

Introduction

Research on the relationship between borderline personality (BP) and pain has yielded two primary findings. BP is associated with:

1. lower pain ratings in response to experimental pain, and
2. higher pain thresholds.

BP is characterized by impulsivity (e.g., self-harm behaviors), affective instability, interpersonal difficulties, suicidal tendencies, and dissociation. However, it is unclear whether any of these characteristics contribute to the BP-pain relationship.

Data from two studies were combined to assess the relationship between BP traits and nociceptive reactions to experimental pain (including the spinally-mediated nociceptive flexion reflex, NFR). To our knowledge, this study was the first to examine the relationship between BP traits and the NFR.

General Methods

- Healthy students, excluded for:
 - < 18 years of age
 - Current acute illness
 - Cardiovascular, neurological, and/or circulatory problems
 - Recent use of analgesic, anxiolytic, antidepressant, or antihypertensive medications
 - Recent psychological trauma
 - Raynaud's disease
- Questionnaires computer-presented
 - Borderline subscales of the Personality Assessment Inventory: Affective Instability, Identity Problems, Negative Relationships, Self-Harm (indirect measure of impulsivity)
 - Dissociative Experiences Scale (DES)

Study 1: General Methods and Hypothesis

- Delivered noxious electric stimuli to sural nerve to measure nociceptive flexion reflex threshold and pain ratings; assessed relationship of BP traits with spinal nociception and subjective pain
- Hypothesis: BP traits will be associated with inhibited pain (lower subjective pain ratings) and inhibited spinal nociception (higher NFR threshold).


Participants

- 25 students
- Sample Characteristics: Primarily Female, White, Single, Unemployed

Study 1: Nociceptive Flexion Reflex

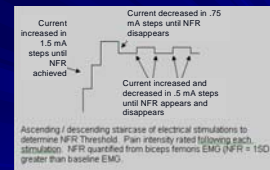
- Elicited by activation of primary nociceptors
- Can be elicited in spinally-transected humans (i.e., spinal reflex)
- Stimulation intensity that reliably elicits NFR (i.e., NFR threshold) occurs near pain threshold
- Used as a measure of spinal nociception to assess descending modulation

Study 1: Measurement of NFR and Pain



- Stimulating Electrode:** placed over left sural nerve
 - Stimulation: train of 5 1-ms pulses with 3-rms ITI (250 Hz)
- Recording Electrodes:** left biceps femoris muscle
- Pain ratings** made via computer following each stimulation

Study 1: NFR Threshold Procedure



- 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 1: PAI-BOR and DES Scores

Scale	Mean	SD	Range
Affective Instability (Possible Range of Scores: 0-24)	6.18	3.41	0-15
Identity Problems (Possible Range of Scores: 0-24)	6.45	3.29	1-16
Negative Relationships (Possible Range of Scores: 0-24)	6.36	3.19	2-13
Self-Harm (Possible Range of Scores: 0-24)	4.55	3.47	0-13
Total PAI-BOR Score (Possible Range of Scores: 0-96)	23.55	8.91	12-45
DES Score (Possible Range of Scores: 0-100)	14.35	12.98	0.75-57.64

Study 1: Results

Affective Instability was negatively correlated with pain ratings. No significant relationships were found between BP traits and NFR threshold.

Scale	Pain Rating	NFR Threshold
Affective Instability	-.38*	-.02
Identity Problems	-.11	.14
Negative Relationships	.00	-.05
Self-Harm	-.18	-.09
Dissociative Experiences Scale	-.28	.06

* p < .05.

Study 2: General Methods and Hypothesis



- Delivered noxious cold stimuli to the forearm by cold pressor task; assessed relationship of BP traits with subjective pain outcomes
- Hypothesis: BP traits will be associated with inhibited pain

Participants

- 23 students
- Sample Characteristics: Primarily Female, White, Single, Employed less than forty hours per week

Study 2: Methods

- Cold pressor procedure, water temperature = 33° F
- Mechanical-Visual Analog Scale (M-VAS) used to continuously rate pain during and after cold pressor
 - Ranged from 0 = "Not at all unpleasant" to 100 = "The most unpleasant pain imaginable"

Study 2: Pain Outcomes

Pain Outcome	Definition
Pain Threshold	Latency (in seconds) from arm submersion to first M-VAS movement
Pain Tolerance	Latency (in seconds) from arm submersion to arm removal from cold pressor

Study 2: PAI-BOR and DES Scores

Scale	Mean	SD	Range
Affective Instability <small>(Possible Range of Scores: 0-24)</small>	7.30	2.84	1-13
Identity Problems <small>(Possible Range of Scores: 0-24)</small>	7.35	3.54	1-16
Negative Relationships <small>(Possible Range of Scores: 0-24)</small>	6.96	3.07	1-16
Self-Harm <small>(Possible Range of Scores: 0-24)</small>	4.48	3.10	0-11
Total PAI-BOR Score <small>(Possible Range of Scores: 0-96)</small>	26.09	8.73	7-46
DES Scores <small>(Possible Range of Scores: 0-100)</small>	19.42	1.16	4.46-48.12

Study 2: Results

Affective instability was positively correlated with pain tolerance. Other traits of BP did not significantly correlate with pain threshold or pain tolerance.

Scale	Pain Threshold	Pain Tolerance
Affective Instability	.27	.47*
Identity Problems	-.26	-.13
Negative Relationships	.05	.24
Self-Harm	.18	-.16
Dissociative Experiences Scale	-.04	-.05

*p < .05.

Conclusions

- Across both studies, affective instability was related to pain, suggesting that this aspect of BP is responsible for the observed relationship with pain.
- Because traits of BP were not related to NFR threshold, these traits do not exert their effects on pain at the level of the spine. Rather, this effect occurs during the evaluation of the painful experience, at the level of the brain.
- The variables that were correlated with affective instability (subjective pain ratings in Study 1, and pain tolerance in Study 2) may be more prone to affective modulation than are variables that were not correlated with affective instability.