

Summary

A history of abuse is a well established risk factor for dysregulation in clinical pain mechanisms and women with premenstrual dysphoric disorder (PMDD) have been shown to have lower pain tolerance. In our on-going study, medically healthy, pain-free premenopausal women, not taking psychotropic medications and without current Axis 1 disorders are recruited based on abuse histories (yes:no) determined by clinical interview and assessed for PMDD. During the confirmed luteal phase women are tested for voluntary pain threshold (onset) and pain tolerance to a cold pressor pain test and a forearm tourniquet ischemic test. In this study we find that control women without PMDD show less pain sensitivity to both a cold pressor and ischemic pain task if they have a history of abuse. The opposite pattern is shown in women with PMDD who are more sensitivity to experimental pain if they have an abuse history. Given the links between physical pain and sensitivity to rejection (e.g. Dewall et al. 2010) we explored whether daily ratings of sensitivity to rejection correlate with pain sensitivity and whether or not a history of abuse and PMDD also predict sensitivity to rejection. We find the opposite of what is predicted by this model: control women who are *more* sensitive to interpersonal rejection are less sensitive to physical pain. We also find that control women with an abuse history are more sensitive to interpersonal rejection.

Sensitivity to Physical and Emotional Pain in Women With Abuse Histories

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Previous research

- ❑ Self reported abuse history related to clinical pain (Leserman et al. 2005)
- ❑ High frequency of abuse in certain chronic pain syndromes including headache and pelvic pain (Sachs-Ericsson et al. 2007) and participants with chronic pain and a history of abuse exhibit more severe symptoms
- ❑ Physical and emotional pain sensitivity linked in previous studies (Eisenberger et al. 2004, Brown et al 2003)
- ❑ Women with PMDD have greater histories of abuse (Girdler et al. 2003) and are more sensitive to experimental pain (Fillingim et al., 1995; Straneva et al., 2002)

