RELIABILITY OF THE WITHIN-SUBJECTS VARIABILITY OF PAIN REPORTS AS ASSESSED BY THE FOCUSED ANALGESIA SELECTION TEST (FAST)

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BACKGROUND AND AIMS

In recent years there is a growing interest in the relatively new concept of within-subjects variability (or fluctuations) of pain reports.

While originally assessed based on daily pain intensity reports collected via diaries, there is also an alternative method based on experimental noxious stimuli, a method called the Focused Analgesia Selection Test (FAST).

While the FAST has proven as clinically relevant [1,4,5], the reliability of this construct has never been tested before.

The aim of the current investigation is to assess the test-retest and inter-rater reliability of the FAST outcomes.

METHODS

Participants: Healthy volunteers.
FAST: 49 stimuli randomly administered 7 times, of 7 different temperatures:

44 45 46 47 48 49 50 °C
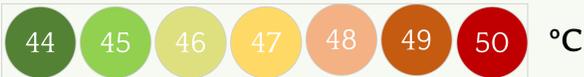
Participants are asked to report: "How much pain from 0-no pain, 100-worst pain imaginable" do you feel in response to (each) stimulus.

FAST main outcomes:
- Correlation coefficient (R^2)
- Intraclass correlation (ICC)
- Coefficient of variation (CoV)

Reliability Assessment of the FAST
The FAST was repeated one week after with same investigator (test-retest reliability) or with a different investigator (inter-rater reliability).

Time: 1 week   Inter-rater: 1 week

Reliability analysis:
- Wilcoxon signed-rank test (difference T1 – T2).
- Spearman correlation (<.40 weak, .40-.59 moderate, .60-.79 strong, >.80 very strong).
- ICC (<.50 poor, .50-.74 moderate, .75-.90 good and >.90 excellent).
- Standard error measurement (SEM).
- Bland Altman plots.

CONCLUSIONS

The FAST shows moderate test-retest reliability after one week, and less impressive inter-rater reliability.

These results are in line with the relatively lower reliability of dynamic quantitative sensory test tasks, such as temporal summation and conditioned pain modulation vs. the static tasks, such as thresholds and tolerance [2,3]. The results highlight the need to adequately train study staff, especially in tasks involving multiple stimuli.
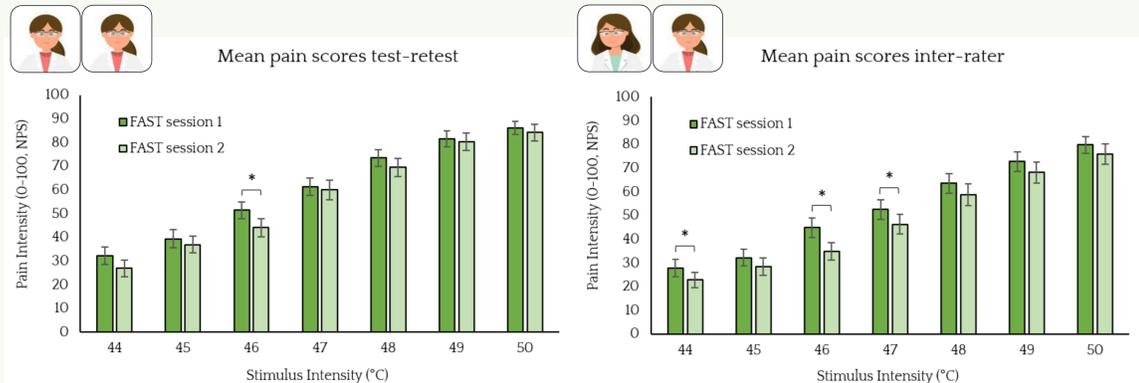
RESULTS

