STUDY 1: RESULTS

	SE-PR
Pain Threshold	
Day 1	.42*
Day 2	.59**
Day 3	.50**
Pain Tolerance	
Day 1	.50**
Day 2	.54**
Day 3	.51**

* p < .05
 ** p < .01
 *** p < .001


- Self-efficacy was positively correlated with pain threshold and pain tolerance to the cold pressor
- Test-retest correlations for SE-PR ranged from $\alpha = .45$ to $.74$

STUDY 2: RADIANT HEAT PAIN

- Study examined pain threshold two times using finger withdrawal to fast-ramped radiant heat (a putative spinal reflex)
- Participant characteristics:
 - 50 healthy undergraduate students (20 male and 30 female)
 - Participants excluded for current acute illness; cardiovascular, neurological, or circulatory problems; or recent use of analgesics

PAIN THRESHOLD: FINGER WITHDRAWAL TO RADIANT HEAT

- Study examined pain threshold using finger withdrawal to fast-ramped radiant heat (a putative spinal reflex)
- Computer-controlled, bottom-illuminated, radiant heat device
- Instructions: "Remove finger as soon as heat becomes painful"
- Pain threshold = finger withdrawal latency (in seconds)



STUDY 2: RESULTS

	SE-PR
Pain Threshold	
Test 1	-.12
Test 2	.03

* p < .05
 ** p < .01
 *** p < .001

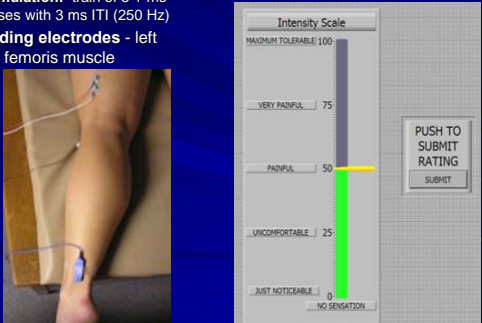
- Self-efficacy was not significantly correlated with radiant heat pain threshold.

STUDY 3 AND 4: ELECTRIC PAIN

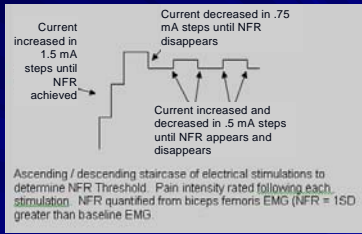
- Combined data to examine the nociceptive flexion reflex (NFR) threshold (a spinal reflex) and subjective pain using electric stimulation to the sural nerve
- Participant Characteristics:
 - 50 healthy undergraduate students total
 - Participants excluded for current acute illness cardiovascular, neurological, or circulatory problems; or recent use of analgesics

MEASUREMENT OF NFR AND PAIN

- Stimulating electrodes - over left sural nerve
 - Stimulation: train of 5 1-ms pulses with 3 ms ITI (250 Hz)
- Recording electrodes - left biceps femoris muscle
- Pain Ratings made following each stimulation



NOCICEPTIVE FLEXION REFLEX



- NFR Threshold = average stimulus intensity (mA) of the last 2 peaks and troughs
- Pain ratings = average of last 2 stimuli during the NFR assessment

STUDY 3 AND 4: RESULTS

	SE-PR	
NFR Threshold	.08	
Pain Ratings of Electric Stimulation	-.24*	*p< .05 **p< .01 ***p< .001

- Self-efficacy was not significantly correlated with NFR threshold, but was significantly correlated with pain ratings of electric stimulation.

CONCLUSIONS

- These data suggest that self-efficacy influences supraspinal, evaluative pain outcomes (subjective ratings of pain, cold pressor threshold and tolerance) but not spinal reflexes (finger withdrawal to radiant heat, NFR threshold).
- Self-efficacy does not appear to alter pain by activating descending modulatory circuitry.