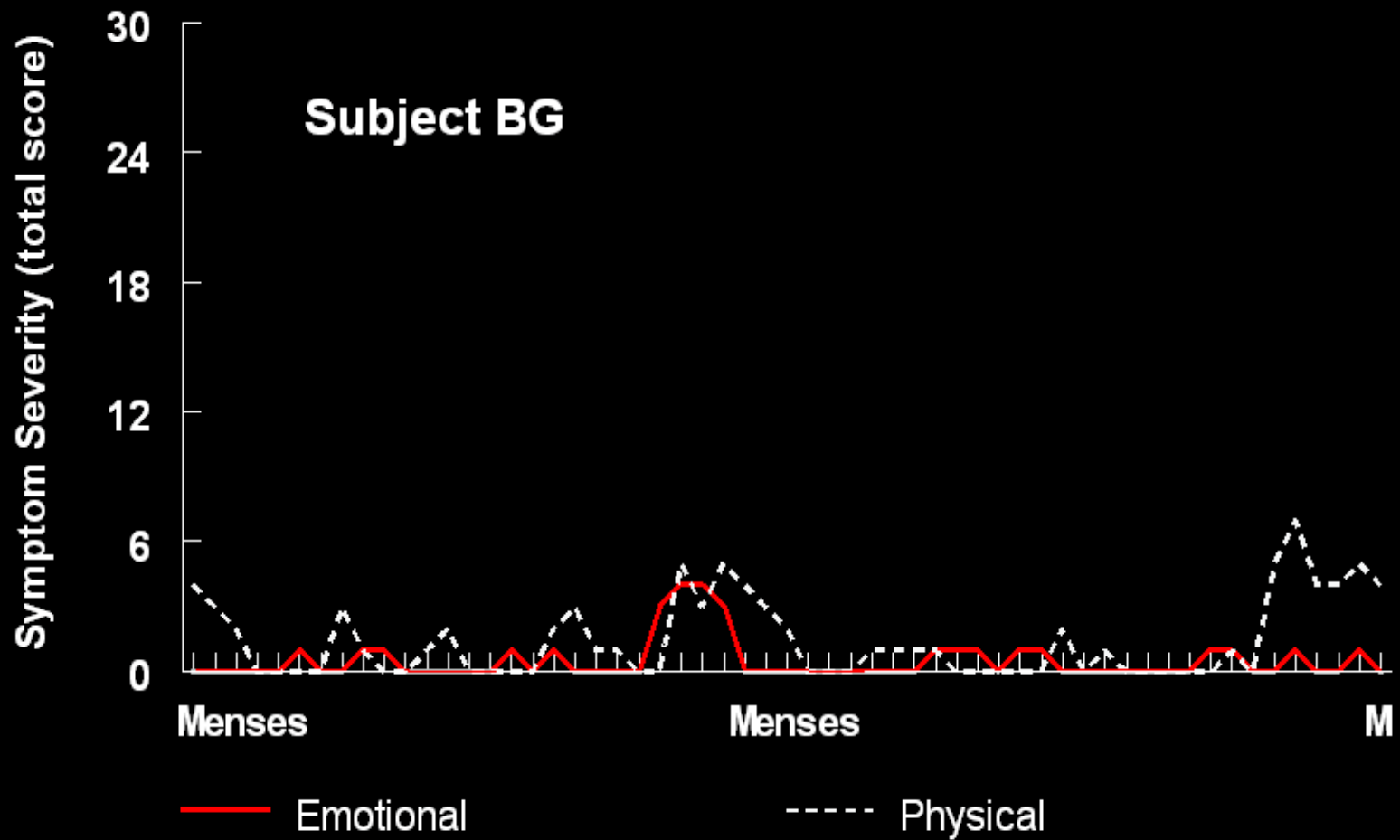
Aims of the study

- ❑ Examine physical pain and emotional pain in light of their shared physiological basis
- ❑ Investigate whether PMDD and abuse