Participants: N=63; same investigator (test-retest reliability) N=33, different investigators (inter-rater reliability) N=30.
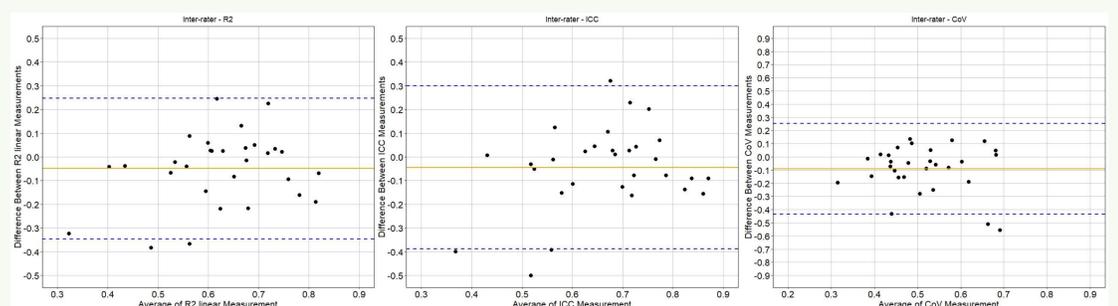The mean time between session was 8.40 (3.71) days, ranging 3 to 19 days.

Mean pain scores test-retest

Mean pain scores inter-rater

Test-retest descriptives of the FAST outcomes (N=33)

N=33	Session 1 Mean (SD)	Median	Session 2 Mean (SD)	Median	p. value
R^2	.62 (.12)	.63	.63 (.13)	.64	.432
ICC	.66 (.12)	.70	.70 (.12)	.71	.116
CoV	.38 (.21)	.34	.36 (.16)	.37	.879

Inter-rater descriptives of the FAST outcomes (N=30)

N=30	Session 1 Mean (SD)	Median	Session 2 Mean (SD)	Median	p. value
R^2	.60 (.16)	.62	.65 (.12)	.66	.133
ICC	.64 (.17)	.69	.69 (.13)	.67	.181
CoV	.34 (.15)	.31	.43 (.24)	.39	.016

Test-retest reliability (N=33)

	Correlation rs	p. value	ICC	p. value	ICC (95% CI)	SEM
R^2	.630	<.001	.560	<.001	(.272–.756)	.080
ICC	.560	<.001	.539	<.001	(.253–.740)	.075
CoV	.163	.364	-.032	.570	(–.381–.317)	.274
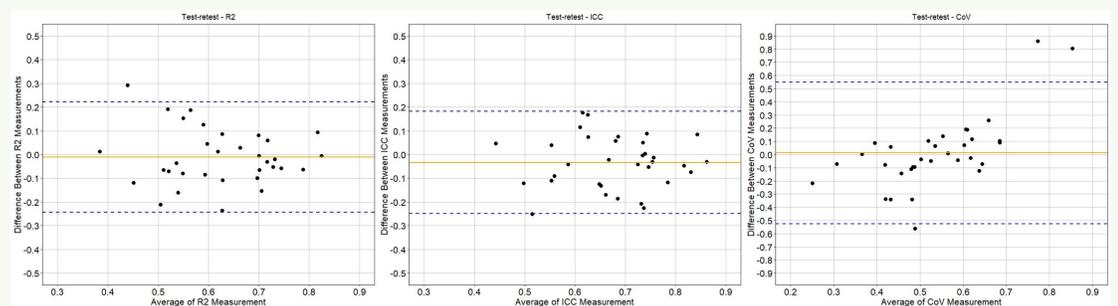
Bland Altman plots - test-retest reliability for R^2 (left), ICC (center), CoV (right).

Inter-rater reliability (N=30)

	Correlation rs	p. value	ICC	p. value	ICC (95% CI)	SEM
R^2	.388	.034	.399	.10	(.068–.655)	.116
ICC	.355	.054	.330	.032	(–.016–.609)	.147
CoV	.764	<.001	.566	<.001	(.240–.772)	.119

Bland Altman plots - inter-rater reliability for R^2 (left), ICC (center), CoV (right).

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Any questions? Curious about this topic? Scan our QR code or email: mariana.ribolhos6@gmail.com