history form distinct phenotypes with regard to the both emotional and physical pain sensitivity

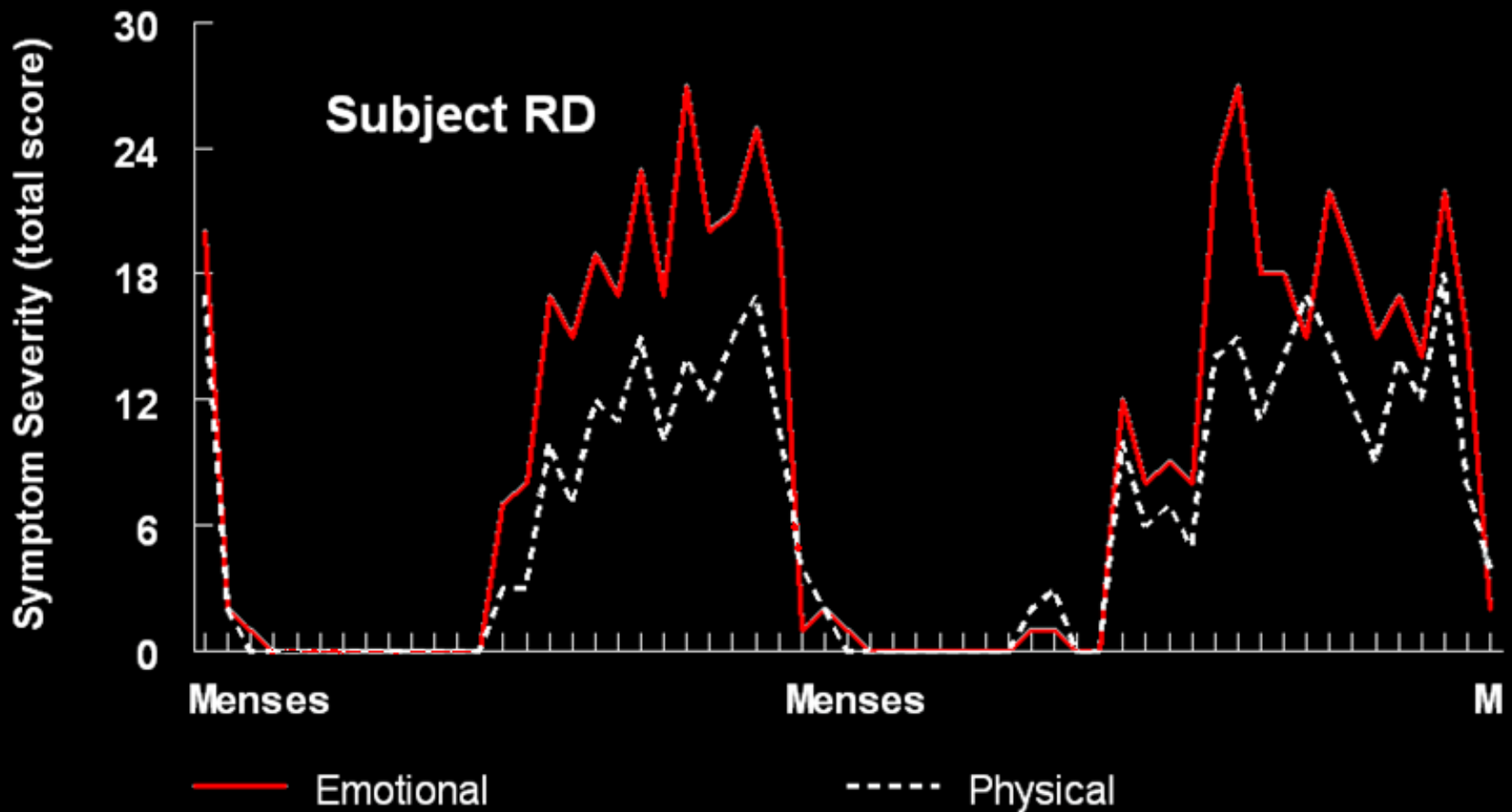
Premenstrual Dysphoric Disorder (PMDD) DSMIV criteria

- Most menstrual cycles in the last year for at least one week premenstrually
- Emotional symptoms
 - Markedly depressed mood
 - Marked anxiety or tension
 - Marked affective lability
 - Persistent and marked anger or irritability
- Physical symptoms
 - Headache
 - Bloating
- The disturbance markedly interferes with work, school or usual social activities and relationships with others.
- These criteria are met based on daily prospective ratings

Daily Symptom Severity in a non-PMDD control woman

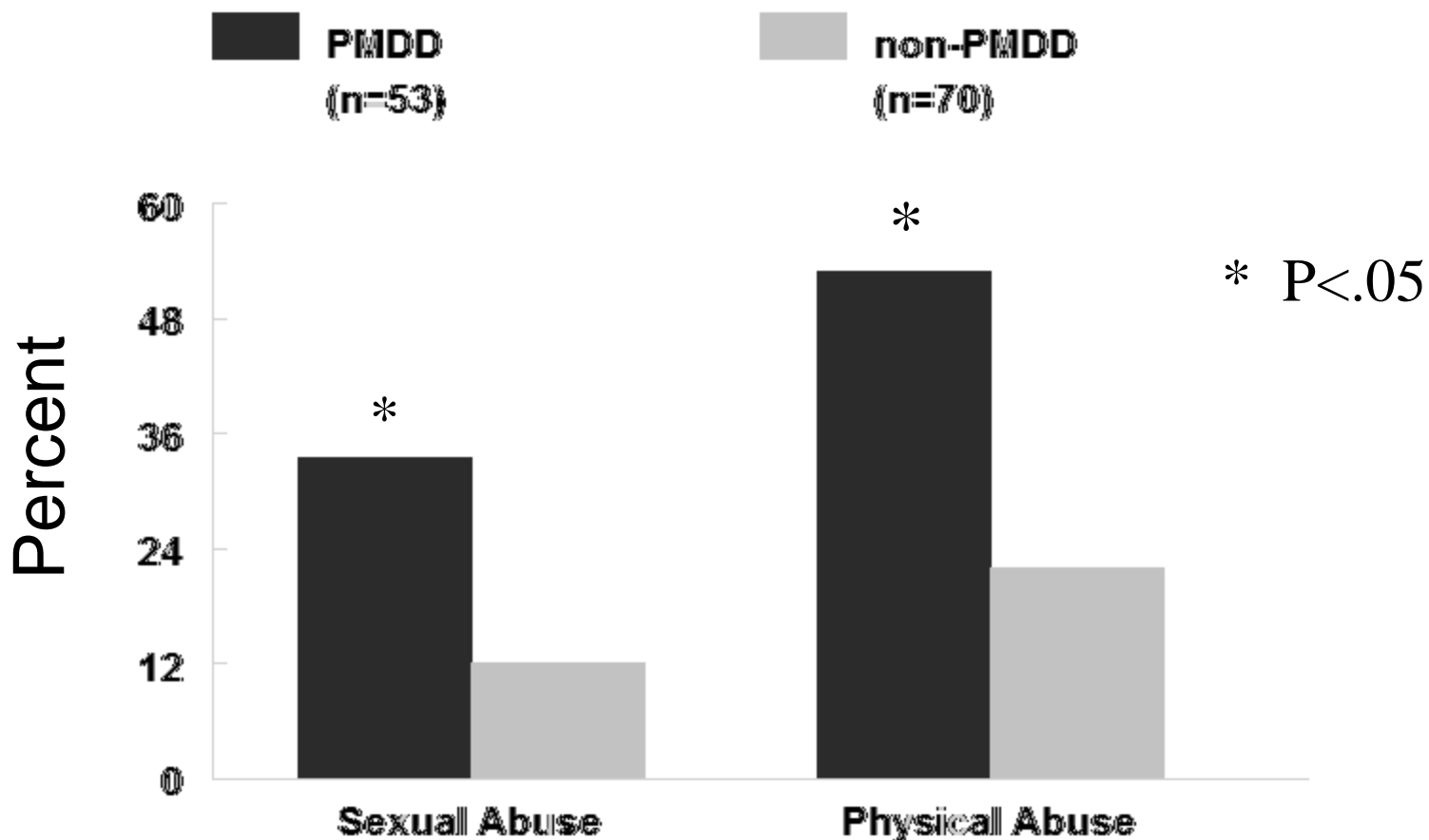


Daily Symptom Severity in PMDD



Abuse Histories in PMDD

(mostly early life)



Abuse Interview

(Leserman et al., Psychosom Med 1996;58:4-15)

- Sexual Abuse (SA):

 - Adult: Clear threat of harm or force

 - Child (<13 yrs): threat or force not required if implied by age differential

- Physical Abuse (PA):

- 1) beat, hit or kicked

- 2) life threat (intent to kill or seriously injure)

*** Women in the following analyses had any kind *
of abuse either during childhood or adulthood ***

Participants

- ❑ Recruitment targeted non-PMDD women with abuse histories
- ❑ A total of 137 women
 - ❑ 65 (47%) PMDD mean age 34.6(7.8)
 - ❑ 72 (53%) nonPMDD mean age 31.4(7.5)
- ❑ All women were in good health, without current chronic medical conditions or DSM-IV Axis I psychiatric disorders, including PTSD
- ❑ None of the subjects were taking prescription medication including oral contraceptives or psychotropic medications.

Participant Breakdown

	PMDD	Control
Abuse History	31	22
No Abuse History	22	26

Two Different Painful Stimuli Presented in a Controlled Protocol

Baseline Rest
10''



ISCHEMIC



PAIN TASKS
-Ischemic
-Cold Pressor

COLD



Pain Testing – Tourniquet



- Arm raised for 30 seconds
- Cuff inflated to 200mmHg
- Subject engaged in 20 handgrip exercises at 30% of maximum force every 2 seconds
- Subject verbally indicates when sensation in forearm first becomes painful (pain threshold)
- Subject verbally indicates when sensation becomes intolerable (pain tolerance)
- Maximum time limit of 20 minutes

Pain Testing – Hand Cold Pressor



- Cooler with 4 C water
- Water circulator prevents water from warming near subject's hand
- Subject submerges hand to wrist
- Subject verbally indicates when sensation in first becomes painful (pain threshold)
- Subject verbally indicates when sensation becomes intolerable (pain tolerance)
- Maximum time limit of 5 minutes

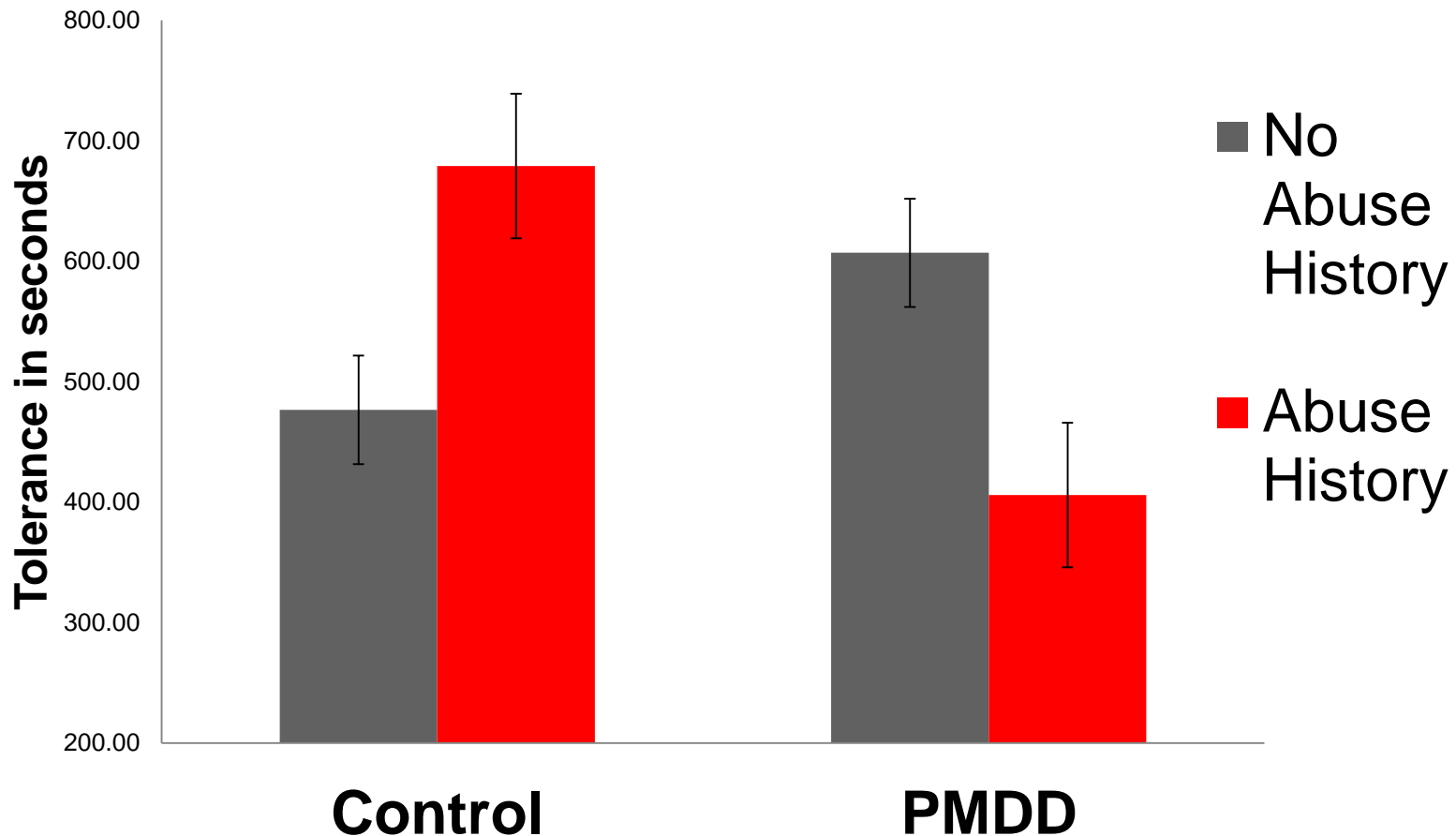
Does PMDD moderate the effect of abuse on physical pain sensitivity?

Ischemic Pain Tolerance

Interaction of PMDD and Abuse History

$F(95)=6.33$

$p=.01$

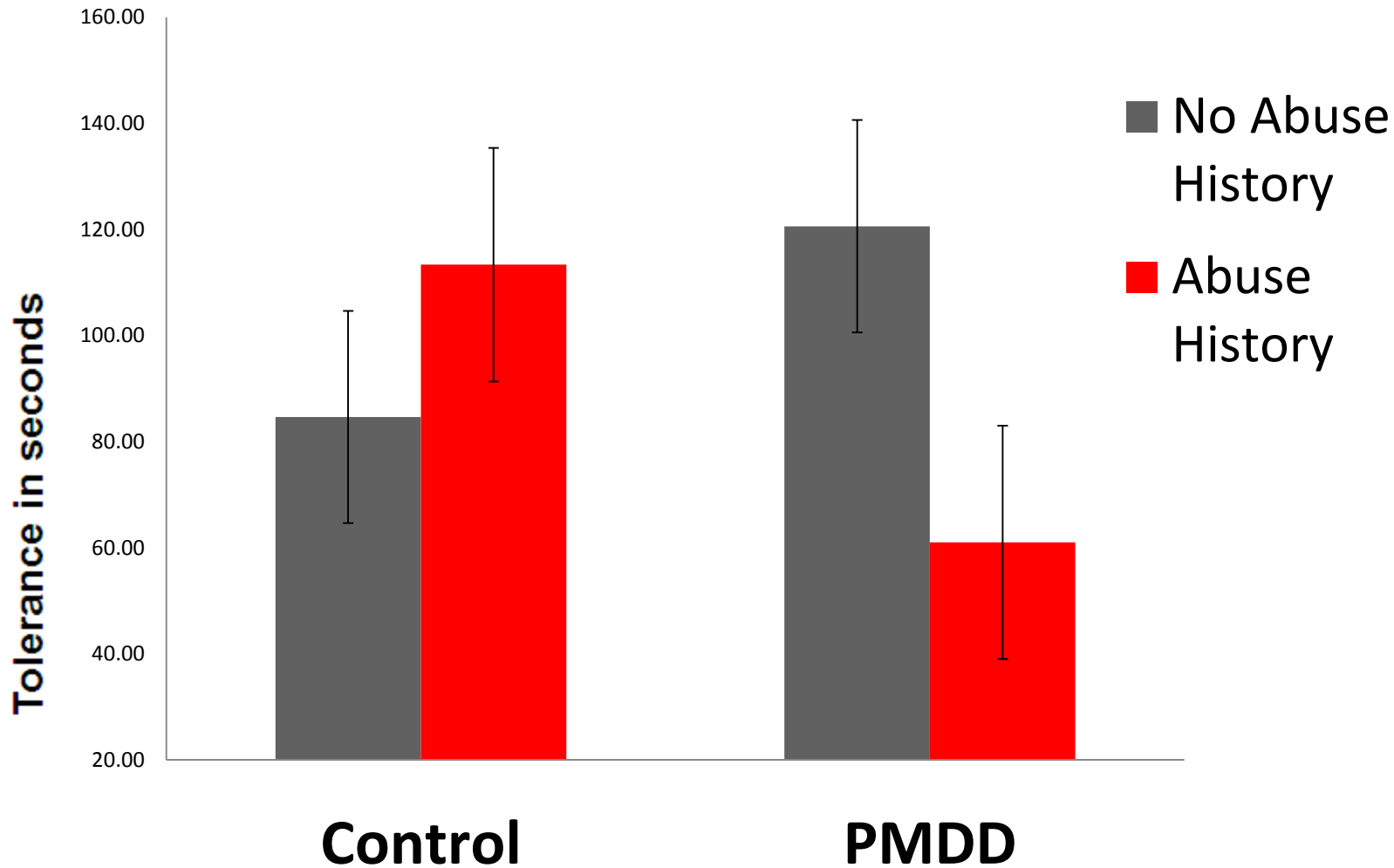


Cold Pressor Tolerance

Interaction of PMDD and Abuse History

$F(95)=3.78$

$p=.05$



Does emotional pain show the same patterns as physical pain?

Link between physical and emotional pain

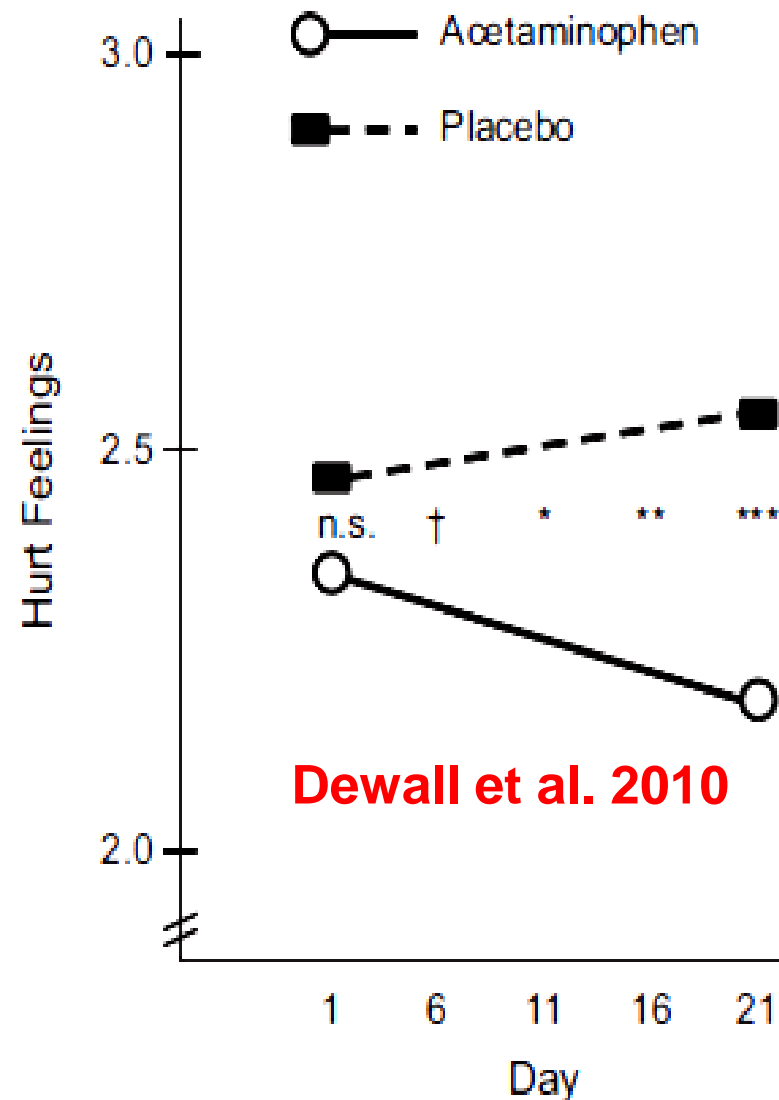
□ Averaged daily ratings for in 2 main phases of the menstrual cycle

□ Item format :

- “Was more sensitive to rejection or my feelings were easily hurt”

1 - not at all, 2 - minimal, 3 - mild, 4 - moderate, 5 - severe, 6 - extreme

Acetaminophen Reduces Social Pain



Dewall et al. 2010

Correlations between emotional and physical pain in all participants

N=102	Follicular sensitivity to rejection	Luteal sensitivity to rejection
Cold tolerance	r=0.08	r=0.08
	p=0.37	p=0.45
TQ tolerance	r=0.02	r=-0.01
	p=0.86	p=0.94

Correlations between emotional and physical pain in controls

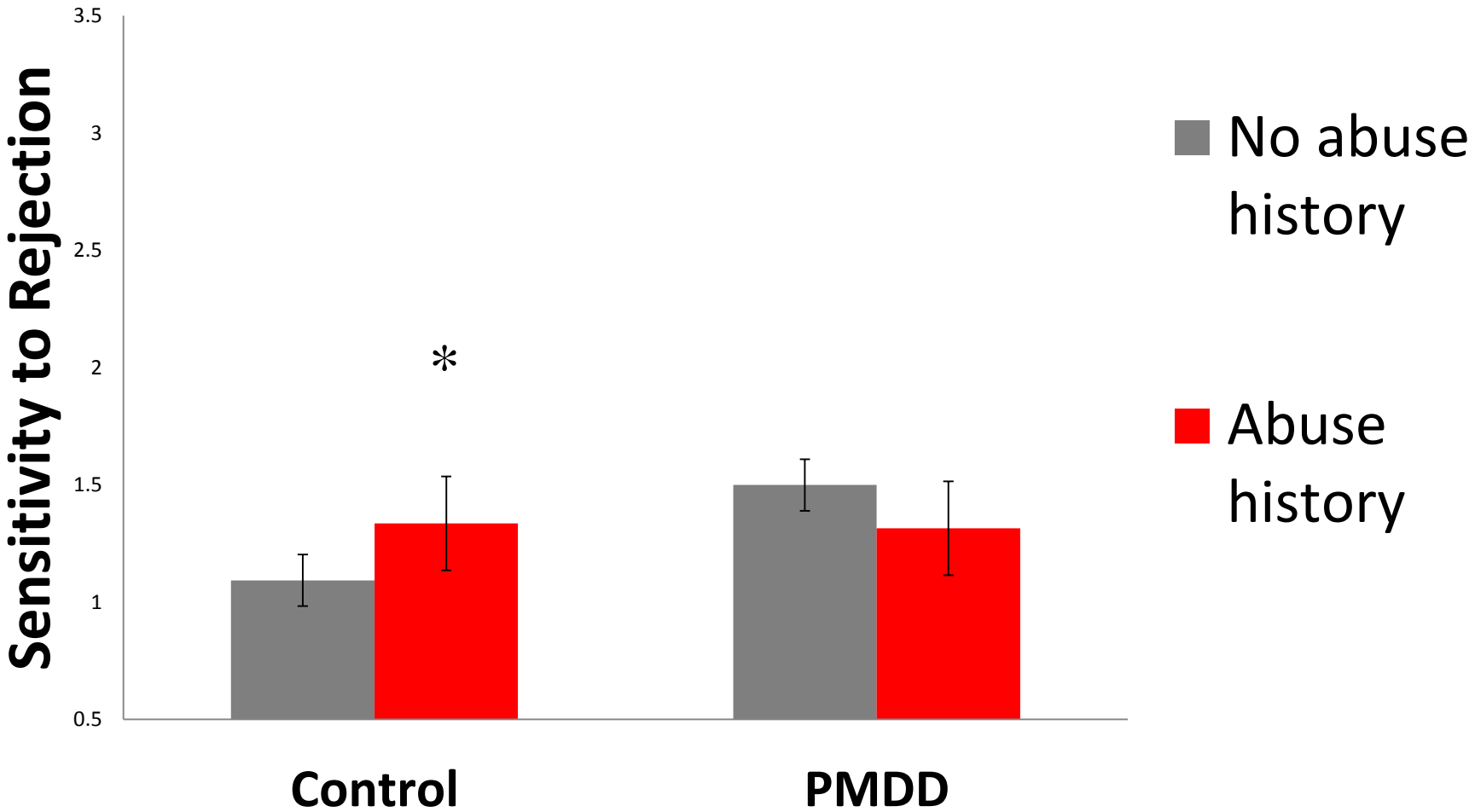
N=44	Follicular sensitivity to rejection	Luteal sensitivity to rejection
Cold tolerance	r=0.20	r=0.34
	p=0.19	p=0.02
TQ tolerance	r=-0.03	r=0.34
	p=0.89	p=0.02

Follicular sensitivity to rejection

Interaction of PMDD and Abuse History

$$F(1,101)=3.97$$

p=.05

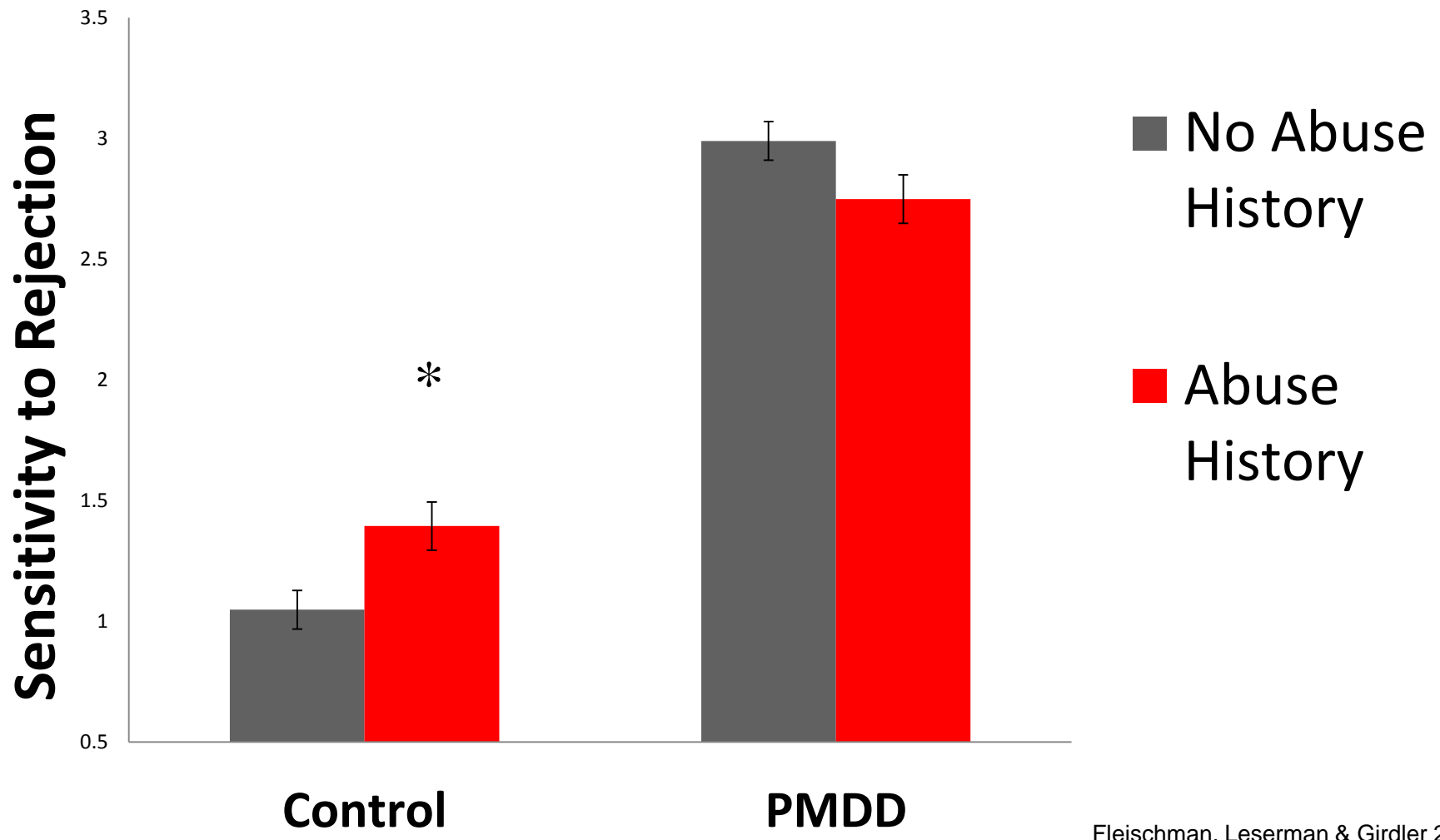


Luteal sensitivity to rejection

Interaction of PMDD and Abuse History

$F(1,101)=4.93$

$p = .03$



Conclusions

- PMDD does have a modulatory effect on the influence of abuse histories on pain sensitivity
- PMDD women with an abuse history are more sensitive to physical pain
- In contrast, the opposite occurs in non-PMDD women
 - Those with a history of abuse show less sensitivity to experimental pain but more sensitivity to interpersonal rejection

Conclusions continued

- ❑ **Reverse** relationship between sensitivity to rejection and pain tolerance in control women
- ❑ Results suggest abuse may identify a clinically distinct subgroup of PMDD women with regard to clinical pain syndromes
- ❑ Future analyses will explore differences between sexual and physical abuse in this ongoing study